Four Case Studies on Commercialisation of Government R&D Agencies

An Organizational Activity Theoretical Approach

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Division of Industrial Work Environment
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September, 2006
Dedicated to the blessed memory of my grandmother
Hajiya Fati Kumbungu
This is the ripen fruit from the seed she sowed those years ago.
FOREWORD

This thesis is a representation of my research work which I conducted from the year 2003 to 2006 with Dr. Ylva Fältholm as my supervisor. My pursuance of this doctoral study was made possible by the magnanimity of Professor Jan Johansson who accepted me in his division, and the kindness of Associate Professor Emma-Christin Lönnroth who recommended for my continuation after completing the International Masters programme in Ergonomics in January 2003. The extension of my scholarship by the Swedish Institute (which was initially to cover only the duration of my masters’ Programme) to cover the first one and half years (i.e. up to September 2004) of my doctoral study was also helpful. Yet still, a successful end to my study would not have been possible without the enormous financial support I received from the Department of Human Works. The department did not only continued with my scholarship from October 2004 to September 2006, but also provided me with the requisite support to visit all the different case locations during my data collection exercises, as well as the opportunity to make presentations of my work at different international conferences/workshops. In the same vein, it is due to the magnanimity of the four organizations that I was unhindered in my data collection exercises and which event made my research visits to each organization quite enjoyable.

The support granted me by each organization and the subsequent cooperation I had from all the ladies and gentleman whom I interacted was quite overwhelming. My sincere appreciation to the Chief Executive Officer of CARIRI (Trinidad), the Executive Director of BOTEC (Botswana), The President of CSIR (South Africa), and the Director of FRI (Ghana) for allowing me access to their respective organizations. Mr. Moses Mengu, the former Deputy Secretary-General of the World Association of Industrial and Technology Research Organization (WAITRO), and currently the Executive Director of BOTEC has been an influencing figure in this respect.

Aside the regular and at times “tensed” review of my work by Dr. Ylva Fältholm, and which interaction has enormously helped in keeping me on track, I also benefited from the noble suggestions of Professor Emeritus Bengt Sandkull of Lund University who read the first draft of my work in the year 2004, and also from the intermittent advices I had from Professor Emeritus Houshang Shahnavaz. I also benefited from the ideas that I
gathered from the seminar I had (together with Ylva) with Dr Bethel Suther, Dr. Monica Nilsson, and Mr. Hans Kylbäck at the Blekinge Institute of Technology in the year 2005.

At the initial stage of my research, I used the platform provided by the research group that was led by Professor Håkan Ylinenpää’s under the Research School’s ARENA for Management and Technology as a useful resource. My various presentations on this platform were rewarded with insightful critics and useful suggestions by my colleagues including, Johan Johansson, Johan Ohlsson, and Dr. Mats Westerberg. Getting to the closing stage of this work, I started a conversation on classical sociological theory with Associate Professor Peter Waara of my department, and this generated useful ideas that added to the insights provided in this thesis. The collection of papers from the Kiruna Conference I received from Associate Professor Lena Abrahamson was also insightful. Associate Professor Örjan Johansson was also an inspirational and motivational source. My colleagues Mr. Johan Ohlsson and Mr. Faramarz Helali were resourceful discussion partners with whom I held brainstorming sessions on issues that appeared illusive to me.

At the international level, Dr. Seth Chaiklin (the President of ISCAR) was an inspirational source. His kind words in relation to my research were quite encouraging. I also thank the organizing committee of the First International Society for Cultural and Activity Research (ISCAR) Congress in Sevilla, Spain, for the honour done me as the chair of Session 150 that discussed theoretical and methodological problems in activity theory. The interaction that Ylva and I had with Professor Yrjö Engeström at the ISCAR congress was also motivating.

I wish to acknowledge the support of the administration group. Going down to their offices was always an occasion for a snap hilarious conservation with Annika Linberg, or to say “hello” to Marie Boström, Anita Kero, Dagny Grunland, Marianne Andersson, and Babro Bladmo. Not forgetting the Hello’s from Lars Sundström, Stig Karlsson, Hans Viklund, Professor Håkan Alm, Associate Professor Elizabeth Berg, Dr. Maria Uden, Dr. Mats Jacobsson, Dr. Peter Bengtsson, Dr. Tore Ärlemalm, Dr. Anita Gärling and Magnus Stenberg, and also from my colleagues; Sara Alander, Guler Alici, Agneta Lundgren, Marie Sandberg, Anna Jansson, Leif Berglund, Karolina Parding, Tina Bäckström, Joakim Nilsson, Eira Andersson, Eva Källhammer, Matti Rantatalo, Johan
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Away from the office, the Fältholm and Blomqvist household was more of an extension of my home. Sharing moments together with Ylva and her husband Peter, sons Marc and Morgan, in the company of her parents, and also Peter’s parents were quite exhilarating. The same goes for the moments shared with Emma-Christin and her two sons, Salim and Dauda. Ingegerd and husband Chris, Hugo and wife Monica, son Santiago and daughter Natasha.

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Finally, I say thank you to all the ladies and gentlemen aforementioned, especially, Ylva for your care and motivation, and Jan for the trust and confidence you had in my capability. MAY YOU ALL BE BLESSED.

Myself and Dr. Ylva Fältholm (my supervisor) sharing a moment together with Professor Yrjö Engeström (with tie) at the First Congress of the International Society for Cultural and Activity Research (ISCAR) in Sevilla, Spain, in September 2005.

Mohammed-Aminu Sanda
Presentations at Conferences/Workshops.


ABSTRACT

In this study, it was established that internal environment factors that seemed to have constrained the attempts by most Research and Technology Organizations (RTOs) in the developing countries to implement and internalise a best management practices (BMP) model (i.e. as an instrument of change) towards commercialisation were rather unidentified contradictions caused by conflicts and disturbances which served, not only as sources of troubles, but also sources of innovation in the RTOs’ organizational activity systems. This observation provided an insight into the phenomenon that; despite the successful use of the BMP model by companies in the developed countries, especially in Europe, the efforts of most RTOs in the developing countries to implement and internalise the model were constrained by some undetermined environmental factors.

The question of how factors internal to the RTOs’ operating environments impacted on their attempts to implement and internalise the BMP model was explored, based on the proposition that; existing tensions in the RTOs activity system serve as internal environment constraints which influence the extent to which external environment factors negatively affect their efforts to implement and internalise the BMP model in their attempts to commercialise. Thus the goal of the study was to create an understanding with both practical and academic values (i.e. from the perspectives of organizational learning) on how the RTOs in developing countries can learn to deal with factors constraining the attempts by most of them to implement and internalise the BMP model (i.e. as an instrument of change) in their efforts to commercialise. The aim was to use organizational activity theory as a platform to provide an understanding of the possible internal factors preventing the RTOs from being successful in their implementation and internalisation efforts, with the objective of developing the requisite tools to guide future remedial actions.

A multiple-case study was carried out with four RTOs in four countries (i.e. South Africa, Trinidad, and Botswana) as cases. Qualitative data on how each case’s commercialisation process impacted on the sub-activity systems of its agents and/or groups (i.e. either as management teams or staff members, or collectively as workforce) were collected through structured interviews with key actors, problem-identification workshops, and surveys (using closed-ended self-completion questionnaires). Both
historical and actual-empirical analyses were carried out for each case using the “analysis of contradiction” approach, with the actions of identified groups in each case (i.e. management team, senior staff, and junior staff) as the sub-unit of analysis, and the actions of the collective group (i.e. workforce) as the main unit of analysis. The contradictions that existed within the organizational activity system of each case were identified, and the findings interpreted at the single-case level.

Results from these analyses showed that the case in South Africa was able to manage the contradictions that emerged in its organizational activity system, and hence was successful with its implementation efforts. The case in Trinidad was found to have experienced some constraints in its institutional rules and communities which generated some contradictions in its activity. Though not significant, the inability of the organization to fully manage it affected its implementation efforts, resulting in a moderate success. The case in Ghana was found to have been constrained in its institutional rule, community and division of labour. Due to its inability to manage the contradictions that emerged in its activity system, its commercialisation effort yielded a relatively poor outcome. The case in Botswana was found to have been highly constrained in its institutional rule, community and division of labour. Contradiction was thus high in its activity system, resulting in relatively failed implementation efforts. These analytic outcomes from the individual cases (i.e. analysis of contradiction) were then crossed analysed using the pattern-matching approach.

Based on the analyses outcome, an understanding was made on factors internal to the organizations’ operating environments which impacted on their implementation of the best management practices. This understanding provided the premise upon which the conclusion stated in the opening paragraph was derived.
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1

INTRODUCTION

This chapter starts with a background of my understanding on the efforts to commercialise some government research and development agencies in Ghana, and how that understanding later translated to a broad understanding of similar efforts by the governments of most developing countries. This is followed by an appraisal of related events that led to the packaging of some best management practices (BMP) to serve as useful resource for such agencies, and also the corresponding observations in their implementation that provided the need for this research. The BMP model, as a resource for large-scale organizational change is then critically discussed from macroergonomics perspectives, in terms of its transferability and implementability. An outline of the research problem, questions, goal as well as aims objectives are also given. The research journey, starting with an overview of an initial study at the MSc level that laid the foundation for this doctoral study, is also presented.

1.1. Background

Long before the initiation of this research, I happened to be aware of the challenges and the corresponding efforts of most of the research institutes under the oversight authority of the Council for Scientific and Industrial Research (CSIR) in Ghana to commercialise, as a result of the significant reductions in the subvention they were receiving from the government. These efforts towards commercialisation were in response to the government’s pursuance of an economic recovery programme (based on the free market concept) in the mid 1990s based on the advices of both the World Bank and the International Monetary Fund. Thus, the commercialisation of the CSIR, which is the umbrella body of fourteen research institutes in Ghana, was initiated under the government’s Private Sector Development Project (PSDP). This is a World Bank-financed project which aims at restructuring and commercialising the operations of the CSIR Secretariat and three research institutions in the industry sector, namely the Institute of Industrial Research (IIR), the Building and Road Research Institute (BRRI) and the Food Research Institute (FRI), in order to enable them provide the requisite technical support to industry and as
such, answer to the needs of the private sector. The objective was to help raise the technological and productive capabilities of Ghanaian local industries, and thus enhance their competitiveness. There is also the Capacity Development and Utilization Project, (CDUP) which is a United Nations Development Programme (UNDP) supported project. This is also aimed at the commercialisation of science and technology information in Ghana through the forging of linkages with the micro-scale, small scale and medium scale enterprises at the downstream levels of the construction, non-traditional exports and tourism sectors. In this regard, new structures and programmes were put in place to ensure the commercialisation of research. Firstly, a Central Business Development Unit (CBDU) headed by a Commercial Manager was established at the CSIR Secretariat. The function of this unit is to coordinate the commercialisation activities of all the institutes under the CSIR and serves as a focal point and a referred-centre for clients. Secondly, Business Development Units (BDUs) were established at the CSIR’s Research Institutes and Centres. The role of these BDUs is to undertake periodic assessment surveys on client needs, and also liaise with the CBDU on such matters as partnership agreements and commercialisation projects. They also report to the CBDU on the commercialisation activities (including revenue generated) in their respective institutes. Thirdly, a Central Commercialisation Monitoring Committee chaired by the Director-General was set up at the CSIR Secretariat to coordinate the work of the Commercialisation Monitoring Committees in the individual Institutes. Other activities under the Private Sector Development Project were an internet connectivity project and the establishment of an industrial design centre to be hosted by the last organization I worked with (i.e. Ghana Regional Appropriate Technology and Industrial Service, or GRATIS Foundation), and which was also engaged in a constrained effort to commercialise its services and products. Thus, prior to my departure from Ghana to Sweden in the year 2001 to study at Luleå University of Technology, I was fully conversant with the various developments relative to the CSIR’s commercialisation efforts. I was aware of the tension that prevailed between the staff and the

1 Actually, the organization I was working with (i.e. GRATIS Foundation) and all the institutes under the CSIR are placed under the same government ministry (i.e. Ghana’s Ministry of Science and Technology). In the beginning of the year 2001, the GRATIS Foundation and the Institute of Industrial Research (IIR) sought to collaborate in response to one of the country’s presidential initiative aimed towards the production of industrial starch. As a member of a joint-research working group in this collaboration effort, I also learnt a lot more (from my interaction with those from the IIR side) about the tensions generated within the CSIR as a collective body as a result the continued constraints to its commercialisation efforts.
management, on one hand, and with the external consultants for the commercialisation project, on the other. This tension resulted in the external consultants withdrawing their services. It then became apparent to all and sundry that the commercialisation effort of the CSIR was clearly constrained. The emergence of such a development also created a platform for what I might term here as the “fault-finding” exchanges between government technocrats and the affected staff members of the CSIR. This gave rise to a scenario whereby the government continued to point its fingers at the CSIR staff for lack of success in the commercialisation effort. In the same vein, the CSIR staffs also pointed their finger at the government for lack of success. Thus at the onset of the student project phase of the master programme in industrial ergonomics in the year 2002, my developed interest in the field of macroergonomics, specifically in the area of organization design and management came into play. This is by virtue of the fact that macroergonomics is concerned with the analysis, design and evaluation of work systems² (with the term work referring to any form of human effort or activity, and the term system referring to sociotechnical systems which can be a single individual using a hand tool or as complex as a multinational organization). As a result of this interest, my desire to gain an understanding of the continued failures of those organizations in my country to commercialise then blossomed and subsequently resulted in my writing a project proposal to this effect. I discussed my proposal with Mr. Moses Mengu, who at the time was the Principal Executive Officer of the World Association of Industrial and Technology Research Organization (WAITRO), and whom I knew (as an acquaintance) to be conversant with the commercialisation efforts of the CSIR in Ghana. Mr. Mengu did not only read my proposal, but introduced me to a report on a “best practice” project he and five others undertook under the auspices of WAITRO. I will refer to this project report as Mengu

² Hal Hendrick (2002) has explained that a work system consists of two or more persons interacting with some form of (1) job design, (2) hardware and/or software, (3) internal environment, (4) external environment, and (5) an organizational design (i.e. the work system’s structure and processes). Job design includes work modules, tasks, knowledge and skill requirements, and such factors as the degree of autonomy, identity, variety, meaningfulness, feedback and opportunity for social interaction. The hardware typically consists of machines or tools. The internal environment consists of temperature, humidity, illumination, noise, air quality, and vibration. It also includes psychosocial factors. The external environment consists of those elements that permeate the organization to which the organization must be responsive to be successful. Included are political, cultural, and economic factors. Of particular importance is the degree of stability or change of these external environment factors and, taken together for a given work system, the degree of environmental complexity they present to the organization. The organizational design of a work system consists of its organizational structure and the processes by which the work system accomplishes its functions.
and Grier (1999) in this write-up. This report expanded my understanding of the practices entailed in the commercialisation process that the Council for Scientific and Industrial Research (CSIR) in Ghana as well a host of other RTOs in most developing countries have tried to implement. It then became obvious to me that the constraints faced by the CSIR in Ghana towards its efforts to commercialise were not an isolated case reminiscent to only one country. I came to the realization that similar government agencies in other developing countries had also been engaged in similar efforts to commercialise their operations. It then became obvious to me that the efforts of most of such organizations were also constrained. As a result, I came to the realization that most RTOs in developing countries harbour the desire that a way will be found to make it possible for them to override the constraints they have been facing, so that they can achieve complete success in their implementation of the best management practices. Thus, after divulging the contents of Mengu and Grier (1999), I shared in their conviction on the potentiality of the best management practices as an effective instrument to assist RTOs in their efforts to commercialise. It is this conviction that drove me to seek a scientific understanding on the environmental factors contributing to the constrained efforts of most RTOs to implement the best management practices.

1.2. RTOs and Best Management Practices.

Small and medium-scale enterprises (SMEs) have been recognised as critical in the economic and social development of most countries. They are especially important for their role in job creation with low investment, regional development, as suppliers to large companies, entrepreneurship development, and for new technology-based firms, innovation of new products and processes. In this respect, institutions such as the Organisation for Economic Co-operation and Development (OECD) has

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Based on the definition for developing countries by the United Nations Industrial and Development Organization, i.e.; small-scale enterprise (employing 5 to 19 workers), and medium-scale enterprises (employing 20 to 99 workers).

\[4\]

The OECD plays a prominent role in fostering good governance in the public service and in corporate activity. It helps governments to ensure the responsiveness of key economic areas with sectoral monitoring. By deciphering emerging issues and identifying policies that work, it helps policy-makers adopt strategic orientations. It is well known for its individual country surveys and reviews. The OECD groups 30 member countries that share a commitment to democratic government and the market economy. It has a global reach based on its active relationships with some other countries, non-governmental organizations and the civil society. Best known for its publications and its statistics, its work covers economic and social issues from macroeconomics, to trade, education, development and science and innovation.
provided guidance for donors on support for the private sector in development which emphasizes the importance of SMEs (OECD, 1994). It recognizes the importance of host country policies, including those providing a stable economic environment, those which allow entrepreneurs to benefit from their enterprises and those which reduce unnecessary regulation of enterprise. In most developing countries, SMEs are assisted by Research and Technology Organizations⁵ (RTOs). This assistance is very important, because as it has been observed by Bhalla and Dilmus (1991), while it seems clear that all developing countries must develop appropriate policies to encourage SMEs to achieve adequate performance in line with rapidly changing technologies, and while it seems that some developing countries will successfully compete in high technology industries, it would also seem that the job of achieving technological mastery is much broader than mastering any single technology. The RTOs are government agencies that were formed in most developing countries during the 1960s to provide technical and business extension services, testing facilities, problem solving services as well as research and assistance to SMEs. In this regard, the ability of RTOs to serve SMEs effectively is an important determinant for the success of SMEs in meeting the competitive challenge of the marketplace. According to Mengu and Grier, it is clear that, irrespective of government policies, SMEs in most developing countries cannot attain their full potential without improvements in their ability to access, absorb, adapt, and exploit new technologies and business techniques. In this context, RTOs play an important role in making this happen. But as Mengu and Grier have argued, the RTOs must provide services to SMEs with the highest level of effectiveness and efficiency to best enhance the capacities of these SMEs to innovate and ultimately to be able to improve their competitiveness and sustainability.

The past three decades has seen the growth in the establishment of RTOs in many developing countries. Originally, these RTOs were mostly structured to function alongside other state-owned parastatals as fully government subsidised agencies. As such, they operated as state-controlled non-profit making agencies, mostly offering free products and services to SMEs. Starting from the mid 1980s, however, the orientation of these RTOs as fully subsidized government agencies started to change. Along this line of change, most of them experienced technological

⁵ During the resurgence of industrialization throughout the world in the middle and late 1960's, a large number of industrial and technological research institutes were established.
transformations in a bid to provide them with the capacity to start generating supplementary income to cater for the reduction in the level of government subsidy they receive to support their operations. The rationale behind the changed images of the RTOs is related to the fast-changing environment in most developing countries due to economic recession with capital taking a higher surplus of wealth. As it is noted in an Asian Development Bank (2001) report, the privatization of public sector enterprises in most developing countries has been a recurrent theme on the international development agenda since the early 1980s. Assistance for this purpose from international aid agencies has been cautious, placing priority first on supporting stabilization programmes and improving existing operational efficiencies. Assistance has also taken the form of technical and financial support for institutional strengthening, enhancing autonomy, and price reforms. The consequence of this was that most governments in the developing countries were compelled by institutions such as the World Bank and other international donor agencies to pull back from their roles as the redistributors of income. This development led to key aspects of the economies of most developing countries being reformed to align with the free and competitive market economy paradigm. In this regard, as noted by Davis et al. (2000), the concept of enterprise was promoted in these developing economies and these were marked by the privatization and deregulation of government agencies. The justification for this, according to Laban and Wolf (1993) is that privatization can lead to greater factor productivity in most cases and that the increased overall factor productivity will lead to better growth. The conventional wisdom in this respect is that the profit incentive will spur private organizations to improve production processes in a way the government, lacking those incentives, would be unable to do. The RTOs were affected in this respect, and the consequence

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6 An Asian Development Bank (2001) report notes that the International Finance Corporation (IFC), the Organisation for Economic Cooperation and Development (OECD), and the World Bank have promoted privatization in structural policy reforms since the mid-1980s. Monitoring and evaluation of experience have provided a valuable global perspective while identifying changes in the operating environment necessary for privatization reforms. Mixed and often seemingly unpredictable results revealed early the need for a liberal macroeconomic framework, deregulation of banking, and reforms to enhance competition and enforce good governance. Appropriate policy reform for capital market development, together with better management of pension funds and other assets, has become part of the evolving process for effective privatization.

7 According to Davis et al. (2000), privatization is a key part of the so-called “Washington Consensus” they note that both the IMF and the World Bank include privatization of some or all state-owned enterprises as an integral part of their structural reform packages. The World Bank is the leader in promoting privatization as an economic reform policy, but the IMF has cooperated closely with the World Bank in this regard. The majority of IMF programs in recent years have included some form of conditionality on privatization.
of their privatisation is the significant reduction in the subsidy they used to receive from their governments (Mengu and Grier, 1999). The consequences of these reductions in subsidies were the emergence of continued pressure from governments for the RTOs to become self-income generating. This situation resulted in most developing countries making several efforts to improve the technology capacity of their RTOs. This was based on the conviction that the RTOs would possess the ability to provide effective services and products to potential clients, and hence be able to generate an equivalent income to compensate for the cuts in government’s financial support to them.

1.2.1. Mengu and Grier’s appraisal of RTO management processes.

Starting from the 1990’s, it became obvious that despite most RTOs in the developing countries undergoing technological transformations, many of them were still unable to operate as commercial enterprises. This phenomenon was studied by Mengu and Grier (1999) in a research covering over sixty RTOs as well as other organizations that support RTOs in thirty-one countries from Asia, Africa, Europe, North America as well as Latin America and the Caribbean (see appendix 1 for a list of the specific organizations). They noted that their study accorded them a much deeper understanding of why some RTOs are successful in their operations while others are not. They therefore concluded that the key impediment to successful RTO performance is often not technology, but management. According Mengu and Grier, the RTOs exist in different contexts and are established for a wide variety of purposes. Thus in order to establish a common understanding of the basic structure of an RTO, they (and other members of a project team) developed a systematic methodology that categorised the management operations of an RTO into major process areas. These processes were further divided into sub-processes which provided them the basis for deriving the daily operational practices that is used by an RTO to fulfil its functions. Mengu and Grier’s schematic representation of an RTO is shown in figure 1a (see next page). As Mengu and Grier explain, this schematic representation of the RTO shows that an RTO is created from the desire of a society or political unit to address the technological needs of its industries. But as they also point out, the society has cultural and industrial characteristics that affect how the RTOs are structured as well as how they operate. Thus, Mengu and Grier’s characterisation of an RTO, in relation to the number labels shown in figure 1 is that; it is created and given direction through the actions of an
ownership or mandating authority, and processes related to this are addressed in governance (1). They also view the RTO itself as consisting of a number of process areas. In this respect, management processes in the RTOs are examined in the practices of organizational management (5) and project management (6).

Figure 1a: Mengu and Grier’s (1999) conceptual model of the RTO.
Similarly, the act of creating awareness of the RTOs capabilities and the selling/contracting of their services is addressed in the practices of Business Development (4). Also, the activities that the RTO does for its clients and beneficiaries (such as, research, development, consulting, testing, and training) are categorised under RTO Services (3). These process areas constitute the heart of the RTO and are supported by other processes categorised under Financial Management (2), Personnel Management (8), and Capability Building (7). Processes related to the RTOs external environment and its links with external agencies are placed under Networking (9) and Government Policies and Programs (10). According to Mengu and Grier, this conceptual model has enabled them to identify the practices that are employed by the RTOs for managing and operating each of the process areas I have highlighted above. They noted that a list of fifty-seven sub-processes was derived from the main process areas. Furthermore, the objective of each sub-process was established and methods to evaluate its effectiveness were created. But as they also pointed out, the quantitative and qualitative data required for objectively measuring the effectiveness of a process or sub-process were, in most cases, not provided by the RTOs. As such, proxy performance indicators which although did not measure the process directly, according to Mengu and Grier, provided a good indication of the effectiveness of the practice used in each case. I have summarised below the RTO management processes that were appraised by Mengu and Grier in their study.

Under RTO governance, they appraised issues relative to ownership and legal structure, the constitution, size and choice of the board, the RTO’s mission and vision, its level of autonomy and mandate, as well as the underlying processes of internal decision-making and change management. Concerning financial management, they appraised the RTO’s funding methods, especially on the issue of government funding and establishment of funding level, grant decision-making, flexibility in use of funds, the retention of surplus/loss as well as the process of financial management system. On the issue of the provision of services, Mengu and Grier looked at service type and mix, the determination of services as well as ways of ensuring service quality, and then the provision of funding and service. They also looked at how business development was managed and financed, the rewards for success, the awareness creation strategy, the identification of both individual and group needs, as well as the methods for project pricing and cost reduction to clients. Their appraisal of the RTO’s organizational management relates to the styles used, the grouping of
capabilities, and unit responsibility level. Regarding project management, they focused on issues relative to the structure and authority of project management, the selection of grant funded project, project assignment, contract signing authority, and project management and follow-up. Additionally, Mengu and Grier looked at how decision on capability building was made and opportunities identified, as well as the funding of staff improvement, and capital investments. Regarding Personnel Management, they appraised processes relative to recruitment/hiring, promotion to managerial positions, advancement of technical staff, compensation payment and decision on package, non-pay based rewards, staff evaluation and their discharging, as well as internal communications. They also looked at some aspects of networking, especially the RTO’s relations with technology providers and industry. Lastly, their appraisal on policy and programmes looked at areas that have to do with the role of RTOs in science and technology policy as well as their use of government programmes.

1.2.2. Best management practices to enhance RTO commercialisation.

Mengu and Grier have noted that their studies of RTO functions in the European Union and elsewhere revealed a great deal of consensus regarding the RTOs’ underlying business principles and the practices used in their daily interaction with client enterprises. They observed that a number of RTOs in the European Union and other developed countries have established networks for the exchange of business principles and best practices of their daily operations as a means for strengthening their management capabilities. Mengu and Grier also noted that by virtue of the RTO management processes they appraised, the World Association of Industrial and Technology Organizations (WAITRO)\(^8\) saw the potential of establishing which of these principles and practices to consider as ‘best management practices’\(^9\). In this respect, they asserted that WAITRO benchmarked\(^10\) ten successful RTO management practices (i.e. best practices and their underlying principles) which it tried to assist some

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\(^8\) WAITRO was founded in October 1970 under United Nations auspices. It provides the platform for effective liaison and exchange of ideas, information, experience and resources among research organizations.

\(^9\) Using relevant performance indicators, all the practices identified within the RTOs were labelled as best practices (first choice), good practices (acceptable alternative), or bad practice (to be avoided).

\(^10\) The assigned reason was that; benchmarking is a powerful tool that is currently being used to assist many companies to improve in order to meet the ever-changing demands being placed on them by their client competitive environment.
RTOs in the developing countries to implement and internalise. The rationale for this is that the ten best management practices stand to provide the RTOs with the information they need to re-structure their management systems and thus improve their capabilities to serve industry better. The management areas covered by the ten best practices, the insights of which I have summarised below, are as follows - governance; policy and programming; financial management; RTO services; business development; organizational management; project management; capacity building; personnel management; networking.

**Governance**

Under governance, the best practice requires that the RTO be controlled by an industry association if serving an industrial sector or by a regional government if serving a region. Also its legal structure should be such that it has financial and decision making autonomy (i.e. as an agency or a foundation). A majority of representatives on the RTO board are to be industry clients and the board’s mandate is to be defined according to the role its clients serve in the innovation chain. Additionally, the RTO chief is to be made to nominate people to sit on the board with the owner approving (or rejecting) his/her (i.e. the RTO’s chief) nominations while the RTO management is to have the responsibility of identifying the needs for change and having the power to address those needs.

**Financial Management**

Concerning financial management, the RTO is to have an accounting system that provides total, unit, and project financial information as soon as possible (on-line is best, then weekly, biweekly). The system is to be made accountable for deliverables rather than to controls that govern how money is spent. Also, it is to be able to retain surpluses and losses.

**RTO Services**

With respect to services, RTOs are to offer few primary service types which give better results than many service types. Also market pull (industry committees, consultations) is to be seen as the best way to determine the service types to offer. Feedback processes from clients (meetings, surveys) are also to be seen as a necessary of ensuring service quality. Grant funding must be provided in proportion to client revenue and
be used to fund service development rather than administration. Identifying and applying appropriate technology must often be seen as offering better solution than developing new technology.

Business Development

On business development, a corporate business development group is to handle awareness and market strategic planning, while project managers conduct the bulk of selling activities. Rewards for business development (financial and recognition) is to be seen as effective. Business development costs must be monitored at the corporate and unit levels. Awareness activities focusing on major client groups must also be conducted. Client needs must be identified based on input from staff, board and regular meetings with industry groups.

Organizational Management

Concerning organizational management, project-oriented management style (base on objectives) must be seen as the best option while hierarchical management style (base on job description) is to be seen as bad. Also the business units are to be made to have full responsibility for financial performance.

Project Management

With respect to project management, project teams that have the appropriate expertise for each project (regardless of where individuals report in the organization) are to be formed. Project managers are to be given the authority and responsibility to manage projects without interference once they have been thoroughly checked by management with contact expertise. A committee of industry and RTO experts is to decide on grant-funded projects. Also, individuals at all levels are to be made to interact with clients and formulate projects. Additionally, project managers are to have financial management systems that will enable them monitor expenses against project budgets, and also progress against project plans.

Capability Building

As concern capability building, inputs from the market (i.e. industry), a client-majority board (i.e. those following technology), and an effective
performance management system, are all to be seen as necessary for identifying capability-building opportunities. Also concerted effort by management teams to make capability-building plans must be seen as much more effective than decisions by individual managers.

**Personnel Management**

Approach to personnel management is to be such that a flexible recruitment system is put in place and which must use input from managers, co-workers and human resources department to select appropriate new staff and promote existing ones. RTOs must set market-competitive salary scales with market salary data, and reward high performance. Non-pay based awards (formal and informal recognition events) are to be seen as effective motivators. A compensation package decision is to be made by the management team for each staff person using the results of individual performance evaluations. Employees are to be evaluated against common objectives by their supervisors and the senior management team, and the results are to be communicated verbally and in writing.

**Networking**

The RTO must support some low-cost and some high-quality networking methods with technology providers and in this regard use at least four methods of interaction with industry in order to understand client needs.

**Policy and Programmes**

Regarding policy and programmes, the RTO is to concentrate on providing appropriate technology. At the same time, it must have access to government programmes for which it competes with other technology providers.

According to Mengu and Grier, during the development phase of these best management practices, over 200 RTOs funding agencies and industry associations were contacted, and the collaboration yielded the information required to carry out the identification of the best practices. They noted that during the implementation phase of these best management practices,
a WAITRO team\textsuperscript{11} selected and worked closely with about fifteen RTOs. They indicated that among these fifteen RTOs, most were unable to implement the recommended practices successfully. The few that they classified as reporting considerable successes are TUBITAK Marmara Research Centre (Turkey), ITAL Packaging Institute (Brazil), Industrial Technology Institute (Chile), Tanzanian Industrial Research and Development Organization (Tanzania), Scientific Research Council (Jamaica), and Caribbean Industrial Research Institute (Trinidad). They further indicated that other RTOs, on their own initiatives, also tried to implement the best management practices or used them as a guide to facilitate their change programmes. These include Council for Scientific and Industrial Research (South Africa), PERA International (UK), Modernization Forum (USA), Council for Scientific and Industrial Research (Ghana), Saskatchewan Research Council (Canada), Alberta Research Council (Canada), Centre de Recherche Industrielle du Quebec (Canada), Central Metallurgical Research and Development Institute (Egypt) and Industrial Chemistry Research Institute (ICRI) (Poland).

\textbf{1.3. Explicit Critique of the BMP model: Towards my Research Justification.}

Mengu and Grier have highlighted the fact that the implementation of the best management practices model (i.e. as instrument for organizational transformation) by most of the RTOs was assisted by experienced management consultants and supported with international donor funding, the belief being that the availability of such resource could ensure the success of the practices’ implementation. But, as I have previously noted in sub-section 1.2.1, Mengu and Grier have acknowledged a form of limitation relative to some aspect of their data collection, and which data provided the base for developing the BMP model. As they explained, some of the quantitative and qualitative data which they used in objectively measuring the effectiveness of the processes or sub-processes were not collected in the RTOs. Rather, they used proxy performance indicators which did not measure the processes directly, but yet provided them with good indications of the effectiveness of the practices used in each case. Thus the issue of critical interest that arises here, in my opinion, has to do with the cross-boundary transfer and implementation consequences of the BMP model, especially when it is viewed as a new technological tool (i.e. from the perspectives of macroergonomics), relative to the limitation

\textsuperscript{11} The team consisted of six members and included both Mr. Mengu and Mr. Grier.
associated with its development. Therefore, in the sub-sections that will follow, I will critically reflect on the BMP model, firstly from the perspectives of its development as an instrument to enhance a large-scale organizational change, and then from the perspectives of its transferability as well as its implementatibility.

1.3.1. BMP model: A universal tool for large-scale organisational change in RTOs?

Macroergonomics, as I have noted in section 1.1, is the study and design of jobs, organizational strategy, organizational structure, incentive systems, and training programmes, in conjunction with the technology (i.e. the BMP model in this study context). According to Hendrick (1996), macroergonomics evolved from socio-technical systems theory (e.g. Cherns, 1976; 1987; Trist and Murray, 1993; Taylor and Felton, 1993; Emery and Trist, 1965), and is focused on designing these features of the organization so that human skills and abilities, as Majchrzak (2001) puts it, are effectively used to achieve personal and organizational goals. Based on this perspective, macroergonomics has been defined conceptually by Hendrick as a top-down socio-technical systems approach to the design of organizational and work system structures, and to related jobs concerning human-machine, human-environment, and human-software interfaces. Thus, according to Hendrick (1995), an important outcome of macroergonomics intervention (which I perceive as reflective of the RTOs’ attempt to implement and internalise the BMP model) is a culture change in which the organizational culture is primarily defined by the organization’s core values. By taking this observation into account, I raise the issue of whether the BMP model really has a universal characteristic which could have enabled its successful implementation and internalisation in the RTOs in different countries whose organisational cultures are primarily defined by their organizations’ different core values. Probably, the universality attached to the applicability of the BMP model by Mengu and Grier (1999) can be explained using an argument by Kleiner (2002) to the effect that, at the outset of a large-scale organizational change, it is important to make a simple, but profound assumption that the change is valid (i.e. the targeted change should be supportive of and aligned with the organization’s purpose). As Kleiner argues, structural changes should normally support strategic changes and all strategic changes should be aligned with the organization’s purpose. Given this, one can then assume that most changes will also result in some type of performance
improvement and/or culture changes. But as Kleiner further points out, there is the need to recognize the fact that many organizations pursue change that does not necessarily meet these criteria. This, in my opinion, appears to be the case with those RTOs whose pursuit for change was to have been facilitated by the BMP model. In this respect, I view as problematic in itself Mengu and Grier’s perceived characterisation of the BMP model as a universal tool which can enhance the large-scale organizational changes required by RTOs in developing countries in their efforts to undergo commercialisation.

1.3.2. The BMP model as a new technological tool: A critical reflection on its transferability.

Mengu and Grier (1999) have perceived the ten RTO best management practices (highlighted in sub-section 1.2.2 above) to hold much potential for the future commercialisation of RTOs. Their conviction was strengthened by the expressed desire of a number of national and international agencies to utilise the best management practices in their programmes. These agencies included the United Nations Industrial Development Organization (UNIDO), United Nations Conference on Trade and Development (UNCTAD), the Commonwealth Science Council, Caribbean Community and Common Market (CARICOM), Southern Africa Development Council (SADC), and the European Association of Research and Technology Organizations (EARTO). The challenge to the potentiality of the best management practices, from the perspectives of Mengu and Grier, lies in finding out why most of the RTOs were unable to implement the best management practices. This, in my opinion, brings to the fore the issue of whether ergonomics consideration was given a credence in the process of transferring the BMP model (i.e. as a new technology) to the RTOs in the IDCs. The relevance of such an issue in the technology transfer process, as Shahnavaz (2002) has emphasized, is that; the level of ergonomic awareness by the technology supplier and receiver firms, as well as their commitment to ergonomic issues, will greatly influence their decision regarding how appropriately transferred-technology will be put into effect. This observation by Shahnavaz, in my opinion, is indicative of the fact the transfer of a technology (such as the BMP model) with universal-functionality is bound to encounter environmental difficulties, irrespective of whether the transfer is from the developed countries to the developing ones or not, as it is indicative from a research finding by reported by Yllinenpää (1996). In a research on the
exportation of training services from Sweden to Russia, Ylinenpää found similarities as well as differences in the way practices were applied by Russian and Swedish SMEs. The differences revealed may, to a significant degree, be seen as differences in market economy maturity. Ylinenpää notes that an infant market economy such as the Russian one operates very much according to a different set of “rules of the game” than a mature market economy such as Sweden. These different business logics certainly influence the strategies and activities of the small businesses operating in these markets, including their strategies and methods for competence development. This observation by Yllinenpää is synonymous to what Shahnavaz (1988) has found in relation to the way the market economies of most industrial developing countries operate. According to Shahnavaz, organizational hierarchy and the down-flow of authority are common practices within organizations in the industrial developing countries (IDCs). He noted that values, such as democracy, empowerment, and power sharing in decision-making, which are regarded as key issues in modern management for proper utilization of human resources (i.e. with regard to intelligence, creativity, problem-solving potential, and ingenuity), do not agree with the cultural sense of hierarchical power in organizations in the IDCs. He also explained that the feudal system of social hierarchy and its value system are widely practiced in most industrial workplaces in the IDCs and this makes, for example, the participatory management approach (which is regarded as essential for the new production mode of flexible specialization and a motivated workforce) a difficult endeavour. As such, Shahnavaz (1989) has argued that an ergonomically designed system that is made for a certain population cannot be used efficiently and safely by a different population in a diverse environment. By implication, I also argue that, even if the BMP model is perceived as an ergonomically designed technology, it is likely that it would not have functioned efficiently in the various RTOs in the IDCs by virtue of their (i.e. RTOs) different diverse environments.

1.3.3. The BMP model as a new technological tool: A critical reflection on its implementability.

Ravenaugh (1994) views implementation as the challenge that comes at the end of all new (and old) methods for improving organizations. In this context, practices related to strategic planning, architecture development, change management, new information systems technologies, business process re-engineering and total quality management are concepts that
have been advocated to improve radically, organization performance. However, advocates of each concept struggle when questioned about successful implementation (Martinsons, 1993; Cash et al., 1988; Deshpande and Parasuraman, 1986). As Ravenaugh notes, in strategic planning, literature abounds on how to develop a plan, but there is comparatively little said about how to implement a strategic plan once it is developed. According to Shahnavaz (2002), there are reports (such as Ketchum, 1984) that confirm the desirability of introducing autonomous work systems in the working cultures of organizations in the industrial developing countries. In the case of the RTOs, this desirability is reflected by their attempt to use the BMP model to guide the introduction of new work systems in their working cultures. But Shahnavaz (1998) has also argued that since organizational change is a difficult, time consuming, and expensive process, then cultural factors, including the way people interact with each other in an organization and commit themselves to organizational goals, are complex matters that have significant bearing on the success of an organizational change. This therefore raises an interesting issue relative to the role of the consultant, and the corresponding confidence reposed in him/her to succeed, as was the case with the RTOs’ best management practices implementation process. An interesting point in this regard, as it is noted by Virkkunen and Kuutti (2000) in reference to Robey, Wishart and Rodriguez-Diaz (1995) is that; practicing managers, consultants and members of organizations increasingly face problems in mastering organizational learning and transformations with the traditional conceptual tools of management. Elaborating on this further, Virkkunen and Kuutti wrote that;

Stewart (1993) estimated a few years back the failure rate of business process reengineering efforts to be as high as 70%. Beer, Eisenstat and Spector (1990) found in their study that organizational change programs fail astonishingly often. The fragmented state of theory carries over to prescriptions and intervention practices. Instead of analyzing the specific demands of the situation, “most practitioners carry a hammer and assume the presence of nails” (Edmondson, 1996). [Virkkunen and Kuutti, 2000, p. 292]

I find the expressions underlined by the quotation above to acknowledge the relative importance of the dichotomy that exist between theory and practice. As Gummesson’s (2000) observes, the contribution of the consultant to practice is backed by bits and pieces of theory. The sense I
derive from Gummesson’s point\textsuperscript{12} is that, the ability of the consultant to be successful in his/her endeavour is dependent on the availability of well established theories on the relative phenomena he/she is to help solve practically. In this context, since the different consultants who variously assisted the RTOs in their implementation efforts were unable to figure out the rationale behind the constraints encountered in the implementation processes, I have presumed that the problem which the RTOs face underlies a phenomenon\textsuperscript{13} with no theoretical clarity. In my opinion, this is not surprising, especially if one takes into account the differences that might possibly exist in the socio-cultural environments of the different RTOs. It is my view that such socio-cultural differences carry with them different languages of translation of the best management practices in the different RTOs, in terms of drawing a parallel distinction between talk and technique as well as ideas and practice. As Sturdy and Fleming (2003) argue, drawing such a parallel distinction is important, because it is seemingly unreasonable to assume that ideas will always be transferred and, even when they are, subscribing to and/or espousing them (i.e. talk) will always be associated with their enactment as techniques. An interesting illustration here is the introduction in the early 1990’s of the business process re-engineering (BPR) model as a best practice and which, as Hammer (1993) puts it, took many corporations by storm as a representation of a radical rethinking of an organization and its cross-functional, end-to-end processes. In a 1993 survey involving over 500 chief information officers (CIOs), Moad (1993) found that the average CIO was involved in 4.4 BPR-based re-engineering projects which was a significant increase in comparison to an average of 1.6 projects the year before. Yet, despite the excitement that surrounded the BPR model, the rate of failure for re-engineered projects were reported by both Stewart (1993) and Belmonte (1993) to be over fifty percent, while Hammer and Champy (1993) estimated the failure rate to be as much as a seventy percent. A reflective question that was raised by Ravenaugh (1994), in this regard is; why does a concept that is becoming so pervasive have such a large probability of failure? I view this question by Ravenaugh to hold

\textsuperscript{12} In his illustration of the difference between the consultant and the researcher, Gummesson made the following distinction:
- The consultant: Pecks at theory and contributes to practice.
- The researcher: pecks at practice (empirical data) and contributes to theory.

\textsuperscript{13} In a personal communication with Mr. Mengu during my problem analysis stage, he acknowledged that no one really seems to understand why the implementation efforts of most RTOs were being constrained, taking into consideration the quality of expertise and resources committed into the process.
much relevance today when it comes to the issue of new best practices and the consequences of their implementations. In this respect, and by paraphrasing Ravenaugh’s question, I also ask: why do new practices models, such as the BPR of the 1990s and the BMP in my study, appear to be so pervasive, but yet end up having a large probability of implementation failure? This question is therefore a signification of the phenomenon that is associated with the constraints encountered by most of the RTOs in the developing countries to implement and internalise the BMP model. My exploration of this phenomenon is thus underscored by the expanse of the research problem, the pursuance of which is to contribute scholarly to both theory and practice using the fragments of empirical data, as pointed out by Gummesson. Therefore, in the next subsections, I will provide an outline of my research problem, its underlying goal, purpose, objectives and also the research questions.

1.4. Research Problem

There is the realization by Mengu and Grier (1999) that despite the fact that the RTO best management practices have been used successfully by companies in the developed countries, especially in Europe, the efforts of most RTOs in developing countries to implement and internalise them are constrained by some undetermined environmental factors. Based on this premises and coupled with my relative curiosity, as it is reflected in my personal observations on developments within the CSIR in Ghana (as I have highlighted in section 1.1), I realize that the exploration of such a phenomenon in a scientific study is of high significance. It is this realisation that prompted me to study the RTOs’ best management practices implementation processes.

1.5. Research Questions.

In order for me to be able to carry out a well designed research on the phenomenon underlined by the research problem I have outlined in section 1.4 above, I (with the guidance of Professor Houshang Shahnavaz)14 used the logical framework approach15 (NORAD, 1999) to

14 Retired Head of the former Division of Industrial Ergonomics, Department of Human Work Sciences, Luleå University of Technology, Sweden.
15 According to the Norwegian Agency for Development Cooperation (NORAD), their logical framework approach is based on the “Logical Framework Method”, which is a way of structuring the main elements in a project, highlighting logical linkages between intended inputs, planned activities and expected results.
develop a problem tree (as shown in figure 1b below) in which I visualised the main causes of the problem and their corresponding effects.

![Problem Tree Diagram]

Figure 1b: Problem analysis tree for BMP model implementation by the RTO’s [Base on NORAD’s logical framework approach].

As it can be observed in the figure 1b above, my visualisation of the substantial and direct causes of the problem is placed parallel underneath it. In the same vein, the substantial and direct effects of the problem are placed parallel above it. Using this as a starting point, I reflected that the focus of a research into this problem (i.e. constrains encountered by the RTOs in their efforts to implement the best management practices) can be
outlined based on three specific questions. These questions, which in my opinion helped in shaping the character of my research, are as follows:

a) Why did the efforts of the RTOs to implement and internalise the best management practices end up being constrained? Are the constraints due to;

i. only factors external to their operating environment?, or

ii. only factors internal to their operating environment?, or

iii. Interplay of factors external and internal to their operating environment?

b) How can these RTOs learn to deal with such environmental factors and their possible interplay, in order to be able to successfully implement and internalise the best management practices?

Using the above questions as a fulcrum, I was able to define the scope of my research, in terms of its goal as well as its aim and objectives, as I will outline in the next subsections.

1.6. Research Goal.

The goal of this research is to create an understanding with both practical and academic values (i.e. from the perspectives of organizational learning) on how RTOs in developing countries can learn to deal with factors constraining the attempts by most of them to implement and internalise a BMP model (as an instrument of change) in their efforts to commercialise.

1.7. Aims and Objectives.

The aim of this research is to develop a framework which can be used by the RTOs to appraise their prevailing operating environment in order to identify possible constraints to overcome prior to future implementation of similar best management practice. This will ensure that such organizations are able to confront possible constraints and thus be successful in the future. Such success is to result in the improvement of their operational performances and output efficiencies, which stands to benefit both SME development and their national technological needs. This is based on the objective that all constraints preventing the RTOs in most developing
countries from being successful in their efforts to implement the best management practices will be identified and understood, so that tools for future remedial actions can be developed.


In this section, I will firstly present the key highlights of the first phase of my research which was carried out as a study at the MSc level. This MSc study looked at the first research question which I have listed in section 1.5 (i.e. why did the efforts of the RTOs to implement and internalise the best management practices end up being constrained?) and in which I explored the phenomenon of whether the constraints encountered by the RTOs were only due to factors that are external to their operating environment. Secondly, I will highlight on how the findings from the MSc study paved the way for the continuation of my research into the problem I have highlighted in section 1.4 in the form of this doctoral study.

1.8.1. Research Phase at the Master’s Level: An overview of my MSc study report.

I undertook the first phase of this research between the years 2002 and 2003 in fulfilment of the requirement for my MSc Ergonomics degree and which study report I reference as Sanda (2003) in this write-up. In this exploratory study, I sought to find out the reason why the efforts of most RTOs in developing countries to implement and internalise the best management practices ended up being constrained. This relates to the first research question (i.e. why did the efforts of the RTOs to implement and internalise the best management practices end up being constrained? Are the constraints due to only factors external to their operating environment?), which I have listed in section 1.5. I also sought to understand the operational systems of the RTOs before, during and after their implementation of the best management practices. This was underlined by my specific objective of using macroergonomic strategies and systems design approaches to identify and establish the possible environmental factors which prevented most RTOs from being able to implement and internalise the BMP model. In this respect, I carried out a mail survey on the implementation of the best management practices

16 This understanding was sought from the perspective of organizational design and management using principles underlined by macroergonomic theory.
among eight RTOs in eight different countries, all of which were part\textsuperscript{17} of those involved in the study by Mengu and Grier (1999). These comprised of four countries from Africa (i.e. Ghana, Zimbabwe, Tanzania, and South Africa), two from Asia (i.e. Sri Lanka and Taiwan), and two from the Caribbean (i.e. Trinidad and Jamaica). I must emphasise here that all the eight RTOs involved in the survey were selected strategically on the advice of Mr. Mengu\textsuperscript{18} by virtue of his deep involvement and knowledge in the RTOs best management practices project. His office at the WAITRO Secretariat also coordinated the administering of the questionnaires on my behalf.

My findings shows that the external environmental factors which seem to prevent the RTOs from successfully implementing and internalising the best management practices are derivatives of constraints associated with some or all of the following: - the prevailing socio-economic and legal frameworks; influence of consumer and market forces; the pervading political atmosphere; the operating climate; subsystem stability (i.e. operating system); the decision-making approach; the educational background (qualification) of its staff; the existing communication interfaces within the RTO’s organizational structure, as well as between the RTO and the surrounding environment (Sanda, 2003). This was against the background belief by the respective RTOs to the effect that best management practices can be transferred across organizational and national boundaries, and that such best management practices are not the preserve of only RTO’s in the developed countries. A summary of the respective best management practices and their constraining external factors which were identified by the eight RTOs are as I have highlighted in table 1 (see next page). My analysis of the survey responses indicated that the dominant constraints experienced by the RTOs resulted from such external environmental factors as consumer and market forces, culture and climate, politics, socio-economic and legal issues, decision-making, and educational background of the staff. It was also obvious that the most dominant constraints experienced by almost all the eight respondents were from consumer and market forces as well as climate and culture. The analysis also indicated that the impacts of these constraints were aggravated by the influences of the organizations’ communication interfaces, and subsystem stability frameworks. I further observed that the

\textsuperscript{17} See appendix 1 for the complete list.

\textsuperscript{18} Mr. Mengu was at the time, the Deputy Secretary-General of WAITRO as well as its Chief Administrator.
The educational background of staff did not impose any significant constraint on the implementations of the practices related to organizational management, financial management, and networking. In the same vein, politics did not impose any constraint on the implementations of the best practices on capacity building.

Table 1: RTOs perceived external environmental constraints on specific Best Management Practices Implemented (Sanda, 2003, p. 56).

<table>
<thead>
<tr>
<th>RTOs</th>
<th>Management Information System</th>
<th>Board’s Cooperation</th>
<th>Competitors Cooperation</th>
<th>Government Cooperation</th>
<th>STAFF Knowledge</th>
<th>Junior Staff Cooperation</th>
<th>Senior Staff Cooperation</th>
<th>CLIENTS Knowledge</th>
<th>Cooperation</th>
<th>OTHER STAKEHOLDERS Knowledge</th>
<th>Cooperation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARIRI</td>
<td>Jamaica</td>
<td>High</td>
<td>None</td>
<td>None</td>
<td>Very Low</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Low</td>
<td>Very Low</td>
<td>None</td>
</tr>
<tr>
<td>JIRDO</td>
<td>Tanzania</td>
<td>Low</td>
<td>None</td>
<td>Low</td>
<td>Low</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Low</td>
<td>Very Low</td>
<td>Low</td>
</tr>
<tr>
<td>SIRODC</td>
<td>Sri Lanka</td>
<td>Low</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Low</td>
<td>Very Low</td>
<td>None</td>
</tr>
<tr>
<td>NERDC</td>
<td>Zimbabwe</td>
<td>High</td>
<td>None</td>
<td>None</td>
<td>Very Low</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Low</td>
<td>Very Low</td>
<td>None</td>
</tr>
<tr>
<td>ITRI</td>
<td>Taiwan</td>
<td>High</td>
<td>None</td>
<td>None</td>
<td>Very Low</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Low</td>
<td>Very Low</td>
<td>None</td>
</tr>
<tr>
<td>CSR</td>
<td>South Africa</td>
<td>High</td>
<td>None</td>
<td>Very Low</td>
<td>High</td>
<td>Low</td>
<td>Very Low</td>
<td>Very Low</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>STEPRI</td>
<td>Ghana</td>
<td>Low</td>
<td>Very High</td>
<td>High</td>
<td>High</td>
<td>Very High</td>
<td>Very High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>SIRDC</td>
<td>Sri Lanka</td>
<td>Low</td>
<td>None</td>
<td>Very Low</td>
<td>Low</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Very Low</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Based on this appraisal, I inferred that it is the combined strength and influences of these dominant environmental factors that might have
resulted in some of the organizations facing additional constraints from their prevailing socio-economic and legal frameworks, and which went on to weaken their sub-system stability. I also observed that the continued prevalence of constraints related to the consumer and market forces, climate and culture, the prevailing political environment, and the communication interfaces, all of which appeared to be inter-related in some respect, created unfavourable atmospheres within the operational environments of the organizations. In turn, this unfavourable atmosphere also seems to have had a relatively strong ability to impact negatively on the operations of these organizations. These observations therefore, provided me with a clue as to why some of the respondent RTOs could not improve upon their overall operational performances despite undergoing three or more organizational and/or system transformations over the past ten years or more.

My observations from the survey agreed closely with those made earlier by Negandhi (1977) from field studies of ninety-two industrial firms in five developing countries (i.e. Argentina, Brazil, Philippines, India, and Uruguay). Negandhi identified five types of external environmental factors that significantly affect organizational functioning. These include the following: - Socio-economic factor (particularly, the degree of stability of the socio-economic environment, nature of the competition, and availability of materials and qualified workers); Educational factor (i.e. the availability of facilities and programmes for employees or potential employees in the local region, and the educational level and aspirations of workers); Political factor (i.e. the degree of stability at all governmental levels and the government’s attitudes toward business and labour, that is friendliness versus hostility, and control of prices); Cultural factor (i.e. social status and caste system in the community, values and attitudes of employees and their families toward work, management, and the nature of trade unions and union-management relationships); Legal factor (i.e. degree of legal controls, restrictions, and compliance requirements). I therefore argued that the rationale behind the inability of most RTOs in developing countries to overcome the influences of these dominant environmental factors, despite their numerous attempts, in one way or the other, could be related to such factors as follows - the influence of the key actors in the decision-making process for the change implementation as well as the methodology to be followed (i.e. adoption, adapting or using other procedures altogether). This observation of mine is reflected in the diversity of the ratings I received from the individual RTOs in relation to
the quality of their management information system as well as the knowledge levels of key actors about the implementation process and their corresponding cooperation to the implementation process (table 2 below).

Table 2: RTOs’ ratings on management information system, staff knowledge and cooperation during the BMP implementation (Sanda, 2003).

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CARIRI</td>
<td>P, SEL</td>
<td>CMF, CC; P, SEL; CMF; CC</td>
<td>CMF, CC; SS</td>
<td>CMF, CC; CC; SS; CMF; CI; DM</td>
<td>CMF; CI; DM; SS</td>
<td>CMF; CI; DM; SS</td>
<td>CMF; CI; DM; SS</td>
<td>CMF; CI; DM; SS</td>
<td>CMF; CI; DM; SS</td>
<td>P, SEL; CMF; CI, DM</td>
</tr>
<tr>
<td>TIRDO Tanzania</td>
<td>SEL; CI, CC</td>
<td>SEL; CMF, CC</td>
<td>SEL; MM, CC</td>
<td>SEL; MM, CC; CC</td>
<td>SEL; MM, CC; SS</td>
<td>SEL; MM, CC</td>
<td>SEL; MM, CC; SS</td>
<td>SEL; MM, CC; SS</td>
<td>SEL; MM, CC</td>
<td>P, SEL; CMF, CI, DM</td>
</tr>
<tr>
<td>STEPRI Ghana</td>
<td>SEL; CMF; CC</td>
<td>SEL; CMF</td>
<td>SEL; CMF</td>
<td>CMF; DM</td>
<td>SEL; CI; CC</td>
<td>SEL; CI; CC; SS</td>
<td>SEL; CI; CC; SS</td>
<td>SEL; CI; CC; SS</td>
<td>SEL; CI; CC</td>
<td>P, SEL; CMF; CI, DM</td>
</tr>
<tr>
<td>SIRDC Sri Lanka</td>
<td>P, CI, DM; EB, CC</td>
<td>P, CMF, DM, CC; SS</td>
<td>P, CMF, DM; EB, CC</td>
<td>P, CMF, CI; DM; EB, CI; SS</td>
<td>P, SEL; DM, CI, SS; DM, CI; EB, CI; SS</td>
<td>DM, EB; CI, SS</td>
<td>DM, EB; CI, SS</td>
<td>SEL; CI, CC; SS</td>
<td>P, SEI; CMF, CI, DM</td>
<td></td>
</tr>
<tr>
<td>NERDC Zimbabwe</td>
<td>CI</td>
<td>CMF; CI</td>
<td>CMF</td>
<td>DM</td>
<td>EB</td>
<td>EB</td>
<td>DM</td>
<td>CI</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>ITRI Taiwan</td>
<td>SEL; CMF, DM, CC</td>
<td>SEL; CI</td>
<td>SEL; CMF; CI</td>
<td>CMF; CI</td>
<td>CMF, DM, EB</td>
<td>SEL; CMF, CI; EB, CC</td>
<td>CMF, CC</td>
<td>P, DM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSIR South Africa</td>
<td>P, CI, SS; DM, SS</td>
<td>CI, CC, SS</td>
<td>P, SEL; CMF; CI, CC</td>
<td>CI, CC, SS; SS</td>
<td>CI, CC, SS; SS</td>
<td>P, SEL; CMF; CI, DM; CC; SS</td>
<td>P, SEL; CMF; CI, DM; CC; SS</td>
<td>CI, CC, SS; SS</td>
<td>P, SEI; CMF, CI, DM; SS</td>
<td></td>
</tr>
</tbody>
</table>

Note:
SEL = Socio-economic and Legal framework; CI = Communication Interface; DM = Decision-making; P = Political Atmosphere; CMF = Consumer and Market Forces; EB = Education Background; CC = Culture and climate; SS = System Stability.
Additionally, I observed that a related influencing factor could be the level of understanding of the change process and the rationale behind it by the different categories of the organization’s staff members as well as its clients, government technical staff, other stakeholders, and even its competitors.

As it is obvious in table 2, I observed that significant variations existed in the level of understanding of the best management practices implementation process among the different categories of staff members as well as other key players within the respective RTOs. In this regard, the board members and senior management staff appeared to be highly knowledgeable about the change process within the organizations. On the other hand, the corresponding knowledge of the junior staff as well as clients, government technical staff, and other stakeholders was very low. The consequence of these factors, as it was indicated by some of the RTOs, are that their managers received low levels of cooperation from both staff members and others associated with their organizations who had a corresponding low knowledge of the best management practices implementation processes. I found this observation to be of interest in relation to the possibility that some internal factors within the RTOs might have contributed to the constrained effects they encountered from the external environment.

Therefore, in order for me to gain more understanding on the dynamics of activities within the RTOs operating systems, I carried out a follow-up study in three RTOs in Ghana, all of whose individual commercialisation and corresponding best management practices implementation process efforts happened to be under the authority of CSIR (Ghana). These are the Institute for Industrial Research (IIR), Food Research Institute (FRI), and Science and Technology Policy Research Institute (STEPRI). The study involved interviews with each of the RTOs’ Directors, and the conduction of problem identification workshops attended by selected staff members. The outcome from the follow-up study supported my earlier observation that strong variations existed with respect to transmitted knowledge and the level of understanding of the change processes by the various categories of staff as well as other interested groups so far as the organizations activities are concerned. I found these to be attributable to the tensions that exist in the practice of governance in the RTOs, especially in relation to its

19 As I have noted in section 1, both the FRI and IIR were made the focus of the CSIR’s commercialisation efforts.
compatibility with the best management practices requirement. This tension also seems to have penetrated the RTOs’ institutional rules and thus generated new developments in their underlying corporate cultures and personnel management. Based on these additional findings, it became evident to me that the prevailing tensions I found to be inherent within the operational or activity environments of the three RTOs in Ghana could have possibly been inherent in RTOs in other countries also. I therefore perceived this observation as providing me with a platform for studying further, the activity environments of other RTOs in different countries which could help in outlining the factors behind the inability of most RTOs to overcome the external environmental constraints, and hence achieve success in their implementation. It is this platform which thus provided the base for this doctoral study, the focus of which I will highlight in the section that follows.

1.8.2. Research Phase at Doctoral Level: Defining the locus of study.

As Mengu and Grier (1999) have noted, the best management practices serve as tools with the capability of transforming the functioning of the RTOs from fully subsidised government agencies into self-income generating ones. But as it is indicative from my MSc study, I concluded that the extent to which the external environmental factors constrain the implementation efforts of the RTOs depend on the level of tension that is developed in activities within their internal operating environment. In this regard, I reason that this conclusion of mine stands to be strengthened by an earlier finding made by Fältholm (1993) in her study on computerization in Swedish pharmacies. She also found that the implementation process of new tools in the pharmacies had led to the emergence of tensions in their internal operating environment. But, as I also noted, the degree of tensions within the operating environments of the RTOs is reflected in their subsystem stabilities, and this can be understood from the perspectives of their historical and environmental context, social dimensions, goals and objectives, institutional rules, divisions of labour, and the intervening instruments of change.

Thus it is the above perspectives that provided me with the justification to with my exploration of the research problem (as I have highlighted in section 1.4) by carrying out a further and extensive research on activities inside the RTOs in order to relate each of the practices highlighted by the BMP model to the RTOs’ prevailing activity systems, but this time round,
in the form of a doctoral study. Hence, in order for me to be able to define the locus of this doctoral study, I will start by quoting the following as written by Polkinghorne (1983):

Like Hanson and Polanyi, Pierce believe that science should be as concerned with the process of discovery as with the process of justification. He saw science as a dialectical interaction between these two processes. The process of discovery begins with the shock of an experience which does not fit into one’s system of thought and sets off doubt. A problem arises when the uniformity of nature which one thinks one has understood is disrupted by an experience that causes one to question and change previous understanding. One begins a scientific inquiry with a conjecture (a hypothesis Pierce used the term *abduction* to designate the mental activity by means of which the hypothesis is formed………….. This is a living process that occurs in the minds of scientist (Polkinghorne, 1983, p. 121).

The sense I derive from this observations by Polkinghorne, in relation to my research journey so far, is that my initial study at the MSc level (as I have highlighted in section 1.8 above) is reflective of the abductive type of reasoning. According to Polkinghorne, abduction is one of three types of inference, the other two being deduction and induction. He explains that abduction is the process of suggesting a hypothesis which can serve as an explanation of what has appeared as puzzling. This seems to be in agreement with my MSc study which had focused on answering the first research question (i.e. why did the efforts of the RTOs to implement and internalise the best management practices end up being constrained? Are the constraints due to only factors external to their operating environment?). The derivation I made from my analyses, in this regard, was that the constraints encountered by the RTOs in their implementation of the best management practices was a result of a possible interplay between factors associated with both their external and internal environments. Based on this derivation, I concluded that existing tensions in an RTO’s activity system serve as internal environment constraints which influences the extent to which external environment negatively affects the RTO’s implementation of the best management practices (BMP) model. I also concluded that the BMP model can be successfully implemented and internalised by organizations if they are able to effectively deal with internal tensions caused by external environmental changes (for example, their ability to continuously and effectively adjust their internal operating environments in response to variations in the socio-economic, cultural, and political factors). Yet I realize that the evidence
based on which I made these conclusions lacked strength when an account is taken of the fact that my follow-up study to understand the impacts of factors internal to the RTOs operating system was a pilot case study on three RTOs from the same country, and operated under the same socio-cultural climate. I view this to be in sharp contrast to the evidence from my survey to understand the influence of factors external to the RTOs operating environment and which involved eight RTOs from eight different countries. I therefore became conscious of the complications that can arise in trying to defend my conclusions in the initial study, especially as to whether my observations in the three RTOs in Ghana can be translated to RTOs in different countries. In this context, I realised that what I termed as conclusions are rather propositions whose generalisation requires the study of different RTOs across different countries.

As I have discussed earlier, culture and climate were regarded as dominant constraining factors by all the eight RTOs in the eight countries I surveyed. I find this to be interesting since all of them held the corresponding view that best management practices, such as the BMP model they tried to implement and internalise in their respective organizations, could be transferred across organizational and national boundaries. A reflection of this is highlighted in table 3 (see next page). In my opinion, this interplay between the RTOs’ positive convictions on the transferability of the BMP model across boundaries, and the classification of their own organizational culture and climate as constraining factors during their implementation efforts is quite paradoxical. In this respect therefore, I allowed my observations on the impact of the internal factors from the RTOs I studied in Ghana to serve as leverage for me to seek a deeper understanding of this internal factor phenomenon. In this respect therefore, I viewed the conduction of activity studies as a plausible path for seeking such an understanding. What I perceive to be of challenging interest, in this regard, is the issue of identifying the relevant theoretical conceptions that underlies the applicability of activity study in the field of Macroergonomics. As I have previously noted in section 1.1, Macroergonomics is a multidisciplinary scientific discipline which is concerned with the analysis, design and evaluation of work systems (with the term work referring to any form of human effort or activity, and the term system referring to sociotechnical systems which can be a single individual using a hand tool or as complex as a multinational organization). But unlike the extensive application of macroeconomics in the study and design of jobs, organizational strategy, organizational structure, incentive systems, and
training programmes, its relative application in organizational activity studies remains unexplored.

Table 3: RTOs’ views on four key issues on the BMP model (Sanda, 2003).

<table>
<thead>
<tr>
<th>RTO</th>
<th>Positions Statements on Significance of Best Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Best Practice can be transferred across organizational and national boundaries</td>
</tr>
<tr>
<td>CARIRI Trinidad</td>
<td>Agree</td>
</tr>
<tr>
<td>TIRDO Tanzania</td>
<td>Agree</td>
</tr>
<tr>
<td>SIRDC Sri Lanka</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>NERDC Zimbabwe</td>
<td>Agree</td>
</tr>
<tr>
<td>ITRI Taiwan</td>
<td>Agree</td>
</tr>
<tr>
<td>CSIR South Africa</td>
<td>Agree</td>
</tr>
<tr>
<td>STEPRI Ghana</td>
<td>Agree</td>
</tr>
<tr>
<td>SRC Jamaica</td>
<td>Agree</td>
</tr>
</tbody>
</table>
1.9. Exploring Internal Factor Phenomenon in Doctoral Study: Which Theoretical Conception?

In section 1.8, I presented an overview of the findings from my MSc study and which conclusions helped define the locus of this doctoral study. As I have noted earlier on in sub-section 1.8.2 above, I view the conduction of an activity study as a representation of the plausible path for me to seek a deeper understanding on the impact of internal factors that I found out to be associated with the constraints being encountered by the RTOs in their BMP model implementation and internalisation efforts. As I also indicated, what I perceive to be of challenging interest, in this regard, is the issue of identifying the relevant theoretical conceptions that underlies the applicability of activity study in the field of Macroergonomics. Thus, in my search for a possible leeway that links organizational activity study to macroergonomics, I conducted a review of Ergonomics Abstracts. I was able to find the requisite link in the journal Ergonomics as it is reflected by its publication of an article\(^{20}\) entitled *Activity theory as a framework for analysing and redesigning work* by Yrjö Engeström. As I also found out, Engeström (1993) has written that;

Rumours about activity theory have been around in western behavioural and social sciences for some time. But in many ways, this theoretical approach is till one of the best kept secrets of academia. This is partly due to language barriers, partly to the epistemological foundations of activity theory which are not immediately transparent to scholars unfamiliar with classical German philosophy and dialect (see Ilyenkov, 1982; Lektorsky, 1980/1984; Mikhailov, 1980; and Bakhurst, 1991, for a careful Anglo-Saxon interpretation). And when a western researcher begins to realise the impressive dimensions of theorising behind the activity approach, he/she my well ask: Is it worth the trouble? Can it be used to produce something interesting? How does one concrete research on the basis activity theory? (Engeström, 1993, p. 64-65).

By taking into account the above observation by Engeström, it becomes obvious to me that there exist impressive dimensions of theorising behind the activity theory approach whose exploitation from a macroergonomics perspective can lead to my producing something interesting that can contribute towards understanding the internal environment phenomenon in the RTOs. This therefore, provided me with the motivation to explore

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\(^{20}\) I will reference this article in the subsequent chapters of this thesis as: “Engeström, Y. (2000a), Activity Theory as Framework for Analysing and Redesigning Work. Ergonomics, 43, 7, 960-974”.

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deeper an understanding of activity theory (as I will discuss in chapter two), leading to my subsequent conviction that it can provide me with a good base for carrying out an activity study. It is this leverage that has culminated into this doctoral study in which I sought to gain a much deeper understanding of the internal operating environments of RTOs across different countries, in relation to the phenomenon that; despite the successful use of the BMP model by companies in the developed countries, especially in Europe, the efforts of most RTOs in the developing countries to implement and internalise the model were constrained by some undetermined environmental factors (Mengu and Grier, 1999).

1.9.1. Specific questions, aims and objectives of doctoral study.

In this doctoral study therefore, I looked at the issue of how factors internal to the RTOs’ operating environments impacted on their attempts to implement and internalise the BMP model which was to have enhanced their efforts to commercialise. In relative terms, I looked at the second and third components of the first research question, and also the second research question, as I have highlighted in section 1.5, that is;

i. Why did the efforts of the RTOs to implement and internalise the best management practices end up being constrained? Are the constraints due to only factors internal to their operating environment or interplay of factors external and internal to their operating environment?

ii. How can these RTOs learn to deal with such environmental factors and their possible interplay, in order to be able to successfully implement and internalise the best management practices?

The specific aim here is to use organizational activity theory as a platform to provide an understanding of the possible internal factors preventing the RTOs from being successful in their implementation and internalisation efforts, with the specific objective of developing the requisite tools to guide future remedial actions. In my opinion, such an understanding can result in the projection of an explanation to the rationale behind the inability of most RTOs in developing countries to be successful in their best management practices implementation efforts. I therefore saw the need to investigate and establish the specific environmental constraints as well as tensions in the organizational activity systems of different RTOs in
different developing countries. I also saw the need to assess the causes of these constraints and tensions, as well as how they impacted on the RTOs’ efforts in their implementation and internalising attempts. Thus, it is through this study that I sought to outline how the RTOs can learn to deal with the internal environmental factors (and possibly, their interplay with external environmental factors) in order for them to implement and internalise the best management practices successfully.

1.9.2. Proposition for the doctoral study.

As I have noted in sub-section 1.9.1 above, there is the need to investigate and establish the specific environmental constraints as well as tensions in the organizational activity systems of different RTOs in different developing countries. As I also noted, there is the need to assess the causes of these constraints and tensions, as well as how they impacted on the RTOs’ efforts in their implementation and internalising attempts of the BMP model. My thinking, in this regard, is inspired by the following philosophical perspective of scientific enquiry as outlined by Polkinghorne;

The two main functions of science are the framing and testing of conjectures. “Science itself, the living process”, Pierce said, “is busied mainly with conjectures, which are either framed or getting tested”. Science is therefore, distinct from thoroughly established truths. In opposition to Hume, Pierce emphasizes that our knowledge is not derived from experience alone: “every item of science came originally from conjecture, which has only been pruned down by experience……. The entire matter of our works of solid science consists of conjectures checked by experience………… Abduction…………furnishes the reasoner with the problematic theory which induction verifies” (Polkinghorne, 1983, p. 121).

In this respect therefore, the sorts of data that I find reasonable to collect was not determined by the research problem, per se, but rather by the following tentative propositions which emerged from my MSc study.

i. Existing tensions in an RTO’s activity system serve as internal environment constraints which influences the extent to which external environment constraints negatively affect the organization’s implementation of Best management practices.
ii. Best management practices can be successfully implemented and internalised by organizations if they are able to effectively deal with internal tensions caused by external environmental changes (for example, their ability to continuously and effectively adjust their internal operating environments in response to variations in the socio-economic, cultural, and political factors).

It is these tentative propositions which provided direction to my scientific investigation, as well as determined, among other things, what evidence I had to collect at any given point in this doctoral study. This is by virtue of my identifying with Polkinghorne’s observation to the effect that a proposition should be a reasoned or likely explanation of the facts, and that it should not be an ill-formed guess, but rather something that can be played out in the imagination before testing. It is also based on my agreeing with Denzin’s (1989) argument that because concepts represent tentative ways of looking at reality, propositions become tentative statements concerning the occurrence and interrelationship of events in the empirical world. As such, propositions occupy the same tentative and processual position in theory as concepts and definitions do. Therefore, in the next chapter, I will look at the requisite theory (i.e. activity theory) within which I will explore the processual position of the propositions I have outlined above.

1.10. Disposition

This thesis is comprised of nine complimentary chapters. The first chapter, which I have already presented above has highlighted on the background events that led to the generation of my personal interest to the conduction of this research and specifically, the carrying out of this doctoral study. In this regard, I have appraised the outcome of the initial phase of my research which I carried out as an MSc study and then followed it up with arguments in support of its contribution to this doctoral study.

The second chapter appraises the relevant activity theoretical issues in relation to the phenomenon under study and also discusses my justification for the development of a new framework for the study of an organization’s activity system.
In the third chapter, I discuss the theoretical and practical implication for my choice of study methodology as concerns the classification of the units of analysis in relation to the developed framework and also my approach towards the generation of evidences.

Chapters four, five, six and seven are presented in the form of country reports and each deal with the individual analysis of evidences generated from each of the four organizations involved in my study. The respective countries are Ghana, Trinidad, Botswana, and South Africa, respectively. In each of these chapters, an overview of the respective RTOs is presented and the data generated are analysed and discussed in line with the theoretical framework and the corresponding conclusions are drawn.

In chapter eight, the outcomes of the respective cases analysed in chapters four, five, six and seven are crossed analysed by pattern-matching.

In chapter nine, which is the last chapter, the outcome of the cross analysis is discussed and a conclusion is drawn. The learning that emerges from the study is also highlighted.
2

THEORETICAL FRAMEWORK

In the previous chapter, I gave an account of the events that provided me with the leverage to seek a much deeper understanding of the internal operating environments of the Research and Technology Organizations (RTO) in developing countries. As I have indicated in chapter one, my intention of seeking such an understanding is shaped by my conviction that it can help me explain the rationale behind the inability of most of them to be successful in their “RTO best management practices” implementation efforts. On the basis of this, I outlined two propositions which in my opinion stand out to give direction to my study. The first proposition is that; existing tensions in an RTO’s activity system serve as internal environment constraints which influence the extent to which external environment constraints negatively affect the organization’s implementation of Best management practices. The second proposition also notes that; best management practices can be successfully implemented and internalised by organizations if they are able to effectively deal with internal tensions caused by external environmental changes (e.g. their ability to continuously and effectively adjust their internal operating environments in response to variations in the socio-economic, cultural, and political factors).

In this chapter, I will give the rationale behind my choice of a theoretical perspective in relation to these propositions. This will be followed by a critical appraisal of relative concepts and principles of the theoretical perspective in order to establish their communalities and/or divergences. The chapter will then conclude with arguments on how these conceptual commonalities and/or divergences contributed in outlining my study framework.

2.1. From Propositions to Theories.

In my bid to outline a study framework which is devoid of theoretical ambiguities, I commence this section by making an appraisal of the concept of practices or strategies implementation in organizations. The idea here is for me to learn of the relevant theory or theories that have been
ascertained by other researchers to give an explanatory insight into the dynamics of practice implementation in organizations. This is by virtue of the fact that the phenomena underlined by my proposition is relative to practices which are deemed best for the management of RTOs in order to enhance their transformation from state funded agencies to income generation organizations. Propositions, according to Polkinghorne (1986), should be a reasoned or likely explanation of facts. As such they should not be an ill-formed guess, but rather something that can be played out in a researcher’s imagination before testing. This therefore brings to the fore the issue of how I should play out my research propositions in my imagination before testing them in reality. In my opinion, such a play is feasible by firstly establishing a link between the propositions and theories that gives an insight into the dynamics of practices in an organization. According to Jarzabkowski (2002), concerns over the gap between the theories of what people do and what people actually do has given rise to the ‘practice’ approach in management literature which focuses on the way that actors interact with the social and physical features of context in the everyday activities that constitute practice. She notes that a theory of practice brings recursiveness and adaptation into a dialectic tension in which the two are inextricably linked. She explains that practice does not occur only in macro contexts which provide commonalities of action, but also in micro contexts in which action is highly localised. She therefore, sees the interaction between these contexts to provide an opportunity for adaptive practice. In this regard, Jarzabkowski concludes that the theoretical rationale for the study of practices may be found in activity theory whose framework provides a dynamic view of strategic practices and their role in organizational continuity or change.

In my opinion, the conclusion by Jarzabkowski is in line with an earlier observation by Nardi (1996) that activity theory is concerned with practice which significantly involves the mastery of external devices and tools of labour activity. Based on these perspectives, it makes sense for me to view the best management practices that underlined the commercialisation of the RTOs as a representation of such external devices whose mastery seems to have eluded them. I therefore find the arguments by Jarzabkowski and Nardi as providing a reasonable ground for me to use an activity theoretical approach to test my research propositions which stand to provide an

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21 I view this assertion as an illustration of a finding in my initial study which points to the fact that the constraints experienced by most RTOs in their transformation toward income generation (macroergonomic changes) were due to the weakness in their micro-ergonomics based practices.
understanding to the research problem of this study (i.e. despite the fact that the best management practices have been used successfully by companies in the developed countries, especially in Europe, the efforts of most RTOs in developing countries to implement and internalise them are constrained by some undetermined environmental factors). In this respect, I see it of interest to appraise those concepts and principles that have been applied in the study of organizations as activity system in order to carve out a clearly defined framework which can guide my study.

In the next section, I will give an insight on activity theory and appraise its application in previous organizational studies by different researchers. My premise for such an appraisal is to find out about existing conceptual frameworks and their applicability or adaptability as methodological and/or analytical tools for my study.

2.2. What is Activity Theory?

In my stride to put into context what activity theory is, I have come across varieties of views and perspectives that try to offer explanations to the question “what is activity theory?”, but before I proceed to discuss such perspective variations, I will firstly appraise the contextual interpretation of the concept of activity. I view this to be important because such contextual clarification will put into perspective the possible shifts in meanings ascribed to the notion of activity. In my opinion, this will make it easier to put into context the activity theoretical perspective that I might have to adapt in order to be able to shape the character of my study.

2.2.1. ‘Activity’ as a concept.

According to Leontiev (1974), activity is a molar and non-additive unit of the life of a material subject. He notes that in a narrower and more psychological sense, activity is a unit of life mediated by mental reflection whose real function is to orient the subject to the world of objects. Therefore in the view of Leontiev, “activity” is not a reaction or a totality of reactions, but rather a system possessing structure, inner transformations, conversions, and development. Leontiev explains further that the basic or constituting characteristics of activity is its objectivity. As such, he views the term “objectless activity” to be devoid of any meaning. He clarifies this by noting that even though an activity may seem objectless, scientific investigation of an activity necessarily requires that its
object is discovered. An important point that Leontiev also raises in this regard, and which I find to be of interest is his clarification that;

No where was activity marked as to which science it belongs to. Besides, scientific experiments show that isolating activity as an object of someone’s specific sphere of knowledge, “praxiology”, cannot be justified. Just like all empirically given reality, activity is studied by various sciences; it is possible to study the physiology of activity, but just as proper is it to study it in political economics or in sociology, for example (Leontiev 1978, p. 55)

Leontiev emphasizes this clarification with the explanation that the original ideas that brought Vygotsky to the problem of the origin of internal psychic activity in external activity differ principally from the theoretical concepts of other authors who were his contemporaries. He pointed out that these ideas of Vygotsky came from an analysis of the features of specifically human activity – work activity; productive activity carried on with tools, activity that is indigenously social (i.e. develops only under conditions of cooperation and sharing by people). It is the exploitation of this idea that led Engeström (1987) to conclude that the structure of an activity is constrained by cultural factors, such as conventions (rules) and social strata (division of labour), and which calls attention to the mediational role of the community and that of social structures including the division of labour and established procedures. Based on these perspectives, Miettinen (1997) also argues that the study of activity ceased to be the psychology of an individual and instead focuses on the interaction between an individual, systems of artefacts and other individuals in historically developing institutional settings. As Bardram (1997) has explained, an activity consists of several actions22, and each action also consists of several operations.

In my opinion, the clarification by Leontiev and the subsequent explanations by Engeström as well as the arguments by Miettinen should be enough to clear away the prevailing notion that the concept of activity is applicable in psychology studies only. As Leontiev has further clarified, it is the community of the macrostructure of external practical activity and

22 Adams et al. (2003) have also noted that an action, in this wise, is a single task performed to achieve a self-contained, pre-conceived result relevant to the overall activity, whilst operations are the work functions or routines within each action determined by the actual conditions and contexts of the action during its performance.
internal activity that theoretically allows it to be analysed\textsuperscript{23} by abstracting it initially from the form in which it occurs. In his arguments, he noted that;

Separate concrete types of activity may differ among themselves according to various characteristics: according to their form, according to the methods of carrying them out, according to their emotional intensity, according to their time and space requirements, according to their physiological mechanisms, etc. The main thing that distinguishes one activity from another, however, is the difference in their objects. It is exactly the object of an activity that gives it a determined direction. According to the terminology I have proposed, the object of an activity is its true motive\textsuperscript{24}. It is understood that the motive may be either material or ideal, either present in perception or existing only in the imagination or in thought. The main thing is that behind activity there should always be a need, that it should always answer one need or another (Leontiev, 1978, p. 62)

By taking into account the numerous issues on the concept of activity, as I have outlined above, I will discuss in the next section the various perspectives with which activity theory is viewed by different people.

2.2.2. Perspectives on activity theory: An appraisal.

According to Engeström (1987), the cultural-historical theory of activity was initiated by a group of revolutionary Russian psychologists in the 1920s and 1930s. He asserts that the approach was the brain-child of Lev Vygotsky and his two colleagues A. N. Leontiev and A. R. Luria who together formulated a completely new theoretical concept to transcend the prevailing understanding of psychology which was then dominated by psychoanalysis and behaviourism. Activity theory, therefore originated as part of an attempt to produce a Marxist psychology by Vygotsky whose work is taken as the core of Soviet psychology. Later on, Leontiev, who was Vygotsky’s student and collaborator, became the main figure within Soviet psychology after the death of the latter in 1934. Even though Vygotsky’s emphasis was on the adoption of a semiotic approach to

\textsuperscript{23} In the words of Leontiev (1978), “The idea of analysing activity as a method of scientific human psychology was proposed, as I have already said, in the early works of L. S Vygotsky. The concept of tooled (instrumental) operations, the concept of purposes, and later the concept of motives (“motivational sphere of consciousness”) were introduced” (p. 62).

\textsuperscript{24} Such restricted understanding of motive as that object (material or ideal) that evokes and directs activity toward itself differs from the generally accepted understanding; but this is not the place to enter into polemics on this question.
psychology, Leontiev (e.g. 1978, 1981) stressed the importance of practical activity as the principal mode of interaction with the world. This shift, according to Rogers and Scaife (1997), led to considerable debate both within and beyond Soviet psychology as to whether activity theory is consistent with Vygotsky’s work or refutes it. They observe that in its current form, activity theory is not an exclusively Soviet approach.

In the opinion of Nardi (1996), activity theory is a powerful and clarifying descriptive tool rather than a strongly predictive theory. In his view, the object of activity theory is to understand the unity of consciousness and activity. As such, he sees activity theory as incorporating strong notions of intentionality, history, mediation, collaboration and development in constructing consciousness. He draws attention to the argument by activity theorists to the fact that consciousness is not a set of discrete disembodied cognitive acts (i.e. decision-making, classification, or remembering). He also notes with certainty that consciousness is not the brain, but it is rather located in everyday practice. Within this context, he notes that what people do is firmly and inextricably embedded in the social matrix of which every person is an organic part.

From the perspectives of Bannon (1997), activity theory consists of a set of basic principles which constitute a general conceptual system that can be used as a foundation for more specific theories. These basic principles of activity theory include object-orientedness, the dual concepts of internalization/externalization, tool mediation, hierarchical structure of activity, and continuous development. The principle of object-orientedness states that human beings live in a reality which is objective in a broad sense; the things which constitute this reality have not only the properties which are considered objective according to natural sciences but socially/culturally defined properties as well. Bannon explains further that activity theory differentiates between internal and external activities and emphasizes that internal activities cannot be understood if they are analysed separately, in isolation from external activities, because there are mutual transformations between these two kinds of activities (i.e. internalization and externalization). It is the general context of activity (which includes both external and internal components) that determines when and why external activities become internal and vice versa. He also points out that the emphasis of activity theory on social factors and on interaction between agents and their environments explains why the principle of tool mediation plays a central role within the approach.
According to Bannon, tools shape the way human beings interact with reality. He relates this to the principle of internalization/externalization which, firstly notes that shaping external activities ultimately results in shaping internal ones. The principle also notes that, tools usually reflect the experiences of other people who have tried to solve similar problems at an earlier time and invented/modified the tool to make it more efficient. This experience, from the perspectives of Bannon, is accumulated in the structural properties of tools (shape, material, etc.) as well as in the knowledge of how the tool should be used. He notes that tools are created and transformed during the development of the activity itself and carry with them a particular culture - the historical remnants from that development. So, the use of tools is a means for the accumulation and transmission of social knowledge. It influences the nature, not only of external behaviour, but also of the mental functioning of individuals.

In the view of Engeström (2000a), many boundaries are collapsing in the world of work and, correspondingly, in the conceptual frameworks of research on work, citing the persistent dichotomy between micro-level processes and macro-structures as a case in point. In his opinion, cultural-historical activity theory is representative of such new framework. He therefore sees activity theory, as it stands today, to be a global multidisciplinary research approach (Engeström et al. 1998, Chaiklin et al. 1999), which is increasingly oriented toward the study of work and technologies (Nardi, 1996).

A critical appraisal of the perspectives I have sampled above indicates that the term “activity theory” attracts different interpretations from different quarters. The issue that arises here, in my opinion, has to do with the question of what activity theory really represent, especially if I am to seek a scientific-oriented interpretation. In this regard, should I perceive it as a theoretical concept, as posited by Engeström? Is it just a clarifying tool as argued by Nardi? Is it just a foundation stone for the formulation of more specific theories as noted by Bannon? As I have noted earlier on (section 2.1), it is my intention to outline a study framework which is devoid of theoretical ambiguities. In order to make this possible, I will look at some historical developments in activity theoretical research in the next section. This, in my opinion, will lead me to develop the requisite theoretical perspective that I can use along the line to outline my study framework.
2.3. Growth in Activity Theoretical Research.

It is obvious from the insight I have provided in section 2.2 above that activity theory has evolved through three generations of research. The first generation, which centred on the works of Vygotsky, created the idea of mediation. This idea was crystallized in Vygotsky’s (1978)\textsuperscript{25} famous triangular model\textsuperscript{26}, shown in figure 2 below, in which the conditioned direct connection between stimulus (S) and response (R) was transcended by ‘a complex, mediated act’ (figure 2a). Vygotsky’s idea of cultural mediation of actions is commonly expressed as the triad of subject, object, and mediating artefact (figure 2b).

![Vygotsky's model of mediated act (a), and its common reformulation (b)](image)

According to Engeström (1987), the limitation of the first generation of activity theory was that its unit of analysis was individually focused. He explained that this limitation was overcome by Leontiev in the second generation of activity theory with the inclusion of the concept of collective activity. The underlying argument presented by Leontiev (1974) was that individuals within a collective activity may have different tasks to perform,

\textsuperscript{25} Even though Vygotsky died in 1934, the publishing date of his work in this book is 1987.

\textsuperscript{26} The interpretative understanding of these figures is derived from an explanation by Leontiev (1974) to the effect that psychology (the premise of Vygotsky’s research) was presented with two alternatives; either to retain the basic two-component scheme of object’s effect change of subject’s present state (or the S – R scheme, which is, in principle, the same thing), or else to start from a three-component scheme that includes a middle link (a "middle term") that mediates the connection between the other two components. The middle link is the subject’s activity and its corresponding conditions, goals, and means.
each with its own sub-goal, and that combined move the group towards the desired outcome.

Based on the above perspective, Leontiev (1981) went on to conclude that just as artefacts mediate the relationship between the subject and the object, rules mediate the relationship between the subject and the community. In the same vein, the division of labour mediates between the community and object. On his part, Engeström views the ideas of community, rules and division of labour to denote the situated social context within which collective activities are carried out. He explains that the community is comprised of one or more people who share the same objective with the subject while the rules regulate the actions and interactions within an activity. The division of labour informs how tasks are divided horizontally between the community members and also refers to any vertical division of power and status. In the opinion of Miettinen (1997), the social mediatedness in this model of collective activity is characterized by the division of labour and rules that mediate the interaction between the individuals in the activity system. As such, the collective activity system as unit of analysis connects the psychological, cultural and institutional perspective to analysis. Miettinen therefore notes that the study of activity ceases to be the psychology of an individual and instead focuses on the interaction between an individual, systems of artefacts and other individuals in historically developing institutional settings.

The first international congress on activity theory, which was held in Berlin, Germany in the year of 1986, marked its recognition as a theory that could be applied outside of a Soviet context. In its current form, activity theory is internationally acknowledged as a multidisciplinary discipline by the International Society for Cultural and Activity Research (ISCAR)\textsuperscript{27}. In this regard, the following interest-sections have been formed by groups of researchers under the fold of ISCAR to promote their interpretation and application of activity theory within the sphere of their respective research areas - (a) Activity Theory and Information

\textsuperscript{27} The first congress of the International Society for Cultural and Activity Research (ISCAR) was held in Sevilla, Spain, in September 2005. 842 registered participants from 44 different countries attended the congress. There were 232 sessions, including 6 invited lectures, 10 collegial meetings, and slightly over 1000 presentations were given (almost 900 papers and slightly over 100 posters). The diversity of participation showed that ISCAR is truly an international and multidisciplinary organization. Different sections have been created under ISCAR by different groups of researchers to promote their application interests.
Technology Section\textsuperscript{28}; (b) Cultural Historical Approaches to Children’s Developmental Section\textsuperscript{29}; (c) Cultural Functional Neuropsychology Section\textsuperscript{30}; (d) Dialectical Psychology Section\textsuperscript{31} (ISCAR News, 2005). In my opinion, the formation of these different sections indicates the growing diversity in the way activity theory is perceived and also applied in different research settings. The fact that groups of researchers have come together to form specific sections to provide them the requisite platforms for networking is also an indication of their recognition of similarities in their conceptual thinking, as well as in their methodological and analytical approaches. Yet, in the light of this growing diversity, it is also important to note that aside the sectional interests I have outlined above, there has also been a growing interest in the application of activity theory in organizational and developmental studies, but for which formal section has not yet been formed under ISCAR. In my opinion, this may be attributed to the presumed difficulty being faced by researchers\textsuperscript{32} in their attempt to apply the theory in organizational settings and possibly the notion held by others that activity theory conflicts with organization theory. As Bannon (1997) has observed, recent developments in the application of activity theory in the study of work in organizations are associated with a larger research community which also includes researchers from Finland.

\textsuperscript{28} The aim is to promote and support an exciting and innovative multidisciplinary discourse which recognizes that the application of activity theory to the development of technology transcends traditional boundaries between the theoretical and applied sciences, and between science, art, and design.

\textsuperscript{29} The aim is to discuss how theories of activity theory to the development of technology transcends traditional boundaries between the theoretical and applied sciences, and between science, art, and design.

\textsuperscript{30} The aim is to create forum for work and research focus on the cultural institutional and historical situatedness of human action/interaction rather than individual neurobiological differences. Covered fields are as follows: - Rehabilitation, occupational therapy, educational and developmental psychology, speech-language pathology, and special education.

\textsuperscript{31} The aim is to focus on theoretical problems of cultural-historical and activity theory starting with the psychophysical problem and theoretical definition of life and psyche ending with ‘tool and sign’ problem, language, Ideality, free will, as well as practical: educational, political, social, cultural and economic issues of this theoretical approach.

\textsuperscript{32} For example, my advisor for this research has acknowledged such difficulty when she worked on her doctoral dissertation (Fältholm, 1998), and attempted applying activity theory in an organizational setting on ‘Work, Cooperation, and Professionalization’.
Germany, Denmark, the United States as well as Sweden. He therefore associated these to the current attempts to expand the coverage of activity theory beyond a purely psychological realm (as reflected in the sectional interest I have listed above) towards a more socially-oriented and organizationally-oriented problems in understanding the dynamics of work activities, such as the “developmental work research” programme developed in Finland by Yrjö Engeström and his co-workers. Therefore, it is obvious to me that Leontiev’s position was put into a more focused perspective by Engeström (1987) and thus paved the way for the use of activity theory in understanding organisational phenomena relative to work activities in organizations. In this regard, attempts have been made (and continues to be made) by several researchers to use Engeström’s approach in the study of organizational and management phenomena in organizations, but the perceived difficulties encountered by many have led to criticism of Engeström’s approach in some respect and the emergence of new frameworks, an event which I will appraise in the next section.

In this appraisal, the issue of interest, from my point of view, is to reflect and understand the conceptual basis to Engeström’s approach, as well as difficulties perceived by others in its application. I view such appraisal to be relevant, because if I relate it to my research propositions (which I have outlined in the opening paragraph of this chapter) and my subsequent arguments (in section 2.1) for using an activity theoretical perspective, I can find possible answers to the question; “can I use Engeström’s approach to outline the frame of my study in the midst of its perceived difficulties, especially if I am to take into account the management-related organizational setting of my study?” This, in my opinion, will pave the way for the exploitation of Engeström’s approach in outlining an effective study framework that I can use in my research which is organizational management-oriented.

33 In Sweden, one group that I know of, and which applies activity theory in its developmental studies, is the research group at the School of Management, Blekinge Institute of Technology in Ronneby. The group includes Dr. Berthel Sutter, Dr. Monica Nilsson and Mr. Hans Kylbäck.

34 The first proposition is that; existing tensions in an RTO’s activity system serve as internal environment constraints which influence the extent to which external environment constraints negatively affect the organization’s implementation of Best management practices. The second proposition also notes that; best management practices can be successfully implemented and internalised by organizations if they are able to effectively deal with internal tensions caused by external environmental changes (e.g. their ability to continuously and effectively adjust their internal operating environments in response to variations in the socio-economic, cultural, and political factors).
2.4. Organizational Activity Theory.

Organizational activity theory, in my opinion, is an emerging activity theoretical orientation based on which studies are carried out in organizations to understand organisational phenomena. The significance of this activity theoretical orientation was highlighted by Engeström (1987, 1990) when he applied the localized formulation of activity theory to the study of organisational activities of both individuals and groups. In pursuance of this, Engeström (2001) also notes that a theory of expansive learning (Engeström, 1987) has been developed within the framework of organizational cultural-historical activity theory. According to Engeström, the driving force behind this is that; the idea of internal contradictions as the driving force of change and development in activity systems has gained its due status as a guiding principle of empirical research. In this respect, he emphasizes the need for the development of conceptual tools to understand the dialogue, multiple perspectives, and networks of interacting organizational activity system. In the pursuance of this need, Engeström has since the early 1990’s applied the concept of organizational activity theory to appraise the work organisation of both individuals and groups (the prominent of which are in health-care settings within Finnish hospital and primary-care systems). Generally, Engeström’s research involves the mediational processes of cognition, communication, and learning related to transformations in work and organizations. His research questions how people can gain control over their collaborative practices and technologies in conditions of complex and contradictory change. He is currently studying teams and networks in a variety of work settings and cultures. He uses cultural-historical activity theory, initiated by Vygotsky and Leontiev, and a multi-method approach called developmental work research.

As a result of Engeström’s conceptual approach, there has been a continuing drive by several researchers to the use of this organizational activity theoretical concept which undoubtedly signifies the third generation of activity theory. A supportive argument for such a continuing drive (which I share) was made by Blackler (1993). In his argument, he noted that just as activity theory avoids divorcing individuals from society, the theory of organizations as activity systems suggests that organizations cannot sensibly be divorced from their contexts. He argued that just as activity theory traces the links between individual and collective thinking, it supports an institutional theory of organizational behaviour when applied to organizations. Yet, it is interesting to note that, aside Engeström and
Blackler, there are other researchers who have also been forceful in their drive to come out with alternative critical concepts in their application of the organizational activity theoretical approach. As a result, there has been an emergence of new developments in the application of activity theory in the study of practices in organizations as activity systems. I have also observed that some of these studies have been the subjects of debates, in relation to their conceptual variability as well as their perceived drift from the interpretational power of activity theory.

In the next sub-sections, I will draw highlights on these conceptual variability as exemplified by the works of Engeström (1987, 1990); Blackler (1993); Blackler, Crump and McDonald (2000); Jarzabkowski (2003), and Thompson (2004). My approach in this section will be to provide a clear view of the works of these authors. Then in the section that will follow (i.e. section 2.5), I will position myself by carrying out a critical appraisal of these works.

2.4.1. Engeström’s model.

In a study which was acknowledged as seminal, Engeström (1987) questioned the notion of traditional learning based on which learning was regarded as a process of acquisition and reorganization of cognitive structures within the closed boundaries of given tasks or problem contexts. In his studies, he perceived traditional conceptions of learning as incapable of meeting the demands of complex social change and creation of novel artefacts and social structures. In his opinion, the traditional conceptions of expansive personality and social development picture expansion as an uncontrollable, spontaneous phenomenon. He then proceeded to present a conceptual framework for a theory of expansive learning activity, transcending the traditional conceptions I have noted in section 2.4 above.

In his theory development approach, Engeström began by analysing the theoretical conceptions of human activity, learning and development. He also analysed the general historical accounts of the development of human learning within selected activities, leading to his specific historical case accounts of expansive human development. He explains that the types of data he used were largely treated in the form of original quotations, while the outcomes and instruments of his analysis were fixed in the form of graphic models. As I have discussed in section 2.3 earlier on, Engeström added to the concept of collective activity (posited by Leontiev) by
viewing the ideas of community, rules and division of labour as denoting the situated social context within which collective activities are carried out. Engeström went on to provide a visualised image of this idea by transforming Vygotsky’s triangle (see figure 2b above) and expanding it into a new model which I have shown in Figure 3 below to symbolise the structure of a collective activity system (figure 3a describes the various elements of the model and figure 3b depicts its general representation). By critically extending the cultural-historical conceptions of Vygotsky and Leontiev, Engeström defined human activity as a systemic formation unifying the processes of production, distribution, exchange, and consumption as transitions between subject, object, instrument, community, rules and division of labour, as I have outlined in figure 3a below. He also defined expansive learning activity as a historically new activity type emerging out of the inner contradictions of traditional school-going, work, science and art.

(3a). detailed representation of Engeström’s (1987) model
This model, according to Engeström, suggests the possibility of analysing a multitude of relations within the triangular structure of activity, as I have highlighted in figure 3a above. He used the following analyses made by Karl Marx as an essential base to provide a theoretical understanding of his model. Citing Marx, he wrote that;

Production creates the objects which correspond to the given needs: distribution divides them up according to social laws. Exchange further parcels out the already divided shares in accord with individual needs: and finally, in consumption, the product steps outside this social movement and becomes a direct object and servant of individual need, and satisfies it in being consumed. Thus production appears to be the point of departure, consumption as the conclusion, distribution and exchange as the middle (………).” (Marx 1973: 89).

According to Engeström, production is to be always seen as the consumption of the individual’s abilities and, also as the means of
production. Correspondingly, consumption is also to be seen as a production of the human beings themselves. Furthermore, distribution is also to be seen as not just a consequence of production, but also as its immanent prerequisite in the form of the distribution of instrument of production and also the distribution of members of the society among the different kinds of production. Finally, exchange too, is found inside the production, in the form of communication, interaction and exchange of unfinished products between the producers. An interesting question that presumably emanated from this analysis of Marx and raised by Engeström is as follows: Does this mean that the boundaries between the sub-triangles of figure 3 are blurred and eventually given up? The answer to this question is traced by Engeström to the following remarks by Marx.

The conclusion we reach is not that production, distribution, exchange and consumption are identical, but that they all form the members of a totality, distinctions within a unity. Production predominates not only over itself, in the antithetical definition of production, but over other moments as well. The process always returns to production to begin anew. That exchange and consumption cannot be predominant is self-evident. Likewise, distribution as distribution of products; while as distribution of the agents of production, it is itself a moment of production. A definite production thus determines a definite consumption, distribution and exchange as well as definite relations between these different moments. Admittedly, however, in its one-sided form, production is itself determined by other moments. For example, if the market, i.e. the sphere of exchange, expands, then production grows in quantity and the divisions between different branches become deeper. A change in distribution changes production, e.g. concentration of capital, different distribution of the population between town and country, etc. finally, the needs of consumption determine production. Mutual interaction takes place between the different moments. This is the case with every organic whole (Marx 1973: 99-100) [cf: Engeström, 1987, p. 79]

Engeström explains that Marx’s notions of the antithetical definition of production and of production in its one sided form, especially when applied to the earliest simple forms of societal organization, seems to refer to the double existence of production as both the whole activity system and as the uppermost sub-triangle or action of that system, as depicted in figure 3a above. According to Engeström, the uppermost sub-triangle represents the individual and group actions that are embedded in a collective activity system. The object is depicted with the help of an oval indicating that
object-oriented actions are always, explicitly or implicitly, characterized by ambiguity, surprise, interpretation, sense-making, and potential for change. In furtherance of this, Engeström (2000a) notes that in activity theory, the distinction between short-lived goal-directed action and durable, object-oriented activity is of central importance. He explains that a historically evolving collective activity system, seen in its network relations to other activity systems, is taken as the prime unit of analysis. He also notes that even though goal-directed actions as well as automatic operations are relatively independent, they serve as subordinate units of analysis which are eventually understandable only when they are interpreted against the background of entire activity systems. Engeström therefore perceives activity systems as realising and reproducing themselves through the generation of actions and operations. He notes that in carrying out expansive developmental research, it is important to firstly gain a preliminary phenomenological insight into the nature of the discourse and problems as experienced by those involved in the activity before delineating the activity system under investigation. Secondly, he proposes rigorous analyses of the activity system. He clarifies that such analyses may be divided into three segments, comprising of the object-historical analysis, the theory-historical analysis, and the actual-empirical analysis.

a. **Object-historical analyses.**

According to Engeström, the object-historical analyses implies identifying and analysing the successive developmental phases of the activity system. However, it aims not only at periodization, but especially at uncovering the secondary contradictions giving rise to the transitions from one developmental phase to another. He points out that this analysis is carried out with the help of the general models of activity (see figure 3b above), as well as with the help of techniques for describing the sequential structure of transitions. He explains that the analysis takes as its point of departure

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35 He explains here that the researcher’s task is to get a grasp of the need state and primary contradiction beneath the surface of the problems, doubts and uncertainties experienced among the participants of the activity. This may be accomplished through comprehensive reading of the internal and public discussion concerning the activity, through participant on-site observations, discussions with people involved in the activity or having expertise about it, and the like.

36 He notes that expansive research is not dealing with activities “in general”, but with real activities realised by identifiable persons in identifiable locations. Delineation is this very act of identifying the personal and geographical locus and limits of the activity. The reason for putting delineation after phenomenology is obvious. Often the locus and limits of activity can be properly defined only after a relatively extensive ‘dwelling in it’.
the qualitative transformations of the object, which is itself to be understood as an activity system. In his words;

> The system of object-activity cannot be regarded as external to the central activity, to be only ‘connected’ with it. To the contrary, the object is to be analysed above all as an integral component of the central activity while simultaneously acknowledging it as a relatively independent activity system of its own. This procedure, moving ‘from within’ the central activity system out to the object-activity and back into the central activity, is essential if the researcher is to preserve his grasp of the self-movement, the self-organizational dynamics of the activity under investigation. In other words, the object becomes an object (Gegenstand) only as a component of the developing central activity (Engeström, 1987, p. 325).

b. Theory-historical analyses

According to Engeström, the theory-historical analysis is motivated by the fact that an activity system in any of its developmental phases utilises a set of shared secondary artefact, that is, concepts and models. He explains that these cultural artefacts are embodied in different modalities (i.e. handbooks, working instructions, fixed procedures for classification and diagnosis, etc), but all of which are, in principle, public knowledge and function as general conceptual instruments of the practical activity. In his words;

> The degree to which these conceptual instruments are acknowledged as theoretical or theory-based is immaterial here. What is essential is that they are partly constructed within the central activity, partly imported into from without. The latter aspect requires a special analysis of the development of the theories introduced into the central activity and eventually of the instrument-producing activities behind those theories. Here again, though a descriptive periodization may be the necessary beginning, the main aim of the analysis is to identify and trace the formation of secondary contradictions initiated by or connected to the secondary instruments of the successive developmental periods (Engeström, 1987, p. 326).

C. Actual-empirical analysis.

According to Engeström, publicly available objectified instruments are powerful constraints, but with them being generalisations, he perceives them to be always interpretable and applicable in multiple ways, for a
multitude of purposes. He, therefore, cautions that carrying out the object-historical and theory-historical analyses are not enough. In his opinion, they need to be complimented by actual-empirical analysis of the internalised and invented models professed and actually used or upheld by the participants of the activity. In his words;

Three tenets may be put forward from the actual-empirical analysis. First, the models actually applied in the activity should if possible be analysed on all the three levels of activity/motive, action/goal and operation/conditions. Second, the models should be analysed as declarative conceptions, as procedural performances, as social discourses or interactions, as communicational networks, and as organizational structures. Third, the models should be evaluated with the help of the results of the historical analyses (a and b above). (Engeström, 1987, p. 326-327).

I view it of relative interest to also note here that Engeström (1987), as a result of his work, has formulated a model of the sequential structure of expansive learning activity. He explained that this sequential structure is worked out with the help of Bateson’s (1978) concept of ‘double bind’, and as a reinterpretation of Vygotsky’s notion of the ‘zone of proximal development’ (I will discuss these later on, in section 2.7, in relation to my self-positioning). He also identified the central instruments that are required for the mastery of expansive learning activity. As he explains, these instruments are worked out through an appraisal of Davydov’s (1982) dialectical theory of concepts, and through a historical classification of types of models. Finally, he outlined a model of expansive research methodology which is isomorphous to the sequential structure of expansive learning activity (I will also discuss this later on, in section 2.7, in relation to my self-positioning and study framework).

Even though the work of Engeström (1987) that culminated in the activity models I have shown in figure 3 above is credited as seminal, as I noted at the beginning of this section, it still generated some criticism from other researchers. In their approach, some of these critics sought to correct what they perceive to be the shortcomings of Engeström’s models. Others also sought to correct what they perceive as the interpretational problems associated with his outlined methodology, as I will highlight in the next four sub-sections.
2.4.2. Blackler’s model.

The critic by Blackler (1993) on the work of Engeström was motivated by his (Blackler’s) concern on developments in the theory of knowing and doing which he perceives to contrast with the conventional rational-cognitive assumptions about management and organization. Blackler argued that this development and the emphasis placed on the importance of esoteric knowledge for business success, suggests that a review of the relationship between knowledge, organization and management is timely. In this respect, he proposed modifications to Engeström’s (1987) contemporary presentation of activity theory on the basis that Engeström’s empirical studies of activity systems concentrated only on documenting the elements of discord within the activity systems. Though Blackler acknowledges the originality and importance of these studies, in terms of their demonstration of high levels of scholarship and empirical rigour, he also views them as revealing in what they do not address. Blackler’s point of contention, in this respect, is that Engeström concentrates on exploring the frictions within activity systems and in picturing these in his (Engeström’s) model of activity systems.

In Blackler’s opinion, Engeström’s primary concern is to demonstrate the value of his (Engeström’s) model of activity as a mediatory device, mapping and exposing contradictions which will initiate a process of self-awareness and social transformation. Even though Blackler agrees that Engeström’s model (see figure 3, pages 51/52) pictures a number of complex relationships very well, he (Blackler) felt the need to modify it for organizational analysis. His argument for such modification is that Engeström virtually said nothing about how the people whose activities he (Engeström) studied reacted to the analysis he produced of the inconsistencies in their activity systems, nor about what happened next, nor on what the emerging pattern of learning and debate suggested about the adequacy of the initial diagnosis.

In furtherance of his argument, Blackler also observes that beyond Engeström’s occasional remark that collective learning does not run smoothly, he (Engeström) did not feature the issue as a concern. Blackler perceives this to be surprising, but yet admits that it did make sense in the context of Marxist activity theory. He then asserts that although Engeström did not use the term ‘false consciousness’, yet it was clear to him (Blackler) that Engeström made the assumption that the core problem in
activity theory is how to alert people to the incoherencies in their lives and to trigger the expansive process of individual and social revelation. Blackler then posits that for others who do not accept Engeström’s theory of the ‘zone of proximal development’\textsuperscript{37}, however, questions concerning the origins of incoherencies within activity systems, what sustains them, and the ways in which people may learn from them remain crucial. He uses this position as a platform to aim at the development of an analysis of activities that, in his opinion, will be free from the difficulties he perceives to be inherent in Engeström’s interpretation of the notion of false consciousness and the zone of proximal development.

Blackler therefore, proposes three changes to Engeström’s general model in order to represent organizations as settings for activity. Firstly he observes that the overall coherency of the system depicted in Engeström’s general model is provided by an expectation that some level of agreement will exist in a community of practitioners on the object of their shared activity. He argues that in the case of formal organizations, however, it can be misleading to assume this. He also notes that complex organizations are likely to embrace a plurality of divergent interest groups who favour a range of goals and priorities. As such, the effective functioning of an organization does not depend on people agreeing on why they are doing something; all that is required is that there is agreement on procedures for determining what should be done. Secondly he observes that structural features may be imposed on organizations from outside. As such, close relationships may be cultivated between key structural features within an organization, binding task demarcations, rules, regulations, technologies, operating assumptions, power structures, and reward and status systems in a tightly-knit whole with an apparent life of its own.

Finally, he observes that his emphasis on developing a non-Marxist interpretation of the internal incoherencies of activity systems (i.e. by locating them within their particular institutional and cultural circumstances) suggests that the historical origins of organizations should be featured in the model. In this regard, he posits that a time-based dimension has been added to his model which I have shown in figure 4 (see next page).

\textsuperscript{37} As I have indicated in section 2.4.1, Engeström (1987) has also formulated a model of the sequential structure of expansive learning activity. He explained that this sequential structure is worked out with the help of Bateson’s (1978) concept of ‘double bind’, and as a reinterpretation of Vygotsky’s notion of the ‘zone of proximal development’. I will discuss this notion later on, in section 2.7, in relation to my self-positioning.
According to Blackler (1993), this modified version of Engeström’s structure of activity was proposed as an account of the hermeneutic foundations of organizations. In his opinion, his framework (figure 4 above) highlights the significance for organization theory of the social origins of motives, the nature and significance of mediating mechanisms in the enactment of activities, the active nature of participation, the relevance of history, and the significance of inconsistency and conflict in activity systems. In order to reflect the potential strength of the relationships between instruments, rules and the division of labour in what he referred to as modern organizations, Blackler pictures the elements at the apex of the outer triangle in Engeström’s general model (see figure 3, pages 51/52) to be located in close proximity to each other at the apexes of the inner triangle. In this regard, he re-interpreted the terms “instruments”, “rules” and “division of labour”, as defined in Engeström’s model as “tools and concepts”, “explicit and implicit rules”, and “organization and role structures” respectively. According to Blackler, in analysing organizations...
as activity systems, emphasis should be directed on the interplay of actions, language, technologies, social structures, implicit and explicit rules, history and institutions. He notes that by this approach, a contribution is made to a central problem in social theory by offering an analysis of the direct and indirect relationships which links individuals and the social systems of which they are a part. He then argued that the theory of organizations as activity systems offers managers an antidote\(^\text{38}\) to simplistic interpretations of the nature of individual knowledge and action, and organizational cultures and competencies. He emphasises that, at its best his approach reframes management. In this respect he views it to model the recurrent and embedded nature of human activities. He also views it to reveal the tentative nature of knowledge and its action orientation, as well as pointing to the opportunities for development promised by engagement and conflict. In Blackler’s perspectives, the origins of organizational practices lie less in rationality and more in their economic and social histories (including institutional norms, ideologies, control battles, demarcation disputes, and technological choices, among others). He argues that it is pragmatic routines and not rules or mission statements that provide the actual basis for co-ordination within an organization and these are embedded in the multi-faceted nature of the organization's activity system. His explanation, in this regard is that changes in routines and outputs may require changes in peoples’ conceptions of their activities and in the workings of their activity systems. What I find to be conspicuously missing in Blackler’s argument here is the notion of object. But by looking at his model (figure 4 above), in comparison to Engeström’s model it then become obvious that Blackler has replaced the activity theoretical conceptions of the ‘object’ of activity with the notion of ‘routines’ of activity. As he asserts in his argument;

In developing a model of organizations as activity systems I have chosen, therefore, to acknowledge the variety of conceptions of activities that may exist within them by depicting routines as the unifying mechanism of the overall system. Organizational routines function as inexplicit, fragile but nonetheless effective vehicles for truce between groups who have developed differing conceptions of their activities (Blackler, 1993, p. 877).

Blackler therefore, views organizations as providing a socially constructed context for actions, because as people ‘act practically’ they interpret and

\(^{38}\)The phrase offers managers an antidote to …. can be interpreted as help managers avoid …..
negotiate such contexts. He then concludes that the appropriate unit for analysing organizational knowledge is not an aggregate of beliefs or rules but a complex of routines, improvisations, setting conditions, and (often implicit) understandings. According to Blackler, what the theory of organizations as activity systems does is to bring a unifying and distinctive framework to a range of issues that would otherwise appear only loosely related. Despite this claim, I have not come across any empirical application of this theoretical framework either by Blackler himself or any other researcher. Therefore, it remains empirically untested. The obviousness of this observation, in my opinion, can be established from another work involving Blackler, but which proposes a new framework that differed not only from Engeström’s model (highlighted in figure 3, pages 51/52), but also that of Blackler’s model (highlighted in figure 4, page 59), as I will be discuss in the next section.

2.4.3. Blackler, Crump and McDonald’s model.

Frank Blackler, (whose work I have discussed in sub-section 2.4.2 above), together with Norman Crump and Seonaidh McDonald have analysed practice in a study of three Strategy Development Groups in a high technology company (High Tech) that was caught in a period of changes. They observe that by using an activity theoretical approach, they were able to analyse High-Tech as a distributed, emergent and decentred knowledge system. Based on this perspective, they assert that an activity theoretical approach to knowing and doing has much in common with contemporary anthropological, ethnomethodological and actor network approaches. In their view, activity theory can be best characterized as ‘functional materialism’. Blackler et al (2000) argue that activity theory denies the conventional assumption that abilities emerge independently from their historical and cultural settings. They attribute such denial to what they perceive as a fundamental approach in activity theory on the idea that human capacities develop when in collaboration with others and also when people act upon their immediate surroundings. In their reference to Engeström’s (1987) model, they acknowledge that;

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39 He points out that the interpretations of such people demonstrate their resilience, and such resilience can and do change.

40 They note that High-Tech is a small player in the global market for electro-optic products which employs an unusually high percentage of highly qualified engineers. Located over three sites that are distributed across the UK, it produces a range of highly sophisticated products for the defence market where it has a strong, and long-established, reputation for innovative design engineering.
Engeström offers a general model of ‘activity systems’. This features the relations between object-oriented activity, agents and the community of which they are a part. Objects of activity are partly given and partly emergent. Engeström suggests (a) that the relations between individuals and the object of their activity are mediated by concepts and technologies, (b) that the relationships between the community and the overall object of its activity are mediated by its division of labour, and (c) that the relations between individuals and the communities of which they are a part are mediated by rules and procedures. Such factors comprise an interrelated bricolage of material, mental, social and cultural resources for thought and action. In his general account of how activities develop, Engeström (1987) makes the point that, as well as being systems that support goal attainment, activity systems are disturbance-producing systems. (Blackler et al., 2000, p. 279-281).

In the view of Blackler et al, the incoherencies, inconsistencies, paradoxes and tensions underlined by Engeström are integral elements of activity systems. They assert that these factors become manifest in ‘disturbances’ when, for example, people are evidently interpreting situations in different ways or when unexpected difficulties emerge in the execution of day-to-day tasks. They note further that such factors also become manifest when inherent dilemmas in the overall pattern of activity become clear.

According to Blackler et al, Engeström has argued that relationships within activity systems are made orderly only by the determination people show as they engage with the objects of their activity. Thus as disturbances become evident within and between activity systems, participants may begin to address underlying issues and to create new learning. Also as people change their situations they change their activities and, simultaneously, they change themselves. In the opinion of Blackler et al, the question then arises of how activity theory can be adapted for organizational analysis. They view that one approach might be to analyse particular organizations as activity systems in their own right. In the same vein, they note that, participants’ understandings of the links between their actions and the overall activity system of which they are a part can become obscured, partly as a result of the complex division of labour that exists in work organizations. They then argue that while the level of internal differentiation between individuals and groups is inevitable in activity systems of any size, complex organizations can easily become segmented and fragmented. Based on these perspectives, Blackler et al postulate that;
As a general rule, the overall objects of the activity and patterns of collaboration in complex work organizations are much more difficult to see and to represent. They tend to be multiple, only loosely connected, emergent, abstract and contestable. Rather than analysing organizations as single activity systems it is more satisfactory, therefore, to analyse them as networks of overlapping activity systems or, for simplicity of expression, as activity networks. The units that make up such networks can be labelled ‘communities of activity’; such communities can be loosely defined in terms of the extent to which members recognize shared work priorities, work with a common cognitive and technological infrastructure, and support each other’s activity. (Blackler et al., 2000, p. 281-282).

Based on the above postulation, they argue that even though Engeström’s general model of activity systems (see figure 3, page 52) reveals the collective infrastructure of expertise within particular activity systems, they have adapted it into a new model (figure 5 below) to feature core organizing processes within networks of activity.

![Diagram](image)

Figure 5: Blackler et al’s (2000) model for organising processes in activity networks.
According to Blackler et al, the central triangle in their model represents the elements whose relationships the model is designed to explore (i.e. one community of activity, others with which it interacts, and the shared object of their endeavours). They explain that in developing an analysis of how the relationships of these elements can be described, they adopted and extended a terminology suggested by Boland and Tenkasi (1995). In this respect, Blackler et al suggest that the processes of ‘perspective making’, ‘perspective taking’ and ‘perspective shaping’ are central to the integration of different expert groups that need to co-operate in the pursuit of multiple, and perhaps competing, objectives. They then conclude that activity theory provides the means to analyse organizations as distributed, decentred and emergent knowledge systems. It is important to point out here that this conclusion by Blackler et al did attract significant criticism from other researchers, especially from Yrjö Engeström and Mark Thompson41.

Commenting on Blackler et al’s conclusion, Engeström (2000b) thinks that the issue raised by their findings stand to easily bring us into the deep waters of defining, interpreting and possibly debating central concepts and principles of activity theory. The first methodological issue highlighted here by Engeström relates to Blackler et al’s choice and use of units of analysis. He disagrees to their position that it is more satisfactory to analyse an organization as a network of nested and overlapping activity systems, rather than as a single activity system. He argues that the distinction between collective long-term activity, individual or group short-term action, and automatic, routinised operation, as well as the movement between these three, is a core principle of activity theory. Quoting from Leontiev he observed that:

Investigation of activity requires an analysis specifically of its internal systemic connections. Otherwise we will not be in a position to decide even the simplest problems - such as making a judgment about whether or not we have an action or an operation in a given case. In this respect activity represents a process that is characterized by continuously proceeding transformations. Activity may lose the motive that elicited it, whereupon it is converted into an action realizing perhaps an entirely different relation to the world, a different activity; conversely, an action may turn into an independent stimulating force and may become a separate activity; finally, an action may be transformed into a means of achieving a goal, into an

41 I will discuss his model later on in section 2.4.5.
Based on the above, Engeström acknowledges Blackler et al’s intention to enlarge the unit of analysis to comprise a network of multiple activity systems, but also argues that little was learnt about the internal systemic connections of the three Strategy Development Groups in the High Tech they studied, and even less about their concrete actions. The second issue touched upon by Engeström is that of Blackler et al’s concept of multiple perspectives. He points out that the concept of perspective is not new in activity-theoretical studies, and has been used to capture the heterogeneity and diversity of orientations among participants of an activity system, or among multiple activity systems (Holland and Reeves, 1994). Engeström then posits that while the notion of perspective offers a useful heuristic, its theoretical characterization remains weak. In this regard, he wrote that;

Is a perspective a cognitive structure, a discursive achievement, or a cultural artefact? How should one go about distinguishing, delineating and naming different perspectives? How does this notion relate to such concepts as, for instance, ‘mental model’, ‘repertoire’, ‘social representation’, or plain old ‘attitude’? Without going further into the complexities of this conceptual minefield, I want to suggest that Bakhtin’s (1982, 1987) conceptual framework of social language, voice, and speech genre offers a historically oriented, theoretically and empirically more powerful avenue for the analysis of heterogeneity and dialogicality (see Engeström R, 1995; Wertsch, 1991). Multivoicedness is not only a characteristic of communities. It is inherent in the speech, thought and action of every individual and becomes manifest in dilemmatic situations of trouble, conflict, and disturbance (Billig et al., 1988). [Engeström, 2000b, p. 308].

Thompson (2004), on his part, has criticised what he perceives as the drift of organizational activity theory from an original concern with the social mediation of human consciousness through intersubjective interaction, to a focus on network relations between organizational communities through inter-collective interaction. He views Blackler et al’s (2000) framework as an attempt to superimpose Boland and Tenkasi’s (1995) concepts of perspective-making, perspective-taking and perspective-shaping onto a modified organizational activity theory model. He then went on to argue that in seeking to investigate the relevance of activity theory to current organizational concerns (such as communities and networks), Blackler et
al have attempted to bend an ontology which is based firmly upon the relationship between the co-emergence of individuals’ behaviour, that of wider groups, and the objects of activity to encompass the co-emergence of ‘community’ behaviour, ‘related communities’ and ‘emerging collective objects of activity’. Thompson continues his criticism by pointing out that a generative dynamic, rooted in the interpretive activity and situated actions of ‘whole’ individuals, has been replaced by Blackler et al with a higher level of (representational) abstraction, in which relationships are posited between the sum of such activity at group level and the sum of such activity at ‘related community’ level, ignoring all non-organizational ingredients of organizational activity.

2.4.4. Jarzabkowski’s model.

On her part, Jarzabkowski (2003) who in my opinion shows great affinity to the views of Blackler (1993) has used activity theory to analyse an empirical investigation of the micro practices of strategy in three universities. In outlining her theoretical base, she agrees to the view of Engeström (1993) that the context of practical activity is defined as an activity system. She also agrees to the view of Blackler (1993) that an organization may be considered an activity system comprising three main constituents; actors, collective social structures, and the practical activities in which they engage. As a consequence, she sees activity theory as providing a framework of four interactive components from which strategy emerges. She outlines the components as the collective structures of the organization, the primary actors whom she conceptualized in her research as the top management team (TMT), the practical activities in which they interact, and the strategic practices through which interaction is conducted.

Jarzabkowski used her framework to study organizational practices, such as the formal strategic practices involved in direction setting, resource allocation, and monitoring and control. She then modelled her findings into activity theory based typologies that illustrate the way practices either distribute shared interpretations or mediate between contested interpretations of strategic activity (see figure 6 next page). According to her, the typologies explain the relationships between strategic practices and the continuity and change of strategy as practice. She notes that the arrows indicate the mediating properties of strategic practices.
What I perceive as interesting, in relation to some of the conceptual perspectives in activity theory that Jarzabkowski’s views to have contributed to her analysis, is her positioning on the works of both Engeström (1993) and Blackler (1993). In relating to Blackler, she wrote that;

A focus upon practical activity is the first contribution of activity theory to our analysis. Practical activity is the site of interaction in which actors engage with their contexts over time. Here activity theory extends other forms of social theory that deal with the interaction between actor and context by adding the practical activity dimension in which interaction occurs (Blackler, 1993) [Jarzabkowski, 2003. p. 25].

In the same vein, she related to the views of Engeström by noting that;

Figure 6: Jarzabkowski’s (2003) model of the activity system
The second key point of activity theory for our analysis is its interpretation of the practices through which actors and collective structures interact in practical activity. Activity theory suggests that interaction arises through the technical and psychological tools that actors use to engage with their environments (Engeström, 1993). [Jarzabkowski, 2003. p. 26].

In her critic of Engeström’s views, as it is expressed in the quotation above, Jarzabkowski agrees that tools have a practical purpose in enabling organizational constituents to engage in strategic activity. But, she also argues that activity theory does not conceptualize tools as primarily the instruments of any particular constituent, such as the TMT she outlines in her model. She posits that tools are rather conceptualized as instruments of mediation between the varied purposes and interests of constituents. She also noted that tools of interaction and mediation may be defined as the practices through which strategy is constructed. Based on this perspective, she observes that;

Blackler (1993) enhances our understanding of the practices by which an activity system mediates between the different interests of constituents. In order to function as a system, different organizational constituents require a means of interacting with each other sufficiently to produce strategic action. Blackler suggests that this mediating function is similar to the notion of formal operating procedures through which the constituents of an organization may reach agreement on the actions to be pursued [Jarzabkowski, 2003. p. 26].

Thus, in the opinion of Jarzabkowski, her study has also extended the empirical application of activity theory by addressing some of the weaknesses that Blackler (1993) has identified in its current uses. She viewed her framework (as highlighted in figure 6 above) as providing a simplified conceptual model of the activity system which may serve as a platform for future application of activity theory to the micro practices involved in constructing strategic action. She therefore, concludes that by linking activity theory to wider change literatures, its potential as an integrative methodological framework for examining the subjective and emergent processes through which strategic activity is constructed can be illustrated.
2.4.5. Thompson’s model.

To start with, it is obvious to me that the attempt by Blackler et al. (2000) to introduce a new framework for interpreting an organization’s activity system was met with strong criticism (as I have discussed in section 2.4.3), especially from Thompson (2004). Yet I find it of significant interest that while Blackler et al. view organizational activity theory as a theory that sets itself a broad agenda for interactive social science, Thompson paradoxically views activity theory to be less a ‘theory’, in the sense of a well-defined approach and set of constructs. He sees it as an explicit focus on the interaction between actors and their surrounding environment which accepts that activity is socio-culturally constructed but maintains that much of the meaning available within any one particular context is determined in relation to the ‘activity systems’ in which it is embedded. In my opinion, this position of Thompson might have informed his criticism of Blackler et al.’s (2000) framework, and also his proposition of a new framework for interpreting organizational activity theory.

Thompson has explained that as a theory of practice, activity theory posits a relationship between the three sides of Engeström’s triangle (see figure 3, pages 51/52) in an attempt to express dynamism. His reason is that all the components represented by the three sides are co-constituted; the meaning being that none of them may be isolated from the others. According to him, this dynamic has relevance to the study of human behaviour in organizations, since it has something specific to say about organizational culture, motivation and action. In this context, he argues that the actions of the ‘subject’ component of the triangle are influenced or ‘motivated’ by whatever artefacts (organizational or non-organizational) that come to mediate his/her consciousness and which at the same time affects the central, emerging object of activity. Thus he views the interaction between the ‘individual’ and the ‘community’ to be mediated by rules. Similarly, the interaction between the individual and the emerging object of activity is mediated by tools (concepts and technologies), and the interaction between the community and the emerging object of activity is mediated by a division of labour, in a triangular relationship. Thompson therefore, proposes a new model which he perceives as a practical framework that would assist future studies using an activity-based ontology. He argues that his proposed framework will result in such future studies retaining their focus on (inter)subjective emergence demanded by the original activity theoretical approach while maintaining a higher level of perspective on
emerging organizational outcomes. I have shown the new model proposed by Thompson in figure 7 below. Thompson therefore views his framework as addressing three issues on activity theory which he perceives to be of concerns to Engeström.

![Figure 7: Thompson’s (2004) proposed model of organizational activity theory.](image)

In his argument, Thompson notes that Engeström (1993) has outlined three methodological principles of organizational activity theory. The first emphasises on using a collective activity system as the unit of analysis. The second relates to the search for internal contradictions as the driving force behind disturbances, innovations, and change in the activity system, and the third calls for analyzing the activity and its constituent components and actions historically. In the opinion of Thompson, these principles are

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42 It is worth noting that the principles in question here have been expanded by Engeström (2001) from 3 to 5. Since Thompson’s work was published in the year 2004, I will assume here that he was not aware of these principles expansion, which Engeström (2001) refers to as the “five principle summarising activity theory”. Therefore, for the sake of clarity, I will mention the three principles noted by Thompson in this section. Later on (when positioning myself) in section 2.6, I will discuss the 5 principles as currently outlined and interpreted by Engeström.

43 I have provided a detailed summary of the three methodologies outlined by from the seminal work of Engeström (1987) in sub-section 2.4.1. I will discuss this vis-à-vis Thompson’s model in positioning myself later on in section 2.5.
consistent with the organizational activity theory’s position on the more structural side of the theories-of-practice continuum. He agrees that the first two principles focus on the analysis of the activity systems in which interaction is embedded, while the third principle adopts a historical position. It is this third principle that Thompson’s seems to have problem with. He argues that this third principle of activity theory posited by Engeström should have adopted an emergent position rather than a historical one. He expresses the view that organizations, as subsets of society, offer employees just some of a number of possible images and symbols to live with and live by. In his opinion, therefore, it follows that the continuing enactment of organizational life is a process that draws upon non-organizational, as well as organizational components. As he notes;

It is argued that the current difficulties encountered by ‘organizational’ activity theory with such distinctions are due, in part, to the theory having drifted away from the original Vygotskian concern with the development of situated people towards the Leontiev-inspired study of collectives. At this collective level—of activity ‘systems’ or ‘networks’—it becomes progressively difficult to distinguish between what is shared and what is non-shared, what is historical and what is newly created, what is physiologically rather than cognitively driven, and indeed how these various elements are co-constituted. Additionally, as will be seen, activity theory’s collective emphasis encourages generalizations about community that may not sufficiently reflect identity-driven conflict within the group being studied: in any practice-based ontology, motives are attributable to people, not groups (Thompson, 2004, p. 586).

Based on the above perspective, Thompson views Engeström’s methodological approach as taking little account of the competing influences on participants (culturally mediated or not). He also sees it as taking little account in determining the meaning and outcome of activities within activity networks. His reason is that, Engeström’s approach has moved from describing an emergent dynamic between ‘whole’ individuals (encompassing organizational and non-organizational aspects) and those objects mediating their consciousness to descriptions of the emergent relationships between employees, their work groups and the objects of their activities. As he notes;

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44 As in Vygotsky’s model (see figure 2b, page 45).
Organizational activity theory’s focus on ‘communities’ demands a particular methodological approach from its proponents: a particular organizational ‘community’, such as a ‘community of activity’ (Blackler et al., 2000), those using a clinical information system (Engeström, 1987), or general practitioners (Engeström, 1993), needs first to be isolated as an analytical unit, whereupon the relationship between its constituent ‘individuals’ and the ‘community’ is then identified, so that its emerging objects of activity can be studied. The problem with this approach is that, in identifying emergent objects through isolating contradictions between individuals and wider activity systems (Engeström, 1993), the analysis occurs within an exclusively organizational setting, and therefore incorporates just one of a participant’s several identities; even inter-organizational settings tend to invite people’s deployments of similar, ‘company man/woman’ personas. Thus, if contradictions are identified, it is extremely difficult to understand how, since there is very little knowledge about the competing influences on the individual that have led to such ‘discoordination’ (Engeström, 1993). [Thompson, 2004, p. 586].

According to Thompson, this insight has two important implications for the application of such theories of emergence to organizations. Firstly, he argues that organizations and organizational symbols should not be reified at group level, since this would be to deny the implications of various literatures that organizations are emergent processes, animated through human interpretive activity. Secondly, he notes that having recognized the importance of such human interpretive activity to organizational life, researchers should acknowledge the role of non-organizational, as well as organizational, influences in conditioning all such interpretive activity in the organizational arena.

Even though Thompson views his proposals concerning activity theory as possessing the potential of contributing to the growing debate about appropriate ways of applying practice-based theoretical approaches within the organizational activity context, I have not come across any empirical application of this theoretical framework either by Thompson himself or any other researcher. Therefore, it remains empirically untested.

45 This is to regard (something abstract) as a material or concrete thing.
46 According to Thompson, literatures on situated learning (Lave and Wenger, 1991), sense-making (Weick, 1995), actor-network theory (e.g. Callon, 1986) and structuration theory (Giddens, 1984) share a phenomenological influence stemming particularly from Heidegger (1978), which views much social activity as pre-reflexive and grounded in physically situated routine, in which the Cartesian subject/object split is temporarily traduced in activity, only to reappear in reflexive awareness upon its disruption (Polanyi, 1967; Giddens, 1984; Winograd and Flores, 1986).
2.5. What is My Position on the Different Activity Models?

One thing which seems obvious to me upon reflecting on the various models I have appraised in section 2.4 above is that, the premise for their development was strongly influenced by organization theorising. The differences that emerged, in my opinion, is a result of the organizational theoretical thinking the respective authors adopted in their interpretations of an organizational activity theory. It is interesting to note that Engeström’s depiction of an activity system *(figure 3, pages 51/52)* as shaped by the humanised aspect of collective and expansive work, and which is in line with the thinking of both Vygotsky and Leontiev was firstly criticised by Blackler. I view Blackler’s criticism to be shaped by his strong lineage to the institutional aspect of viewing collective work in organizations.

The point of interest here, in my opinion, is whether the character of Engeström’s model is completely devoid of the institutional impact on collective activity in an organization, as Blackler’s argument seems to portray. One can see from the box I have labelled *(iv)* in figure *(8)* *(see next page)* that the institutional impact on collective activity is obvious in Engeström’s model as highlighted by the instruments for the activity. Yet, it is also obvious that the visibility of such impact is shrouded by the strong humanised perspective of Engeström model, and which perspective is also reflected in his application of the model (for example, Engeström, 1990).

In this regard, therefore, I view the arguments by Blackler as an attempt to remove the institutional shroudedness from Engeström’s perspective of human-centred activity, and which critic I also share. This is because the work processes in organization are not influenced by only the actions and/or interactions of the people involved in the work, but also by their interactions with the work environment. Arguing from the perspectives of macroergonomics, the issue of interrelatedness, which notion is explained by Kast and Rosenzweig (1985) to suggest a social system in work activity, then becomes of relative importance in association with Blackler’s critic of Engeström. As I have previously noted in chapter one (sub-section 1.9.1), macroergonomics is a multidisciplinary scientific discipline which is concerned with the analysis, design and evaluation of work systems (with the term *work* referring to any form of human effort or activity, and the term *system* referring to sociotechnical systems which can be a single individual using a hand tool or as complex as a multinational organization).
Figure 8: Four historical types of activity and expansive transition
(Engeström, 1987, p. 284)\textsuperscript{47}

\textsuperscript{47} Note that the boxes in the original figure are not numbered. I have numbered them in this case for ease of reference.
Thus, I agree with Blackler that the institutional shroudedness in Engeström’s model should be cleared and its (i.e. institutional) impact on the collective activity be made obvious. On the other hand, I also view Blackler’s depiction of this institutional strengthening (i.e. in Engeström’s model) with a new model of an activity system (see figure 4, page 59) as debatable. The problematic issue here, in my opinion, is Blackler’s replacement of the ‘object’ of activity in his model with ‘routines’. I view this to depict his model as a representation of an activity without an object. By implication, this means that Blackler’s representation signifies an activity without a motive, and which perspective is contrary to the concept of object-oriented activity which form the basis of Engeström’s thinking. In this regard therefore, and from the perspectives of macroeconomics, I share Kast and Rosenzweig’s view of the organization as consisting of goal-oriented arrangements (i.e. containing people with a purpose), psychosocial systems (i.e. with people interacting in groups), technological systems (i.e. with people using knowledge and techniques), and an integration of structured activities (i.e. with people working together in patterned relationships).

As I have already outlined in section 2.4.1, Engeström has provided a theoretical interpretation of his model, assigning meaning to each of the triangles that can be isolated within the model using an analysis provided by Karl Marx. In this respect, the relationship between subject, object and instrument signifies the production element of the activity. Similarly, the relation between subject, community and the rules signifies the exchange element of the activity. In the same vein, the relationship between the community, division of labour and the object signifies the distribution element, while the relationship between the subject, community and the object also signifies the consumption element of the activity. In my opinion, difficulties might arise if an attempt is made to define these relationships within Blackler’s model. It is worth noting here that Blackler himself did not highlight on this relationship, and as a result introduces a limitation to the theoretical interpretation of his model. I view this limitation as a potential source of problem that can be encountered in the analyses of possible relations within the triangular structure of activity.

48 i.e. Production creates the objects which correspond to the given needs: distribution divides them up according to social laws. Exchange further parcels out the already divided shares in accord with individual needs: and finally, in consumption, the product steps outside this social movement and becomes a direct object and servant of individual need, and satisfies it in being consumed. Thus production appears to be the point of departure, consumption as the conclusion, distribution and exchange as the middle (...).” (Marx 1973, 89) [cf. Engeström, 1987, p. 78].

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Though I recognise the relevance of the contributions by Blackler et al., (2000), Jarzabkowski (2003) and Thompson (2004), I view their frameworks to depict conceptual generalisations which make them difficult to adopt or adapt. My position here is from the perspective of modelling a suitable framework to guide my research into an organization’s activity system, especially when it relates to the issue of best management practices implementation. In my opinion, a theoretical framework must have the capability of providing avenues for accessing the requisite organizational activity components as well as aid in their analysis so as to provide meaning to the phenomenon under study.

The debate and disagreements that surrounded the framework proposed by Blackler et al, (see figure 5, page 53) as I have previously highlighted in section 2.4.3, gives a clear indication of its character. My critical view of this framework is that it puts into oblivion the critical role of the subject in an activity system. Blackler et al’s replacement of the subject (as in Engeström’s model) with the concept of “community of activity”, in my opinion, makes it difficult to see how the object of the activity (which they referred to as the “emerging collective object of activity”), in its independent existence, can subordinate to itself and also transform an activity without a subject. In my opinion, an important activity theoretical issue that Blackler et al’s model cannot be used to address, but for which Engeström’s model can serve as an explanatory platform, relates to the issue of an activity’s objectivity. As Leontiev has noted, the objectivity of an activity is responsible not only for the objective character of images, but also for the objectivity of needs, emotions and feelings.

In the case of the models by Jarzabkowski⁴⁹ (see figure 6, page 67) and Thompson (see figure 7, page 70), they appear to me as representations of activities which are not object-oriented. Based on this perception, I perceive them to lack the potential of providing me with insights on the objectivity of an organizational activity. In this regard, I view the model by Engeström (see figure 3, pages 51/52) as entailing such capability. I perceive this model to have created a platform that I can use as a dynamic base in outlining my study framework. By this, I do not intend to say that all of the conceptual issues raised by the others are wrong. As it might be obvious in my appraisal of their works in section 2.4, some conceptual

⁴⁹ As I have indicated in section 2.4.4 earlier on, Jarzabkowski positioned herself closely to the views of Blackler (1993), and as such, it is not surprising to me that she failed to reflect the issue of objectivity in her model.
issues were raised by Blackler, Blackler et al., Jarzabkowski and Thompson which, in my opinion, needs consideration when developing the base for my study framework. The point here is that by taking into account their differences, I can utilise their potentials to outline an effective framework which I can use to study and analyse practice implementation in organizations from the perspectives of the same three methodological approaches outlined by Engeström as I have indicated earlier on in section 2.4.1.

Therefore, in the section that will follow, I will give insights into the outlining of my study framework, as adapted from Engeström’s model. I will also provide an insight into the theoretical principles that will underlie its application. But before proceeding, it will be important to take into account the following comment by Engeström in relation to the adaption of his model (especially figure 3b), which I have previously discussed in section 2.4.1.

I understand the above point raised by Engeström to imply that his model has two important faces. Firstly, the model offers a theoretical interpretation of an activity (figure 3a, page 51). Secondly, it can also be used as an analytical template (figure 3b, page 52) to examine the dynamics of an activity system. By implication, I perceive Engeström as saying that his model, as an analytical template, is not a rigid one and that it is flexible enough to allow for, what I might term “adaptable transformation of the model to fit a study context”. In the next section, I will discuss my transformational adaption of Engeström’s model to provide an outline of my study framework.

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50 Engeström (1987) has noted that in carrying out expansive developmental research, it is important to firstly gain a preliminary phenomenological insight into the nature of the discourse and problems as experienced by those involved in the activity before delineating the activity system under investigation. Secondly, he proposes rigorous analyses of the activity system. He clarifies that such analyses may be divided into three segments, comprising of the object-historical analysis, the theory-historical analysis, and the actual-empirical analysis.
2.6.  Contextualising Engeström’s Model into a Study Framework.

The value of any theory, as Leontiev (1974) has noted, is not whether it provides an objective representation of reality, but rather how well it can shape an object of study, highlighting relevant issues. I view the challenge here to concern the question of how to gain a preliminary phenomenological insight into the nature of the discourse and problems experienced by people involved in the activity and also how to delineate the activity system under study. In my opinion, this challenge requires the outlining of a study framework that will allow me to get a grasp of the need state and primary contradiction beneath the surface of the problems, doubts and uncertainties experienced among the participants of the activity. This therefore, calls for the delineation of the organizational activity system which, according to Engeström, (1987) is the very act of identifying the personal and geographical locus and limits of the activity. The underlying issue here, as I understood from Engeström, is that carrying out expansive research does not mean that the researcher will deal with activities in general. Rather, the researcher will have to deal with real activities realised by identifiable persons in identifiable locations. Engeström himself has provided a leeway in this respect. As I noted in section 2.5, he maintains that with the help of his model, activity can be analysed in its inner dynamic relations and historical change. Yet, he cautions that this claim must be substantiated by using and transforming the model in the analysis of the development of concrete activities. In this respect, what I perceive him to be saying is that his general model is flexible enough to be transformed to fit a study context. I also understand him to be saying that there is the need to clearly establish the type of historical activity\(^{51}\) to which the general model is to be conformed.

As I have noted in section 2.4.1 earlier on, Engeström (1987)\(^{52}\) has also explained that an activity should, if possible, be analysed on all the three levels of activity/motive, action/goal and operation/conditions. He also notes that his model should be analysed as declarative conceptions, as

\(^{51}\) See figure 8 (page 74) for the four types of activity and expansive transition outlined by Engeström (1987).

\(^{52}\) According to Engeström, three tenets may be put forward for the actual-empirical analysis. First, the models actually applied in the activity should if possible be analysed on all the three levels of activity/motive, action/goal and operation/conditions. Second, the models should be analysed as declarative conceptions, as procedural performances, as social discourses or interactions, as communicational networks, and as organizational structures. Third, the models should be evaluated with the help of the results of the historical analyses (a and b above). I have commented on (a) and (b) in section 2.4.1.
procedural performances, as social discourses or interactions, as communicational networks, and as organizational structures. By relating these observations to my research, it is obvious from my accounts in chapter one that my study will focus on analysing the activities/motives, actions/goals and operations/conditions in the organizational activity systems of the Research and Technology Organizations (RTO) during their commercialisation processes. As I have noted in chapter one (section 1.5) earlier on, it is through this study that I will seek to outline how the RTOs can learn to deal with the internal environmental factors that prevented most of them from being successful in implementing and internalising the best management practices\textsuperscript{53} that were expected to enhance their commercialisation\textsuperscript{54}. My interpretation of successful implementation of the best management practices, in relation to figure 8 (see page 74), is that an RTO’s organizational activity system is expected to have been fully shaped (even though this sounds ideal) into a collective and expansively mastered activity (see box (iv) figure 8). Therefore, by virtue of the fact that the best management practices implementation efforts of most of the RTOs were relatively unsuccessful, I can perceive the shape of their organizational activity system (real situation) to be a reflection of either a humanized activity (see box (iii) in figure 8) or a rationalised activity (see box (ii) in figure 8). Since I expect the shape of the organizational activity systems of the respective RTOs that I will be studying to be determined from the data that I will collect, I view it as important to understand the theoretical interpretations of the activity elements (i.e. subject, community, rules, division of labour, as well as the object) as it is entailed in figure 8 as well as it is in Engeström’s general model (see figure 3b, page 52).

a. Subject and Community

The underlined subject of activity is viewed to be the collective individuals in the organization. But within the contextualised nature of my study, as I found from an earlier study (Sanda, 2003), such collectiveness is also

\textsuperscript{53} I have discussed these practices in chapter one under sub-section 1.2.2.

\textsuperscript{54} I have also explained in chapter one that, in my opinion, such an outline can result in the projection of an explanation to the rationale behind the inability of most RTOs in developing countries to be successful in their best management practices implementation efforts. It is in this regard that I saw the need to investigate the specific environmental constraints and tensions in the organizational activity systems of different RTOs. I also saw the need to assess the causes of these constraints and tensions, as well as how they impacted on the RTOs’ efforts in their implementation and internalising attempts.
aggregated into different and identifiable groups\textsuperscript{55} (i.e. management team, senior staff members, and junior staff members). The implication of this, in my opinion, is that the subject element in Engeström’s general model can be contextualised to symbolise the character of collectiveness in the organization either as what I might term separate groups (i.e. management team, senior staff members, junior staff members) or as a collective groups (i.e. workforce). Based on this subject categorisation and differentiation, it becomes obvious that the character of the community element in Engeström’s model is also defined. In my opinion, this might explain the reason why the character of this element was not pre-defined by Engeström as it can be seen in box (iv) of figure 8 in section 2.5. In order to develop a good understanding of the community, which I perceive as a “societal cluster”, it then becomes imperative to also understand how its climate and culture can impact differently on the activity system. In this regard, I find the outlined distinction between organizational climate and culture by Glendon (2001) to be an inspirational resource. He clarifies that while there is a strong relationship between them, climate can be viewed as a more superficial concept than culture. Based on this perspective, I perceive an organization’s climate to essentially reflect the quality of its internal environments in which the attitudes and perceptions of its employees feature prominently.

Thus, in the context of organizational management transformation, I perceive the subject of the activity to revolve around identifiable groups (agents) such as the management team and staff members. It is these agents who collectively form the workforce (i.e. community) and get involved in various activities that are required to meet a set of objectives in order to yield some outcomes. In this respect, I find it of relative importance to understand the prevailing character of the community in the organizations I am studying in relation to the established observations I have outlined above. I view this to indicate the need for dimensions, such as, autonomy, cohesion, trust, pressure, support, recognition, fairness, discourse, appropriation and social relations within an organization to be assessed since all these stand to influence the quality of the mediational actions required to meet set goals. In relation to the organizational culture, I perceive it to embody varieties of dimensions assessable at three different levels (i.e. a relatively accessible level, intermediate level and deep level), as proposed by Glendon. In this respect, the most accessible level refers to

\textsuperscript{55} Indication of group identities in the organizations I am studying can be seen in the first row of table 2 (see page 27) in chapter one
observable behaviours and associated norms within an organization. The intermediate level includes attitudes and perceptions, which are not directly observable, but which may either be inferred from behaviours or assessed through questioning. At the deepest level are core values, whose depth, breadth, progression, strength, pervasiveness, direction and localization within an organization need to be assessed, in addition to those organizational climate measures relating to member attitudes, beliefs, and perceptions, which can help in accessing certain components of the dimensions of organizational culture.

By taking into account the diverse nature of the organizational variables which need to be understood, in relation to their possible embeddedness as elements in the mediation tools and/or actions between specific subjects in the organization and its network of communities, on one hand, and between the community and the agent, on the other hand, I see the need to analyse their mediational relationship in-depth.

b. Rules and division of labour.

Having put into context the character of the “subject” and “community”, the question that arises in my mind is whether the “rules” element and/or the “division of labour” element in Engeström’s model can also be contextualised from the perspectives of my study. In my opinion, I can say that such an attempt is feasible. As I have stated in the opening paragraph of this chapter, the premise of my study is to understand the problems experienced by some research organisations during their commercialisation and for which organizational activity was guided by an “RTO best management practices” model. In my view, this model is in conformity to the character of the instrument in a collective activity as pre-defined by Engeström (see box (iv) in figure 8).

Therefore, in order for me to understand how the model’s (instrument) application in the organizational activity system affected procedural performances, social discourses or interactions, communicational networks, and organizational structures, it is imperative that I assess the management organization as characterised by the rules. Similarly, the work organization must also be assessed as characteristic of the division of labour within the organizational activity system.
c. The object

There is an on-going discussion on the notion of “object” as exemplified in a collection of articles by Engeström and Blackler (2005), Adler (2005), Bruni (2005), Law and Singleton (2005), Miettinen and Virkkunen (2005) as well as Suchman (2005) which are published in a special edition of the journal *Organization* (with Engeström and Blackler as special editors). In their appraisal of the various views presented by the afore-mentioned contributors, Engeström and Blackler wrote that;

Two key insights have been suggested by three styles of theorizing objects. First, it would be a mistake to assume that objects are ‘just given’; objects are constructed by actors as they make sense, name, stabilize, represent and enact foci for their actions and activities. Second, at the same time it would also be a mistake to assume that objects are constructed arbitrarily on the spot; objects have histories and built-in affordances, they resist and ‘bite back’. These insights are of crucial importance for organization studies. Note that both the active construction and the resistance of culturally meaningful objects mainly take place in work organizations. Arguably, indeed, organizations are built and maintained around partially shared, partially fragmented and partially disputed objects. It falls to organizational researchers to study the practices by which the objects of work are constructed, to reflect upon associated consequences and to consider (and to help others both consider and develop) desirable alternatives (Engeström & Blackler 2005, p.310).

Taking cue from the above observations by Engeström and Blackler, it then becomes imperative that the main object of the RTOs’ commercialisation is to transform their old ways of carrying out research activity (i.e. academic-oriented) into new ways (i.e. commercial-oriented research activity) in order to enhance their capacity to self-generate income from their scientific research undertakings. My view of this object relative to the opinion of Leontiev (see discussion under sub-section 2.2.1) is that it is to determine the outcome of the RTOs’ commercialisation. My perception of this kind of object is that it is a creation derived from organizational needs that is influenced by both internal and external realities and is mostly guided by the desire or ambition for future improvement. Based on this perspective, the “object” element in Engeström’s model can be characterised as an deal object. Within this context, the object is to be seen as a heterogeneous and internally contradictory, yet enduring, constantly reproduced purpose of a collective
activity system that motivates and defines the horizon of possible goals and actions, as argued by Engeström (1995). This is because, the object, as Kuutti (1996) argues, can be a material thing which is less tangible (a plan) or totally intangible (a common idea), as long as it can be shared for manipulation and transformation by participants in an activity. Based on this discussion, the contextualised form of Engeström’s model (see figure 3, page 51/52) as a representation of my study framework can be pictured as I have shown in figure 9 below.

Figure 9: Outline of my study framework as a representation of an RTO’s organizational activity system.
I hold the view that in the process of commercialisation as occurred in the organizations I am studying, the interaction between the subject (i.e. agents) and the object of the commercialisation (i.e. carrying out of scientific research by agents as an income generation collective activity) is to be facilitated by the use of an instrument which is modelled into a package of best management practices. Likewise, the interaction between the subject and the community (i.e. staff, management, and board) is also facilitated by the use of a mediated action base on a set of rules (i.e. outlined guides and directions for the effective application of the instrument). In the same vein the relationship between the community and the object is facilitated by a division of labour as prescribed by the instrument. This is in line with the observation by Leontiev (1974) to the effect that the middle link that mediates the connection between the other two components is the agent’s activity and its corresponding conditions, goals, and means. As such, examination of an activity demands specific analysis of its inner and systemic connections. In this respect, I view the influence of the instrument of mediation that defines the relationship between the subject and the object as a key factor. Hence the instrument serves as the control mechanism which determines the strength and quality of the mediation between the subject and the community (as defined by the institutional rules), as well as the mediation between the community and the object (as defined by the division of labour).

I therefore perceive my study framework to have the potential to serve as a useful empirical tool for both data collection and analysis, as I will highlight in the next section.

2.6.1. Application and interpretation of my study framework.

In the application of my study framework, as shown in figure 9 above, I will view the functionality of the institutional rules as source of mediational action in an organization’s activity system to have an influence on the quality of the management processes, depending on the dialectic interaction between its new elements and those shaped by its history. This stands to determine the extent of its ability to ensure an effective

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56 These are the identifiable groups constituting the workforce in the organization (i.e. management team and staff members).

57 Engeström has outlined that in a collective and expanded activity, the instrument for the activity can come in the form of springboards, models and microcosms (i.e. secondary instruments), and also as a developmental methodology (i.e. tertiary instrument). See the box I have marked (iv) in figure 8 (page 74) in section 2.5.
organisation of the community to meet the exchange value of the instrument relative to the subject and the object. In a similar vein, I will view the functionality of the division of labour to be influenced by the quality of the work organisation processes. This also stands to determine the effectiveness of the distribution value of the instrument relative to the community and the object. Based on these, the production value of the instrument relative to the subject and the object as well as the consumption value of the object relative to the subject and the community can also be assessed. In my opinion, therefore, the interpretation of the study framework (figure 9 above) can be facilitated by using the following five principles outlined by Engeström (2001) which summarise the current shape of activity theory.

a. *First principle.*

The first principle postulates that a collective, artefact-mediated and object-oriented activity system, seen in its network relations to other activity systems, is taken as the prime unit of analysis. Goal-directed individual and group actions, as well as automatic operations, are relatively independent but subordinate units of analysis, eventually understandable only when interpreted against the background of entire activity systems. Activity systems realize and reproduce themselves by generating actions and operations.

b. *Second principle.*

The second principle concerns the multivoicedness of activity systems. It postulates that an activity system is always a community of multiple points of view, traditions and interests. The division of labour in an activity creates different positions for the participants. The participants carry their own diverse histories and the activity system itself carries multiple layers and strands of history engraved in its artefacts, rules and conventions. The multivoicedness is multiplied in networks of interacting activity systems. It is a source of trouble and a source of innovation, demanding actions of translation and negotiation.

c. *Third principle.*

The third principle is on historicity. It postulates that activity systems take shape and get transformed over lengthy periods of time. Their problems
and potentials can only be understood against their own history. History itself needs to be studied as local history of the activity and its objects, and as history of the theoretical ideas and tools that have shaped the activity. Thus an activity needs to be analysed against the history of its local organization and against the more global history of the organizational concepts, procedures and tools employed and accumulated in the local activity.

d. Fourth principle.

The fourth principle relates to the central role of contradictions as sources of change and development. In this context, contradictions are not the same as problems or conflicts, but they are historically accumulating structural tensions within and between activity systems. This contradiction pervades all elements of activity systems. Activities are open systems. When an activity system adopts a new element from the outside (for example, a new technology or a new object), it often leads to an aggravated contradiction where some old element (for example, the rules or the division of labour) collides with the new one. Such contradictions generate disturbances and conflicts, but also innovative attempts to change the activity.

e. Fifth principle.

The fifth principle proclaims the possibility of expansive transformations in activity systems. Activity systems move through relatively long cycles of qualitative transformations. As the contradictions of an activity system are aggravated, some individual participants begin to question and deviate from its established norms. In some cases, this escalates into collaborative envisioning and a deliberate collective change effort.

In the next section, I will highlight on the dynamics of my study framework (see figure 9, page 83) and its potential to serve as both a methodological and analytical tool for my research.

Engeström (2000a) has clarified that in activity-theoretical studies of work, deviations from standard scripts are called disturbances (e.g. Engeström 1996, Norros 1996). He explained that they typically indicate developmentally significant systemic contradictions and change potentials within the activity. In other words, while the object and motive give actions coherence and continuity, by virtue of being internally contradictory, they also keep the activity system in constant instability.
2.7. Study Framework as a Representation of Organization’s Activity System: Picturing its dynamics.

In section 2.6 above, I gave an overview of events that resulted in the outline of the theoretical framework to guide my study. The point of interest here is to draw a mental picture of the dynamics of activities within an organization’s activity system as outlined by my study framework. Leontiev has noted that the concept of activity is necessarily connected with the concept of motive. He explained that there is no activity without a motive, and as such, an unmotivated activity is not an activity that lacks a motive, but rather an activity whose motive is subjectively and objectively hidden. An added perspective to Leontiev’s observation was provided by Engeström (1993) when he argued that the motive for change efforts arises from analyzing the contradictions and possibilities in the object and also from projecting a new historical form of the object as an expansive solution to the tensions that prevail. In this regard, Engeström has outlined that an expansive transformation can be accomplished when the object and motive of an activity are re-conceptualised to embrace a radically wider horizon of possibilities than in a previous mode of the activity. As I have noted in section 2.4.1 earlier on, Engeström views object-oriented actions to be always, explicitly or implicitly, characterized by ambiguity, surprise, interpretation, sense making, and potential for change. In this regard, he argues that a full cycle of expansive transformation is to be understood as a collective journey through a zone of proximal development of the activity (i.e. the distance between the present everyday actions of individuals and the historically new form of societal activity that can be collectively generated as a solution to the double bind potentially embedded in the everyday actions). His illustration of the zone of proximal development is shown in figure 10 (see next page). He depicts this zone as a grey area (as I have indicated in figure 10) between actions embedded in the current activity with its historical roots and contradictions, the foreseeable activity in which the contradictions are expansively resolved, and the foreseeable activity in which the contradictions have led to contraction and destruction of opportunities. According to Engeström, the notion of zone is crucially different from the notion of goal. While a goal is a fixed end point or end state, a zone is the distance or the area between the present and foreseeable future. He notes that if such a zone is not worked out, specific goals are built on sand, or pinned onto thin air. Thus the working out of a collective zone of proximal development calls for a conceptual model that can be used to represent the activity as an object-oriented system.
In my opinion, this illustration of the zone of proximal development provides a clear picture of the relative journey of the RTOs’ in their commercialisation efforts. The steps that can be taken to get the outline of developments in such a journey have also been outlined by Engeström as I shown in figure 11 below.

Figure 11: Expansive cycle of learning action (Engeström, 2000a).
An issue of interest to me in this respect is the contextual interpretation of the observations by both Leontiev and Engeström in relation to the expansive transformation in an organization, especially as it is shaped by the best management practices implementation process. It is therefore obvious to me that the measure of relative success or otherwise of the implementation process by the RTOs can be understood from the perspectives of the expansive cycle of learning actions that might have occurred. In the view of Engeström (2000a), a crucial triggering action in the expansive learning process (see figure 10 above) is the conflictual questioning of the existing standard practice which can lead to deepening analyses (i.e. analysis of contradictions) and eventually to a sharper and more articulated questioning. He explains that in the process of these actions, modelling of a new solution, new instrumentality, and a new pattern of activity emerges. He notes that the actions of questioning and analysis are aimed at finding and defining problems and contradictions behind them.

I will therefore, limit the scope of my study to involve the first three processes depicted in figure 11 above (i.e. questioning to generate data, and historical as well as actual-empirical analyses). In this respect, I will use my study framework (see figure 9, page 83) to understand the past activity systems (before commercialisation) of the organizations I am studying and their foreseeable (expansive) activity systems (based on the RTO best management practices model). In the same vein, I will use it to study the organizations’ present activity systems as shaped by their commercialisation processes in order to gain an insight of their respective zones of proximal development. The insights gained will then be transposed on the different elements of the study framework, to provide the bases for the future modelling of new solution.

I will discuss my methodological approaches for the collection of empirical data as well as their analyses in the next chapter (i.e. chapter three)

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59 I have discussed this in the chapter one, under section 1.2.
60 This is the first strategic action.
61 This is the second strategic action.
62 This is the third strategic action in expansive learning. According to Engeström, it is already involved in the results of the analysis of contradictions, and it reaches its fruition in the modelling of the new solution, the new instrumentality, the new pattern of activity.
3

METHODOLOGY

In chapter two, I gave an overview of activity theory in its broad perspective and proceeded on with critical appraisals of five theoretical frameworks, each of which sought to put into perspective the interpretational outlines underlying the concept of organizational activity theory. These are the works of Engeström, Blackler, Blackler et al., Jarzabkowski and Thompson. What emerged from the critical appraisal of these works was my ability to position myself within their varying theoretical conceptions, an event that culminated in the outline of my study framework. The issue that arises here, in my opinion, concerns the applicability of this framework as a methodological guide for the data collection and also as a template for data analysis. In this chapter, therefore, I will discuss the contextual character of my research based on the study framework. Within this perspective, I will firstly define the scope of my study. This will be followed by a discussion that will lead to my characterisation of the study type. I will then end with a discussion on my methodological approach for both data collection and analysis.

3.1. Scope of Study.

If I am to define the scope of this study, I will categorize it as starting from a proposition whose foundations I have discussed in chapter one. From the proposition, I journeyed “eastwards” into the realm of theory which I also discussed in chapter two. The journey continues from the realm of theory into the reality of empirical investigation of individual organizations which methodological outline I will discuss in this chapter, and whose conduction I will also highlight in the next four chapters (i.e. chapters four, five, six and seven). The journey continues in chapter eight with a cross analysis of empirical results from the individual organizations and a reflection back to theory on the efficacy of the study framework (i.e. contextualised Engeström’s model) as a template for future research in similar organizational settings as this study. Therefore, my overall perspective of this journey, in relation to the purpose of this study is to test theory. As such, this study is neither an action-oriented research nor a development-oriented research in its entity. Yet, it is possible that indirect actions and/or developments can emerge from the feedback mechanisms that I will put in
place in order to facilitate my data collection and/or data analysis exercises.

3.2. What is my Characterisation of this Study?

Yin (1994) has outlined that the complete research design, covering the five components (i.e. study questions, its propositions, its units of analysis, the logic linking the data to the propositions, and the criteria for interpreting the findings), requires the development of a theoretical framework for the case study that is to be conducted. He notes that rather than resisting such a requirement, a good case study investigator should make the effort to develop this theoretical framework, irrespective of whether the study is to be exploratory, descriptive, or explanatory. According to Yin, the use of theory in doing case studies, is not only an immense aid in defining the appropriate research design and data collection, but it also becomes the main vehicle for generalizing the results of the case study. At this juncture, it is imperative that I ask the question as to whether my research design is in conformity to the above observation by Yin. An answer to this question, in my opinion, will easily emerge from the following appraisal of my research journey so far. In chapter one (section 1.5), I have used as a platform, an observation by Polkinghorne (1983) on the process of scientific inquiry to argue that the outcome of my initial study (i.e. Sanda, 2003) is a result of the abductive type of reasoning (i.e. the process of suggesting a hypothesis which can serve as an explanation of what appears as puzzling). As a recall, Polkinghorne observes that;

Like Hanson and Polanyi, Pierce believe that science should be as concerned with the process of discovery as with the process of justification. He saw science as a dialectical interaction between these two processes. The process of discovery begins with the shock of an experience which does not fit into one’s system of thought and sets off doubt. A problem arises when the uniformity of nature which one thinks one has understood is disrupted by an experience that causes one to question and change previous understanding. One begins a scientific inquiry with a conjecture (a hypothesis). Pierce used the term *abduction* to designate the mental activity by means of which the hypothesis is formed…………..This is a living process that occurs in the minds of scientist” (Polkinghorne, 1983, p. 121).

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63 I will return to this discussion later on in chapter nine.
64 According to Polkinghorne, abduction is one of three types of inference, the other two being deduction and induction.
I also noted that my initial study (whose outcome I have summarised in chapter one, section 1.4) has focused on answering the first research question\(^{65}\) (i.e. why did the efforts of RTOs\(^{66}\) in most developing countries to implement and internalise best management practices as key component of their commercialisation efforts ended up being constrained?). My conclusion, in this respect, was that tensions in an RTO’s activity system are internal constraints that negatively affect an RTO’s implementation of Best management practices. But as I have explained in chapter one (under section 1.5), the analytical data based on which I made this conclusion lacks strength when an account is taken of the fact that my follow-up study to understand the impacts of factors internal to the RTOs operating system was a pilot case study on three RTOs from the same country (i.e. Ghana) operating under the same climate. In this vein, I have viewed the analytical data from the pilot study to contrast those obtained from my survey which involved eight RTOs from eight different countries \(\text{(see table 1 in chapter on, page 25)}\). As such, I became conscious of the complications that can arise in trying to defend my conclusions in the initial study, especially as to whether my observations in the three RTOs in Ghana can be translated to RTOs in different countries. By virtue of this observation and also from the perspective of self-criticism, I have argued that what I referred to as “conclusions” are rather “propositions” whose generalisation requires the study of different RTOs in different countries. By implication, I felt the need to investigate and establish the specific environmental constraints as well as tensions\(^{67}\) in the organizational activity systems of different RTOs in different developing countries. In this respect, I have posited that the sorts of data that I will find reasonable to collect will not be determined by my research problem, \textit{per se}, but rather by the tentative propositions that have emerged from my initial study (i.e. Sanda, 2003). The propositions which I have outlined in chapter one (sub-section 1.5), on the one hand, indicates that existing tensions in an RTO’s activity system serve as internal environment constraints which influences the extent to which external environment constraints negatively affect the RTO’s implementation of Best management practices. On the other hand, best management practices can be successfully implemented and internalised by organizations if they are able to effectively deal with internal tensions caused by external environmental changes (for example, their ability to continuously and effectively adjust their internal operating environments in

\(^{65}\) See chapter one, sub-section 1.3.5.

\(^{66}\) Research and Technology Organizations.

\(^{67}\) The nature and types of “constraints” and “tensions” are subjects of investigation and understanding.
response to variations in the socio-economic, cultural, and political factors). I have also viewed these propositions as standing to give direction to my scientific investigation in relation to the identification of its theoretical orientation and the subsequent determination of the appropriate framework to guide the data collection and/or analysis processes. In this respect, I position myself along the views of Denzin (1989) and thus perceive the propositions as expressing the temporal and situational context that requires explanation from my study. Therefore, in order for me to understand the possible relationships that are underlined by the propositions, I view it as necessary to understand the context in which such relationship might exist.

In chapter two, I gave the rationale behind my choice of the activity theoretical perspective in relation to these propositions. I followed this with a critical appraisal of the relative concepts and principles of organizational activity theory, leading to my establishment of their communalities and/or divergences, especially as underlined by the works of Engeström (1987); Blackler (1993); Blackler, Crump and McDonald (2000); Jarzabkowski (2003), and Thompson (2004). I then argued on how these conceptual commonalities and/or divergences contributed in outlining my study framework based on Engeström’s model. As I have explained under section 2.6, my study framework is, in a way, an extension of Engeström’s model which emerged as a result of my contextual characterisation of three of its key elements (i.e. the rule, community, and division of labour). As I have noted in section 2.5, this is due to my taking account of the following comment by Engeström in relation to the adaption of his model (especially, figure 3b in page 52) which I also discussed previously under section 2.4.1, that is;

I maintained that with the help of this model, activity can be analysed in its inner dynamic relations and historical change. However, this claim must be substantiated by using and transforming the model in the analysis of the development of concrete activities (Engeström, 1987, p. 81-82).

By implication, I perceive Engeström as saying that his model, as an analytical template, is not a rigid one and that it is flexible enough to allow

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68 See chapter two, section 2.4 (sub-sections 2.4.1 to 2.4.5).
69 See chapter two, sections 2.5 to 2.7.
70 See figure 9 in chapter two (page 83).
for, what I termed as the adaptable transformation of the model to fit my study context.

Reflecting on the above discussion\textsuperscript{71}, it is clear to me that this is an empirical study through which I can explore in-depth the preliminary findings from the pilot study I have carried out in my initial study in order to test the veracity of the two propositions that culminated from that study. This clarity is established by my positioning of the study within an organizational activity theoretical framework which offers the requisite avenue for outlining my study framework and putting it into context. Yet, by virtue of the flexibility of the organizational activity theoretical model that I have adapted (i.e. Engeström’s model) and my contextual extension of its elements (in order to shape the character of my study framework), it then implies that my study also have some elements of theoretical reflections on the contextualised character of the theoretical model (i.e. my study framework) as a template for similar studies in the future. It is therefore obvious from these chronicled observations of mine that I am undertaking a case study enquiry (Yin, 1994) which stands to cope with the technically distinctive situation of the RTOs’ activity systems in which there will be many more variables of interest than data points. It is also obvious that my case study will rely on multiple sources of data, with evidence needing to converge in a triangulating fashion, and also benefits from my prior development of theoretical propositions to guide the data collection and analysis. In my opinion, this latter view is in tandem with the observation by Denzin (1989) that propositions give theory its quality of explanation, and thus permit the construction of deductive schemes. As Denzin explains, when a proposition states an empirically observable event, the concepts it combines are variables. In some cases, these variables have two values (i.e. present or not present) while in other cases, they take values of degree (i.e. greater or less).

3.3. Case Study Classification.

In section 3.2 above, I gave an overview of events which, in my opinion, establish the deductive characteristics of this study as well as the requisite need for it to involve different RTOs in different developing countries. This therefore places the study of my cases within the realm of the deductive system of enquiry. For as Polkinghorne (1983) argues, most researches in the social and behavioural sciences do not deal with\textsuperscript{71} I will return to this discussion later on in chapter nine.
deductively related proposals, but are limited to isolated hypotheses. In the
deductive system, as Polkinghorne notes, the explanation of a fact consists
of showing that it is an instance of a theory. It is important to note here that
this explanation of facts in a deductive system of enquiry is not all that
easy. One difficulty, as argued by Polkinghorne, is that the deductive logic
dispenses with the time concept and treats the actual processes of thought
as laid down in an eternal present – just in order to avoid contradictions
between successives. The implication I gather here is that my study will
involve more than one case. This specifically means that I will be carrying
out a multiple case study. But as Yin (1994) has observed, my decision to
undertake this multiple-case study is not taken lightly. In this regard, I am
conscious of the possible question that I may encounter in relation to the
number of cases that I deemed as necessary or sufficient for this study.
Here, I will take exception from the argument by Yin that because it is
inappropriate to use sampling in this respect, then the typical criteria
regarding sample size is also irrelevant. This position of Yin is a fact that is
shared by all the major researchers in the field, including Stake (1995) as
well as Feagin, Orum, and Sjoberg (1991). In a bid to strengthen this
opinion, I will also relate to the position of Tellis (1997) to the effect that
in doing case studies, one does not need to have a minimum number of
cases, or to randomly ‘select’ cases. The relevant issue here (with which I
quite agree) is that the selection of cases must be done so as to maximize
what can be learned in the period of time available for the study.
Therefore, in the opinion of Tellis, what the researcher has to do is to work
with the situation that presents itself in each case.

Thus by taking into account the views of both Yin and Tellis, my selection
of cases (which I will discuss in the next section) is based upon the
certainty that I wanted to have about the results of my multiple-case study
within the time-binded frame of this doctoral research.

3.4. Selection of Cases.

In the opinion of Yin, the logic underlying the use of multiple-case studies
is the same. He notes that the cases must be carefully selected so that they
can either predict similar results (i.e. a literal replication) or produce
contrasting results, but for predictable reasons (i.e. a theoretical
replication). The implication of this logic in relation to my study is that the
character of my cases needs to be seen from the perspective of either a
literal replication or a theoretical replication. Yet, by taking into account
the observation by Yin (1996), which indicates the relative importance of a theoretical framework in the choice of either of the two replication types, I find myself in confrontation with the issue of which option to choose since my study is guided by a theoretical framework. But as Yin explains, the theoretical framework has to state the conditions under which a particular phenomenon is likely to be found (a literal replication) as well as the conditions when it is not likely to be found (a theoretical replication).

The question that arises here, in relation to my study framework, is; “does my theoretical framework have a stated condition that makes room for a theoretical replication?” In order to answer this question, I view it of relative importance to revisit the proposition that led to the development of my study framework. The proposition is that existing tensions in an RTO’s activity system serve as internal environment constraints which influence the extent to which external environment constraints negatively affect the organization’s implementation of best management practices (BMP). The implication here is that BMP can be successfully implemented and internalised by organizations if they are able to effectively deal with internal tensions caused by external environmental changes. The phenomenon of interest here, in my opinion, is the issue of an RTO being successful in the implementation and internalisation of best management practices. The condition for this to happen is that the organizations must able to deal with internal tensions in their activity systems. By implication, this means that RTOs (or cases) that are successful in their implementation of best management have been able to deal with the internal tensions that might have existed in their activity system. In the same vein, cases that are not successful in their implementation of best management practices are to be seen as not able to deal with internal tensions that exist in their activity systems. Also, by virtue of this interpolation, my second answer to the question I have posed above is that; “my selection of cases will follow the theoretical replication procedure”. Therefore, by considering the underlying significance of the proposition to the application of my study framework, it is obvious to me that the case results to emerge from my study settings should be capable of predicting a theoretical replication. The consequence of this, in my opinion, is that it makes the selection of cases in my study an issue of strategic importance. As I have noted in section 3.3 above, I will strategise the selection of my cases in this study in order to allow me easy and copious access to data. Such data must also stand capable of providing me with the level of certainty that I might want to have so that the consequent results can have practical relevance to the
organizations selected as cases, as well as academic value in testing the theoretical implications of my study framework. In my strategic selection approach, I took into account the fact that the rationales for setting up these RTOs are basically the same (i.e. to serve as bases for their countries’ industrial growth, and assisting small and medium scale enterprises to develop their capability). As such, they share some similarities with respect to their structures. Despite this similarity, variations exist with respect to their sizes, operating environments and management styles. It is worth mentioning here that such variations (though in a different study setting) have been used by Fältholm (1998) as an underlying criterion for her selection of cases. In her arguments, she wrote that;

The criteria presented in the theoretical framework provided strong guidance in selecting cases in this research project, as it implies that variations regarding technological level, organizational structure and group structure should be taken into account. Because of variations in these criteria four cases that represent occupational gendered and organizational diversity were selected.....As a result of these conclusions, four cases were thus selected: female white-collar workers in a typical office work place, male blue-collar workers in the warehouse of a paper mill, midwives in a Swedish delivery ward and project administrators, architects and users cooperating in the planning of a new hospital (Fältholm, 1998, part II, p. 2-3).

But in relation to my study, it is important to note that irrespective of the variations I have outlined above, the commercialisation processes of these RTOs were mostly underlined by their implementation of similar best management practices. By taking this into consideration, I have selected four RTOs with varied characteristic as my cases in this study. The rationale behind the selection of four specific cases is two-fold; that is, (i) rationale from my side as the researcher, and (ii) rationale behind the RTOs’ management acceptances to be cases.

3.4.1. Rationale behind my selection

My rationale for selecting four cases is that the results to be derived from them (in relation to my study framework72) will have the power to strengthen the research findings and the conclusions. In choosing these four cases, I took into account the explanation by Mengu and Grier (1999) to the effect that an RTO is created from the desire of a society or political

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72 See figure 9 in chapter two (page 83).
unit to address the technological needs of its industries. As they highlighted in their schematic representation of the RTO (see figure 1a in chapter one, page 8), the society has cultural and industrial characteristics that affect how the RTOs are structured as well as how they operate in different countries. In this respect, therefore, it was quite obvious to me that the cases that I had to choose were bound to have both different social-cultural and industrial characteristics, and which might have possibly affected the structure and operations of each case. With this awareness in mind, I considered the following three selection criteria to be of strategic importance. Firstly, each case must have been subjected to commercialisation. Secondly, the outcome of the commercialisation must show variation in terms of relative measure (i.e. from unsuccessful to successful ability to self-generate income). In my application of this second criterion, I used the report by Mengu and Grier (1999) as a guide and the selection was made in consultation with the first author of this report (i.e. Mr. Mengu).

As I have noted earlier on in chapter one (sub-section 1.2.2), Mengu and Grier have explained that during the implementation phase of the best management practices model, they worked closely with about fifteen RTOs and their findings indicated that most of these RTOs were unable to implement the recommended changes successfully. I also took into account observations from my initial study (i.e. Sanda, 2003) on how cases viewed the impact of both external and internal indicators on their implementation of the best management practices model (see tables 1 and 2 in chapter one, pages 25 and 27). My third criterion is that; the management of each case must express total interest in my study and be prepared to allow me unhindered access to data collection in their organizations. This is because the exercise of data collection exercise involved travelling from Sweden to case locations outside Europe and thus expensive. By taking into account the limited resources available for my study, it then become obvious that I source and collect as much data (and if necessary seek their refinement) at case locations since movement “to and fro” case locations is not plausible. In conformity with the selection criteria I have outlined above, I selected four cases from four countries (i.e. Trinidad, Ghana, Botswana, and South Africa) whose management expressed their interest in my study and also their readiness to relate to my third strategic criteria as I have outlined above. These cases also provided me with two different regional settings (i.e. Western/Southern Africa and Caribbean/Latin America regions). My motive for selecting each of these four specific cases is as follows: - The
RTO in Trinidad was involved in a successful institutionalisation of a quality management system before it started its attempts to commercialise. As such, I find it to be a good case to study, taking into account its continuing effort to be successful in this respect. The RTO in Ghana had been engaged in an effort to implement and internalise best management practices, which could help transform it from a fully subsidized institution into a profitable income generating organization. This effort is on-going with the RTO still striving for success in its efforts to commercialise. The RTO in Botswana had been involved in several best management transformation efforts without much of a success. The commercialisation of the RTO in South Africa was perceived to be relatively successful. Even though there are variations in my motive for choosing each of the above cases, the obviousness of their collective significance here is underlined by an observation of Yin (1994) to the effect that in multiple-case study, one goal is to build a general explanation that fits each of the individual cases, even though the cases will vary in their details.

3.4.2. Rationale for RTOs’ management acceptances as cases of study.

It is important to note that prior to the expression of interest by the respective management of the four cases in my study, and also the indication of their readiness to allow me unhindered access to data collection in their organizations (in line with my third strategic criteria as I have outlined in section 3.4.1 above), they on their part sought for the direct and immediate benefit that their organizations will gain from my study visit. This culminated into me providing them with much insight into my research by making available the report from my initial study (Sanda, 2003), as well as a write-up highlighting the background of this study and its theoretical direction. I also provided them with a “future workshop” guide that I intended using for the conduction of a problem identification workshop (I will discuss this in section 3.5) whose outcome stands to provide the management of the cases (especially those in Ghana, Botswana and Trinidad) significant direct and immediate benefits.

73 The organization has undergone a restructuring programme geared to improve the quality and range of services provided to its clients. I will highlight on this later in chapter five.

74 Yin (1994) has highlighted on this in Box 25 of his book (see page 112).
In the next section, I will describe and discuss my approach for the collection and analysis of empirical data in this study. In this regard, I will draw attention to the explanation by Yin (1994) to the effect that case study, as strategy, comprises an all encompassing method – with the logic of design incorporating specific approaches to data-collection and data analysis. In this sense, Yin agrees with Stoecker (1991) that the case study is neither a data collection tactic nor merely a design feature alone, but a comprehensive research strategy, as my subsequent discussions will reveal.

3.5. Method for Data Collection.

In the opinion of Feagin, Orum and Sjoberg (1991), the most essential characteristic of case studies is that they strive towards a holistic understanding of cultural systems of action. They explain that cultural systems of action refer to sets of interrelated activities engaged in by actors in a social situation. I find this opinion of Feagin et al to be in conformity with the methodological position of Engeström (1987)\(^75\). Engeström has clarified that doing expansive research does not mean dealing with activities “in general”, but with real activities realised by identifiable persons in identifiable locations. His view here is that activity systems realise and reproduce themselves through the generation of actions and operations. Based on this perspective, he notes that in carrying out expansive developmental research, it is important for the researcher to firstly gain a preliminary phenomenological insight into the nature of the discourse and problems as experienced by those involved in the activity before delineating\(^76\) the activity system under investigation. From my understanding, what Engeström means by “phenomenological insight”, in this regard, is that; in activity theory-oriented studies, it is the task of the researcher to get a grasp of the need state and primary contradiction beneath the surface of the problems, doubts and uncertainties experienced among the participants of the activity. In his view, this may be accomplished through comprehensive reading of the internal and public discussion concerning the activity, through participant on-site observations, discussions with people involved in the activity or having expertise about it. By transposing these views of Engeström on the contextual frame of my study (i.e. organizational management

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\(^75\) I have discussed this in chapter two, sub-section 2.4.1.

\(^76\) Delineation, as explained by Engeström (1987), is the act of identifying the personal and geographical locus and limits of the activity.
transformation), it becomes obvious that the subject of the organizational activity, as data source, revolves around identifiable groups (agents) such as the management team and staff members. Since these agents, as a collective entity, constitute the community, I view it of relative importance to understand the character of such community in the respective cases, in relation to the observations by Engeström, as I have outlined above. But in order for me to be able to provide an understanding of the community’s character, it is imperative that I assess relative dimensions such as, autonomy, cohesion, trust, pressure, support, recognition, fairness, discourse, appropriation and social relations within each organization (or case). The question that arises here is; “how are my actions toward the assessment of these dimensions going to be triggered”? As I have noted in chapter two, section 2.7 earlier on, it is obvious to me that the measure of relative success or otherwise of the commercialisation processes by the RTOs can be understood from the perspectives of the expansive cycle of learning actions that might have occurred in them. But as Engeström (2000a) has posited, a crucial triggering action in the expansive learning process (see figure 10 in chapter two, page 88) is the conflictual questioning of the existing standard practice which can lead to deepening analyses (i.e. analysis of contradictions) and eventually to a sharper and more articulated questioning. He notes that the actions of questioning and analysis are aimed at finding and defining problems and contradictions behind them. As Engeström (1987) clarifies, the term contradiction as a source of tension in the activity system indicates a misfit between elements within an activity, and/or between different activities. These contradictions manifest themselves as problems, ruptures, breakdowns, and clashes.

Therefore, the empirical approach for this study has involved the collection of data from multiple sources on how activities are carried out by agents in the RTOs. Firstly, I carried out the questioning process from the perspectives of structured interviews with each organization’s Head as well as key actors using the interview questions guide I have shown in appendix II and appendix III respectively. By key actors, I mean staff members with deep insights of events which might have occurred during the implementation exercises. Secondly, I made personal observations on the

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77 I have discussed in chapter two, section 2.6.
78 As I explained in chapter two, section 2.6, it is these agents who collectively form the workforce (i.e. community) and get involved in various activities that are required to meet a set of objectives in order to yield some outcomes.
79 This is the first strategic action.
80 This is the second strategic action.
ways various activities are carried out and also on how these activities and the actors carrying them interact with one another. This involved my interaction with staff members at different departments/units during their normal working hours. But unlike the case in Ghana whose operating environment I was quite familiar with (as I have highlighted in chapter one, section 1.1), and thus was able to assign meanings to my observations, I had to compliment my observations in the cases from Botswana and Trinidad with a survey which I carried out among each organization’s staff using a self-completion questionnaire with close-ended questions (see appendix IV). For the case in South Africa, I also sat (as a passive participant) in a strategic workshop organized by the organization with some of its stakeholders. Thirdly, I conducted a participatory problem identification workshop\(^{81}\) (Skoglund-Öhman and Shahnavaz, 2004; Sanda, 2003; Helali and Shahnavaz, 1998; Jungk and Mullert, 1987) for the cases in Ghana, Botswana and Trinidad. I used the outcome to develop an overview of the actors’ perception of key problems associated with each of these cases’ activity systems in relation to their inability to successfully implement and internalise the best management practices, as it relates to their respective commercialisation efforts. Similar participatory approach has been used by Engeström (2001; 1999) to identify specific organizational problems related to specific tasks in Finnish hospitals and health care system. I deem it important to note here that I did not conduct the problem-identification workshop in the case from South Africa, but rather took part (as a passive participant) in a one-day strategic workshop. This is by virtue of the underlined fact that the organization’s commercialisation effort is successful.

In the next sub-sections, I will firstly discuss the justification for my selection of the structured interview approach. After this I will provide an insight on my approach for the problem identification workshop.

3.5.1. Interview approach

Denzin (1989), citing Maccoby and Maccoby (1954), defines an interview as a face to face verbal interchange in which one person (i.e. the interviewer) attempts to elicit information or expressions of opinion or belief from another person or persons (i.e. the interviewees). My use of the interview as a data collection approach is in line with this definition. It is to

\(^{81}\) This is normally referred to as “Future Workshop” because of its effectiveness in using the problems identified to seek future solutions.
enable me to collect as much information as possible from the persons who are associated with the commercialisation processes of the cases in my study. My expectation here is that the interview approach stands to accord me a greater qualitative insight into the internal dynamics of the cases’ commercialisation processes and which insights, in my opinion, might not be gained through quantitative measures. This therefore, raises the question of whether the use of the interview approach as a scientific method requires a look at possible theoretical issues of importance. By relating to the opinion of Kvale (1996), my answer to this is “yes”. According to Kvale, addressing the methodological questions of conducting an interview leads to theoretical issues. He argues that the mode of understanding implied by qualitative research involves alternative conceptions of social knowledge, meaning, reality, and truth in social science research. Based on this argument, he posits that the basic subject matter is no longer objective data to be quantified, but meaningful relations to be interpreted. In my opinion, it is the insight to be gained (using the interview approach) from such meaningful relations as entrenched in my selected cases’ societal environments that stands to add value to my understanding of the relative outcomes of their commercialisation processes. As Kvale has noted, there is a move away from obtaining knowledge primarily through external observation and experimental manipulation of human subjects toward an understanding by means of conversations with the human beings to be understood.

The significance of Kvale’s point is underlined by the fact that in the interview process, the subjects (interviewees) do not only answer the questions prepared by the researcher (interviewer), but they (interviewees) also formulate their own conceptions of their lived world in the dialogue (interview conversation). My expectation here is that the sensitivity of the interview approach and its closeness to the interviewees’ “lived world”, as Kvale has posited, will lead to the evolution of knowledge that I can use to understand the relative outcomes of the commercialisation processes of my selected cases. Therefore, Kvale perceives the research interview as a conversation about the human life world, with the oral discourse transformed into texts to be interpreted. He notes that since the purpose of hermeneutical interpretation⁸² is to obtain a valid and common

⁸² Kvale elaborates further on hermeneutic interpretations by writing that “Although the subject matter of classical hermeneutics was the texts of literature, religion, and law, there has been an extension of the concept of text to include discourse and even action. Thus, in Truth and Method, Gadamer (1975) starts with Plato’s dialogues and regards both the conversation and the oral tradition as presuppositions for understanding the written texts, which historically are secondary phenomena. In
understanding of the meaning of a text, then hermeneutics is of double relevance to interview research. As Kvale explains, hermeneutics, firstly, elucidate the dialogue that produces the interview texts to be interpreted. Secondly, it clarifies the subsequent process of interpreting the interview texts that are produced, and which may again be conceived as a dialogue or a conversation with the text.

3.5.2. Classifying my interview approach.

The interview approach that I used (i.e. structured interview) relates to one of three forms that Denzin has classified in relation to their degree of structuring, or standardisation (Richardson, Dohrenwend, and Klein, 1965). The three forms are the Schedule Standardized Interview (SSI), the Unstructured Standardised Interview (USI)\(^{83}\) and the Unstructured Interview (UI)\(^{84}\). According to Denzin, the schedule standardized interview form represents the most structured level, in which the wording and order of all questions are exactly the same for every respondent. All questions in this form of interview are also comparable so that when variations between respondents appear, they (i.e. variations) can be attributed to actual differences in response and not to the interview instrument.

Regarding the unstructured standardised interview form, Denzin notes that it closely approximates the focused interview approach in which certain types of information are desired from all respondents, but the particular phrasing of questions and their order are redefined to fit the characteristics of each respondent. In this regard, the non-scheduled standardised interviewer works with a list of the information required from each respondent (Richardson, Dohrenwend, and Klein, 1965). With respect to the unstructured interview form, Denzin notes that no pre-specified set of questions are employed and questions are also not asked in a specified order. He also points out that a schedule is not employed in the unstructured interview form and this gives the interviewer a great deal of freedom to probe various areas as well as to raise and test specific hypotheses during the course of the interview.

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83 This is also referred to as the “Non-scheduled Standardised Interview”.

84 This is also referred to as the “Non-standardised Interview”.

his article, *human Action as a Text*, Ricoeur (1971) extends the hermeneutic principles of interpretations of the texts of the humanities to the interpretation of the object of the social sciences – meaningful action” (Kvale 1996, p. 47).
In the evaluation of these three interview formats, Denzin suggests the use of the following six criteria:

**Conveying meaning**: The conveying of meaning, as emphasised by this criterion, is difficult in the SSI because respondents are from different backgrounds and settings; therefore, a phrase or question frequently does not elicit a common meaning. With the USI, questions can be rephrased and re-ordered to convey meaning; in the UI, of course, this is even truer.

**Securing respondents’ interest**: When the problem of respondents’ interest is considered, the SSI form again raises problems; but if extensive pre-testing has been done, many of these problems can be avoided. When the USI and the UI forms are employed, it is up to the interviewer to re-order and re-phrase questions so that they motivate a reply.

**Ensuring the interviewer’s clarity**: The issue of interviewer’s clarity is less of a problem with the SSI, because this has presumably been resolved before the interviewer is sent into the field; with the SSI form, there should be only pre-determined re-phrasing or re-ordering of questions by the interviewer. With the USI and UI forms, however, untrained interviewers will often re-interpret questions and restate them in a manner quite different from that intended by the investigator.

**Making intentions precise**: This criterion should not be a problem with the most structured interview form, the SSI. Unfortunately, however, the problem of interpretation again falls on the interviewer.

**Relating each question to overall intent**: The problem of interpretation in this criterion also falls on the interviewer. The criterion demands that each question be related to the overall intent: this is not always the case, even in the SSI.

**Handling the problem of fabrication**: The problem of fabrication, as emphasised by this criterion, looms largest with the SSI, for too frequently the interviewer has no specific set of questions with which to challenge the respondent’s reply. With the USI and UI, it is relatively easy to challenge the respondents and check their replies.

In my approach, I used the schedule standardized interview form as the best suited for my study. It provided me an avenue in the interview process
to create a platform based on which the interviewees answered not only the questions I prepared, but they (interviewees) also had the opportunity to formulate their own conceptions of the organizations in which they work during the interview conversation. Even though Denzin views the SSI format as difficult in conveying meaning and also entailing the problem of securing respondents’ interest as well as the problem of fabrication, such concerns are derided by hermeneutics which, as Kvale explains, elucidate the dialogue that produces the interview texts that I interpreted. In the next sub-section, I will discuss the schedule standardized interview form with insights on how I addressed such potential difficulties and problems as noted by Denzin, in order to account for both data reliability and validity.

3.5.3. The schedule standardized interview.

The rationale behind the use of the schedule standardised interview, according to Denzin, is provided by Richardson, Dohrenwend, and Klein (1965). It rests on the belief that for any study, the respondents have a sufficiently common vocabulary so that it is possible to formulate questions which have the same meaning for each of them. In other words, it is assumed that the respondent will be presented with the same stimuli and that these will elicit the same range of meanings for each. As Denzin has pointed out, this assumption of presenting respondents with same stimuli has been called into question by Benney and Hughes with the argument that;

Interviews are of many kinds. Some sociologists like them standardised and so formulated that they can be administered to large groups of people. This can be done only among large homogenous populations not too unlike the investigators himself in culture. Where languages are too diverse, where common values are too few, where the fear of talking to strangers is too great, there the interview based on a standardized questionnaire calling for a few standardised answers may not be applicable. Those who venture into such situations may have to invent new modes of interviewing (Benney and Hughes, 1956, p. 137). [cf: Denzin, 1989, p. 104].

What I find intriguing about this element of Denzin’s point is that even though this view of Benney and Hughes might have proved useful in some study settings in the past, a critical reflection of it within the context of my study will show otherwise. Firstly, I argue that the use of the SSI approach is not only for situations where the respondents constitute a large group, as
Benney and Hughes have noted. In my opinion, the same approach can be used for a small group situation. I justify this with the observation that in sharp contrast to the thinking of Benney and Hughes, my study dealt with a small group of respondents in each case (i.e. between 15 and 20 persons). The respondents were also in environments with no language diversity and also without the fear of talking to me as the researcher. This is by virtue of the fact that the managements of the respective cases have given their indication of interest and full cooperation in this research, the outcome of which they view will be of benefit to their respective organizations. The advantage I derived here was that each of the structured questions in the interview instrument became the lead question that opened up as well as facilitated my control of the interview conversation.

Therefore, in choosing the SSI approach in my study, I related to its rationale as provided by Richardson, Dohrenwend, and Klein (1965) by perceiving my interview respondents in the respective cases to have had a sufficiently common vocabulary by virtue of the homogeneity of their working environment. Based on this perspective, the content of my interview instrument (see appendices II and III) is at the most structured level, highlighting the key aspects of my study framework and was given in the same way to all respondents. In the same vein, the wording and order of all the lead questions are exactly the same for every respondent in each of the respective cases. My reason for this is to retain the uniformity of the interview instruments as tools for dialogue elucidation and whose contents exhibit the requisite parts of my study framework at one view.

3.5.4. Problem-identification (future) workshop: An insight.

Future workshops are a very open process and the concept was invented by Robert Jungk when he conducted workshops in Vienna at the end of the

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85 My conviction in this respect is underlined by my personal experiences in two field researches I participated in which I used the scheduled structured interview techniques to successfully generate secondary data. My first use of this technique was in 1992 when I worked as a research assistant in a Ghana Government/International Development Research Centre (Canada) joint research on small-scale aluminium enterprises in Ghana. The second experience was in 1999 when I worked as a principal researcher (Appropriate Technology) in a research funded by the Ghana Wildlife Society on the conservation of the forest cover of Ghana’s highest mountain (Mountain Afadjato).

86 The specific number of people I interviewed in each case will be highlighted in the subsequent chapters for specific cases analyses.

87 English is the official and working language for each case and in which all the respondents have fluency.
1950s with the intention of mobilising citizens who did not normally express themselves during debates. In recent years, according to the Strategic Futures Team (2001), the method has been applied to a much wider range of environments including companies, government departments and trade unions. But as Dator (1996) has observed, these traditional institutions are no longer as influential, respected, or popular as they once were. He argues that these institutions are gradually becoming uncertain about their current role and future mission, a situation that is making them to rethink what they are and where they are going. The rationale for such rethinking, as Dator argues (and which I share) is that many of the organisations that exist today are internally divided and in turmoil, and hence uncertain of what to do. Taking into account this observation of Dator, the issue of interest here, in my opinion, is to understand the underlying process in carrying out the problem-identification workshop, especially as it relates to my study. My description here is based on the standardised practical procedure used by Professor Houshang Shahnavaz and which he also taught as an MSc course to my class in the MSc Ergonomics programmes in the year 2002, but with technique modification to the first step as a way of enhancing data reliability. In order to facilitate the application of this technique, I (together with Ingegerd Skoglind-Ohman and Professor Shahnavaz) have prepared a workshop guide entitled “Conduction of Future Workshop: User’s Guide for Workshop Leaders” (see appendix V), and which tool I have used as a resource in this study.

At the start of the workshop session, I granted each of the participants the opportunity to briefly describe a concrete problem that he/she has experienced during the organization’s commercialisation process. As I have noted above, I introduced a technique modification to the standard procedure normally used in this first step, in order to enhance the reliability.
of the concrete problems described by the participants which I used as qualitative data. In the standardised procedure, the participants are made to voice out their problem statements to the hearing of everybody. My adaption of this procedure in the pilot phase of my initial study (Sanda, 2003) reveals that some participants feel intimidated and hence find it difficult to voice out real problems when in the midst of their superiors, possibly for fear of reprimand. Therefore, in this study, instead of making the participants’ voice out their problem statements, I provided each of them with a set of similar papers and pens (with no colour variation) on which to write their respective problem statements, eliminating the possibility of each statement source being identified by other participants. This made it easier for all the participants to express themselves genuinely and without showing any traces of apprehension by the presence of those in superior positions. Each of the written statements by each of the participants were re-written exactly and boldly on large sheets of paper until a point was reached whereby no one among the participants had any more critical problems to write out. Thereafter, the participants were made to vote on the listed problems, with each participant being allocated seven votes to be given to the most serious problems, of which two received three votes each and the remaining one receiving only one vote. After calculating the votes, the listed-problems were compiled in ranking order based on their total votes. Following this, four discussion topics covering the four problems that received high rankings were defined. This was followed by assigning the remainder of the listed-problems to the most appropriate of the four discussion topics. Later, the participants were made to verify whether their expressed problems were listed under the appropriate topic. The discussion topics were then classified as the workshop sub-themes which the participants used as platforms to discuss and come out with their solution proposals to the listed-problems.

The data I collected from the workshop proceedings (especially, compilations of the listed-problems) complemented and enriched the data I collected from the interviews. With regard to the immediate benefit to the organizations (or cases), I prepared a workshop report (one day after the workshop) detailing the entire proceeding (i.e. from the listed-problems to the solution proposals) and presented it to the management of each organization with copies to each workshop participant for comments and verification. I also discussed each report with the director of each RTO, and this has resulted in them taking remedial actions on some of the
problems identified at the workshop and for which appropriate solutions were proposed by the participants as feasible.


As I have noted in chapter two, sub-section 2.4.1 earlier on, Engeström (2000a) has noted that in carrying out expansive developmental research, rigorous analysis of the activity system is very important. It is obvious from my discussion in section 3.5 above that the core of my analytic data for such rigorous analyses will be the conversational texts from my interviews. This therefore raises the issue of theoretical presupposition based upon which the interview analyses are to be carried out. But as Kvale (1989) has argued, the theoretical basis of an investigation provides the context for making decisions about how interviews will be analysed. He posits that different techniques of analysis are means for answering different thematic questions, and thus the analyst’s theoretical conceptions of the subject matter influence how he or she analyses the interviews. I find these views of Kvale to be of relevance, in relation the theoretical preposition that stands to provide contextual platform for the analyses of my interview texts. This is because Kvale perceives the analyses of interviews as part of theory generation, as well as an application or testing of theories, and thus concurs with the purpose of my study which is to test theory (as I have noted in section 3.1).

In this respect, my analytical approach is carried out within the perspective of the analytical segments outlined by Engeström which I have discussed in chapter two (sub-section 2.4.1), and which I have also outlined in figure 11 (see page 88). These are the historical analysis (step 2a in figure 11), and the actual-empirical analysis (step 2b in figure 11). But as Engeström has outlined, the historical analysis of the activity system has to be carried from both its objective and theoretical perspective. This view (which I share) is reinforced by Virkkunen and Kuutti (2000) who maintain that the activities in organizations, the problems in realizing these activities, the possible means of solving the problems, as well as the obstacles of learning, are historically specific (i.e. they are determined by the local and historical form of the activity and the available cultural means of solving the problems). Therefore, I agree with the position of Virkkunen and Kuutti to the effect that;
We cannot proceed in understanding organizational learning without analyzing concretely the historical development of both the problems to be mastered, and the possible mechanisms of learning (Virkkunen and Kuutti, 2000, p. 292).

In this regard, I will define the units of analysis in relation to my study framework (figure 9 in chapter two, page 83), from the perspectives of Engeström’s (2001) first principle of activity theory. This principle postulates that a collective, artefact-mediated and object-oriented activity system, seen in its network relations to other activity systems, is taken as the prime unit of analysis. Based on this perspective, goal-directed individual and group actions, as well as automatic operations, are relatively independent but subordinate units of analysis, eventually understandable only when interpreted against the background of entire activity systems. This is because activity systems realize and reproduce themselves by generating actions and operations. But as I have explained in chapter two (section 2.6), the underlined subject of activity from the perspective of my study framework is the collective individuals in the organization.

I have also explained that within the contextualised nature of my study, as I found from my earlier study (i.e. Sanda, 2003); such collectiveness is also aggregated into different and identifiable groups ⁹³ (i.e. management team, senior staff members, and junior staff members). I then argued that the subject element in my study framework can be contextualised to symbolise the character of collectiveness in the organization either as separate groups (i.e. management team, senior staff members, and junior staff members) or as a collective group (i.e. workforce). In this context therefore, my sub-unit of analysis is the organizational activity system of the separate groups in the organizations I am studying while the main unit of analysis is the organizational activity system of the collective group.

3.6.1. Objective/theory historical analysis.

In carrying out the object-historical analyses, I will seek to identify and analyse the successive developmental phases of the activity systems of the organizations I am studying, with the help of my study framework. As I have noted in chapter two (section 2.4.1), Engeström has clarified that the object is to be analysed above all as an integral component of the central

⁹³ Indication of group identities in the organizations I am studying can be seen in the first row of table 2 in chapter one (page 27).
activity while simultaneously acknowledging it as a relatively independent activity system of its own. Thus this procedure of moving ‘from within’ the central activity system out to the object-activity and back into the central activity, is essential if the researcher is to preserve his grasp of the self-movement, the self-organizational dynamics of the activity under investigation. By taking this observation into account, my main focus here is to uncover the contradictions that gave rise to the transitions from one developmental phase to another in the respective organizational activity systems of the cases. My analytical interpretation, in this regard is guided by Engeström’s fourth principle of activity theory which I have outlined in chapter two (sub-section 2.6). As a recall, the fourth principle posits that contradictions are not the same as problems or conflicts, but are historically accumulating structural tensions within and between activity systems. This principle also notes that when an activity system adopts a new element from the outside (for example, a new technology or a new object), it often leads to an aggravated contradiction where some old element (for example, the rules or the division of labour) collides with the new one. Such contradictions generate not only disturbances and conflicts, but also innovative attempts to change the activity.

With respect to the theory-historical analyses, I will look at the set of shared secondary artefacts (i.e. concepts and models) that were utilised by the organizations during their commercialisation process (i.e. the developmental phases of their organizational activity systems). As Engeström (1987) explains, these cultural artefacts are embodied in different modalities (i.e. handbooks, working instructions, as well as fixed procedures for classification and diagnosis), and that they are in principle public knowledge and function as general conceptual instruments of the practical activity. In the context of my study, the artefacts that I expect to have functioned as the general conceptual instruments of the practical activity of the organizations I am studying (i.e. during the commercialisation processes) are embodied in the best management practices model which I have discussed in chapter one (sub-section 1.2.2). But as Engeström has observed, the degree to which these conceptual instruments (i.e. the best management practices model in this study) are acknowledged as theoretical or theory-based is immaterial here. In agreement with Engeström’s argument, what I perceive to be essential here is that the conceptual instruments used to guide the commercialisation efforts of the cases in my study (i.e. the best management practices model) is partly constructed within their central activity system, and partly
imported into it from the outside. Therefore, I will also seek to identify and trace the formation of contradictions initiated by or connected to the instruments used in the successive developmental period of the respective cases central activity systems. My analytical interpretations here will also be guided by Engeström’s third principle and fifth principle of activity theory which I have outlined in chapter two (sub-section 2.6). As a recall, the third principle postulates that activity systems take shape and get transformed over lengthy periods of time with their problems and potentials being understood only against their own history. Thus an activity needs to be analysed against the history of its local organization and against the more global history of the organizational concepts, procedures and tools employed and accumulated in the local activity. The fifth principle is on expansive transformations in activity systems as they move through relatively long cycles of qualitative transformations. It posits that as the contradictions of an activity system are aggravated, some individual participants begin to question and deviate from its established norms, and which event, in some cases, escalates into collaborative envisioning and a deliberate collective change effort.

3.6.2. Actual-empirical analysis.

Aside the object/theory-historical analyses, as I have described in section 3.6.1 above, I will also carry out an actual empirical analysis of the internalised and invented organizational practices professed and actually used or upheld by the actors within the respective organizations or cases. This is by virtue of the fact that the carrying out of the object-historical and theory-historical analyses are not enough to provide in-depth insight of the organizational activity system, as Engeström (1987) has cautioned. In this regard, I will be guided by the following three tenets put forward by Engeström.

- Firstly, I will analyse the commercialisation processes of the cases from the perspectives of their respective implementation of the best management practice model on all the three levels of activity/motive, action/goal and operation/conditions.

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According to Engeström (1987), publicly available objectified instruments are powerful constraints, but with them being generalisations, he perceives them to be always interpretable and applicable in multiple ways, for a multitude of purposes. He therefore, cautions that carrying out the object-historical and theory-historical analyses are not enough.
Secondly, I will analyse them as declarative conceptions, as procedural performances, as social discourses or interactions, as communicational networks, and as organizational structures.

Thirdly, I will use the results of the historical analyses to understand the past activity systems (i.e. before commercialisation) of the organizations I am studying and their foreseeable (i.e. expansive) activity systems (based on the RTO best management practices model).

My analytical interpretations here will also be guided by Engeström’s second principle of activity theory which I have outlined in chapter two (sub-section 2.6), and also within his contextual interpretation of the zone of proximal development as I have illustrated in figure 10 (see chapter two, page 88). As a recall, the second principle which concerns the multivoicedness of activity systems postulates that an activity system is always a community of multiple points of view, traditions and interests. It also posits that the division of labour in an activity creates different positions for the participants, the participants carry their own diverse histories, and the activity system itself carries multiple layers and strands of history engraved in its artefacts, rules and conventions. The multivoicedness is multiplied in networks of interacting activity systems and thus serves as a source of both trouble and innovation, demanding actions of translation and negotiation.

Starting from the next chapter (i.e. chapter four), I will provide detail analytic insights of each of the four individual cases in my study. Each case study will consist of a whole study in which I will seek convergent evidence regarding the facts and conclusions for the entire case. Thus, in my analytical approach, I will firstly carry out an explanation-building analysis of data at the single-case level. The goal here is to analyse the case studies by building an explanation about each case. Afterwards (i.e. in chapter eight), I will carry out a cross case analysis by comparing the explanations from the single-case using pattern-matching. The logic for the pattern-matching, as Yin (1994) explains, is to compare the empirical patterns that emerge from the single-cases analyses with the predictable pattern from my study proposition. This will lead to my drawing of an overall conclusion for this study as well as the outlining of its theoretical implications in chapter nine.
3.7. Addressing the Issue of Reliability and Validity

It is important to observe here that in choosing the scheduled structured interview approach, I also took into account the issues of data reliability and validity. As a way of enhancing data reliability, I recommended that each respondent (identified by the respective management of the selected cases) must have been in the organizations long enough to have had sufficient perspective of the case’s commercialisation process. In this regard, the respondents in each case represented a collective sample of both management and non-management persons. Also, each respondent was provided with a synopsis on my research alongside the interview instrument in advance (i.e. prior to the start of my field visit and subsequent collection of data at each case location). As a recall, I have explained in section 3.4.2 that, prior to the expression of interest by the respective managements of the four cases in my study, and also the indication of their readiness to allow me unhindered access to data collection in their organizations\textsuperscript{95}, they on their part sought for the direct and immediate benefit that their organizations will gain from my study visit. As I also pointed out, I provided them with an insight into my research by making available the report from my initial study (Sanda, 2003), as well as a write-up on the background of this study and its theoretical direction. I also provided them with a “future workshop” guide that I used for the conduction of the problem identification workshop (I have discussed this in section 3.5) whose outcome provided the cases with some immediate benefits.

These steps, as I have recalled above, did not only enhance the reliability of my data sources, but also helped me addressed the issue of validity, especially as it relates to the seven elements outlined by Kvale (1996)\textsuperscript{96}.

\textsuperscript{95} This is in line with my third strategic criteria for case selection, as I have outlined in section 3.4.1.

\textsuperscript{96} The following have been outlined by Kvale’s (1996) to account for validation at seven stages:

- **Thematising.** The validity of an investigation rests on the soundness of the theoretical presuppositions of a study and on the logic of the derivations from theory to the research questions of the study.

- **Designing.** The validity of the knowledge produced depends on the adequacy of the design and the methods used for the subject matter and purpose of the study. From an ethical perspective, a valid research design involves beneficence – producing knowledge to the human situation while minimising harmful consequences.

- **Interviewing.** Validity here pertains to the trustworthiness of the subject’s reports and the quality of the interviewing itself, which should include a careful questioning as to the meaning of what is said and a continual checking of the information obtained as a validation in situ.

- **Transcribing.** The question of what constitute a valid translation from oral to written language is involved in the choice of linguistic style for the transcript.
Firstly, the validity of my study was ensured by the soundness of the activity theoretical framework whose derivative logic has given credence to my study framework (as I have summarised in section 3.2). In specific terms, the issue of external validity (Yin, 1994) is, on the one hand, addressed by the domain that is created by my study framework and to which findings from this study can be generalised, and on the other hand, by my use of the replication logic tactic in this multiple-case study (as I have discussed in section 3.4). The issue of construct validity (in line with Yin’s recommendations) is also addressed by my establishment of correct operational measures for the activity theoretical concepts that I used in this study (as I have discussed in chapter two) and also my use of multiple sources of evidence in my data collection. Secondly, the validity of knowledge to be produced has been guaranteed by my underlined purpose of this study and the consequent methods for the collection of data (which I have discussed in section 3.5) and also for data analysis (which I have discussed in section 3.6). The reliability of the interviewing process is also ensured by putting in place a mechanism that ensured the quality of the interviewing itself and also the trustworthiness of the interviewees’ comments. In this respect, I used a case study protocol (as recommended by Yin) whose characteristics demonstrated that key aspects of this study, such as the data collection procedures which I have discussed in section 3.5 can be replicated. As a way of ensuring reliable translations of the interview conversations from oral to written text, I transcribed all the recorded interview conversations exactly as I heard them and sought the clarity of portions which sounds unclear from affected interviewees while on site at each case. The validity of the data analysis is also ensured by virtue of the fact that the questions which constituted the interview texts were highlighted by elements from my study framework.

Thus in order to ensure the validity of my analytical accounts (presented in the next four chapters), the following steps were taken. Firstly, I divided the transcribed data from each interviewee into specific response-categories. I also classified the respective response-categories into specific groups with each group identified by the leading question in the interview instrument that gave rise to their texts. Secondly, I compiled all texts categorised under same groups from each of the interviewees to produce an

- **Analysing.** This has to do with whether the questions put to an interview text are valid and whether the logic of interpretations is sound.
- **Validating.** This involves the question of whether a given report is a valid account of the main findings of a study, as well as the role of readers of the report in validating the results.
expanded, but randomised collection of responses for each of the leading interview questions. Thirdly, for each case, I circulated these compilations of randomised responses or interview texts (using e-mail) to the respective respondents for their comments. The feedback I received from the respective cases on the sense generated from the collective texts was positive. Based on these feedbacks, I used the collective texts as a platform to carry out my initial data analyses for each case. I later used these analyses to prepare a “special” report for each case which I forward to the respective managements for their comments. The feedback I received from each organization showed that they were in agreement with the content of my report to them and thus validated my findings. In this respect, therefore, my analyses (the approach of which is presented in the section below) in the next four chapters are reflective of the contents of my reports to the respective cases.

3.8. Outlining the Common Analytic Approach for the Cases to be presented in Chapters Four, Five, Six, and Seven.

As I have noted in sub-section 3.6, my analytic approach is two-fold and within the perspective of the analytical segments outlined by Engeström\(^97\) which I have outlined in figure 11 (see page 88). These are the historical analysis (step 2a, figure 11), and the actual-empirical analysis (step 2b, figure 11). But as Engeström has outlined, the historical analysis of the activity system has to be carried from both its objective and theoretical perspective. In this regard, I will define the units of analysis in relation to my study framework (see figure 9 in chapter two, page 83), from the perspectives of Engeström’s (2001) first principle of activity theory, which postulates that a collective, artefact-mediated and object-oriented activity system (seen in its network relations to other activity systems) is to be taken as the prime unit of analysis. In the same vein, goal-directed individual and group actions, as well as automatic operations, are to be viewed as relatively independent, but subordinate units of analysis which can be eventually understandable when they are interpreted against the background of the entire activity systems. Thus, as I have noted in section 2.6, the sub-units of analysis will be identified within the various elements embedded in the different mediation media (i.e. the instrument, the institutional rules, and the division of labour) as influenced by specific agents (i.e. either the management team, or staff members, or their

\(^{97}\) I have discussed this in chapter two (sub-section 2.4.1).
collective reflection as a workforce) within each organization’s activity system.

In my first approach, I will carry out an object-historical analysis base on which I will seek to identify and analyse the successive developmental phases of the organization’s activity system with the help of my study framework. As I have noted in chapter two (section 2.4.1), Engeström has clarified that the system of object-activity is to be analysed above all as an integral component of the central activity while simultaneously acknowledging it as a relatively independent activity system of its own. By virtue of this procedural movement from within the central activity system out to the object-activity and back into the central activity, I will be able to preserve my grasp of the self-movement as well as the self-organisational dynamics of the activities in each organization that I will describe and appraise in the respective chapters (i.e. chapters four, five, six and seven). Thus, in line with Engeström’s first principle, I will look at the conflict that emerged between the activity system of each organization and a neighbouring system (i.e. government activity system) and also search for revised objects for its activity. My main focus here is to uncover the conflicts that necessitated each organization’s transition from being a fully-funded government research organization to a self-income generating one. As I have explained in chapter three (sub-section 3.6.1), my analytical interpretation in this regard will be guided by Engeström’s fourth principle of activity theory. This principle relates to the central role of contradictions as sources of change and development. In this context, contradictions are not the same as problems or conflicts. They are historically cumulating structural tensions within and between activity systems that generate not only disturbances and conflicts, but also innovative attempts to change the activity. Following this, I will carry out a theory-historical analysis by looking at the set of secondary artefact\(^9\) (in this case the best management practices model) that was utilised by each organization during its commercialisation process (i.e. the developmental phases of its organizational activity system).

In my second approach, I will firstly carry out an actual empirical analysis of the internalised and invented organizational practices professed and

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\(^9\) As Engeström (1987) explains, these cultural artefacts (i.e. concepts and models) are embodied in different modalities (i.e. handbooks, working instructions, as well as fixed procedures for classification and diagnosis), and that they are in principle public knowledge and function as general conceptual instruments of the practical activity.
actually used or upheld by the actors within each organization or case. As I have explained in chapter three (sub-section 3.6.2), this is by virtue of the fact that the carrying out of the object-historical and theory-historical analyses (as it will be in my first approach) will not be enough to provide an in-depth insight of the organizational activity system, as Engeström (1987) has argued. This is from the perspective that publicly available objectified instruments are powerful constraints, but with them being generalisations, they are always interpretable and applicable in multiple ways and for a multitude of purposes. In this respect, therefore, I will describe analytically the characteristics of the institutional rules, division of labour and the community in each organization’s activity system using the actions of the identified groups (i.e. management team, senior staff, and junior staff members) as my subordinate units of analysis. As I have outlined in chapter two (section 2.7), analysing organizations as activity systems (Blackler, 1993) emphasises the interplay of actions, language, technologies, social structures, implicit and explicit rules, history and institutions. This approach, according to Blackler makes a contribution to a central problem in social theory (i.e. it offers an analysis of the direct and indirect relationships which link individuals and the social systems of which they are a part).

In my descriptions, I will seek to recognise the contradictions that exist within the separate elements of each group’s activity system as well as highlight possible inconsistencies that might exist between such elements. As such, my descriptive analyses of each organization’s commercialisation process (from the perspectives of its implementation of the best management practice model) will be on all the three levels of activity/motive, action/goal and operation/conditions. I will also highlight it in terms of procedural performances, social discourses or interactions, communicational networks, and also as organisational structures. Secondly, I will analyse and discuss each organization’s activity system, using the collective group (i.e. workforce) actions as my prime unit of analysis. My analytical interpretations here (as I have explained in sub-section 3.6.2) will also be guided by Engeström’s second principle concerning the multivoicedness of activity systems, which is to be seen not only as a source of trouble, but also as a source of innovation for which actions of translation and negotiation is demanded.
4

CASE ONE

Food Research Institute (Ghana)

My motive for selecting this specific case (as I have previously discussed in chapter three, sub-section 3.4.1) is underlined by the fact that the organization has been engaged in an effort to implement and internalise best management practices, which can help transform it from a fully subsidized institution into a profitable income generating organization. This effort is on-going with the RTO still striving for success in its efforts to commercialise. Therefore, in this chapter, I will give an insight of the approach I used to collect empirical data99 on the organization’s commercialisation process based on its attempt to implement the RTO100 best management practices101 from the year 1996 to 2003. I will follow this with a description (based on the analytic approach I have outlined in chapter three, section 3.8)102 of the organization’s activity system103 during the transition period of its attempt to transform from being a non-commercial R&D agency into that of a commercial one.


The empirical data that I used to analyse the organization’s commercialisation process was obtained through structured interviews104 (see appendices II and III for the interview questions guide) with the Senior Scientific Officer (i.e. the coordinating Officer for the organization’s commercialisation process) and eighteen staff members whom I identified as key actors in the efforts to implement the RTO best management practices. I also conducted a problem identification

99 This is based on my broad methodological approach which I discussed in chapter three (section 3.5).
100 i.e. Research and Technology Organization.
101 I have discussed this in chapter one, sub-section 1.2.2
102 See page 117.
103 My outline of this will be based on the model shown in figure 9 (see page 83) which characterised my study framework as I discussed in chapter two under section 2.6.
104 I have discussed this methodological approach in chapter three (sub-section 3.5.2) in relation to its application in this study.
workshop\textsuperscript{105} (see appendix V for the workshop guide) with support from the organization’s director under the theme “the problems with FRI’s commercialisation efforts” with seventeen people representing the management, senior staff and the junior staff in attendance. This workshop provided a platform on which the participants identified problems relative to the best management practices implementation efforts. The information I generated from this workshop served two purposes. Firstly, it provided me with additional empirical data, complementing those from the interviews. Secondly, it provided beneficial information to the organization’s director\textsuperscript{106} on those organizational problems for which the management could easily find remedies. In the sections that follow, I will firstly give a profile of the FRI. This will be followed by a highlight on factors and events that underlined the start of the commercialisation process. I will also carry out in-depth individual functional analyses for the rules, division of labour and the community as they impacted on the organization’s activity system during the commercialisation process.

4.1.1. Profile of the FRI

The background information I had on the FRI as part of my empirical data shows that the organization was established by the Government of Ghana in 1963 as an independent organization and is located in the capital, Accra. It became part of Ghana’s Council for Scientific and Industrial Research (CSIR) when the council was established in 1968. The FRI has since then operated under the supervision of the CSIR whose broad mandate\textsuperscript{107} is to pursue the implementation of government policies on scientific research and development. In this regard, the work of the FRI was reviewed, monitored and periodically evaluated by the CSIR, in order to ensure that research being carried out by the organization directly benefits identified sectors of the economy and was within the national priorities. I also gathered from my data that the organization’s staff strength (as at the time of my visit) was 172. This was made up of 33 research staff, 36 senior

\textsuperscript{105} I have discussed this methodological approach in chapter three (sub-section 3.5.4) in relation to its application in this study.

\textsuperscript{106} This is in the form of a special workshop report. I did this in response to a prior requisition by the organization’s director for a part of this field study that could provide immediate benefit to the management of the organization.

\textsuperscript{107} The CSIR co-ordinates all aspects of scientific research in the country with the mandate to ensure that the research institutes of the Council and other organisations engage in research in Ghana, co-ordinate and co-operate in their research efforts. It also exercise control over the research institutes, centres, units and projects of the Council with the power (after consultation with the Minister) to create, reconstitute, merge or dissolve any institute, centre, unit or project of the Council.
technical and administrative staff, and 105 junior members of staff. The research staff members include engineers, food scientists and technologists, biochemists, chemists, entomologists, microbiologists, economists, and nutritionists, among others. The organization is equipped with analytical laboratories for chemistry, microbiology and biochemistry. It also has an engineering and maintenance workshop and a test kitchen. In addition, the organization has a pilot plant equipped with operational wet and dry processing lines. The organization offers services in the following areas: - Analyses of food samples and provision of quality control services to local food and pharmaceutical industries, private laboratories, food aid agencies, importers and exporters of food commodities; Assistance to local food industries to formulate and improve finished products such as marmalades, fruit juices, squashes and cordials, canned sardines and tuna, bakery products (including composite flours) and refined vegetable oil; Assistance to prospective food processors in the identification, selection and installation of appropriate equipment and machinery, Provision of technical training to personnel from the food industry- including quality control officers and production technicians for food processing establishments and extension officers. It also provides attachment training for students and graduates from the Departments of Biochemistry, Agriculture, Engineering and Food and Nutrition from local universities; Dissemination of scientific and technical information to industries, prospective entrepreneurs, students and the general public.

4.2. The Path towards Commercialisation.

The FRI’s commercialisation process emanated from a decision by the Government of Ghana in 1996 to cut down on its yearly subvention\textsuperscript{108} to all government R&D agencies from one hundred percent to seventy percent. This decision was against the background\textsuperscript{109} of the fast changing environment in most developing countries as a result of economic recession which eventually led to the privatisation of most government agencies. The government’s expectation in this respect was that such agencies must acquire the requisite competence that could enable them to self-generate the remaining thirty percent. Therefore, in the case of the FRI, the government’s expectation was that the organization would carry out scientific research not only to improve the country’s technological

\textsuperscript{108} I have discussed the circumstances that gave rise to such cuts in subvention by governments in chapter one, section 1.2.

\textsuperscript{109} I have discussed the background to this issue in chapter 1 under section 1.2.
base, but also to be capable of self-generating income from it in order to ensure its (i.e. FRI) continued survival. In this respect, the organization was to start operating as a commercial agency as opposed to its continued reliance on government subsidies. I interpret this governmental directive as reflecting a new rule in the government’s activity system (as policy-making subject). The implication of this governmental directive was that it conflicted with the organization’s activity system which had the object of carrying out scientific research under full government funding in order to improve the country’s technological base. Therefore by considering the object-orientation of the FRI’s activity system\(^{110}\), I view it to have drifted into a dialectic process (i.e. series of conflicts and resolutions) initiated by the government’s policy-making activity. In my opinion, this scenario involving the respective activity systems of the government (as the policy-maker or influencing agent for the change) and the organization (as the subject of change) can be viewed as I have shown in figure 12 below (see next page). I have used the dotted arrow to signify the dialectical path.

This dialectics in my opinion, gave rise to the development of tensions and disturbances in the organization’s activity system. Thus driven by the need to address such disturbance, the FRI shifted in its object-orientedness by underlining a new expanded object for its activity system (i.e. carrying out scientific research under reduced government funding, but with capability to self generate income). From an activity theoretical perspective, I view the shift in object-orientation to imply that the FRI’s goal of continuing with its scientific research activities under full government funding was short-lived (as noted by Engeström, 2004). As I have previously discussed in chapter two (section 2.6), Engeström has clarified that objects should not be confused with goals. He explains that goals are primarily conscious, relatively short-lived and finite aims of individual actions. By relating further with the views of Knorr-Cetina (1997), he notes that objects serve as centering and integrating devices for regimes of expertise that transcend an expert’s lifetime and create the collective conventions and the moral order communitarians are concerned about. In this regard, Engeström has posited that the object is a heterogeneous and internally contradictory, yet enduring, constantly reproduced purpose of a collective activity system that motivates and defines the horizon of possible goals and actions.

\(^{110}\) i.e. to carry out scientific research under full government funding in order to improve the country’s technological base.
In order for the organization to be able to align itself towards its new object-orientation, it undertook to transform its organizational activity system (figure 12 above) by implementing the RTO best management
practices\textsuperscript{111} (as a modelled new solution) within the framework of a broader commercialisation programme under the CSIR. I have used the underlined elements of the best management practices to picture the organization’s anticipated activity system for the commercialisation in figure 13 below.

\textbf{Figure 13:} FRI’s foreseeable collective activity system as a commercialised agency.

\textsuperscript{111} I have discussed the underlined bases that led to the generation of these practices in chapter one, sub-section 1.2.1.
In this regard, I perceive the object of the organization’s collective activity system as being expansively\textsuperscript{112} transformed to include an element of income generation. By this object expansion, the organizations’ was (by virtue of its implementation of the best management practices model) expected by the government to be capable of generating thirty percent\textsuperscript{113} of its income. Therefore, the organization’s mission for transformation from a non-profit to a commercial R&D agency was to carry out market-oriented applied research by providing technical services and products profitably to the private sector and other stakeholders. Thus its focus was on the provision of scientific and technological support to the growth of the food and agricultural sectors of the national economy in line with its corporate prioritisation and national objectives. The overall goal of the organization was to assist in poverty alleviation through the creation of opportunities for generating and increasing income within the micro, small, medium and large scale food industry. It was also to contribute to food security, foreign exchange earnings and the application of cost-effective food processing technologies that are environmentally friendly. The organization intends to realise these by achieving the following objectives:

- Development and provision of technical information, training and services to the private sector and other stakeholders in the food industry.
- Provision of appropriate technology packages for processing and storage of raw agricultural produce to facilitate the curtailment of post harvest losses and promote value addition for local and export markets.
- Strengthening the organization's capability and linkages with industry through human resource and infrastructure development, restructuring and reorganization for effective commercialisation of operations.

In this regard, new structures and programmes were instituted to benefit both the FRI and other agencies under the mandate of the CSIR\textsuperscript{114}. Within

\textsuperscript{112} In my opinion, the emergence of such presupposition can be interpreted from the perspective of Engeström’s (2001) fifth principles of activity theory which proclaims the possibility of expansive transformations in activity systems. As Engeström notes, activity systems move through relatively long cycles of qualitative transformations. Thus as the contradictions of an activity system are aggravated, some individual participants begin to question and deviate from its established norms. In some cases, this escalates into collaborative envisioning and a deliberate collective change effort.

\textsuperscript{113} The remaining seventy percent is provided by the government in the form of annual subvention.

\textsuperscript{114} The distinctive features of the 1996 Act which distinguish the CSIR from previous legislation on national scientific research are the emphasis accorded private sector concerns and the introduction of market principles into the Council’s operations through the commercialisation of research. The
In this context, a central business development unit (CBDU) headed by a commercial manager was established at the CSIR Secretariat. This unit coordinated the commercialisation activities of all the agencies (including the FRI) under the CSIR, and thus served as a focal point and referral centre for potential clients. Additionally, business development units (BDUs) under the direct control of the CBDU were established in the FRI and other agencies under the mandate of the CSIR. The premise for such transformation was that the FRI would acquire the requisite capability to market its products/services and be able to self-generate the thirty percent cut on the annual subvention it receives from the government.

In the sections that will follow, I will describe and analyse the empirical data that I gathered on events that pervaded the organization’s commercialisation efforts. As I have already noted, this was as a result of the transition of its activity system from that of a non-commercial R&D agency (figure 12 above) to that of an income generating R&D organization (figure 13 above) through the implementation of the RTO best management practices. As I have noted in chapter two (section 2.5) earlier on, a close relationships is expected to have been cultivated between new key structural features within the organization. According to Blackler (1993), this is to have resulted in binding task demarcations, rules, regulations, technologies, operating assumptions, power structures, and reward and status systems in a tightly-knit whole with an apparent life of its own. Therefore, my analytical approach will be guided by the outline of my theoretical framework which I have previously discussed in chapter two under section 2.6. In this regard, I will draw highlights on the dynamics of the embedded elements in the organization’s activity system based on the characteristics of the rules, the division of labour, and the community (as defined in the theoretical framework\(^{115}\)) during the transition period. In line with Engeström’s first principle of activity theory (as I have noted earlier on), my units of analysis will be the collective activity system, while group actions will be the subordinate units of analysis. The specific groups that I identified to constitute the workforce in this organization and whose respective actions I will subject to analysis are the management team and the staff members. It will also become imperative that I describe and analyse the actions of the senior staff members and the junior staff members as separate groups. My reason for

\(^{115}\) See figure 9 in chapter 2, section 2.6 (page 83).
this is informed by the fact that staff members in the organization are officially categorised as part of specific groups, each with its own group-identity as an “Association” (senior staff members) or as a “Union” (junior staff members). Thus it is obvious to me that the events to be highlighted by my empirical data are reflective of actions that are influenced by group-based actors in the organization.


In section 4.2 above, I gave a summarised insight of the characteristics of the institutional rules that guided the organization’s work before the start of the commercialisation process and also those expected to have been in place in order to ensure the success of the process. In my opinion, such insight reflects the contrived nature of the FRI as a purposive organization by virtue of the new structural features it is to acquire as a result of the commercialisation. As I have outlined in figure 12 (see page 124), the institutional rules which are subject to transformation were characteristic of administrative guidelines for managing government ministries and departments (i.e. civil service codes). These were expected to have been substituted by the new guidelines (see figure 13, page 125) as provided in the best management practices \(^{116}\) for governance, organizational management, capability building, personnel management, project management, and business development. The issue at stake here is for me to analyse the characteristics of the rules that prevailed during the transformational transition. I will start by describing the nature of the organization’s management system as it prevailed during the commercialisation process. This is in relation to my earlier discussion in chapter two (section 2.5) in which I relate to the explanation by Blackler (1993) that the effective functioning of an organization does not depend on people agreeing on why they are doing something. As he notes, all that is required is that there is agreement on procedures for determining what should be done. In my opinion, it is such procedural agreement or institutional rules that shape an organization’s management system and dictates the way it functions. In this regard, I view the institutional rules as characterised by regulations, power structures, and reward and status systems (as shaped by both explicit and implicit rules that define social behaviour). As such, I perceive that the functionality of such a system can be well established by understanding how the rules dictate its structural set-up and also its application as template for managing the psycho-social

\(^{116}\) I have already discussed these practices in chapter one under section 2, sub-section 1.2.1.
environment in the organization. Therefore in the subsections that will follow, I will firstly describe and analyse how the management structures in the organization functioned in relation to the institutional rules. I will then follow this with a description and analysis of how the institutional rules functioned as the template for managing the psycho-social characteristics of the staff members.

4.3.1. Functionality of the organization’ management structures

Based on the empirical data I collected from the interviews as well as the workshop, I learnt that the organization has an external management board, which acts as an advisory body to the director of the organization. This board has a maximum of eleven members, out of which forty percent comes from the private sector. I also gathered that appointment to serve on this board is made by the governing council of the CSIR (which is the ultimate authority of the CSIR). Under the board, there is the position of a director, and then a deputy director. I view the institution of the board to contradict the requirement of the best practice for governance under which the director of the organization is to have the authority to nominate people to serve on the board. There also exist divisions, each composed of a minimum of four staff members and a head. Internally, the organization has in place an internal management committee, which, from my understanding, handles issues relative to staff welfare. This committee, which comprises the heads of the divisions, and representatives from the research scientist, technical staff, and the junior staff, is viewed by most of the interviewees to be used by the director to administer the organization’s work environment.

From the perspectives of the organization’s management, the internal management committee, by virtue of its composition, is the main decision-making body within the organization, but most of the interviewees tend to disagree. This is based on the perception held by most of the interviewees that the committee is basically powerless, taking into consideration the complex decision-making matrix of the organization. Other interviewees also view the committee as a medium used by the organization’s management to intimidate staff members who dissent against the wishes of the management. My general impression, in relation to the organization’s complex structure, is that the law (act of parliament) that underlined its establishment in the 1960s, and which remains binding, can be viewed as
being flawed under the organization’s current dispensation. This notion is clearly outlined in the following comment by an interviewee;

CSIR has become a huge bureaucratic entity. There is the need for the CSIR itself, as a supervisory outfit, to be restructured so that it can meet our organization’s current expectation. For the past four years, the Deputy Director-General of the CSIR has been appointed by the Director-General to chair the External Management Boards of all\textsuperscript{117} the different organizations/Institutes under its auspices, so that the Deputy Director-General would report to him directly. There is an argument by the various organizations/Institutes to have this changed. Previous experience has shown that using an external chairman is very effective.

Therefore, it seems apparent to me that most of the organization’s institutional characteristics were maintained during the effort to commercialise, causing a contradiction between the management team and the instrument (BMP\textsuperscript{118}), as I have outlined in figure 14 below. The systemic contradictions giving rise to the disturbances are depicted with the help of the two-headed lighting-shaped-arrows (Engeström, 2000a).

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure14.png}
\caption{Sub-activity system of the management team due to the institutional rules.}
\end{figure}

\textsuperscript{117} In all, there are 14 different organizations under the auspices of the CSIR in Ghana.
\textsuperscript{118} i.e. Best Management Practices. I will use this initial in the figures in reference to the full term.
As Engeström has noted, such contradictions generate disturbances\textsuperscript{119} and conflicts, but also innovative attempts to change the activity. Based on this perspective, it is imperative to me that corresponding disturbances were generated between the management team and the object of the commercialisation process, on one hand, and between them and the institutional rules to guide the process, on the other. My realisation here is that the guidelines provided by the RTO best management practices for such practices as governance, personnel management, and organizational management were not fully utilised. The rules that prevailed are shaped by civil service codes which lack the requisite flexibility to relate to the requirements of the commercialisation efforts, despite the attempt to infuse it with the best practice for business development. In my opinion, this is indicative of a scenario whereby the functionality of the formal rules (underlined by the BMP) for the commercialisation process were stalled by the continued application of old rules (underlined by civil services codes) which I view in this context as a representation of informal rules. The obvious consequence of this development, in my estimation, was that the character of governance in the organization continued to be strongly influenced by the bureaucratic management approach underlined by an organizational structure that remained vertical and hierarchical (based on job description). This situation, in my opinion, was clearly in opposition to the requirement of the best practices for organizational management which opted for a project-oriented management style (based on objectives). The impression I developed in this respect is that, despite the provision of specific guidelines in the RTO best management practices\textsuperscript{120} to enhance the commercialisation effort, the organization’s institutional structure basically remained as that of a government civil service\textsuperscript{121}, as previously depicted in figure 12 above. This observation is corroborated by the critical problems (i.e. commercialisation concept not well understood by staff members) relative to the institutional rules that were identified by the participants at the problem-identification workshop. Taking cue from

\textsuperscript{119} Engeström (2000a) has clarified that in activity-theoretical studies of work, deviations from standard scripts are called disturbances (e.g. Engeström 1996, Norros 1996). He explained that they typically indicate developmentally significant systemic contradictions and change potentials within the activity. In other words, while the object and motive give actions coherence and continuity, by virtue of being internally contradictory, they also keep the activity system in constant instability.

\textsuperscript{120} These are outlined in chapter one, sub-section 1.2.2.

\textsuperscript{121} These are government departments which serve as the supporting outfits for the Government Ministries. It is worth noting that when the organization was functioning as a non-profit making entity, it was classified as a supporting outfit to one of such ministries (i.e., the Ministry of Science and Technology). Though limited autonomy was granted it prior to it being asked to be self-income generating, its classification still remains intact. [From official sources].
Blacker (1993)\textsuperscript{122}, I view the consequence of this to be the inability to cultivate close relationships between key structural features within the organization to bind the institutional rules relative to task demarcations, regulations, operating assumptions, power structures, as well as reward and status systems in a tightly-knit whole.

4.3.2. Managing the organization’s psycho-social environment.

Based on my discussion in section 4.3.1 above, it is obvious to me that the retention of the old management structure made it difficult to institute the regulations, operating assumptions, power structures, as well as reward and status systems defined by the best practice for personnel management, which requires inputs from managers and the workers alike. The consequence of this, as I learnt from the interviews, was the creation of distinct class groups within the staff membership, and which situation compounded the management’s difficulty. The staff members were classified into three main groups whose distinct identities were shaped by the hierarchical management structure. These distinct groups were the management team, senior staff (i.e. researchers/scientist) and junior staff (i.e. technical and administrative support personnel). The result of such distinction was the creation of tension among the three different groups due to their uncomplimentary existence. My derivation of such tension was underscored by the senior staff members, most of whom perceived their junior counterparts to be undisciplined and not well-trained on the fundamentals of work ethics. Even among those who expressed such view, there were others who also held the opinion that some of their own colleagues tolerate such acts of indiscipline, and even encourage them to some extent, by refusing to sanction junior staff members viewed as offenders. As commented by an interviewee;

\begin{quote}
Senior members must set good examples, in terms of discipline and hard work. Supervision should be improved at all levels. Every staff member must be made to sign attendance book both ‘in’ and ‘out’.
\end{quote}

\textsuperscript{122} As I have outlined in chapter two (section 2.5), Blackler (1993) has pointed out that organization theorists from Weber onwards have commented on the contrived nature of purposive organizations. Structural features may be imposed on organizations from outside. Close relationships may be cultivated between key structural features within an organization, binding task demarcations, rules, regulations, technologies, operating assumptions, power structures, and reward and status systems in a tightly-knit whole with an apparent life of its own.
In the same vein, some of the middle-level staff members also perceived themselves as being subjected to bias when it comes to the issue of job status, as is it can be derived from the following expression by another interviewee;

Staff should be motivated by the level of work done. Some staff members in certain categories do not have stringent criteria for promotion, that is, there should be different lines of progression for different categories of non-research staff. For example, the position of a Chief Technical Officer in the mechanical workshop should not be equated to that in the laboratory where so many courses have to be taken before progression.

My realisation, in this regard is that the expected input for the best practice in personnel management, especially from the junior staff members during the commercialisation was absent. Additionally, the prevalence of such a tension led to the generation of mistrust as well as the fear of intimidation among the junior staff members within the organization. In my estimation, this mistrust was so deep-rooted between the different groups to the extent that it rendered the rules underlined by the best practice for business development inapplicable. This is one practice that the organization’s management did its outmost to institute. As I have already noted in section 4.3 above, the relevant structures for this practice were created, but the attempts by the organization’s management to make them institutional were stalled. An example in this regard, as I learnt from the interviews, has to do with the senior staff members resisting the new business rule that requires a corporate business development group to handle the organization’s awareness and market strategic planning. Their argument in this case was that, by the nature of the outlined structure for the business development strategy, their control over the direction of research activity would be diminished. In support of this position, I learnt that the attempt to institute this new business structure also introduced into the system its own cumbersome procedures, especially in relation to the various steps that staff members had to go through before their requests are granted for the acquisition of materials for work. This was viewed by the interviewees to have been the hallmark for delays in project undertakings.

I also gathered from the interviewees that the monitoring and auditing of purchases within the organization was relatively weak. This was viewed by the interviewees to have resulted in an unmanageable expenditure situation, leading to waste of the organization’s limited resources. The
consequence of this phenomenon was that the release of funds for commercial activities were delayed, an event which mostly resulted in untimely delivery of inputs. The consequences of these, as expressed by an interviewee is that;

We end up developing technologies which continue to gather dust on the shelves. Our organization was given up to the end of the year 2000 to generate 30 % of its income, but the best we could do, even as at the year 2002 was to be able to generate only 6 %. Based on this, our commercialisation effort can thus be classified as not successful.

This observation, in my opinion clearly contradicts the best management practice for financial management which requires the institution of an accounting system that easily provides total, unit, and project financial information. It is obvious to me that the disturbances that emerged as a result of the integration of a significant aspect of the organization’s old rules (see figure 12 in page 124) and the business element of the best management practices (see figure 13 in page 125) did impact negatively on the ability of the organization to realise its vision for the commercialisation. The incompatibility between the activity systems of the senior staff members and their junior colleagues was a result of the historically accumulating structural tensions that had accumulated both within and between their respective activity systems. The incompatibility between the two sub-activity systems was as a result of the cumulated tension that exists between the different objects that seems to have shaped their group activities. This observation was corroborated by the participants at the problem-identification workshop who identified the differential attitudes of the staff members towards the organization’s commercialisation process as a critical problem that added to the tensions between the sub-activity systems of the senior staff members and their junior colleagues.

Based on my earlier discussions, it is apparent to me that the activities of the senior staff members are guided by the old object of the organization’s activity system (i.e. carrying out academic-oriented research activity). I find this to be in sharp in contrast to the junior staff members whose actions seemed to be have been guided by the object of the commercialisation process (i.e. conduction of commercial-oriented research activity). My impression of the interactive group sub-activity systems for both the senior staff members and their junior counterparts which appeared incompatible is outlined in figure 15 (see next page).
As I have outlined in figure 15 above, the outline of the sub-activity system for the senior staff members shows the existence of a cumulated tension between them (i.e. as a group of researchers/scientists) and the new rules (i.e. regulations, operating assumptions, power structures as well as reward and status system) that emphasise teamwork (in the form of division of labour) within the context of the organization’s commercialisation process. The indication here is that the senior staff members showed great reluctance to accept change, especially by foregoing their previous independence and partnering others in the community, including their junior colleagues. They rather continued to show their preference for working as individuals as compared to teamwork. This, therefore, gives an indication of the existence of structural tension between them, as a group, the outlined rules and the corresponding division of labour\textsuperscript{123} that was to have prevailed during the commercialisation process, and which I have

\textsuperscript{123} See figure 13 in section 4.2 (page 125).
discussed earlier. In the same vein, similar tension prevailed between them and other groups in the community.


In section 4.3 above, I looked at the characteristics of the institutional rules that prevailed during the organization’s commercialisation process in relation to those underlined by the best management practices. In this section, I will follow a similar trend by looking at the transformational characteristics of the division of labour. As I have summarised in figure 12 (see page 124), before the start of the commercialisation, the senior staff (researchers) used to undertake projects at their own pace and which depends on the availability of funds from government/external donors. They also used to engage technicians in the physical production and or laboratory testing of their results. The junior staff members (support personnel) provide administrative services to both the management board and the researchers. This division of labour was to have been transformed into a new outline (see figure 13 in page 125) which requires the organization’s management team to identify needs for change and the power to address such needs. Also a corporate business development group was to handle awareness and market strategic planning. In the same vein, each project was to be handled by project teams with the appropriate expertise, and the business units given the responsibility for financial performance. My description and analysis below will therefore look at the characteristic of this transition during the commercialisation process. In this approach, I will look at the way labour was divided from an organizational perspective (i.e. human-human and human-machine), for as Blackler\textsuperscript{124} puts it, the theory of organizations as activity systems suggests that organizations cannot sensibly be divorced from their contexts.

I learnt from the interviews that a new unit, namely the business development unit was formed within the organization to serve as the ‘nerve centre’ of the commercialisation effort (i.e. to serve as the link between the organization and clients). I understand that this was part of the structural transformation that took place before the start of the commercialisation process, as I have noted earlier on in section 4.2. Yet, I also find it of

\textsuperscript{124} According to Blackler (1993) just as activity theory avoids divorcing individuals from society, the theory of organizations as activity systems suggests that organizations cannot sensibly be divorced from their contexts and indicates that the concept of organizational boundary is problematic. Similarly, just as activity theory traces the links between individual and collective thinking, applied to organizations the approach supports an institutional theory of organizational behaviour.
interest when most of the interviewees failed to see the usefulness of this new unit by virtue of its location and control. My understanding here is that the new unit is sited at a location which renders it completely isolated from the remaining divisions in the organization, and functions under the direct control of a coordinating body within the CSIR. By virtue of this arrangement, the ability of the business development division to contribute effectively to the organization’s commercialisation was reduced. The rationale behind this is that the researchers who are to cooperate with the division were reluctant to do so. As I learnt from the interviews, the reluctance showed by the researchers emerged from their perception of the new division as an imposition by the coordinating body at the CSIR, rather than an independent component of the organization. This tension, in my opinion, is a result of the structures put in place by the CSIR to serve as platforms for instituting the best practice for business development, as I have previously noted in section 4.2. I also view it to be a result of individual researchers’ fear of losing the overall control they used to have on projects by having the business aspect of it taken away from them. An indication of this, in my opinion, is reflected in my earlier appraisal of the characteristics of the rules in section 4.3 above.

The decision by the CSIR to assume direct control of the business development division was informed by the best practice recommendation for the establishment of corporate business development group to handle awareness and market strategic planning. The apparent contradiction here, in my perspective, has to do with the roles that project managers have to play. As it is indicative of the best practice for business development, the project managers who are to head the business development divisions are to conduct the bulk of the selling activities on behalf of their organizations. This clearly requires the need for them to operate in close proximity to the researchers who are to receive rewards (both financial and recognition) for enhancing business development and which cost can easily be monitored within the organization. I also learnt from my interviews that as a consequence of the tension that surrounds the issue of role play between the researchers and personnel at the newly formed business division, the organization ended up indulging in several, but rather scattered activities under the guise of commercialisation. I view this to be completely out of tune with the best practice for offering services which recommends the offering of few service types for the attainment of better results. Another insight I had from the interviews relates to the perceived problem of staff members not understanding the kind of inter-dependent relationship that is
supposed to exist among the various categories of staff members, as well as among the various divisions of the organization. A reflection of this is also portrayed in my description and analysis of the rules earlier on in section 4.3. I learnt from the interviewees that the organization tried to offer too many services at the same time despite the difficulties in carrying out project activities caused by the lack of requisite logistics, and also the difficulties in sourcing for raw materials. Even though the equipment and materials used to perform activities are viewed by most of the interviewees to be adequate. It was explained in the interviews that most of these were previously acquired as parts of donor funded projects, with the scale favouring scientific research work. In this respect, the equipment and materials that are used for administrative work is deemed as highly inadequate. Thus the absence of effective tools, such as computers to facilitate administrative work within the organization tends to have an enormous negative impact on the overall output efficiency of its activities. As it was pointed out by an interviewee,

> The inability of the organization to provide adequate facility to the junior staff as part of the change process is a drawback. The continued usage of poor facilities by junior staff to carry out their functions resulted in output delays which extended to affect the desired outputs of the research staff.

As a consequence, the workforce is perceived by the interviewees to have not contributed effectively to the commercialisation process. I also understood that the inability of the workforce to contribute effectively was dictated by other factors, such as the continued reliance on poor storage facilities, absence of maintenance schedule for equipment, continued electricity and water outages, as well as inadequate monitoring and audit of purchases. I also gathered from the interviewees that the organization tried to associate with other institutions in the field of research and from industry, as a means of enhancing the business avenues for its products and services. This effort, as I understood it, was stalled due to the ineffectiveness and the consequent short life spans of the bonds that were formed with the others. Most of the interviewees viewed this situation (i.e. the weakness in the collaboration efforts) to have created an atmosphere whereby the organization got involved in multiplicity of activities, including those they perceived to lie beyond its area of specialisation and competence. This event, as I gathered, contributed significantly in eroding the operational synergy which is to have existed between the organization and other institutions that are also under the auspices of the CSIR. This
situation is put into a proper perspective by an interviewee in the following expression;

The new mandate given to the organization, and which resulted in the commercialisation process required that it generates one-third of its revenue. Similar mandates were also given to the remaining organizations under the auspices of the CSIR. This situation has given rise to some kind of serious competition and rivalry between these individual organizations, including our own. As such, the organization felt that the only way out is to expand the scope of its operations, a decision which has resulted in it delving into extended areas beyond its competence level, instead of collaborating with others who have superior expertise.

As it emerged from the interviews, attempts to address this situation led to the engagement of the services of foreign consultants, but whose intervention, from the perspectives of most of the organization’s staff members, did not yield the desired results. According to an interviewee;

The foreign consultants who were hired to assist in the implementation of the best management practices during the commercialisation process were highly incompetent. They rather saw the whole contract as an opportunity to offer employment to their own staff without really understanding the issue before them. As a result, their contract was abrogated.

Based on this appraisal, it is obvious to me that the division of labour within the organization was not properly oriented to ensure an effective coordination of activities within the organization. I view the source of the disturbances and the resulting tensions that prevailed to be the activity system of the senior staff (researchers) of the organization. The contradiction that I perceive to have been generated in the sub-activity system of the researchers is shown in figure 16 (see next page). In my opinion, these disturbances can be viewed to have arisen due to the reluctance of the senior staff (researchers) to adequately relate to the outlined best practices for project management and business development, both of which define the characteristics of the division of labour. Thus I view the contradiction between the senior staff members and the instrument to have created the atmosphere that resulted in further disturbance and tension between them and members of the community. In my opinion, this scenario gives a fair reflection of Engeström’s (2001a) explanation to the fact that when an activity system adopts a new element
from the outside (for example, a new technology or a new object), it often leads to an aggravated contradiction where some old element (for example, the rules or the division of labour) collides with the new one.

Figure 16: Sub-activity system of senior staff due to the division of labour.

As I have shown in figure 16 above, the collision between the old way of handling projects and the new one is clearly visible within the division of labour during the organization’s commercialisation process. The consequence of this, in my opinion, is that the synergy that is to emerge within the organization’s community did not materialise. What emerged is rather a sense of distrust among different groups and also structural tensions within the organization.

4.5. Characteristics of the Community.

As I have outlined in the study framework\textsuperscript{125}, it is important to look at the organization’s climate and culture in order to gain an understanding of the community’s group characteristics. Therefore in this section, I will

\textsuperscript{125} See figure 9 in chapter two (page 83).
describe and analyse the state of the organization’s human resource system as well as the information flow process and communication system that prevailed during the commercialisation process. I will also appraise issues relative to the organization’s values and norms as well as their impact on personnel management.

4.5.1. State of the human resource system.

The general impression I gathered from the interviewees is that the commercialisation process, at its onset, was welcomed with much enthusiasm and high expectations by the staff members. The rationale for this was that they viewed the best management practices being introduced, especially those related to personnel management, project management, and capability building as inspirational sources for their competence development. The enthusiasm of the staff members is perceived by the interviewees to have waned in the course of time, and finally gave way to a collective feeling of demotivation. They ascribed this to a failure by the organization’s management to periodically attach staff members to industries, as a means of giving them a first hand experience of learning about industrial expectations and requirements. In addition to this, I also understood that some staff members lacked the requisite competence (i.e. from the perspectives of skills upgrading) they needed to perform creditably in their fields as a result of their non-participation in refresher courses. This event, in the view of most of the interviewees has resulted in the organization being slow in its responses to clients’ demands. From the perspectives of the management, the emergence of such event is due to the lack of funds, which is also a result of the government cutting down on the level of its financial support to the organization. These observations are put into perspectives by the following comments of an interviewee;

Staff members can be said to be motivated as individuals, but collectively, they are not, because they depend on the government for their remunerations which are not adequate. Most do not know how to give quality service, because they lack the capacity to handle potential clients. It is unfortunate that by not providing adequate incentive to the staff, the organization is also not exploiting their full potential.

It is also apparent that most of the staff members did not view their efforts as being appreciated by the management. This situation, as I gathered from the interviews, also contributed to the lowering of motivation among the staff members, and the subsequent erosion of their strong commitment
towards the organization’s commercialisation efforts. In the words of an interviewee;

The organization must institute both “best worker” and “discipline” awards, in order to encourage staff members to do more. In the same vein, the management must find ways to motivate staff members who have served the organization for ten years or more by presenting them with awards for long service. This will make them feel appreciated and serve as a source of inspiration for others.

It was also revealed in the interviews that most newly recruited members of staff tend to always experience problems of settling down, as a result of the management not readily assigning them such basic facilities as an office accommodation. The problems of such staff members are also perceived by most of the interviewees to be compounded by their initial lack of understanding of their precise job descriptions. All these developments are viewed as failures on the part of the organization’s management. These events, in addition to the lack of proper orientation for such new staff members are also perceived by most interviewees to have resulted in the increase to their level of demotivation, as well as lowering their commitments towards the organization’s objectives for the commercialisation programme. The interviewees collectively view that the organization’s management do not see it as a priority to draw the requisite plans or programmes for the training of its staff members to acquire new competences. As observed by an interviewee;

The organization’s transformation process should have made allowance for the training needs of staff members to be identified on periodic, say yearly, basis. This could have resulted in staff members developing competence in the use of new equipment, new methods, as well as in the upgrade of their professional skills.

Thus, it is obvious from these observations, that the capability of the organization to perform was negatively affected by the low morale that pervaded its operating environment. Even in the circumstances whereby plans or programmes are drawn for the improvement of the organization’s manpower resource, they were shelved from the staff members. This observation is corroborated by the critical problems (i.e. lack of funds, demotivation of staff, and lack of training) relative to the human resources that were identified by the participants at the problem-identification workshop (pictures in the next page show some of the participants in group deliberations during the workshop).
Based on this perspective, I infer that the organization was not able to develop the required competence that is needed to ensure the effective functioning of its human resources system under the commercialisation programme. The consequence of this is the feeling of demotivation experienced by the staff members, a situation which could have resulted in the lowering of their productive capacity. The issue of demotivation among the staff members which I view to be a result of the disturbances between them and the management team is quite visible, as I have indicated in figure 17 below.

Figure 17: Sub-activity system of the management shaped by the human resource system.
In my opinion, this contradiction between the management team and the community is attributable to the inability of the management team to provide effective motivators (such as market-competitive salary scales and formal/informal recognition events) as recommended by the best management practices for personnel management. This therefore, indicates the presence of a contradiction between the management team and the guidelines for instituting the best practice for personnel management in relation to the application of its guidelines. This consequently establishes the contradiction that exists between them (i.e. management team) and the objective of the organization to self-generate income by pursuing a commercial-oriented research activity.

4.5.2. The information flow process and communication system.

As it became obvious to me from the interviews, there was the general view among the staff members that they lack information on the entire commercialisation process embarked upon by the organization. This was attributed to the existence of significant amount of constraints in the information flow process, which in effect renders it completely inefficient and therefore, ineffective. This was viewed by most of the interviewees to have arisen as a result of the management’s attitude of limited communication as well as their non-regular interaction with the staff members. The consequence of these was that the staff members really did not well understand what the organization’s commercialisation programme is all about. I observed that this view was strongly shared among the junior staff members, who felt that they were put on the sideline so far as the implementation of the best management practices for the commercialisation was concerned. As such, most of the staff members admitted that they really lack knowledge on the organization’s products and services which are specifically being commercialised. In this regard, there was a general consensus among the interviewees that the quality of communication within the organization is very poor. In the words of an interviewee:

The commercialisation appears to be for some few people and not for the entire staff members. There is a problem of communication within the system. It is just not effective. As such, the link between the organization and industries, as potential clients, is very weak.

From the perspectives of the senior staff members, as I gathered from the interviews, the evolution of such a situation was by virtue of the fact that
the commercialisation programme itself was forced on the organization by the government through the CSIR. I also understand that even though the CSIR is the supervisory body of the organization, it also had no direct authority over the implementation of the best management practices in the organization’s commercialization process. The CSIR was perceived by the interviewees to have rather functioned as a proxy for the National Institutional Renewal Programme (NIRP), a governmental outfit with oversight responsibility for the commercialisation of all government agencies. In this respect, the organization’s management team was viewed by the interviewees as not having a complete understanding of the commercialisation process itself. The obviousness of this is relayed by the following assertion of an interviewee;

> The senior staff members have seen the need for the restructuring of the entire commercialisation programme and have made recommendations to the government to restructure the NIRP by involving people from the CSIR in the restructuring effort. In this regard, the senior staff members have mostly shown disinterest in participating in any workshop related to the commercialisation process due to the non-receipt of feedback from previous workshops. They feel that it is a waste of time.

In my opinion, the apparent breakdown in the information flow process and feedback mechanism within the organization is a portrayal of the inefficiency as well as the ineffectiveness of its communication system. Therefore, it is obvious to me that those in management failed to attach much importance to the practice of regular interaction with the staff members during the commercialisation process. I view this to have contributed significantly to the segmentation of the workforce, leading to the creation of the tensions between the different groups and consequently creating disturbances between the different elements in the management’s sub-activity system as I have outlined in figure 18 (see next page).

The negative impact of the tensions and disturbances created by the communication system that exists in the organization is obvious since the desired inputs from both staff and industry were stalled. As I have highlighted in figure 18 above, the presence of internal disturbances among the different groups in the community (i.e. the management team, the senior staff and the junior staff) led to a contradiction between the management team (as subjects of the activity) and the community. I view the consequence of this to be the development of further contradiction
between the management team and the best practices for both project management\textsuperscript{126} and business development\textsuperscript{127} during the commercialisation.

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{image.png}
\caption{Management’s sub-activity system shaped by the communication system.}
\end{figure}

In my opinion, this clearly indicates the contradiction that exists between the management team and the object of the commercialisation whose realisation they are to spearhead.

\textsuperscript{126} The emphasis of the best practice for project management is that project teams that have the appropriate expertise for each project (regardless of where individuals report in the organization) are to be formed. Project managers are to be given the authority and responsibility to manage projects without interference once they have been thoroughly checked by management with contact expertise. A committee of industry and RTO experts is to decide on grant-funded projects. Also, individuals at all levels are to be made to interact with clients and formulate projects. Additionally, project managers are to have financial management systems that will enable them monitor expenses against project budgets, and also progress against project plans.

\textsuperscript{127} The emphasis of the best practice for business development is that a corporate business development group is to handle awareness and market strategic planning, while project managers conduct the bulk of selling activities. Rewards for business development (financial and recognition) is to be seen as effective. Business development costs must be monitored at the corporate and unit levels. Awareness activities focusing on major client groups must also be conducted. Client needs must be identified based on input from staff, board and regular meetings with industry groups.
4.5.3. Orientation of organizational values and norms.

It is apparent to me that the organization’s attempt towards creating a new image for itself is not guided by a requisite transformation in its old organizational culture, as defined by its norms and values. Apparently, the staff members found it difficult to understand the guiding norms for the commercialisation process and the related values expected of them. This lack of clarity in the organizational values and norms seems to have had lots of impact on the staff members’ attitude toward the best management practices for the commercialisation programme. There was an indication, from the management’s perspectives, that the overall commitment of the staff members was below expectation. This reflection is countered by most of the staff members with the view that, those constituting the management of the organization seem to be lacking in their commitment toward the commercialisation exercise. As it was explained in both the interviews and during the workshop, this was by virtue of the prevalence of what I understand to be unproductive norms, such as non-adherence to time schedule for delivery, demotivation on the part of staff members and clients, as well as the charging of unrealistic price for products and services. I also gathered from the interviews that most of the organization’s senior staff members were not in line with the organization’s new objective of operating as a business corporate entity. In this respect, most of their research work activities are viewed as not directed towards meeting the organization’s marketing needs. This was attributed, in part to the organization’s failure to embark on an aggressive promotional activity, as well as its inability to identify itself to specific products and services which could have given it competitive advantage over potential clients. As I learnt from the problem identification workshop, this development is attributable to what was perceived by most staff members to be the failure in efforts to conscientise the researchers on the significance of the organization operating as a business entity.

The organization was also viewed by the interviewees to operate in manners that result in the quality of its products sometimes being regarded as questionable (i.e. continued provision of results and services, which normally lack accreditation, to clients). There was also the general consensus that the organization continues to operate under poor administrative services, with apparently non-delegation of duty. The interviewees also share the general view that most of the senior staff members tend to always show disinterest on issues that they view as not
bringing direct benefit to themselves as individuals. The repercussion of this is reflected in the following expression of an interviewee;

There is no trust in the working environment. There is also no commitment to the organization’s objectives by the staff. All these have arisen because there is nothing like a new organizational culture with which the staff could have themselves identified.

I infer from this assertion that the organization’s past history, which was shaped by the civil service culture, continued to influence the staff members’ attitude. This is apparently underscored by the inability of the management to infuse a new and acceptable organizational culture shaped by the best management practices being implemented, and which is an important requirement of the commercialisation programme. This seems to have resulted in a situation whereby the perception of the staff members towards the commercialisation process is influenced by their personal core values as against those of the organizations, and which culminated in their distrust and suspicion of the entire process. In this respect, therefore, the issue of management commitment was identified as a critical problem by the participants at the problem-identification workshop. It is also evident to me that the effectiveness of the community members is reduced by the apparent weakness in the organization’s human resource system, leading to the generation of distrust and demotivation, especially among the staff members. I view this to have been aggravated by the ineffectiveness of the communication system as a result of the inefficient information flow process. As such, the organization’s community seems to exist without a definite culture which, in my opinion, could have helped in the definition of its norms and values.


Based on my description and analysis of the characteristics of the various elements in the organization’s activity system, I have shown (in subsection 4.3.1) that a hierarchical organizational management style, which is seen as bad from the perspective of the best practice for organizational management, was used to guide the commercialisation process rather than the recommended project-oriented management style. In my opinion, the retention of the hierarchical management style by those in authority might be related to what I presume to be the fear of losing their influences and powers which allow them to dictate events within the organizations as individuals by virtue of their hierarchical position. This is because the best
practice for organizational management requires the institution of a project-oriented management style based on which there will be some devolution of powers from individuals to teams. In another vein, it is also quite obvious that the head of the organization did not have the requisite authority to operate and take independent decisions in relation to the best management practices implementation under the commercialisation programme.

As I have reflected in section 4.3 above, the organization’s head continued to operate under the oversight authority of the Deputy Director-General of the Council for Scientific and Industrial Research (CSIR), which is the general administrative authority of the organization. In this regard, the management board, as constituted under the organization’s old system (see figure 12 in section 4.2, page 124), remained in place. Thus it is obvious that the power to influence activities relative to the commercialisation process lay beyond the authority of the head of the organization as well as its governing bodies. This contradiction to the best practice for governance seems to give credence to the lack of trust in the internal structures of the organization, a factor which can be credited to the development and the subsequent harbouring of fear among the staff members on possible management intimidation. This phenomenon was additionally compounded by the prevalence of an ineffective information flow process and communication system, as well as the lack of operational transparency as I have noted in section 4.5 above. The diffuse and complex organizational structure that pertains in the organization can be traced to a possible functional incompatibility that might have arisen between the requirements of the RTO best management practices being implemented, especially between that underlined by governance under the commercialisation programme and the “Act of Parliament” dating back to the 1960s which established the organization as a non-profit making government outfit. In this respect, the organization’s governance is drawn along the line of other non-commercial government departments, such as those constituting the country’s civil services (i.e. government ministries). As I have noted in section 4.4, it is also indicative that the equipment and materials which are supposed to be used for administrative work were highly inadequate as compared to those for scientific and research work (mostly obtained from donor funded projects). The continued use of poor facilities by the junior staff members, in my opinion, was a factor that contributed to output delays, and in the process affects the output schedules of the research staff. I view this disparity to be a major drawback for the organization since it
appears to make the junior staff members, who form the core staff providing support services within the context of the organization’s change process, non-effective. My overview of the tensions created in the organization’s activity system during the commercialisation process is given in Figure 19 below.

**Figure 19: Tensions present in FRI’s activity system during the commercialisation.**
Aside the fact that most of the staff members held on to their own core values, they also assessed the management’s actions from the perspectives of the organization’s past history, especially when it functioned as a non-commercial government department. I view this to depict the erosion of a unified organizational culture which was supposed to have guided the commercialisation programme. I also view it to signify the failure to internalise the organization’s new values and norms among the staff members. Therefore, it is evident to me that, as a result of the tension in the human resource systems, and also the inefficiency of the information flow process and communication system within the organization, an atmosphere was created which made it relatively difficult for the management system to function, thus constraining the organisation of work activities in the process. As it is evident from figure 19 above, the elements of tensions that prevails in the communication interfaces and decision-making process, in relation to the organization’s activity system seems to have emanated from the parent body, (i.e. CSIR), which was perceived as having become a huge bureaucratic entity, and hence was not functioning in ways which could have assisted the organization in the realisation of its objectives. As Engeström has outlined in the second principle of activity theory, this scenario gives a clear expression of multivoicedness within the activity system and which seems to have multiplied in the networks of interacting activity systems, thus serving as sources of trouble, demanding actions of translation and negotiations. Therefore, the apparent tension in the information flow process and communication system in the organization appears to have negatively affected the understanding of almost all the staff members on the transformations that were expected of them. The most significantly affected, in this wise seems to be the junior staff members who appeared to have been completely put on the sideline. Hence, they did not have any knowledgeable insight into the organization’s commercialisation programme. This gives a possible reflection of the management’s inability to introduce or inculcate an understanding of the organization’s new corporate culture within the operating environment. The consequence of this was that the staff members did not internalise the new corporate culture. They rather allowed their individual core values to impact on their understanding and interpretations of the organization’s values and norms in relation to the processes that were taking place. In my opinion, all these are reflective of disturbances within the institutional rules, the division of labour and the community (as I have variously highlighted before in sections 4.3, 4.4 and 4.5). I view all these disturbances to underline the
contradictions in the organization’s collective activity system as I have summarised in figure 20 below.

![Diagram of organizational activity system]

Figure 20: Summary of contradictions present in FRI’s collective activity system during the commercialisation

My overall impression of the organization’s collective activity system with its networks of contradictions between its different activity elements and their internally tension-laden characteristics is reflected in figure 21 (see next page).
Complexity of organizational structure and binding rules.

Oriented as that for a civil service (95%), with infusion of business practices (5%).

Problems on attempts to change parts of the organization's corporate culture and history.

Prevalence of mistrust. Apparent segmentation of staff.

Apparent lack of cooperation.

Problem with information flow and communication system. Deemed as not efficient.

Individual history and core values of staff also impacted negatively, resulting in the apparent show of distrust in management decisions.

Conflicts in the organisation of work. Issue of role play between consultants and research staff.

Disparity in the supply of tools and instruments for work activities. Difficulties in terms of administrative support work.

Engagement in multiplicity of activities, mostly beyond competence limit.

Location of business division considered unsuitable for smooth collaboration.

Figure 21: Reflection of tensions behind the contradictions in FRI’s collective activity system during the commercialisation.
Thus I view the disturbances that surrounded the workforce’s application of the rules as contributing to the tension within the organization’s community, and also with respect to the way labour is divided. This is reflected by the lack of adequate provision of incentives to the staff members due to the organization’s continued reliance on inadequate government subsidies. Also, the high degree of disparity that existed between senior research staff and their junior counterparts with respect to the availability of equipment and materials required for the performance of work activity points to the contradiction that exists between the workforce and the division of labour. Additionally, the combined influence of the constrained human resources and the inefficiency of the information flow process and communication system, in addition to the obvious conflicts between the rules and division of labour resulted in a further contradiction between the workforce and the objective of the organization’s commercialisation process. The contradiction that persists between the workforce and the rules (best practice guidelines) with respect to governance, organizational and personnel management might have emanated largely from the complex decision-making matrix binding the organization to the CSIR, and for which no major attempt is made to overhaul. It appears to have laid the foundation for shaping the attitudes of most of the staff members and also created the condition for them to be influenced by their individual histories, as well as by the organization’s history as a government non-profit making department. It also seems to have given rise to a situation whereby the staff members judge organizational issues from the perspectives of their personal core values.

4.7. Analytic Discussions and Conclusions.

By picturing the entire frame of figure 21 above, it is quite obvious to me that the attempt to effect change by the organization with instruments obtained from external sources under the context of its prevailing sub-system instability, resulted in varieties of hindrances. This is reflected by the absence of the required synergy among the elements in the organization’s collective activity system. As I have noted in chapter two (sub-section 2.4.1), Engeström’s definition of an activity is that it is a systemic formation unifying the processes of production, distribution, exchange, and consumption as transitions between subject, object, instrument, community, rules and division of labour. Thus by comparing the outlines of this definition (see figure 3a in chapter two, page 51) to the outlines of figure 21 above, it is obvious that the unifying process that the
interfaces of production, consumption and exchange are expected to create in the organization’s collective activity system did not materialise.

As it is evident from the picture I have drawn in figure 21, I argue from the perspective of Marx (1979)\textsuperscript{128} that by virtue of the tensions that prevails in the organizations collective activity system, the production (i.e. subject-instrument-object triangular interface) that emerges from the commercialisation process could not create the requisite object which corresponds to the organization’s outline needs. Even though an element of distribution (i.e. community-object-division of labour triangular interface) seems to be apparent, its exchange (i.e. subject-rules-community triangular interface) fails to materialise. In the same vein, there is no element of consumption (i.e. subject-object-community triangular interface) of the commercialisation process. This is because the production element\textsuperscript{129} could not step outside the organization’s social movement to become the direct object and servant of the organization’s needs in order to satisfy its consumption. In my opinion, this observation underlines the significance of the point by Marx (1973) that a definite production determines a definite consumption, a definite distribution, and a definite exchange as well as the definite relations that exist between these different interfaces. But as he also notes, production is itself determined by other moments and therefore a change in distribution also changes production.

I therefore argue that, as a result of the failure of the organization’s management to ensure the complete overhaul of the previous system prior to the commercialisation programme, its subsequent retention and translation resulted in the corporate image of the organization being defined within the context of its past existence. This is by virtue of the fact that no organizational activity can be completely independent of its

\textsuperscript{128}Marx has explained that production creates the objects which correspond to the given needs: distribution divides them up according to social laws. Exchange further parcels out the already divided shares in accord with individual needs; and finally, in consumption, the product steps outside this social movement and becomes a direct object and servant of individual need, and satisfies it in being consumed. Thus production appears to be the point of departure, consumtion as the conclusion, distribution and exchange as the middle (…).” (Marx 1973: 89) \textit{cf:} Engeström, 1987, p. 78]

\textsuperscript{129} According to Engeström, production is to be always seen as the consumption of the individual’s abilities and, also as the means of production. Correspondingly, consumption is also to be seen as a production of the human beings themselves. Furthermore, distribution is also to be seen as not just a consequence of production, but also as its immanent prerequisite in the form of the distribution of instrument of production and also the distribution of members of the society among the different kinds of production. Finally, exchange too, is found inside the production, in the form of communication, interaction and exchange of unfinished products between the producers.
history. All these factors might have collectively impacted on the sense
and meaning of the organization’s commercialisation process, and which
outcome, in my opinion, seems to be unsatisfactory. This is because the
organization was given up to the year 2000 to be able to generate the
required 30% of its income, but as at the year 2002, it was able to generate
only 6% of its income. Since the organization is determined to continue
with the commercialisation process and be successful in generating its set
target of 30% self-income through a successful implementation of the
RTO best management practices, the picture of the scenario that I have
created so far can be related to Engeström’s depiction of the zone of
proximal development\(^\text{130}\). Such a success, in my opinion will mean that the
organization’s collective activity system will be reflective of the
foreseeable activity system (see figure 13 in page 125) as I have outlined
earlier on in section 4.2. In this respect, I view the events underlined by
figure 21 above to represent the combined reflection of the organization’s
past and present activity. In my opinion, the organization can transform its
current collective activity system into the foreseeable one highlighted by
figure 13 in section 4.2 (i.e. successful as a commercialised entity) and
thus avoid the creation of a possible contracted activity system, if it can
understand and overcome its zone of proximal development. Understanding
and overcoming developments within such zone therefore calls for the
expansive transformation in the organization’s current activity
systems, as underlined by Engeström (2001) in the fifth principle\(^\text{131}\) of
activity theory.

As I have clarified in chapter two (section 2.7) in relation to Engeström’s
(2000a) representation of the cycle of learning action (figure 11 in page
88), the extent of my study is to provide the base for understanding
possible developments that the organization has to deal with in its
commercialisation effort. I therefore view my descriptions and analyses of
the organization’s collective activity system (from section 4.1 to 4.6, and
broadly summarised in figure 21 above) as providing an understanding of
the organization’s internal environment, and hence in line with my first
proposition for this study. As a recall, I proposed in chapter one (section
1.5) that existing tensions in an RTO’s activity system serve as internal

\(^{130}\) I have discussed this under theoretical framework. See figure 9 in chapter 2 under sub-section 2.7.

\(^{131}\) The fifth principle proclaims the possibility of expansive transformations in activity systems. Activity systems move through relatively long cycles of qualitative transformations. As the contradictions of an activity system are aggravated, some individual participants begin to question and deviate from its established norms. In some cases, this escalates into collaborative envisioning and a deliberate collective change effort.
environment constraints which influences the extent to which external environment factors negatively affect the organization’s implementation of the best management practices. I also noted in chapter one (section 1.4) that my findings \(^{132}\) from an earlier study (Sanda, 2003) points to some external environment factors that also constrained the RTOs’ commercialisation processes. These factors include the RTO’s prevailing socio-economic and legal frameworks, the influence of consumer and market forces, the pervading political atmosphere, the operating climate as well as the subsystem stability (i.e. operating system). The specific external factors that I identified in this case are highlighted under STEPRI\(^ {133}\) in table 1 (see chapter one, page 25). I therefore view that by cross-analysing the insights that I have provided in this case together with those to be gained from cases two, three and four (which I will do later in chapter eight) the requisite platform for modelling new solutions to facilitate the internalisation of the best management practices model in future commercialisation process can be established. By implication, the cross analyses is to signify the possible contribution in the applicative understanding of Engeström’s model and principles of activity theory in relation to my study framework \(^ {134}\) (which I will discuss later in chapter nine) as a template for guiding an organization’s commercialisation process through the zone of proximal development and towards the attainment of a possible expanded activity (i.e. its foreseeable activity system, as I have discussed in section 4.2 and summarised in figure 13, page 125).

\(^{132}\) This is based on a survey among RTOs in 8 different developing countries concerning external environmental factors which seem to prevent the RTOs from successfully implementing and internalising the best management practices.

\(^{133}\) i.e. Science and Technology Policy Research Institute (Ghana). Its Director answered the survey questionnaire.

\(^{134}\) See figure 9 in chapter two (page 83).
CASE TWO

Caribbean Industrial Research Institute (Trinidad)

My motive for selecting this specific case as I previously discussed in chapter three (sub-section 3.4.1) is underlined by the fact that the organization was involved in a successful implementation of a quality management system before it started its attempts to commercialisation, thus making it a good case to study from the perspectives of its continuing effort to be successful in this respect. As it is with the previous chapter (i.e. chapter four), I will also start this chapter by giving an insight of the approach I used to collect empirical data on the organization’s commercialisation process based on its attempt to implement the RTO best management practices from the year 1997 to 2003. I will follow this with a description (based on the analytic approach I have outlined in chapter three, section 3.8) of the organization’s activity system during the transition period of its attempt to transform from being a non-commercial R&D agency into that of a commercial one.


The empirical data that I used to analyse the organization’s commercialisation process was obtained through structured interviews (see appendices II and III for the interview questions guide) with the Quality Manager and eighteen staff members whom I identified as key actors in the efforts to implement the RTO best management practices. I complemented this with a general survey on issues relative to human resource and organizational norms, using a self-completion, three-point

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135 This is based on my broad methodological approach which I discussed in chapter three (section 3.5).
136 i.e. Research and Technology Organization.
137 I have discussed this in chapter one, sub-section 1.2.2
138 See page 117.
139 My outline of this will be based on the model shown in figure 9 (see page 83) which characterised my study framework as I discussed in chapter two under section 2.6.
140 I have discussed this methodological approach in chapter three (sub-section 3.5.2) in relation to its application in this study.
141 Coordinating officer for the organization’s commercialisation process.
scale questionnaire (see appendices IV) which I administered on twenty-two randomly selected staff members. I also conducted a problem identification workshop (see appendix V for the workshop guide) with support from the organization’s Chief Executive Officer under the theme “challenges we face in our efforts to increase the profitability of our organization’s output and services” with fourteen people representing the management, senior staff and the junior staff in attendance. This workshop provided a platform on which the participants identified problems relative to the best management practices implementation efforts. The information generated from this workshop served two purposes. Firstly, it provided me with additional empirical data, complementing those from the interviews. Secondly, it provided beneficial information to the organization’s director on those organizational problems for which the management could easily find remedies. In the sections that follow, I will firstly give a profile of the CARIRI. This will be followed by a highlight on factors and events that underlined the start of the commercialisation process. I will also carry out in-depth individual functional analyses of the rules, division of labour and the community as they impacted on the organization’s activity system during the commercialisation process.

5.1.1. Profile of CARIRI

The background information I had on the CARIRI as part of my empirical data shows that the organization was established in 1970 by the Government of Trinidad and Tobago. It operates from two locations, namely the University of West Indies campus, St. Augustine, and the Trincity West Industrial estate, Macoya, both in Port of Spain, the capital of Trinidad and Tobago. It provides testing and technological services to private and public sector organizations both locally and regionally. The organization’s mission is to advance the economic and social development of Trinidad and Tobago and other countries in the Caribbean Region by providing technical and technological support, creating and transferring technology to the producers of goods and services, and maintaining a positive work environment that encourages employee commitment to the financial viability and success of the organization. In the pursuit of this mission, the organization has undergone a restructuring programme geared

142 I have discussed this methodological approach in chapter three (sub-section 3.5.4) in relation to its application in this study.
143 This is in the form of a special workshop report. I did this in response to a prior requisition by the organization’s director for a part of this field study that could provide immediate benefit to the management of the organization.
towards the improvement of quality and range of services it provides its clients (i.e. introduction of a quality management system). The restructuring exercise includes the upgrading of physical infrastructure, the acquisition of new equipment, and the development of the organization’s human resource capability, as well as the improvement of its operation system. By virtue of this exercise, the organization’s physical resources include modern and well equipped laboratory facilities in the area of food, microbiology, analytical chemistry, petroleum and industrial materials. As at the time of my research visit for data collection (i.e. August 2003), the organization is acknowledged to be operating under internationally recognised quality management systems. Information I obtained from the organization’s official records indicates that on the 27th May, 1997, it became the first organization to be recognised in the Caribbean region to have its laboratories accredited under the United Kingdom Accreditation Services (UKAS). It also received the International Standards Organization (ISO) 9002 certification, and is the only science and technology organization in the region with this dual accreditation/certification. ISO 9002 is a quality assurance model made up of quality system requirement which applies to organizations that produce, install, and service products. Thus ISO expects organizations to apply this model and to meet these requirements by developing a quality system, which the organization did through its restructuring exercise (as I have highlighted above).

The key focus areas of the organization’s operations are biotechnology (food and Microbiology), analytical chemistry, petroleum, industrial materials, environmental management, training, and information. It currently operates with a multi-disciplinary staff of approximately 120 persons. These include 40 Scientist/Researchers in the areas of microbiology, food technology, analytical chemistry, petroleum chemistry, information management, chemical engineering, quality management systems, finance/economics, marketing, civil engineering, environmental management, and organizational health and safety. These professionals are backed by 45 technicians and 35 support staff. The organization’s major clients include major local, regional international organizations. Locally, the organization provides services to micro, small and large organizations. It provides services to the various government ministries, key companies in the energy industry, the construction sector, the food processing and hospitality industry, government agencies, the light manufacturing industry, heavy industries, including the petrochemical industries and a range of private sector enterprises. Regionally, it provides services to the
Caribbean Development Bank, Inter-American Institute for Cooperation on Agriculture, University of Surinam, and various governments and private sector organizations throughout the region. The organization’s international clients include the United Nations, the Organization of American States, and the International Development Research Centre.

5.2. The Path towards Commercialisation.

The organization’s march from being a government-subsidy dependant agency towards commercialisation was initiated by the government of Trinidad in 1986 from the perspective of a restructuring exercise that resulted in the upgrading of the organization’s physical infrastructure. Along this line, the organization acquired new equipment, and also succeeded in improving upon its operation system, a feat that resulted in its acquisition of the International Standard Organization (ISO) 9002 certification and the United Kingdom Accreditation System (UKAS) certification in recognition of its quality management systems meeting the established international standards. With this international recognition at hand, the government viewed the organization as having the human resource capable of utilising the organization’s improved operation system towards the provision of a wide range of quality and profitable services to its clients. The implication here was that the government wanted the organization to take advantage of the outcomes from its (i.e. organization’s) successful total quality management system (i.e. ISO 9002 and UKAS accreditation) and use them as business and commercial tools in marketing the organization’s services and products. In this respect, the organization was to start operating as a commercial agency with the capability of generating its own income, as opposed to its continued reliance on government subsidies. I interpret this governmental directive (i.e. CARIRI must exploit its ISO 9002 certification and UKAS accreditation to operate as a commercial agency, generating its own income), as reflecting a new rule in the government’s activity system (as policy-making subject). The implication of this governmental directive was that it initiated a dialectic process (i.e. series of conflicts and resolutions) in the organization’s activity system (which has the object of carrying out scientific research under full government funding in order to improve the country’s technological base). In my opinion, this scenario involving the government (as the policy-maker or influencing agent for the change) and the organization’s activity system (as the subject of change) can be viewed
as I have shown in figure 22 below. I have used the dotted arrow to signify the dialectical path.

Figure 22: CARIRI’s organizational activity system in conflict with government’s activity system at the start of commercialisation.
The organization therefore, introduced the best management practices model\textsuperscript{144} as part of a commercialisation process in order to re-orient its activity system towards attaining the requisite business competences and marketing capabilities in fulfilment of its new objective. I have also used the underlined elements of the best management practices model to picture the organization’s anticipated activity system for the commercialisation, as shown in figure 23 below.

Figure 23: CARIRI’s organizational collective activity system as a commercialised R&D agency.

\textsuperscript{144} I have discussed this model and the specific management practices it entails in chapter one (section 1.2).
The introduction of this new instrument also marked the start of a new implementation process in the organization, which was the implementation of the best management practices. As I have noted earlier on, the organization’s commercialisation process is supposed to take advantage of its acquisition of international certification on quality management quality system. In this regard, I perceive the object of the organization’s collective activity system as being expansively transformed to include an element of income generation. By this object expansion, the organization’s was (by virtue of its implementation of the best management practices model) expected by the government to be capable of generating eighty percent of its income. In the sections that will follow, I will describe and analyse the empirical data that I gathered on events that pervaded the organization’s commercialisation efforts. As I have already noted, this was as a result of the transition of its activity system from that of a government-subsidised R&D agency (figure 22 above) to that of an income generating R&D organization (figure 23 above) through the implementation of the RTO best management practices. Therefore, by following the analytical lines I have drawn in chapter four, my approach here will also be guided by the outline of my study framework which I have previously discussed in chapter two (section 2.6). In this regard, I will draw highlights on the dynamics of the embedded elements in the organization’s activity system based on the characteristics of the rules, the division of labour, and the community (as defined in the study framework) during the transition period. In line with Engeström’s first principle of activity theory (as I have noted earlier), my units of analysis will be the collective activity system, while group actions will be the subordinate units of analysis. The specific groups that I identified to constitute the workforce in this organization and whose respective actions I will subject to analysis are the management team and the staff members. Thus it is obvious to me that the events to be highlighted by my empirical data are reflective of actions that are influenced by group-based actors in the organization.

5.3. Characteristics of the Institutional Rules.

In section 5.2 above, I presented a summarised insight of the institutional rules that guided the organization’s work before the start of the

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145 This presupposition can be interpreted from the perspective of Engeström’s (2001) fifth principles of activity theory which proclaims the possibility of expansive transformations in activity systems.

146 The remaining twenty percent is provided by the government in the form of annual subvention.

147 See figure 9 in chapter 2, section 2.6 (page 83).
commercialisation process and also those expected to have been in place in order to ensure the success of the process. As I have outlined in figure 22 above, the institutional rules to be transformed were reflective of administrative guidelines for managing government ministries and departments (i.e. civil service codes), and also guidelines underlined by the total quality management system. In the course of the organization’s commercialisation process, these rules were to have been reinforced by the new guidelines (see figure 23 above) as provided in the best management practices\textsuperscript{148} for governance, organizational management, capability building, personnel management, project management, and business development. The issue at stake here is for me to analyse the characteristics of the rules as they prevailed during their transformational transition. As such, I will describe the nature of the organization’s management system as it prevailed during the commercialisation process. In my description, I will view the institutional rules\textsuperscript{149} as characterised by regulations, power structures, and reward and status systems (as shaped by both explicit and implicit rules that defines social behaviour). This is based on my perception that the functionality of such a system can be well established by understanding how the rules dictated its structural set-up and also its application as template for managing the psycho-social environment in the organization. Therefore in the subsections that will follow, I will firstly describe and analyse how the management structures in the organization functioned in relation to the institutional rules. I will then follow this with a description and analysis of how the institutional rules functioned as the template for managing the organization’s psycho-social environment.

5.3.1. Functionality of the organization’s management structures.

Based on the empirical data I collected from the interviews as well as the workshop, it is indicative to me that significant efforts were made in the organization (by those managing it and their external consultants) to change the management style in conformity with the organization’s goal of transforming into a commercialized agency. My analysis of the interviews

\textsuperscript{148} I have already discussed these practices in chapter one under section 2, sub-section 1.2.1.

\textsuperscript{149} This is in relation to my earlier discussion in chapter two (section 2.5) in which I relate to the explanation by Blackler (1993) that the effective functioning of an organization does not depend on people agreeing on why they are doing something. As he notes, all that is required is that there is agreement on procedures for determining what should be done. In my opinion, it is such procedural agreement or institutional rules that shape an organization’s management system and dictates the way it functions.
reveals two distinctive classes of opinions (i.e. the management team’s perspective and staff member’s perspective) in relation to the management of the organization’s re-institutionalisation of its rules and structures based on the best management practices model (which I have highlighted in figure 23, page 163). The impression I gathered from the interviewees with management leanings was that, the staff members were able to re-orient themselves toward the changes in the organization’s rules, leading to their acceptance of the prevailing management style within a short period of time. But, as most of the interviewees pointed out, this perception of the staff being accommodating was not as simplistic as it sounds. Their (interviewees) explanation in this regard was that, at the initial phase of the institutional restructuring within the organization, the management has had to cope with the resistance that was offered by the staff members. The emergence of this resistance was credited to the management’s failure at the time to adequately inform the staff members on the reasons for the changes in the organization which they (staff) feared that they were going to be negatively affected. According to some of the interviewees, this resistance did not impact on the organization’s institutional restructuring because the management were able to respond quickly to the staff members’ concern with adequate clarification on the commercialisation process as well as explanations to the changes. Despite the impression created by this view of the emergence of new rules (formal) from the changes within the organizations, I also learnt from the interviews that in addition to the new rules, some informal ones also emerged within the organization, but which were perceived by the management to have co-existed positively with the formal rules in the organization. From the management’s perspective, most of the informal rules have been gradually transformed and incorporated into the formal rules. The issue of interest here, in my opinion, has to do with whether this perspective of the organization’s management was also shared by others in the organization. My interview data, in this respect, points to the expression of opinions by other interviewees that run contrary to those I have discussed above. A good preview of such contrary views is provided by the following distinct expressions made by different interviewees;

*Interview comment 1:*

There are some elements of informal rules within the organization. Once they are not causing any harm or being fraudulent, they are alright. There are some of that. If I don’t see them eye to eye, I try to ignore them. There are some which affect the organizational process, for
example, an organization going against its formal rules and producing inferior products. There is the need to revise those rules that ran contrary to the transformation process, and this must be done gradually.

*Interview comment II:*

Informal rules do exist which tend to impact negatively on the organization, and this must be looked at and possibly minimised within the system. Some of these, and which are of concern to the staff, are normally heard through hear say, but never expressed to management formally. I suppose some of these could be formalised through a tripartite system, that is, management – union – staff.

Even though I tried to have the interviewees to state (in clear terms) what these informal rules are, the best they could do was to highlight on some scenarios which they might have noticed in the organization, but which in their opinion was against the requirements of the best management practices model. But paradoxically, all the interviewees expressed the opinion that on a general note, the formal rules that guided activity undertakings in the organization were in line with the guidelines provided by the RTO best management practices for governance, personnel management, and organizational management. Yet, what I perceive to be the bone of contention relative to the interviewees’ feeling about the presence of informal rules in the organization (and to which the management seems to agree), was associated with the actions of management that are civil service-oriented. As I understand from the organization’s management perceptive, even though the practice of governance in the organization was guided by the best management practices model, some important civil service-oriented codes were also infused in order to protect the interest of the government as the sole owner of the organization.

The question that arises here, and which I will discuss in the next subsection is; what do the interviewees mean by informal rules, especially if they paradoxically agree that the organization’s institutional rules during the commercialisation was underlined by the RTO best management practices for governance, personnel management, and organizational management as it was enshrined in the RTO best management practices model? In other words; were the informal rules the interviewees’ psycho-social perceptive interpretation of management’s decision and actions that were shaped by the civil-service codes retained by the organization?
5.3.2. Managing the organization’s psycho-social environment.

Even though the infusion of civil service-oriented codes in the practice of governance in the organization was perceived by the interviewees to have held together and worked, as I have discussed in section 5.3.1 above, I rather perceive such infusion as giving credence to situations whereby some actions and/or decisions are taken, but whose bases are perceived as informal. What I find to be intriguing, in this respect, was the opposing perspectives of the organization’s management and the staff on the underlying source of the informal rules. From what I understand from the management’s side, the only problem that led to the emergence and/or application of the informal rules in the organization relates to the preparedness of the individual staff members, as individuals, to go by the formal rules. But looking at this issue from the staff members’ perspective, most of the interviewees were of the opinion that those in management positions were selective in their treatments of staff in the organization. The argument of the interviewees, in this regard, was that despite the formal rules for project undertakings being clear-cut, the same cannot be said on output measurement. There was therefore, the general feeling that the output performances of different people in the organization (especially staff members from the middle-level downward) were measured differently, mostly using rules that differed from those underlined by the best management practice for personnel management. This was viewed by most of the interviewees to have resulted in some staff members harbouring the feelings of being marginalised within the organization. Reflecting on this issue, an interviewee stated that;

With the current management structure, I am not sure if such situation could be easily identified for rectification. There are a lot of inconsistencies in the management structure and these have generated elements of distrust and disaffection within the system.

The cumulating impacts of such view (as I have expressed above) from most of the interviewees, in my opinion, appears to have created the notion among the long-serving staff members that some of the rules being used for the purpose of personnel management in the organization were unfavourable especially when it related to the issue of promotion. The consequence of this situation seemed to be the re-shaping of most staff members’ attitudes and trusts toward the organization’s commercialisation process. A picture of this observation was also reflected by the distribution
of the relative responses in the questionnaire survey as I have shown in plot (i) below.

As such, most of the staff members continued to cherish what they termed as "those nice days", which was an indication of their continuance to hold on to the organization’s past history. The interviewees reference to the phrase “those nice days", as I understand it, relates to the organization’s past history when it functioned as a pure research institution with relaxed rules, ease of task undertakings as well as the existence of tea or coffee breaks and the likes. It is therefore obvious that most of the staff members continued (somewhere at the back of their minds) to see a beautiful organization with relaxed rules (which in reality was contrary to what really prevails), and operating in a business-like manner. This was against the background of the management’s expectation that the staff members should have developed the psychological frame of mind to the fact that they are working for money, and as such, must work in a business-like environment. The counteracting expression from most of the staff members was that the quality system rules were stringent and required a lot of time to record everything. These preceding views tend to indicate the presence of perspective differences among the staff in relation to the quality of the prevailing internal rules of the organization, which was supposed to serve as the guiding principle to their approach to tasks. I view this as a signification of tension within the organizations community. This
presupposes that the organization had not been able to fully transform the perception of its staff to fit its current image (i.e. the organization’s perceived corporate culture). Hence, there is the tendency that most of the staff members continued to be influenced by the past history of the organization (i.e. when it was operating under government subvention with its relaxed operational rules). It is therefore apparent that the elements of the organization’s institutional characteristics that were retained by the organization (as I have discussed in section 5.3.1 above) during the commercialisation process, did not infuse positively with those of the best management practices (BMP) model. This is evident by the tensions that have emerged inside the organization leading to a contradiction (depicted by two-headed lighting-shaped-arrows) between the management team and the institutional rules, as I have outlined in figure 24 below.

Figure 24: Sub-activity system of the management due to the institutional rules.
As Engeström notes, such contradictions generate disturbances and conflicts, but also innovative attempts to change the activity. Based on this perspective, it is obvious that the tension that was generated in the community was due to the contradiction that prevailed between the management team and the community. My realisation here is that the guidelines provided by the RTO best management practices for the practices of governance, personnel management, and organizational management were not fully utilised.

5.4. Characteristics of the Division of Labour.

In section 5.3 above, I looked at the characteristics of the institutional rules that prevailed during the organization’s commercialisation process in relation to those underlined by the best management practices. In this section, I will follow a similar trend by looking at the characteristics of the divisional of labour. As I have summarised in figure 22 (see page 162) before the start of the commercialisation, staff in different specialised units in the organization operated upgraded and specialised laboratories, using standard quality management operating procedures as prescribed by both ISO 9002 and UKAS. The staff in each specialised unit worked as core-team members on projects at their own pace. The core activities in this regard involve the interaction between the researchers and their technicians (responsible for physical production and or laboratory testing of researchers’ results) as well as with their support personnel (providing administrative services to the units). This division of labour was to be strengthened into a new outline (see figure 23 in page 163) which required the organization’s management team to identify needs for change and the power to address such needs, as well as the setting up of a corporate business development group to handle awareness and market strategic planning. In this vein, Project teams were to continue with their handling of projects, but the responsibility for financial performance was to be assigned to business units.

Therefore, in the sections that will follow, I will look at the characteristic of this transition by describing and analysing the way labour was divided during the commercialisation process, especially from an organizational perspective\(^{150}\) (i.e. human-human and human-machine). I learnt from the

\(^{150}\) According to Blackler (1993) just as activity theory avoids divorcing individuals from society, the theory of organizations as activity systems suggests that organizations cannot sensibly be divorced from their contexts and indicates that the concept of organizational boundary is problematic.
interviews that at the onset of the commercialisation process, the organization’s management encountered problems in their attempt to re-orient the way work functions are structured. As I have highlighted above, respective units in the organization used to enjoy some levels of autonomy in their work undertakings, including the handling of the finances they get from the government as well as from donor funded projects in their units. In this regard, some units became financially stronger and functionally more successful than other units. Therefore, when the management, acting in line with the best management practices for project management and business development (see figure 23), set up a corporate business development group, with the responsibility of handling awareness and market strategic planning for the entire organization, they (management) encountered strong resistance from the units. But as I understand from the management perspective, this resistance by the units was short-lived as a result of their (i.e. units) appreciation of the functional clarity underlined by the best practice for project management (i.e. project teams in each unit are to continue with their handling of projects). Yet, it was evident from my interviews that there were elements of conflicts in the new work distribution system, especially at the individual unit level, and which seemed to point at possible duplication of functions. Despite this, the units did collaborate on some projects with the outcome targeted for each collaborator agreed upon by all those involved. In the views of some interviewees, this collaboration prevailed without many problems. As it was noted by an interviewee;

> When problems arise within a team, we come together, and try to solve them, base on our project management schedule. Normally the team elects a project manager to keep everybody on track. Basically there are no problems with respect to division of labour between human and non-human actors……. There are some elements of activity overlap as well as gaps within the system, especially in the administrative sections. I call it a healthy sign.

It was revealed further by the interviewees that, as part of the transformation towards income generation, the different units of the organization were classified into different operating centres and then given financial targets to achieve. I learnt that performance incentives, such as material rewards, were to be given to staff working in units that were able to meet their financial targets, in line with the best management practices

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Similarly, just as activity theory traces the links between individual and collective thinking, applied to organizations the approach supports an institutional theory of organizational behaviour.
for business development. Yet, this arrangement was also viewed by most of the interviewees as encountering some resistance from the respective units. The ascribed reason was that those units used to deal directly with clients, but have now been stopped by the management, in order for the newly established business unit to assume that role, an event which the units viewed as interference in their operations. On the issue of client’s first point of contact with the organization for services, a scenario was created by some of the interviewees depicting potential clients as tending to call on any staff member whom they thought might be in a position to help them. This scenario, in my understanding showed the kind of leverage that the respective units had over the newly established business unit which was to be the first point of contact for potential clients. This observation was highlighted in the following expression by an interviewee;

In the scenario whereby clients telephone in and talk to the receptionist as the first point of contact, she in turn is supposed to direct them to the business unit. That is how it is supposed to be. But sometimes because of her experience, she knows that this query should go to this or that unit, but according to the formal procedure she is to direct all enquiries to the business unit.

The probable explanation for this scenario, based on my observation, can be derived from the fact that the new business unit was yet to have the requisite strength to assume the control of handling clients. Thus the unit which had only two staff members was viewed by most of the interviewees as not up to the task since (in their perceptions) the content of the organization’s business was enormous for two persons to handle. As I also learnt from the interviews, the organization had its own standard operating procedure for all the units to follow in order to avoid possible conflicts emerging in role playing. Yet, I also understand that some elements of conflicts did arise once in a while, especially when staff from different units worked in unified teams with specific targets to meet, but amidst indications that a segment of the team might fail by virtue of the resources available. This concern was expressed by an interviewee as follows;

This is an area where management have to come out with the right solution. There is a long way to go, and for the commercialisation to be successful, there should be a vigorous attempt to remedy these conflicts. In this perspective, realistic targets should be set for all groups. Management should prioritise their focus by clearly setting demarcation for the efforts of the various units, such as 50% effort for commercialisation, with 50% for addressing other issues, including
human relations, as compared to the current policy of 80% commercialisation target, which has left the human relation element lacking.

The above expression, in my opinion, is in clear contrast to the notion that working in teams raised no major problems, because as it emerged from the problem-identification workshop, the issue of “poor inter-personal relation” among project team members was a critical problem. Even though teamwork was evident and functional within individual units, the functionality of cross-unit teams that were formed to work on same projects appeared to have experienced disturbances as a result of tension among the different units contributing members to the cross-unit teams. An attribution to this observation was the conflicting perception by most of the staff members to the effect that they had the freedom to carry out their tasks without any interference, but yet identified the issue of too much interference from management as a critical problem during the problem-identification workshop. The pictures below show some of the participants\textsuperscript{151} during the workshop (with me wearing yellow tops in the second picture).

Thus by assessing the various observations I have outlined above, it is obvious that the functionality of the division of labour within the organization’s prevailing structure was negatively affected by the disturbances and tensions that emerged between the different specialised units, on one hand, and the newly created business unit, on the other. By implication, I perceive this to reflect the constraints encountered by the management in their attempt to manage the work functions of the different

\textsuperscript{151} With me standing fifth left in the second picture.
units in the organization. The contradictions that I perceive to have been generated in the sub-activity system of the organization’s management are shown in figure 25 below.

Thus I view the contradiction between the management and the division of labour as creating the atmosphere that resulted in further disturbance and tension among the different units. This scenario, in my opinion, is a reflection of Engeström’s (2001a) explanation that when an activity system adopts a new element from the outside (for example, a new technology or a new object), it often leads to an aggravated contradiction where some old element (in this case the division of labour) collides with the new one. As I have shown in figure 25 above, the collision between the old way of

Figure 25: Sub-activity system of the management due to the division of labour.

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handling financial aspects of projects and the new one was clearly visible within the division of labour during the organization’s commercialisation process. The consequence of this, in my opinion, was that the synergy that is to emerge among the different specialised units and the new business unit in the organization did not materialise.

5.5. Characteristics of the Community.

As I have outlined in my study framework, it is important to look at the organization’s climate and culture in order to gain an understanding of the community’s group characteristics. Therefore in this section, I will describe and analyse the state of the organization’s human resource system as well as the information flow process and communication system that prevailed during the commercialisation process. I will also appraise issues relative to the organization’s values and norms as well as their impact on personnel management.

5.5.1. State of the human resource system.

It was revealed from the interviews that at the start of the commercialisation process in 1997, the management’s attempt at retraining the organization’s staff to acquire the requisite competences relative to the functioning of the best management practices model encountered problems due to the lack of funding. As such, the process commenced with staff members expressing their resistance to conform. This event was viewed by some interviewees to have resulted in the generation of distrust and demotivation among the staff members, but which development they perceived to have been ignored by the management. The interviewees’ perception of the management’s inaction, as I understand, was due to the absence of a separate human resource unit (headed by a qualified human resource manager) with the responsibility of monitoring staff welfare. But this (as I must point out here) does not mean that the organization did not put in place a mechanism for assessing human resource issues. In reality, the organization had a human resource officer, but whose ability to perform was questioned by most of the interviewees. The impact of this observation on the commercialisation process was that the management experienced problems in its requirement that the units operate from the perspectives of meeting set-targets. By virtue of this requirement, the management was to have recognised the additional training needs of the staff members (especially the administrative competence of the
scientists/researchers) through a competent human resources unit, but which recognition failed to materialise. The general consensus among the interviewees was that, as a consequence of such failure, most of the organization’s researchers ended up being frustrated in their attempt to enhance the attainment of set project targets due to they lacking the requisite competence for administrative work. The organization’s secretaries were viewed by the interviewees to have also lacked the requisite competence (aside their typing duties) which could have enabled them to function well as administrative-support staff. As such, there was the general feeling that the management tended not to see the need to upgrade the capability of the administrative staff to the same level as those on the technical side. As it was asserted by an interviewee;

There is the need to focus not only on upgrading the competence of technical staff, but also that of the administrative personnel as well when thinking of positive transformation. The two must go hand in hand.

This observation was reinforced by the management’s admission that special short-term training programmes were designed for the organization’s scientists/researchers to acquire business skills prior to the commencement of the commercialisation process and during the implementation transition period. This was supposed to have helped in reshaping them to become more business-minded, despite being scientists. Yet, there were those among this category of staff members who, in the opinion of most interviewees, thought that they could not be business-oriented by virtue of their professional training, and therefore, should not be pressured to function as such. Another human resource issue that emerged from the interviews concerned the organization’s inability to retain its trained staff members. It was apparent that the organization continued to face the problem of staff turnover. This was attributed by most of the interviewees to the absence of an effective incentives scheme to motivate new staff members to stay and in order to contribute to its success. This situation seems to have resulted in the management’s reversion to the services of consultants as a buffer to the unstable organizational subsystem. The consequence of such management action was the generation of displeasure among most staff members who viewed such action as a show of the management’s distrust in their (i.e. staff) capabilities and competences. This expression of tension emanating from the state of the prevailing human resource system was relayed in the following comment by an interviewee;
Management must also think critically before engaging the services of consultants, so that these consultants don’t end up creating more turbulence in the subsystem rather than creating cooperation and harmony. It will be ideal for all parties in conflict within the organization to sit down and find ways of reaching a compromise. This is a better option than jumping for the services of consultants.

On the issue of incentives, the salary was viewed by the interviewees as poor, and which factor they ascribed as a key factor in the organization’s inability to attract qualified professionals from the industries to help it (i.e. organization) in the commercialisation process. The consequence of this, as I understand, was that the organization had to depend on recruiting mostly new and unskilled people from the university. But as I understand from the management’s perspectives, such new recruits, on the positive side, were trained by the organization to acquire the requisite competences to make them fit into the system. But on the negative side, most of these new staff members left the organization after relatively short periods of stay and in the process took with them the competences that they acquired. In the perceptions of the interviewees, the organization was unable to improve upon the remuneration of its staff members, because it continued to depend on government subvention for its survival. In this regard, the government also ensured that the organization continued to operate alongside the civil service structure. Thus the issue of high staff turnover experienced by the organization was basically due to the lack of adequate remunerations. Mostly, those who left were relatively induced by better offers from other establishments. Other factors were also perceived by the interviewees to have aggravated such development. This was indicated in the following comments by an interviewee;

In terms of staff turnover, new professionals who come in normally leave after an average period of two years. In my opinion, the current organizational structure is such that most of such people see it as not making room for one to rise up within the organization. There is also lack of autonomy in the tasks that the staff members carry out. Your ability to undertake a project without having someone constantly dictating to you is also absent. This should not be so, particularly in such working environment as that of the organization………. In my view, higher level employees need to experience certain level of autonomy and decision-making since they stand to provide the avenue for an employee's personal growth in terms of competence as well as confidence building.
It is quite obvious that issues relating to human resource were a major problem. There were indication of tensions in the organization’s community caused by the management’s handling of issues relative to staff development and remuneration which appeared to contrast the requirements for personnel management as provided in the best management practice model. A picture of this observation is also reflected by the distribution of the relative responses in the questionnaire survey, as I have shown in plot (ii) below.

Thus, it is obvious from the above observations that the capability of the organization to perform was negatively affected by the low morale that pervaded its operating environment. It is also obvious that the tension that prevails in the organization’s human resource negatively affected its bids towards competence development and therefore its ability to improve its manpower base. The contradiction that I perceive to have been generated

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152 Approach to personnel management is to be such that a flexible recruitment system is put in place and which must use input from managers, co-workers and human resources department to select appropriate new staff and promote existing ones. RTOs must set market-competitive salary scales with market salary data, and reward high performance. Non-pay based awards (formal and informal recognition events) are to be seen as effective motivators. A compensation package decision is to be made by the management team for each staff person using the results of individual performance evaluations. Employees are to be evaluated against common objectives by their supervisors and the senior management team, and the results are to be communicated verbally and in writing.
in the sub-activity system of the organization’s management is shown in figure 26 below.

Based on this perspective, I infer that the organization was not able to develop the required competence that was needed to ensure the effective functioning of its human resource, under the commercialisation programme. The consequence of this was the feeling of demotivation experienced by the staff members, a situation which appeared to have resulted in the lowering of their productive capacity. The issue of demotivation among the staff members, which I view to be a result of the disturbances between them and the management team, was quite visible, as I have indicated in figure 26 above. In my opinion, this contradiction between the management team and the community is attributable to the inability of the management team to provide effective motivators (such as

Figure 26: Sub-activity system of the management shaped by the human resource system.
market-competitive salary scales and formal/informal recognition events) as recommended by the best management practices for personnel management. An attribution to this observation, as it emerged from the problem-identification workshop was the perception by most staff members to the effect that they receive more performance recognition from their own colleagues than they did from the organization’s management. In this regard, therefore, constraints in the functioning of the organization’s human resource system were also identified as a critical problem at the problem-identification workshop. A picture of this observation is also reflected by the distribution of the relative responses in the questionnaire survey as I have shown in plot (iii).

![Plot (iii)](image)

This, therefore, indicates the presence of a contradiction between the management team and the guidelines for the best practice for personnel management, and also reflects the contradiction that exists between them (i.e. management team) and the institutional rules.

5.5.2. The information flow process and communication system.

As I learnt from the interviews, the functional state of the organizations communication system was flawed with the flow of information inside the organization being crippled from the way it should have been within the context of a change process. Therefore, with the communication system not functioning well and information on the commercialisation process not
reaching staff members continuously, majority of them seemed not to know exactly what was going on in the organization. Also, there appeared to be no effective feedback mechanism put in place by the management in order for them to learn from the problems of staff members relative to the commercialisation process. The consequence of this was relayed in the following expression by an interviewee;

I think that everybody should have access to information. Failure to do this has led to displeasure and gossiping, possibly as a result of information leakage from within.

I also understand that additional elements, such as the complex content of messages that were circulated by the management as well as the erosion of social interactions between the management and the staff members aggravated the malfunctioning of the communication system. Such aggravation was viewed by most of the interviewees to have led to the reinforcement of staff members’ restrained appreciation of the commercialisation process. A sense of this was relayed by an interviewee as follows;

I think it will be a good idea if staff down to the level of the security personnel understands what the organization commercialisation drive really means. Then lots of benefit could be derived, in terms of the handling of potential clients who come into contact with the organization. This is by virtue of the fact that there are lots of intelligent people in the system.......... There is the need to talk to people in the organization at the level of their own language. Issues relating to the commercialisation efforts should be explained to them in order to make them appreciate the reason why management expected them to function in certain ways.

This observation clearly contrasts a position from the organization’s management indicating that it interacted regularly with the entire staff using what it (i.e. management) termed as the open-communication approach as its cultural philosophy. But in the same vein, the management admitted that its approach was still not perfect. Therefore, it was quite apparent that the communication system that prevails within the organization served as a source of tension within its community. There were indications that most of the staff members had difficulties in coming to terms with the communication approach that was used by the management. The implication here was the impression developed by most of the staff members to the effect that, the various unit managers in the
organization could not make or were not allowed to take decisions on issues that affected the aspirations of staff members operating under them. In my opinion, the apparent breakdown in the information flow process and feedback mechanism within the organization was a portrayal of the inefficiency as well as the ineffectiveness of its communication system. Therefore, it is obvious to me that those in management failed to attach much importance to the practice of regular interaction with the staff members during the commercialisation process. A picture of this observation is also reflected by the distribution of the relative responses in the questionnaire survey as I have shown in plot (iv) below.

![Plot (iv)](image)

In my view, this contributed significantly in the creation of tensions in cross-unit teams (as I have discussed earlier in section 5.4) and consequently created disturbances between the different elements of the management’s sub-activity system. The negative impact of the tensions and disturbances created by the communication system that existed in the organization was obvious since the desired inputs from both staff and industry was negatively affected. The contradictions that emerged in the management’s sub-activity system in this regard are as I have outlined in figure 27 (see next page).
Figure 27: Management’s sub-activity system shaped by the communication system.

As I have highlighted in figure 27 above, the presence of internal disturbances among the different groups in the community (i.e. the management team and the staff) led to a contradiction between the management team (as subjects of the activity) and the community. I view the consequence of this to be the development of further contradiction between the management team and the best practices for both project management\textsuperscript{153} and business development\textsuperscript{154} during the commercialisation.

\textsuperscript{153} The emphasis of the best practice for project management is that project teams that have the appropriate expertise for each project (regardless of where individuals report in the organization) are to be formed. Project managers are to be given the authority and responsibility to manage projects without interference once they have been thoroughly checked by management with contact expertise. A committee of industry and RTO experts is to decide on grant-funded projects. Also, individuals at all levels are to be made to interact with clients and formulate projects. Additionally,
5.5.3. Orientation of organizational values and norms.

There was a consensus among the interviewees that before the start of the commercialisation process, the culture that prevailed in the organization was a type of “family culture” which created strong bonds within the organizations community. The operating environment, as highlighted by most of the interviewees, is such that the work atmosphere is relaxed and devoid of management pressure. In the same vein, both the scientists/researchers and management personnel provided lots of guidance and motivation to young professionals in the organization. According to an interviewee:

> The organization’s culture that we talk about refers to a family structure that prevailed within the system in the past, and it entailed lots of professional support across board among the staff. Now such cooperation is lost. When there is a problem within the system now, some will say that it is not their problem, but rather the organization’s problem.

The prevailing perception of staff members, as highlighted in the interviews, was that as a result of the organizational restructuring that took place (in line with the commercialisation process), the family culture in the organization waned and as a consequence, the tight bond that used to exist among the staff members also started to break. Additionally, most of the interviewees viewed the trend of new staff coming into the organization and leaving after relatively short periods of stay (as I have discussed earlier on in section 5.4) to have basically resulted in the disappearance of the family culture altogether. This, in my opinion, was an indication of the tensions that pervaded the organization’s community due to the erosion of a culture that was once cherished by the staff. Though a new corporate culture is supposed to be in place, there was an indication of staff members not relating to it positively, and this was reflected in the views of interviewees who craved for the revival of the old organizational culture. I view this as indicating that some of the staff members bore traces of people

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154 The emphasis of the best practice for business development is that a corporate business development group is to handle awareness and market strategic planning, while project managers conduct the bulk of selling activities. Rewards for business development (financial and recognition) is to be seen as effective. Business development costs must be monitored at the corporate and unit levels. Awareness activities focusing on major client groups must also be conducted. Client needs must be identified based on input from staff, board and regular meetings with industry groups.
who had their own history of not wishing to change. The stance to hold on to the past by the staff, as it was explained in the interviews, was shaped by the impact of a down-sizing (i.e. staff retrenchment) exercise at the start of the commercialisation process, and which event made even the unaffected staff members to feel insecure. This feeling of insecurity and its relative influence on the staff members’ resistance to the organization’s corporate culture was perceived by the interviewees to have been deepened, on one hand, by the management’s curtailment of some benefits previously enjoyed by staff members. On the other hand, the interviewees perceived the insecurity to be deepened by the management’s institution of the new practice for business management which the staff members viewed as increasing their workload and/or responsibilities. As it was noted by an interviewee;

Drinking coffee brings relaxation and allows you to have fresh ideas. In my opinion, that is why management likes drinking it. It will be a good idea for management to think of providing such drinks to the entire staff. The point is not the drinking, but the pleasure to be derived from the idea of drinking it. We staff members think that it brings some kind of prestige, and hence will motivate everyone in the system. I wish that the “tea-room” function of the past be reinstated. It will raise staff morale.

This trace of resistance to the prevailing process, as explained in the interviews, was dominant among staff members in the middle or higher level categories, but not the highest level. As a consequence, the administrative processes were said to have become a bit frustrating to comprehend with, as it was clarified in the following observation by an interviewee;

I currently see the new professionals coming on board as very selfish and arrogant. They most often look down on some of the old staff who are not degree holders, but have acquired enormous professional experience through years of work and have been able to rise through the ranks with time. This has resulted in a situation where almost everyone one has to fight for recognition within the system, the consequence being a negative impact on the subsystem stability. Issues of loyalty are causing divisions within the ranks and file. Sense of professionalism is also giving way to self-glorification. There are traces of lack of knowledge among the young professional within the system now.

Though the interviewees viewed the issue that was raised in the expression above as not affecting the commercialisation process in any negative sense,
they generally perceived such issue to have lowered the morale of some staff members. In this respect, some of the staff perceived the management to have not appreciated their (i.e. staff members) personal efforts towards performance improvement. But from the perspectives of the management, the resistance (especially from scientist/researchers) to change in the organizational culture subsided after a short period of time. The source of such resistance, as it was explained in the interviews, was the requirement of the management that the researchers adhere to the practices for project management and business development as underlined by the best management practice model, but which the researchers perceived as a threat to their work. In this respect, the researchers continued to hold on to the view that by virtue of the strong emphasis on the business element of the commercialisation process, the academic element of their competence was being diminished since they did not even have the time to read scientific journals. In the view of an interviewee;

"The organization’s major problem is that we have been given financial targets to meet. This is based on the presumption that our organizations will one day be one hundred percent cost effective without depending on government subventions. I think that is impossible. If people recognise reality and recognize that an organization which has to do a little bit of research in its operations cannot be one hundred percent independent of government subventions, it will help a lot, and will allow the researchers some time to do some bits of research."

It is therefore obvious from above that the staff members continued to hold on to the organization’s old culture, as they perceived it to reflect values with which they identified themselves. An issue that arises here pertains to how the interviewees perceived the extent to which such tension permeated the organization’s community. In this respect, most of the interviewees had argued that since the organization was set up to be industry focused, there was the need to restructure its management board to consist of people from industry. This was against the background of the situation whereby most of the serving members were viewed by most staff members to have had limited understanding of the functioning dynamics of such an industrial organization. There was consensus among the interviewees that some people on the board did not like the changes in the organization’s culture because they perceived it as threatening their personal positions and influences in the organization. As such, most of the actions of the board on the organization’s efforts to commercialise were generally perceived by the interviewees to be more obstructive than constructive. This issue of power
relation and its transcendence to the organization’s decision-making level was reflected by the following expression of an interviewee;

In my opinion some members of the current board, especially those from the universities, do not have the interest of seeing the organization move ahead. The solution here is to transform the board itself, but the difficulty is that; who is prepared to do that? Possibly, there is nobody. Politics appears to be having a greater influence in this respect.

This difficulty was ascribed to the fact that originally, the organization was designed as a fully government-funded civil service structured institution. As such lots of people in the government, including the politicians who serve on the board were perceived as seeing the organization in that light, despite the fact that it had to operate as a business entity and be self-income generating due to the significant cut in government subvention. Another constraint to the prospects of the commercialisation process was said to be the conflict in service provision faced by the organization against other institutions in the country, such as the Board of Standards and the Government Chemist. Part of the problems that arose from such conflicts was credited to events, such as those expressed below by an interviewee;

The National Bureau of Standards (NBS) is responsible for accrediting organizations in the country, but has not received ISO accreditation itself. Yet, our organization, despite having fully accredited laboratories, is still government controlled and is supposed to respond to the NBS. This is a paradox. I see the organization as having an advantage over the NBS, if it could only find a political way out of the prevailing paradox.

Another class of opinion linked to the image problem was the sense of feeling held by the interviewees to the effect that the constraints that were associated with the organization’s commercialisation process were a result of it tending to do too many things at any given point in time. As such, most of the staff members were of the conviction that the idea of trying to transform the organization into a fully self-income generating entity was an illusion. The interviewees’ expression of reality, in this regard, was whether some of the organization’s existing units had the capability of generating the necessary income to justify their establishment. Basically, there was the general impression that the staff members were not in direct conflict with the organization’s prevailing management philosophy. The bone of contention here seemed to be the mode of transmitting such philosophy within the organization and its inability to break the aura surrounding the perceptions of its staff, which had been greatly influenced
by the organization’s past image as well as the staff’s own individual core values. A reflection of this observation was the identification of motivation related issues at the problem-identification workshop, such as, lack of incentives and compensation across board not being fair, as critical problems in the organization. Thus the tensions and disturbances relative to the organizational culture created an atmosphere in which the desired inputs from the staff were stalled. Such tensions and disturbances also gave rise to contradiction in the sub-activity system of the management team, as I have highlighted in figure 28 below.

![Management’s sub-activity system due to orientation of values](image)

Figure 28: Management’s sub-activity system due to orientation of values.

As I have highlighted in figure 28 above, the presence of tension among the different groups in the community (i.e. management team, staff members, and board) appeared to have reinforced the contradiction between the management team (as subjects of the activity) and the community. I view the consequence of this to be the development of further contradictions between the management team, as well as the
community, and the best management practices guide (institutional rules) for both governance\textsuperscript{155} and personnel management\textsuperscript{156} during the commercialisation.

5.6. Functional Analysis of CARIRI’s Collective Activity System.

Based on my description and analysis of the characteristics of the various elements in the organization’s activity system, it is apparent that there existed tensions and disturbances in the organization’s rules, the co-existence of the community members as well as in the division of labour (i.e. in relation to work distribution or task assignment). The tensions in the rules seem to result in the staff’s seeking to align themselves with the organization’s old norms and values. This can be perceived as a portrayal of resistance from the staff and their apparent show of distrust towards the attempt by the management to integrate business elements into the institutional rules while retaining some of the civil service codes which used to guide the organization’s operation. I have shown in section 5.3 that the practice of governance in the organization was not only guided from the perspective of the best management practices model. Some civil service-oriented institutional codes were also used by the organization in order to protect the interest of the government (as the sole owner of the organization). The consequence of this was the emergence of tensions among the community members and within the organization’s collective activity system. Such tensions had also given rise to disturbances which, in my opinion, made the commercialisation process a difficult task to manage. The existence of such tensions and disturbances (as I have variously discussed in sections 5.5) was manifested by the differences in

\textsuperscript{155} The emphasis of the best practice for governance is that the RTO must be controlled by an industry association if serving an industrial sector or by a regional government if serving a region. Also Its legal structure should be such that it has financial and decision making autonomy (agency, foundation). Majority of representatives on the RTO board are to be industry clients and the board’s mandate is to be defined according to the role its clients serve in the innovation chain. Additionally, the RTO chief is to be made to nominate people to sit on the board with the owner approving (or rejecting) his/her nominations while the RTO management is to have the responsibility of identifying the needs for change and having the power to address those needs.

\textsuperscript{156} The emphasis of the best practice for personnel management is that a flexible recruitment system is put in place and which must use input from managers, co-workers and human resources department to select appropriate new staff and promote existing ones. RTOs must set market-competitive salary scales with market salary data, and reward high performance. Non-pay based awards (formal and informal recognition events) are to be seen as effective motivators. A compensation package decision is to be made by the management team for each staff person using the results of individual performance evaluations. Employees are to be evaluated against common objectives by their supervisors and the senior management team, and the results are to be communicated verbally and in writing.
perspectives with which the management and staff viewed events in the organization’s collective activity system. My overview of the tensions created in the organization’s activity system during the commercialisation process is given in Figure 29 below.

Figure 29: Tensions present in CARIRI’s activity system during commercialisation.
Despite the changing image, the management had to deal with the organization’s board whose civil service structural composition was maintained by the government (as the owner of the organization). This had resulted in a situation whereby board members coming from other establishments deemed as the organization’s competitors were part of its decision-making body. In this context, there seemed to be elements of suspicion, especially between the management and staff members, on one hand, and then between both of them and the board, on the other. This show of distrust had also permeated into the organization division of labour. It is obvious from my discussion in section 5.5 that new and old staff members held different visions of the organization. While the old staff members continued to hold on to the organization’s historical past, the new staff members also came in and held on to the new organizational image envisioned by the management. These differences in perspectives introduced a semblance of tension within the division of labour. This can be viewed from the perspectives of some staff members not being fully related to the organization’s new work culture. As a result of this and the apparent constraints that were associated with the human resources and information flow mechanisms, the organization’s working environment did not provide the requisite atmosphere for the enhancement of staff performance. As I have discussed previously (in section 5.5), this also reflects the contradiction that existed between the organization’s workforce (as collective subject of activity) and the functionality of the best practice guideline for personnel management (i.e. instrument). This therefore, indicates an aggravation of the contradiction in the organization’s collective activity system (fifth principle of activity theory\textsuperscript{157}; Engeström, 2001). I perceive such aggravation to be underlined by the various scenarios I have discussed in section 5.5, and in which most of the staff members (even as individuals) appear to question and/or deviate from the organizational norms set by the management for guiding the commercialisation process. Since activities are open systems, it is therefore, indicative that these contradictions pervade all elements of the organization’s collective activity system, as postulated by Engeström (2001) in the fourth principle of activity theory. My reflection of the contradictions in the organization’s collective activity system is as I have summarised in figure 30 (see next page).

\textsuperscript{157} The fifth principle proclaims the possibility of expansive transformations in activity systems. Activity systems move through relatively long cycles of qualitative transformations. As the contradictions of an activity system are aggravated, some individual participants begin to question and deviate from its established norms. In some cases, this escalates into collaborative envisioning and a deliberate collective change effort.
Figure 30: Summary of contradictions present in CARIRI’s collective activity system during the commercialisation

My overall impression of the organization’s collective activity system with its networks of contradictions between its different activity elements and their internally tension-laden characteristics is reflected in figure 31 (see next page).
Oriented as that for a private business (90%), but with influence from civil service codes (10%).

Problems encountered on actions to re-orient the organization's corporate culture and history.

Apparent lack of cooperation.

Prevalence of mistrust. Individual history of staff also impacted negatively, resulting in the apparent show of distrust in management decisions and actions.

Problem of communication.

Different specialized units operated upgraded and specialized laboratories, using standard quality management operating procedures as prescribed by ISO and UKAS certifications to self-generate income.

Management team to identify needs for change and the power to address such needs.

Corporate business development group to handle awareness and market strategic planning.

Each project to be handled by project teams with the appropriate expertise.

Business units responsible for financial performance.

Guidelines as provided in the following best management practices:

- Governance,
- Organizational management,
- Capability building,
- Personnel management,
- Project management,
- Business development,
- Governance,
- Organizational management,
- Capability building,
- Personnel management,
- Project management,
- Business development,
- Governance,
- Organizational management,
- Capability building,
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- Personnel management,
- Project management,
- Business development,
- Governance,
- Organizational management,
- Capability building,
- Personnel management,
- Project management,
- Business development,
By picturing the entire frame of figure 31 above, it is quite obvious to me that the attempt to effect change in the organization by incorporating instruments obtained from external sources into those that had shaped its prevailing sub-system resulted in varieties of hindrances. This was reflected by the limitation of the required synergy among the elements in the organization’s collective activity system. As I have noted in chapter two (sub-section 2.4.1), Engeström’s definition of an activity is that it is a systemic formation unifying the processes of production, distribution, exchange, and consumption as transitions between subject, object, instrument, community, rules and division of labour. Thus by comparing the outlines of this definition (see figure 3a in chapter two, page 51) to the outlines of figure 31 above, it is obvious that the unifying process that the interface of exchange (to a larger extent) and that of consumption (to a lesser extent) are expected to create in the organization’s collective activity system did not materialise.

5.7. Analytic Discussions and Conclusions.

As it is evident from the picture I have drawn in figure 31, I argue from the perspective of Marx (1979)\(^{158}\) that by virtue of the tensions that prevails in the organizations collective activity system, the production (i.e. subject-instrument-object triangular interface) that emerged from the commercialisation process was relatively constrained in its creation of the requisite object that outlined the organization’s commercialisation needs. Even though an element of distribution (i.e. community-object-division of labour triangular interface) appeared apparent, its exchange (i.e. subject-rules-community triangular interface) failed to materialise. In this regard, the element of consumption (i.e. subject-object-community triangular interface) of the commercialisation process appeared to have been slightly affected in a negative way. This was because the production element could not totally step outside the organization’s social movement to become the direct object and servant of the organization’s needs in order to satisfy its consumption. I perceive this observation as underlining the significance of a view by Marx to the effect that a definite production determines a

\(^{158}\)Marx has explained that production creates the objects which correspond to the given needs: distribution divides them up according to social laws. Exchange further parcels out the already divided shares in accord with individual needs: and finally, in consumption, the product steps outside this social movement and becomes a direct object and servant of individual need, and satisfies it in being consumed. Thus production appears to be the point of departure, consumption as the conclusion, distribution and exchange as the middle (…).” (Marx 1973: 89) \[cf: Engeström, 1987, p. 78\]
definite consumption, distribution and exchange as well as the definite relations that exist between these different interfaces. As Engeström explains further, production is to be always seen as the consumption of the individual’s abilities and, also as the means of production. Correspondingly, consumption is also to be seen as a production of the human beings themselves. Furthermore, distribution is also to be seen as not just a consequence of production, but also as its immanent prerequisite in the form of the distribution of instrument of production and also the distribution of members of the society among the different kinds of production. Finally, exchange too, is found inside the production, in the form of communication, interaction and exchange of unfinished products between the producers. I therefore argue that, as a result of the organization’s management retention of some rule-related elements from its previous system during the commercialisation process, it resulted in its corporate image being defined within the context of its past existence. As Engeström has argued, this is by virtue of the fact that no organizational activity can be completely independent of its history. All these factors might have collectively impacted on the sense and meaning of the commercialisation process with the achieved outcome (a moderate success) falling below the organization’s expectation. The measured outcome ranges between 60% and 65% as compared to the organization’s expectation of 80% self-income generating capability at the minimum level.

As I have clarified in chapter two (section 2.7) in relation to Engeström’s (2000a) representation of the cycle of learning action (see figure 11 in page 88), the extent of my study is to provide the base for understanding possible internal developments that the organization has to deal with in its commercialisation effort. I therefore view my descriptions and analyses of the organization’s collective activity system (from section 5.1 to 5.6, and broadly summarised in figure 31 above) as providing an understanding of the organization’s internal environment, and hence in line with my first proposition for this study. As a recall, I proposed in chapter one (section 1.5) that existing tensions in an RTO’s activity system serve as internal environment constraints which influences the extent to which external environment factors\(^\text{159}\) negatively affect the organization’s implementation of the best management practices. I also noted in chapter one (section 1.4)

\(^{159}\) I have given an overview of such external factors in chapter one, section 1.4, with a tabular summary of their impacts on some organizations (see tables 1 and 2 in pages 25 and 27 respectively).
that the findings from my earlier study (Sanda, 2003) points to some external environment factors that also constrained the commercialisation process. The specific external factors that I identified in this case are highlighted under CARIRI in table 1 (see chapter one, page 25). I therefore view that by cross-analysing the insights that I have provided in this case together with those previously gained in case one, and those to be gained from cases three and four (which I will do later in chapter eight), the requisite platform for modelling new solutions to facilitate the internalisation of the best management practices model in future commercialisation process can be established. By implication, the cross analyses is to signify the possible contribution in the applicative understanding of Engeström’s model and principles of activity theory in relation to my study framework (which I will discuss later in chapter nine) as a template for guiding an organization’s commercialisation process through the zone of proximal development and towards the attainment of a possible expanded activity (i.e. its foreseeable activity system, as I have summarised in figure 23, page 163).

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160 My findings from a survey among RTOs in 8 different developing countries shows that the external environmental factors which seem to prevent the RTOs from successfully implementing and internalising the best management practices are derivatives of constraints associated with some or all of the following: - the prevailing socio-economic and legal frameworks; influence of consumer and market forces; the pervading political atmosphere; the operating climate; subsystem stability (i.e. operating system); the decision-making approach; the educational background (qualification) of its staff; the existing communication interfaces within the RTO’s organizational structure, as well as between the RTO and the surrounding environment.

161 i.e. Caribbean Industrial Research Institute (Trinidad). Its Director answered the survey questionnaire.

162 See figure 9 in chapter two (page 83).
6

CASE THREE

Botswana Technology Centre’s (Botswana)

My motive for selecting this specific case (as I have previously discussed in chapter three, sub-section 3.4.1) is underlined by the fact that the organization has been engaged in an effort to implement and internalise best management practices, which can help transform it from a fully subsidized institution into a profitable income generating organization, but which effort has so far proved to be a challenge. Therefore, in this chapter also (as it is with chapters four and five), I will give an insight of the approach I used to collect empirical data on the organization’s commercialisation process based on its attempt to implement the RTO best management practices from the year 1979 to 2003. This will be followed by a description (based on the analytic approach I have outlined in chapter three, section 3.8) of the organization’s activity system during the transition period of its attempt to transform from being a non-commercial R&D agency into that of a commercial one.


The empirical data that I used to analyse the organization’s commercialisation process was obtained through structured interviews (see appendices II and III for the interview questions guide) with the Managing Director and eighteen staff members whom I identified as key actors in the efforts to implement the RTO best management practices. I

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163 At the time of my research visit in 2004, a new Managing Director has taken over the running of the organization. As such, the organization’s effort is on-going and it is still striving for success in its efforts to commercialise.

164 This is based on my broad methodological approach which I discussed in chapter three (section 3.5).

165 i.e. Research and Technology Organization.

166 I have discussed this in chapter one, sub-section 1.2.2

167 See page 117.

168 My outline of this will be based on the model shown in figure 9 (see page 83) which characterised my study framework as I discussed in chapter two under section 2.6.

169 I have discussed this methodological approach in chapter three (sub-section 3.5.2) in relation to its application in this study.
complemented this with a general survey on issues relative to human resource and organizational norms, using a self-completion, three-point scale questionnaire \textit{(see appendices IV)} which I administered on twenty-two randomly selected staff members. I also conducted a problem identification workshop\textsuperscript{170} \textit{(see appendix V for the workshop guide)} with support from the organization’s director under the theme “Examination of the reasons as to why BOTEC failed to meet its mandate” with eighteen people representing the management, senior staff and the junior staff in attendance. This workshop provided a platform on which the participants identified problems relative to the best management practices implementation efforts. The information I generated from this workshop served two purposes. Firstly, it provided me with additional empirical data, complementing those from the interviews. Secondly, it provided beneficial information to the organization’s director\textsuperscript{171} on those organizational problems for which the management could easily find remedies. In the sections that follow, I will firstly give a profile of BOTEC. This will be followed by a highlight on factors and events that underlined the start of the commercialisation process. I will also carry out in-depth individual functional analyses for the rules, division of labour and the community as they impacted on the organization’s activity system during the commercialisation process.

6.1.1. Profile of organization.

The background information I had on BOTEC, as part of my empirical data, shows that the organization was established by the Government of Botswana in the year 1979 with the vision of it becoming the best in the innovative application of science and technology for the development of Botswana. The organization is located in Gaborone, the capital of Botswana. Its underlying mission, in this respect, is to improve the quality of life of the people as well as to contribute to the economic development of the country by promoting science and technology through research and development, technology transfer, industrial support, policy development, as well as specialised informational services and systems on technology solutions for industry, business, and education. The organization has staff strength of 150. It offers services in the areas of renewable energy

\textsuperscript{170} I have discussed this methodological approach in chapter three (sub-section 3.5.4) in relation to its application in this study.

\textsuperscript{171} This is in the form of a special workshop report. I did this in response to a prior requisition by the organization’s director for a part of this field study that could provide immediate benefit to the management of the organization.
technologies, electronics systems, sustainable architecture, energy efficiency and energy audits, waste water management, specialised information on emerging technological solutions, international networks, as well as information and technology systems (ICT) for development. The organisation also provides specialised science and technology information to customers including government ministries\textsuperscript{172}, departments, institutions and individuals.

6.2. The Path towards Commercialisation.

The organisation’s commercialisation process emanated from a decision by the Government of Botswana in the early 1990s to start a systematic cut-down of its yearly subvention\textsuperscript{173} to all government R&D agencies. As it was with the organizations in Ghana and Trinidad (which I have discussed in chapters four and five), this decision was against the background\textsuperscript{174} of the fast changing environment in most developing countries as a result of economic recession which eventually led to the privatisation of most government agencies. The government’s expectation in this respect was that such agencies must acquire the requisite competence that could enable them self-generate an equivalent of the government subvention-cut. Thus in the case of BOTEC, the government subvention-cut is to affect the organization’s operational cost other than staff salary. In this context, the government is to continue with the provision of funds for the payment of staff, but the organization was to self-generate income to support administrative overhead costs. By virtue of this new government policy, the organization was to start operating as a commercial agency. I interpret this governmental directive as reflecting a new rule in the government’s activity system (as policy-making subject). The implication of this governmental directive was that it conflicted with the organization’s activity system which has the object of carrying out scientific research under full government funding in order to improve the country’s technological base. Therefore by considering the object-orientation of BOTEC’s activity system (i.e. carry out scientific research under full government funding in order to improve the country’s technological base), I view it to have drifted into a dialectic process (i.e. series of conflicts and resolutions) initiated by the government’s policy-making activity. This

\textsuperscript{172} I gathered that the organisation was instrumental in drafting the science and technology policy for Botswana.

\textsuperscript{173} I have discussed the circumstances that gave rise to such cuts in subvention by governments in chapter one, section 1.2.

\textsuperscript{174} I have discussed the background to this issue in chapter 1 under section 1.2.
scenario involving the respective activity systems of the government (as the policy-maker or influencing agent for the change) and the organization (as the subject of change) can be viewed as I have shown in figure 32 below. I have used the dotted arrow to signify the dialectical path.

Figure 32: BOTEC’s organizational activity system in conflict with government’s activity system.
In this regard, I perceive the object of the organization’s collective activity system as being expansively transformed to include an element of income generation. By virtue of this object expansion, the organizations’ was expected by the government to be capable of generating income to cater for its annual administrative overhead cost. I have used the underlined elements of the best management practices to picture the organization’s anticipated activity system for the commercialisation, as shown in figure 33 below.

![Diagram](image)

**Instrument**

RTO Best management practices for the commercialisation of products and services.

**Object**

Transform organization into a strong Research and Development outfit with the competence of carrying out scientific research under reduced government subvention, but with the capability to self-generate income by commercialising its products and services.

**Expected Outcome**

Generation of income to cover annual administrative overhead cost.

**Subject**

Workforce

**Institutional Rules**

Guidelines as provided in the following best management practices:

- Governance,
- Organizational management,
- Capability building,
- Personnel management,
- Project management,
- Business development,
- Institutional Rules.

**Community**

- Board (with financial and decision-making autonomy)
- Management Team
- Staff members
  - Researchers/Scientists
  - Technicians
- Administrative (support) personnel

**Division of Labour**

- Management team to identify needs for change and the power to address such needs.
- Corporate business development group to handle awareness and market strategic planning.
- Each project to be handled by project teams with the appropriate expertise.
- Business units responsible for financial performance.

Figure 33: BOTEC’s foreseeable organizational activity system for commercialisation.
The premise for the organization’s application of the best management practices model in its commercialization programme was for it to be able to acquire the requisite competence and capability that could have enabled it sought high levels of innovation and creativity in technological developments. It was also supposed to have enabled it acquired the capability to operate within the context of professional ethics and thus be able to offer excellence in research and development as well as in service delivery. By this perspective, the organization was expected to be able to commercialise its products and service to its potential clients. The organization’s mission for transformation from a non-profit to a commercial R&D agency was to conduct market-oriented applied research and provide technical services as well as products profitably to the private sector and other stakeholders.

In the sections that will follow, I will describe and analyse the empirical data that I collected on events that pervaded in the organization’s commercialisation efforts. As I have already noted, this was as a result of the transition of its activity system from that of a non-commercial R&D agency (figure 32 above) to that of an income generating R&D organization (figure 33 above) through the implementation of the RTO best management practices. As I have noted in chapter two (section 2.5) earlier on, a close relationships was expected to have been cultivated between new key structural features within the organization. cultivation of such close relationship, as Blackler (1993) has explained, was to have resulted in binding task demarcations, rules, regulations, technologies, operating assumptions, power structures, and reward and status systems in a tightly-knit whole with an apparent life of its own. Therefore, my analytical approach here (as it is in chapters four and five) will be guided by the outline of my theoretical framework which I have previously discussed in chapter two (under section 2.6). In this regard, I will draw highlights on the dynamics of the embedded elements in the organization’s activity system based on the characteristics of the rules, the division of labour, and the community (as defined in the study framework175) during the transition period. In line with Engeström’s first principle of activity theory (as I have indicated earlier), my units of analysis will be the collective activity system, while group actions will be the subordinate unit of analysis. The specific groups that I identified to constitute the workforce in this organization and whose respective actions I will subject to analysis are the management team and the staff members. It will also become imperative

175 See figure 9 in chapter 2, section 2.6 (see page 83).
that I describe and analyse the actions of the senior staff members and the junior staff members as separate groups. My reason for this is informed by the fact that staff members in the organization are officially categorised as specific groups, each with its own group-identity (i.e. either as senior staff members or junior staff members). Thus the events to be highlighted by my empirical data are reflective of actions that are influenced by group-based actors in the organization.


In section 6.2 above, I gave a summarised insight of the characteristics of the institutional rules that guided the organization’s work before the start of the commercialisation process and also those expected to have been in place in order to ensure the success of the process. In my opinion, such insight reflects the contrived nature of BOTEC as a purposive organization by virtue of the new structural features it is to acquire as a result of the commercialisation. As I have outlined in figure 32 (see page 201), the institutional rules which were subject to transformation were characteristic of administrative guidelines for managing government ministries and departments (i.e. civil service codes). These were expected to have been substituted by new guidelines (see figure 33 in page 202) as provided in the best management practices for governance, organizational management, capability building, personnel management, project management, and business development. The issue at stake here is for me to analyse the characteristics of the rules that prevailed during the transformational transition. I will start by describing the nature of the organization’s management system as it prevailed during the commercialisation process. This is in relation to my earlier discussion in chapter two (section 2.5) in which I relate to the explanation by Blackler (1993) that the effective functioning of an organization does not depend on people agreeing on why they are doing something. As he notes, all that is required is that there is agreement on procedures for determining what should be done. In my opinion, it is such procedural agreement or institutional rules that shape an organization’s management system and dictates the way it functions. In this regard, I view the institutional rules as characterised by regulations, power structures, and reward and status systems (as shaped by both explicit and implicit rules that defines social behaviour). I therefore, perceive that the functionality of such a system can be well established by understanding how the rules dictate its structural

176 I have already discussed these practices in chapter one under section 2, sub-section 1.2.1.
set-up and also its application as template for managing the psycho-social environment in the organization. Therefore in the subsections that will follow, I will firstly describe and analyse how the management structures in the organization functioned in relation to the institutional rules. I will then follow this with a description and analysis of how the institutional rules functioned as the template for managing the psycho-social characteristics of the staff members.

6.3.1. Functionality of the organization’ management structures.

Based on the empirical data I collected from the interviews as well as the workshop, I learnt that during the commercialisation process, the organization’s institutional structures which were civil service-oriented and highly bureaucratic, did not undergo the requisite transformation underlined by the best management practices model (see figure 33). As I understand from the interviews, the rules that safeguard the functioning of the organization’s bureaucratic institutional structures were underlined by two major civil services codes, namely, the condition of service and the scheme of service. The interviewees’ perception of these rules was that their (i.e. rules) application and subsequent functionality were shrouded by complicated bureaucratic procedures which impacted negatively on the organization’s commercialisation efforts. A picture of this was drawn by an interviewee in the following expression;

We have internal rules which could be categorised into three forms. Firstly, we have the condition of service, secondly, the scheme of service, and thirdly, some minor regulations and policies on housing and the like. The condition of services, which guides the organization’s operations, is strictly based on that for all government institutions in the country. Even our job titles are also derived from those pertaining in the civil service. The scheme of service outlines issues concerning recruitment and placement of staff members are outlined. Yet, these rules are flouted a lot, especially by the heads of departments who had authoritative power over the human resources manager, to the detriment of staff members in the organization.

The organization, according to most of the interviewees, had some elements of informal rules, most of which were observed as if they were formal in contrast to the requirements of the best management practices

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177 The civil service is comprises of departments and organizations that provide both administrative (to a large extent) and technical support services to government ministries and associated outfits.
model. The emergence of such situation, as I understand, was a result of the management’s inability to put in place the necessary mechanisms which could have facilitated the institution of the requisite practices to enhance the commercialisation effort. This atmosphere was viewed by most of the interviewees to have created a situation whereby everyone in the organization does things his/her own way, thereby creating a state of inconsistency in the collective approach towards organizational activities. In this respect, the informal rules that prevailed within the organization appeared to have played a significant role in shaping the mind-set and attitudes of most of the staff members towards work. There was the generally held view among the interviewees that this shaping of staff mind-set was also related to the several, but yet unsuccessful attempts at institutional restructuring in the organization during the commercialisation process. As a consequence, most of the interviewees perceived the institutional structures that prevailed during the commercialisation process to have lacked both functional and directional clarity. This was said to have resulted in a situation that gave credence to the emergence of duplication and subsequent confusion in the organization’s activities. An explanation to this observation is reflected in the following expression by an interviewee;

With respect to my unit, internally, they refer to it as a unit, but to the outside the world, they call it a department, which to me sounds like they are cheating us. They only realise our importance when they go out. Internally, they do not realise the importance of our unit. Sometimes you get lots of calls from people outside asking for lots of information, but when you come to face reality on the information that they are looking for, you realise that you are not the right person to give such information. Instead that area is being covered by someone else. There is lots of duplication in the organization and we seem to be falling in between. If I look at our division, our units, and our sections, they come last in the organization’s activities.

Based on these perspectives, there was the generally held notion among the interviewees that, during the commercialisation processes, apparently no attempt was made by the various managements of the organization to reorient the institutional rules to reflect the requirements of a business-oriented research and development organization. The same old rules were said to have always been adopted in all the newly derived organizational systems, the consequences of which were also said to have been their numerous failures to strengthen the organization’s operations. A reflection
of this observation can be derived from the following views as expressed by an interviewee;

I think the rules that are guiding our operations now are the old rules which have been adopted into the new system. They have never been changed. In fact, they are not consistent with the way we are supposed to function now. If we still continue to have confusion about the structure of the organization, then how can we really get a clear picture of the division of labour?....... I think the current management structure is not right. Actually, we do not have the foundation for building a research institution as it pertains in most countries. I see the human resource manager more as an advisor to the management and hence do not have the power to take decisions. This manager is not a member of the organization’s management.

It is indicative from the observations above that there were no clearly defined institutional rules to guide the implementation of the best management practices as defined by the various strategic plans which guided the organization’s transformation processes. In this regard, the continued reliance on government’s civil service institutional codes as the definitive source for the organization’s structural and management designs seemed to have contributed significantly in shaping the attitude of its staff members, in relation to their perceived way of functioning178 within the organization, as against the requirement of a scientific research and development outfit. In this respect, the retention of the hierarchical type of structure can be viewed as a major contributing factor to the inability of the organization’s management to implement the various strategic plans developed. This can be seen from the context of the management having attempted to introduce new ways of doing things within the organization while at the same time retaining the old structures which might have necessitated the change. It also reflects the possible conflicts in governance that emerged in the attempt to make new strategies function under the old institutional rules, and which conflicts seemed to have escaped the attention of those in management. Therefore, it is apparent to me that most of the organization’s institutional characteristics were maintained during the effort to commercialise, giving rise to a contradiction between the management team and the instrument (BMP179), as I have outlined in figure 34 (see next page). The systemic contradictions giving rise to the

178 It is obvious that most of the staff members saw themselves as civil servants.
179 i.e. Best Management Practices. I will be using this initial in the figures in reference to the full term.
disturbances are depicted with the help of the two-headed lighting-shaped-arrows (Engeström, 2000a).

As Engeström has noted, such contradictions generate not only disturbances\(^{180}\) and conflicts, but also innovative attempts to change the activity. Based on this perspective, it is imperative to me that corresponding disturbances were generated between the management team and the object of the commercialisation process, on one hand and between them and the institutional rules to guide the process, on the other. My realisation here is that the guidelines provided by the RTO best management practices for governance, personnel management and management were not fully utilised. The rules that prevailed were shaped by civil service codes which lacked the requisite flexibility to relate to the requirements of the commercialisation efforts, despite the attempt to infuse it with the best practice for business development. In my opinion, this is indicative of a scenario whereby the functionality of the formal rules (underlined by the BMP) for the commercialisation process were stalled by

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\(^{180}\) Engeström (2000a) has clarified that in activity-theoretical studies of work, deviations from standard scripts are called disturbances (e.g. Engeström 1996, Norros 1996). He explained that they typically indicate developmentally significant systemic contradictions and change potentials within the activity. In other words, while the object and motive give actions coherence and continuity, by virtue of being internally contradictory, they also keep the activity system in constant instability.
the continued application of old rules (underlined by civil services codes) which I view, in this context, as a representation of informal rules. The obvious consequence of this development, in my estimation, is that the character of governance in the organization was strongly influenced by the bureaucratic management approach underlined by an organizational structure that remained vertical and hierarchical (based on job description). This observation, in my opinion, is clearly opposite to the requirement of the best practices for organizational management which opts for a project-oriented management style (based on objectives). The impression I developed in this respect is that, despite the provision of specific guidelines in the RTO best management practices\textsuperscript{181} to enhance the commercialisation effort, the organization’s institutional structure basically remained as that of a government civil service (i.e. as a supporting outfit for a Government Ministry) as I have previously depicted in figure 32 (see page 202). An attribution to this observation can be linked to the following critical problems that were identified during the problem-identification workshop, that is: (i) the mandate of the organization for commercialisation has never been clear; (ii) too much bureaucracy in project administration; and (iii) unclear organizational structure. The picture below shows some of the participants in a group pose with myself (front row, first right), Professor Houshang Shahnavaz (front row, first left) and Associate Professor Emma-Christin Lönroth (second row, first left) at the workshop.

It is worth noting here that when the organization was functioning as a non-profit making entity, it was classified as a supporting outfit to one of such ministries (i.e. the Ministry of Science and Technology). Even though

\textsuperscript{181} These are outlined in chapter one, sub-section 1.2.2.
limited autonomy was granted the organization prior to it being asked to self-income generating, it is obvious that this classification still remains intact.

6.3.2. Managing the organization’s psycho-social environment.

Based on my discussion in section 6.3.1 above, it is obvious to me that the retention of the old management structure made it difficult to institute the regulations, operating assumptions, power structures, as well as reward and status systems defined by the best practice for personnel management which required inputs from managers and the workers alike. The consequence of this, as I learnt from the interviews, was the creation of distinct class groups within the staff membership, and which situation compounded the management’s difficulty. The staff members were classified into three main groups whose distinct identities were shaped by the hierarchical management structure. These distinct groups were the management team, senior staff (i.e. researchers/scientist) and junior staff (i.e. technical and administrative support personnel). The consequence of such distinction was the creation of tension among the three different groups due to (what I understand to be) their uncomplimentary existence. As I have noted in the previous sub-section, the interviewees acknowledge the existence of informal rules in the organization during the commercialisation process. They viewed such rules as having tried to fill the apparent gaps left by the formal ones that were to have emerged from the best management practices model. The consequence of this development, as I understand from the interviews, was that the mind-set and attitudes of most staff members towards the commercialisation process became non-committal, in sharp contrast to the expectations of the management. In this respect, most of the staff members were viewed by the interviewees to have sustained their perception of the organization’s identity as a fully-subvented government agency and this was compounded by the frequent changes of the organization’s Heads during the commercialisation process. This observation can be pictured in the following expression by an interviewee;

In the past we used to have different visions and missions which were written in different ways. We have also had three managing directors changed since we started the commercialisation process. Some did not stay at their post long enough for them to be able to implement any sort of strategy. Therefore, it seems that the organization inherited the system of other government and public institutions, whereby you can come to
work and choose to work, or not to work, but you still get paid at the end of the month.

Yet, despite the interviewees’ depiction of the organization’s institutional structures as civil service oriented which was underlined by a bureaucratic form of management, they (i.e. interviewees) held different perspectives on who constituted the organization’s management. These differing views were exemplified in the following comments by different interviewees;

*Interview comment I.*

The organization’s management is composed of three people. In reality, we are supposed to have a middle management, but we do not. We will simply say, we have management and staff, and most of the decisions which are being made in the organization are made by those three people. In terms of other groups contributing to decisions, it is very, very minimal. It is only the management and the board.

*Interview comment II.*

The structure I would like to see here is very simple. You have your Chief Executive Officer (CEO) and you have the deputies. We should do away with unit managers, but rather have project managers with the staff members reporting directly to him/her. He/she, in turn reports directly to the CEO. There can be a layer between the project manager and the CEO, say a director who should control the project manager.

*Interview comment III.*

This is a research and development institution, heavily dependent on engineering, but engineering is represented very little on the management. The structure is more of a civil service, and not that of a research and development institution. There is no room for a researcher to develop his brains. We have people who are sometimes called senior managers, that is, the head of departments. There is also another group called the unit managers. These unit managers are a very unfortunate group. They are the supervisors within their units and as such, their staff members see them as real managers and hence, part of the organization’s management, but which in reality they are not.

An appraisal of the views I have sampled above indicates that the staff did not have clear understanding of the institutional guides which were to provide the platform for management actions during the commercialisation process. This gives a reflection of the management’s inability to institute
the best practices for organizational management\(^{182}\), capability building\(^{183}\) and project management\(^{184}\) which were expected to enhance the commercialisation process (see figure 33 in page 202). Therefore, most of the interviewees were of the view that the management did not make clear the institutional rules (as provided in the best management practice model) that could have provided the staff with good understanding of the organization’s new direction. According to the interviewees, the management rather introduced a code of conduct in the organization as a form of institutional guide, but which failed to provide the staff with the requisite guidance during the commercialisation process. This action of management, in my opinion, indicates the existence of contradiction (in their sub-activity system) between them and the underlined objective of the organization’s commercialisation process (i.e. undertake commercial-oriented scientific research activity). As a consequence of this, there was also a contradiction between the management (as subjects of activity) and the instrument (i.e. the best management practices model), as well as the structures and rules that they instituted to guide the commercialisation.

Based on the interviewees’ accounts, it was imperative that the contradiction in the sub-activity system of the organization’s management contributed in defining the character of the sub-activity system of the staff. Thus the continued tendency of the staff to identify themselves with the organization’s old orientation (as part of the civil service) during the commercialisation process was indicative of the contradiction that existed between them (as subjects of activity) and the best management practice model (i.e. instrument), on one hand, and between them and the rules that were instituted by the management, on the other. My impression of the

\(^{182}\) Concerning organizational management, project-oriented management style (base on objectives) must be seen as the best option while hierarchical management style (base on job description) is to be seen as bad. Also the business units are to be made to have full responsibility for financial performance.

\(^{183}\) As concern capability building, inputs from the market (industry), a client-majority board, those following technology, and an effective performance management system, are all to be seen as necessary for identifying capability-building opportunities. Also concerted effort by management teams to make capability-building plans must be seen as much more effective than decisions by individual managers.

\(^{184}\) With respect to project management, project teams that have the appropriate expertise for each project (regardless of where individuals report in the organization) are to be formed. Project managers are to be given the authority and responsibility to manage projects without interference once they have been thoroughly checked by management with contact expertise. A committee of industry and RTO experts is to decide on grant-funded projects. Also, individuals at all levels are to be made to interact with clients and formulate projects. Additionally, project managers are to have financial management systems that will enable them monitor expenses against project budgets, and also progress against project plans.
interactive group sub-activity systems for both the management and the staff members which appears incompatible is outlined in figure 35 below.

As I have outlined in figure 35 above, the incompatibility between the sub-activity systems of the management and the staff members was a result of the historically accumulating structural tensions that had accumulated both within and between their respective activity systems. The incompatibility between the two activity systems was a result of the cumulated tension that existed between the different objects that seemed to have shaped their group activities. Judging from my earlier discussions, it is apparent to me that the activities of the staff members were guided by the old objective of the organization’s activity system (i.e. carrying out academic-oriented research). I find this to have contrasted that of the management whose action appeared to have been guided by the object of the commercialisation process (i.e. carrying out commercial-oriented research). Therefore, the

Figure 35: Sub-activity systems of management and staff due to application of rules.
outline of the sub-activity system of the staff members shows the existence of cumulated tensions among themselves, and also between them and the new rules (i.e. regulations, operating assumptions, power structures as well as the reward and status system) that emphasised teamwork (in the form of division of labour) within the context of the organization’s commercialisation process. This observation is corroborated by the critical problems (i.e. organization’s mandate has never been clear, too much bureaucracy in project administration, and unclear organizational structure) relative to the institutional rules that were identified by the participants at the problem-identification workshop.


In section 6.3 above, I looked at the characteristics of the institutional rules that prevailed during the organization’s commercialisation process in relation to those underlined by the best management practices. In this section, I will follow a similar trend by looking at the transformational characteristics of the divisional of labour. As I have summarised in figure 32 (see page 201), before the start of the commercialisation, the senior staff (researchers) used to undertake projects at their own pace with funds from the government. They also used to engage technicians in the physical production and or laboratory testing of their results. The junior staff members (support personnel) provided administrative services to both the management board and the researchers. This division of labour was to have been transformed into a new outline (see figure 33 in page 202) which would have required the organization’s management team to identify needs for change and the power to address such needs. Also a corporate business development group was to handle awareness and market strategic planning. In the same vein, each project was to be handled by project teams with the appropriate expertise, and the business units given the responsibility for financial performance. My description and analysis below will therefore look at the characteristic of this transition during the commercialisation process. In this approach, I will look at the way labour is divided from an organizational perspective (i.e. human-machine), for as Blackler185 puts it, the theory of organizations as activity systems suggests that organizations cannot sensibly be divorced from their contexts.

185 According to Blackler (1993) just as activity theory avoids divorcing individuals from society, the theory of organizations as activity systems suggests that organizations cannot sensibly be divorced from their contexts and indicates that the concept of organizational boundary is problematic. Similarly, just as activity theory traces the links between individual and collective thinking, applied to organizations the approach supports an institutional theory of organizational behaviour.
The pursuance of project work activities in the organization, as I learnt from the interviews, was saddled with problems that were caused by recurring factional in-fighting among different units and/or divisions. The core of these problems, as I understand, was traceable to the issue of role play and the extent to which such roles were to be played by either a staff member or by a unit and/or division. The emergence of such friction among different units was credited by most of the interviewees to a development during the commercialisation process when the management cautioned the staff of some divisions for not committing themselves toward income-generating projects. From then on, the affected staff and their corresponding divisions also sought to justify themselves by competing for all new projects rather than collaborate with others in the organization. The consequence of this development, as I learnt in the interviews, was that individual staff members assumed the roles of project initiators, project developers and project implementers within the organization, but which event was in contrast to the guides for organizational management\textsuperscript{186}, business development\textsuperscript{187} and project management\textsuperscript{188} as provided by the best management practice model\textsuperscript{189}. This situation seems to have polarised the organization’s working environment to such an extent that networking was virtually absent. It also signifies a sense of non-collaboration and non-cooperation, not only between the different divisions of the organization, but also between units in the same division, as it is reflected in the following expression by an interviewee.

We had a situation in the past where someone came up with an idea. We formed a team and worked hard on it. Afterwards, we submitted it to the

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\textsuperscript{186} Concerning organizational management, project-oriented management style (base on objectives) must be seen as the best option while hierarchical management style (base on job description) is to be seen as bad. Also the business units are to be made to have full responsibility for financial performance.

\textsuperscript{187} On business development, a corporate business development group is to handle awareness and market strategic planning, while project managers conduct the bulk of selling activities. Rewards for business development (financial and recognition) is to be seen as effective. Business development costs must be monitored at the corporate and unit levels. Awareness activities focusing on major client groups must also be conducted. Client needs must be identified based on input from staff, board and regular meetings with industry groups.

\textsuperscript{188} With respect to project management, project teams that have the appropriate expertise for each project (regardless of where individuals report in the organization) are to be formed. Project managers are to be given the authority and responsibility to manage projects without interference once they have been thoroughly checked by management with contact expertise. A committee of industry and RTO experts is to decide on grant-funded projects. Also, individuals at all levels are to be made to interact with clients and formulate projects. Additionally, project managers are to have financial management systems that will enable them monitor expenses against project budgets, and also progress against project plans.

\textsuperscript{189} I have this in chapter one, sub-section 1.2.2.
management who rejected it because it has no market, which is understandable. Now this is the problem that we have to contend with. What comes up first? Where do you get the money for the market study? Well, this is the kind of thing they are trying to come up with. Right now, the process is not rigorous. You try as much as possible to involve people from other units, but the mentality right now is that of isolation. Each unit now wants to have its own project, and which idea is not good for the organization. I think these are among the things that have led to projects not being seen as the organization’s project, but rather, as unit’s project. Also, other units will not necessarily be supportive towards the projects of units different from their own, because in their opinions, such supports will make other units become better than their units.

The polarisation of the organization’s working environment and the tensions it generated, as I learnt in the interviews, was credited to a situation in which different units belonging to same divisions were simultaneous undertaking different projects, and which events culminated into unhealthy competition for same resources. It was also revealed in the interviews that severe differences existed among those in the marketing division and the researchers who formed the core of the organization’s technology division. As it was explained by some of the interviewees, this tension was as a result of the technology division’s objection to the key role that the marketing division was to play within the context of the commercialisation (i.e. to be responsible for handling awareness and market strategic planning, as against its previous role of only liaising between the technology division and the clients, but not as partners in the entire project development processes within the organization). In this regard, the interviewees’ perceived the interaction between the two divisions as uncompromising, and by virtue of which they disagreed with each other on all project-related issues. This impasse was also viewed by the interviewees’ to have led to the duplication of functions, especially with project managers doubling up as administrators. In the view of some interviewees, these managers spent much of their time preparing bills (usurping the functions of the finance unit) instead of shifting their focus on guiding the research aspect of projects. As a consequence, problems emerged in the timely provision of the requisite services to clients since the bills prepared by the project managers had to be re-examined by staff at the finance unit for the appropriate corrections. This tension is reflected in the following expression by an interviewee;

In my opinion, what is happening right now is that, people in the research teams sit down and do their own thing. They only come to
finance when they need the money. This is the greatest error we are committing. Finance is normally not involved at the beginning of projects. Finance will also sit down and look at the submissions purely from financial point of view.

The reporting system that prevailed within the organization’s division of labour was also viewed by the interviewees to be too long and cumbersome. The outline of this system was that, a unit manager in a division reports to a project manager within the division. The project manager also reports to the director of the division, who in turn reports to the organization’s head. By this arrangement, as it was explained in the interviews, the project managers appeared as superior to the unit managers, but at the completion of a project, the project manager’s position fades out, and the person occupying that position reverts back as a subordinate to a unit manager. As a result of this complication in role playing, there had arisen some problems with regards to the definition of roles in project teams, especially, as it related to who manages, monitors and controls a project. The consequence of this was that the initiation and subsequent commencement of new projects was done haphazardly with project teams that were formed ending up being poorly managed. This event was put into perspectives by an interviewee as follows;

When it comes to the issue of collaboration, I get disappointed. I still think that we have a long way to go in this direction. Whenever you are, say, part of a team in a project, it is very difficult to send your message across to the rest of the team members. Now let us say the project manager from another unit manages that team, but for the unit manager here, those people are still his. So, somewhere along the line, there is going to be conflict, because one will expect them to do something here, but they will end up busily doing something there. There is also this thing you see in the team members, thinking that the project is for this unit and not for that unit. So the system does not encourage networking.

By assessing the various points I have raised above, it can be inferred that the approach used by the management to manage activity undertakings in the organization during the commercialisation process had no clear outlines. As I have noted earlier, it is evident that networking among the different units and/or divisions in the organization was almost absent. The quality of cooperation was also very poor due to the unhealthy competition. Such an unhealthy competition also appeared to have eroded any trace of effective project collaboration within the organization’s operating environment. The consequence of these developments was the
entrenched tendencies of individual units and/or divisions to hold on to their self-carved identity. A picture of this observation is also reflected by the distribution of the relative responses in the questionnaire survey, as I have shown in plot (v) below.

![Plot (v)](image.png)

This situation, in relation to the generation of a very weak teamwork spirit, stands to explain the rationale behind some staff members perceiving themselves as having had work overloads in comparison to others. There also prevailed an apparent lack of understanding and appreciation of the functioning of the different divisions and their relevance, as was reflected in the labour division structure. This situation seems to have contributed significantly towards the malfunctioning of project teams. It is also apparent that there was no uniform procedure to guide project undertakings. Based on this appraisal, it is obvious to me that the division of labour in the organization was not properly oriented to ensure an effective coordination of activities within the organization and this paved the way for multivoicedness\(^\text{190}\) to emerge in the sub-activity system of the staff. Therefore, I view the source of the disturbances and the resulting tensions to be the activity system of the staff in the different units of the organization. In my opinion, the prevalence of these disturbances can be related to the reluctance of the staff to adequately relate to the outlined best

\(^{190}\) This relates to Engeström’s (2001) second principle of activity theory, which I have discussed in chapter one (sub-section 2.6.1). It postulates that an activity system is always a community of multiple points of view, traditions and interests with the division of labour creating different positions for the participants, who in turn, carry their own diverse histories, while the activity system itself carries multiple layers and strands of history engraved in its artefacts, rules and conventions.
practices for project management and business development, both of which define the characteristics of the division of labour. The contradictions that I perceive to have been generated in the sub-activity system of the staff are shown in figure 36 below.

I view the contradiction between the staff and the instrument to have created the atmosphere that resulted in further disturbances and tensions between them and other members of the community. The consequence of this was the emergence of contradiction between the staff and the instrument (i.e. the best management practices model). This development has also given rise to contradictions between the staff and the institutional rules that prevailed during the commercialisation process, on one hand, and the way project and other work activities were undertaken and managed (i.e. the division of labour), on the other. By virtue of these, the contradiction that existed between the staff and the object of the commercialisation process becomes evident. In my opinion, this scenario

Figure 36: Sub-activity system of the staff due to the division of labour.
gives a fair reflection of Engeström’s (2001a) explanation to the fact that when an activity system adopts a new element from the outside (for example, a new technology or a new object), it often leads to an aggravated contradiction where some old elements (for example, the rules or the division of labour) collide with the new ones. As I have shown in figure 36 above, the collision between the old way of handling projects and the new one was clearly visible within the division of labour during the organization’s commercialisation process. The consequence of this, in my opinion, was that the synergy that was to have emerged within the organization’s community did not materialise. What emerged was rather a sense of distrust among different groups and also structural tensions within the organization. This observation is corroborated by the critical problem (i.e. projects goals were not shared by all staff) that was identified by the participants at the problem-identification workshop.

6.5. Characteristics of the Community.

As I have outlined in the study framework\textsuperscript{191}, it is important to look at the organization’s climate and culture in order to gain an understanding of the community’s group characteristics. In this section, therefore, I will describe and analyse the state of the organization’s human resource system as well as the information flow process and communication system that prevailed during the commercialisation process. I will also appraise issues relative to the organization’s values and norms as well as their impact on personnel management.

6.5.1. State of the human resource system.

In the early 1990s when the organization embarked on its commercialisation process, the management at that time, which incorporated lots of experts from abroad, was cited by interviewees to have taken the staff members through some restructuring programmes and for which some positive changes were experienced. Based on this, there was said to have been a decision by the organization’s board to localise the management of the organization. According to most of the interviewees, the staff members felt the decision to be strange, taking into account the fact that they did not have the requisite experience. This was said to have marked the start of activities in the organization sliding down towards the drain, so far as skills and manpower capacity were concerned. As a result

\textsuperscript{191} See figure 9 in chapter two (see page 83).
of this development, the morale of the staff members was said to have gone down. It was explained in the interviews that staff members who were part of earlier projects had since left, and the only few who remained were not researchers, and hence could not come up with new projects or ideas. From the perspectives of the interviewees, most of the new staff members joined the organization with the impression that they were coming in to find a crop of qualified and experienced researchers with whom they were going to work as well as understudy. These impressions were said to have been erased when such staff members rather found themselves under situations that required them to perform functions and/or actions beyond their levels of competences. In the words of an interviewee;

These new staff members end up being told that, ‘you are project manager. Come up with project ideas. Write a project memo and implement a project, because we are here for projects’. So in that respect, most of these staff members were left in the dark feeling that, ‘I cannot do this’. This happened, because the assumption at the management level was that, anyone who is a graduate and an engineer by profession can be a project manager, or can be a consultant, but these are two different things. Such a new person might have done it as a course in the university, but they do not have the practical experience.

Thus the excitements with which new staff members joined the organization were viewed by the interviewees to have faded away during the commercialisation process, with its (i.e. the excitements of the staff) place being taken by the feeling of demotivation. This situation, as I understand, was partly responsible for the departure of most staff members who joined the organization in the early 1990s, and which event was credited to have laid the foundation for the problem of staff turnover, as it is reflected by the following comment of an interviewee;

With time, the organization seemed to have become a training ground for others, who came in, and after a short period, leave to join other organizations. If you look back from 1999 up to this time, you realise that we have lost about 65 % of our staff. We have lost many staff. I think the organization is going to lose many of us.

I learnt from the interviews that this problem of staff turnover had continued to increase in strength because the staff members appeared not to derive any satisfaction from their work activities. Therefore, as a result of the organization’s inability to retain its trained-staff, it did not succeed in its efforts toward capability building (as it is underlined in the best
management practices model). In this respect, I understand that even the staff members who remained at post had also shown their frustration toward the commercialisation process by virtue of their non-acquisition of the requisite skills and expertise (as it is underlined in the best management practices model) in the areas of project management, business development as well as networking. Thus it is imperative here that human resource issues on skills and motivation had impacted negatively on the staff members’ approach to their work, as well as on their perspectives of the organization’s commercialisation process. As such, the issue of human resource (with respect to personnel management) was perceived by the interviewees to have been problematic. This was put into perspective by the following interviewee’s comment:

The organization’s problem is due to the fact that we do not have an independent human resource department. In our opinion, due to the lack of authority for the person who is in charge of human resource, we end up mostly recruiting unsuitable people and then send them out for non-relevant training. This is happening, because it is the authority of the heads of divisions to dictate terms to the human resource office.

I can infer from the observations above that aside the sense of insecurity among some staff members, the quality of the organization’s human resource was greatly affected in a negative sense, as a result of the high

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192 For capability building, the model requires that inputs from the market (industry), a client-majority board, those following technology, and an effective performance management system, are all to be seen as necessary for identifying capability-building opportunities. Also concerted effort by management teams to make capability-building plans must be seen as much more effective than decisions by individual managers.

193 With respect to project management, project teams that have the appropriate expertise for each project (regardless of where individuals report in the organization) are to be formed. Project managers are to be given the authority and responsibility to manage projects without interference once they have been thoroughly checked by management with contact expertise. A committee of industry and RTO experts is to decide on grant-funded projects. Also, individuals at all levels are to be made to interact with clients and formulate projects. Additionally, project managers are to have financial management systems that will enable them monitor expenses against project budgets, and also progress against project plans.

194 On business development, a corporate business development group is to handle awareness and market strategic planning, while project managers conduct the bulk of selling activities. Rewards for business development (financial and recognition) is to be seen as effective. Business development costs must be monitored at the corporate and unit levels. Awareness activities focusing on major client groups must also be conducted. Client needs must be identified based on input from staff, board and regular meetings with industry groups.

195 The organization must support some low-cost and some high-quality networking methods with technology providers and in this regard use at least four methods of interaction with industry in order to understand client needs.
turnover of its skilled manpower. I relate this to the inability of the management to institute the relevant training programmes for the staff as a way of re-orienting them towards the commercialisation process. Based on this perspective, I also infer that the organization was not able to develop the required competence that was needed to ensure the effective functioning of its human resource system under the commercialisation programme. It is also obvious that the management did not make visible to the staff members adequate provisions which might have ensured the continuance of improved skills development and capability building for both the new and old staff along the lines of the organization’s new areas of competence. Additionally, the ability of the organization’s management to perform was negatively affected by the low morale that pervaded the organization’s operating environment due to the tensions and disturbances that led to the emergence of contradictions in their (i.e. management’s) sub-activity system, as I have indicated in figure 37 below.

Figure 37: Sub-activity system of the management shaped by the human resource system.
The consequences of such tensions and disturbances were the evolution of senses of demotivation among the staff members and the subsequent lowering of their productive capacity. This, in my opinion, is also compounded by the inability of the management team to provide effective motivators (such as market-competitive salary scales and formal/informal recognition events) as underlined by the best management practices for personnel management. Therefore, the impact of demotivation among the staff members, which I view to be a result of the tensions and disturbances between them and the management team, was quite visible in the functioning of the division of labour. The presence of those tensions and disturbances was also indicative of the contradictions that existed between the management team as well as the community and the guidelines for the best practice for personnel management (i.e. in relation to the application of its guidelines). This consequently established the contradiction between them (i.e. management team) and the object of the organization’s commercialisation process (i.e. carry out commercial-oriented research activity). Key factors that seemed to have led to the weakness in the organization’s human resource base included the retention of the same upper management as well as the board, lack of research challenges, non-recognition of useful knowledge within, as well as the deterioration of competence with respect to the skills of the staff members. A picture of this observation is reflected by the distribution of the relative responses in the questionnaire survey as I have shown in the plot (vi) below.

![Plot (vi)](image)

The above observation was corroborated by the critical problems (i.e. lack of facilities, lack of appropriate skills in research and development, and
terribly low salary) that were identified by the participants at the problem-
identification workshop. Thus, I view these as indicative of the
contradiction between the management team (as subjects of activity) and
the best management practices model (as it relates to the practices for
governance, capability building and project management). Therefore, the
apparent non-encouraging support from the management appeared to have
contributed in the organization’s inability to re-orient the staff members to
function in line with its new vision and mission.

6.5.2. The information flow process and communication system.

The functionality of the information flow processes and the
communication system within the organization was generally perceived by
the interviewees to have been a big problem. In their view, the
management’s handling and dissemination of information relative to the
commercialisation process was poor with regards to it (i.e. information)
flowing downwards from the top. In this respect, the contact between
majority of the staff members (especially those who constitute the middle-
level and junior personnel) and the organization’s management as well as
the board was minimal. I also learnt from the interviews that as a result of
the non-transparent way of disseminating information in the organization,
the management’s attempt to implement new ideas highlighted by the best
management practices model was met with resistances by the staff. This
development was associated with the generation of distrust among the staff
members, leading to a situation whereby they started to harbour the notion
that, whatever good ideas they passed on to the management, it did not
come back to them in a positive way. Communication was therefore
viewed by the interviewees to be poor to the extent that the actions of most
staff members in the conduct of their work were influenced by their
personal perceptions of what appeared appropriate rather than by a
streamlined procedure from the management. This therefore, reflects the
absence of the requisite feedback mechanism that could have encouraged
interaction between the management and the staff in the course of the
organization’s commercialisation process. A reflection of the
communication problems in the organization was provided by an
interviewee in the following expression;

Even for the consultancies that were done, we have heard nothing. You
cannot see any report saying, O.K., we are failing because of A, B, or C.
This year, I was expecting management to come out and say, “We have
been failing because of A, B, or C, and now we are thinking of
something different from what we have been doing”. Our management is still unable to explain to us what it is that we are doing.

In this respect, most of the staff members appeared as if they did not really know about the existence of the best management practices model and what it was to achieve, due to problems of communication and poor information flow. The consequence of this, as I understand from the interviews, was that most of the staff members received minimal or no guidance in their activity undertakings. As such, most of them had to count on self-drawn conclusions in order to shape the character of their routines in the organization, but which the management saw as contrary to the organization’s aspirations of self-income generation. This situation was described by the interviewees to have had its own negative impact on the organization’s commercialisation efforts, as it is reflected in the following interviewee’s comment;

It is difficult when you relate the attitude of the staff to this plan of commercialisation. The staff raised the concern that, ‘we do not know exactly what the plan is about. We do not know what is expected from us. The thing was not done in any proper way’. There was an element of disillusion here. These are some of the things that the management never get to know for them to be able to even think of corrective measures. I got to know because of my interaction with them.

The organizational structure, by its highly hierarchical design (as I have discussed in section 6.3.1) was also viewed by most of the interviewees to have added to the constraints in the information flow and feedback processes within the operating environment. An outline of a scenario relative to this observation showed that if a staff member encounters a problem, he or she had to take it up first with the unit manager who in turn takes it up to the division’s director. The director of the division also takes it up with the managing director. As I understand from the interviews, the constraint in this hierarchical way of communicating was that, in those circumstances in which either the unit managers or the directors chose not to reason with staff members’ having problems, the communication process were then made to die off at those levels. As an interviewee pointed out;

The problem is that I talk to the Head on an issue and he eventually agrees with me. The next time I go back to him, he might have talked to other people that are against the idea, and then he will come and change his mind. What I will eventually do is that, I will try to agree with the
Head that I will take this idea and try them within my own division and see whether it will take us anywhere. The problem then becomes that, when you agree to go on, you are definitely going to meet other people from other divisions, and when you do not get them when you need them, you cannot make that much progress.

It can therefore be inferred that the quality of communication and information flow within the organization was poor. This might have contributed, to a large extent, to the feelings of resentment that the staff members developed towards the various transformation attempts in the organization. The tendency by most staff to relate strongly to their units and/or departments might have further widened the communication gap to the extent that some individual staff members perceive their colleagues as not giving encouraging recognition to their efforts and/or outputs within the organization. Additionally, there was a collective feeling that the previous management did not accord most staff members encouraging recognition, in relation to their tasks performances and outputs. These perceptions are attributable to the staff members’ lack of understanding of the organizational system that prevailed as a result of the block in information flow and also the poor quality of the inter-personal communication system. These constraints might have made it difficult for the staff members to really understand the rationale behind the derivation of new strategic plans, when previous ones appeared not to have been fully implemented. It is also indicative that there was a complete breakdown in the feedback mechanism put in place, if any, within the organization. In my opinion, the apparent breakdown in the information flow process and feedback mechanism within the organization was a portrayal of the inefficiency as well as the ineffectiveness of its communication system. The effect of this seemed to be the complete malfunctioning of the organizational system, with the consequent results being the staff members’ inadequate understanding of the management’s approaches towards the transformation of the organization’s operational focus.

It is therefore, obvious that the management failed to attach much importance to the practice of regular interaction with the staff members during the commercialisation process. The negative impact of the tensions and disturbances created by the communication system that existed in the organization is obvious since the desired input from the staff was stalled. I therefore view these developments to have contributed significantly in the segmentation of the workforce, leading to the creation of the tensions between the staff and those in management positions. The consequences of
these tensions and disturbances were the creation of contradiction among the different elements of the management’s sub-activity system as I have outlined in figure 38 below.

As I have highlighted in figure 38 above, the presence of internal disturbances among the community members (i.e. the management team and the staff) was indicative of the contradiction that existed between the management team (as subjects of the activity) and the community. It also highlighted the existence of contradiction between the community and the unclear rules that the management seemed to have used in guiding the organization’s commercialisation process. By implication, it also highlighted a contradiction between the community and the instrument (i.e. the best management practices model for personnel management, project management and business development) which signified the importance of communication. I view the consequence of these to be the emergence of
further contradiction between the management team and the best practices for personnel management\(^{196}\), project management\(^{197}\) and business development\(^{198}\) during the commercialisation. In my opinion, this clearly indicates the contradiction that exists between the management team and the division of labour, on one hand, and between them and the object of the commercialisation whose realisation they are to spearhead, on the other.

6.5.3. **Orientation of organizational values and norms.**

There was the general impression among the interviewees that the organizational culture (and the norms associated with it) during the commercialisation process was not definitive in terms of consistency and clarity, but rather reflective of the bureaucratic rigidity that is associated with the organization’s institutional structures (as I have noted in section 6.3 earlier on). This critic was against the background that even though the management had tried to use different approaches and styles in their handling of the organizational changes relative to the commercialisation process, they did not create the kind of culture that could bring the organization’s community together. Therefore, the organization was described as having been infected by what most of the interviewees referred to as individualism and compartmentalisation of departments. In this respect, the organization was viewed by the interviewees as having had

\(^{196}\) Approach to personnel management is to be such that a flexible recruitment system is put in place and which must use input from managers, co-workers and human resources department to select appropriate new staff and promote existing ones. RTOs must set market-competitive salary scales with market salary data, and reward high performance. Non-pay based awards (formal and informal recognition events) are to be seen as effective motivators. A compensation package decision is to be made by the management team for each staff person using the results of individual performance evaluations. Employees are to be evaluated against common objectives by their supervisors and the senior management team, and the results are to be communicated verbally and in writing.

\(^{197}\) The emphasis of the best practice for project management is that project teams that have the appropriate expertise for each project (regardless of where individuals report in the organization) are to be formed. Project managers are to be given the authority and responsibility to manage projects without interference once they have been thoroughly checked by management with contact expertise. A committee of industry and RTO experts is to decide on grant-funded projects. Also, individuals at all levels are to be made to interact with clients and formulate projects. Additionally, project managers are to have financial management systems that will enable them monitor expenses against project budgets, and also progress against project plans.

\(^{198}\) The emphasis of the best practice for business development is that a corporate business development group is to handle awareness and market strategic planning, while project managers conduct the bulk of selling activities. Rewards for business development (financial and recognition) is to be seen as effective. Business development costs must be monitored at the corporate and unit levels. Awareness activities focusing on major client groups must also be conducted. Client needs must be identified based on input from staff, board and regular meetings with industry groups.
a scattered culture with different divisions defining their own values and norms, as it is reflected in the following comment;

We are not integrated. We do not have inter-functional teams. Each team is defending its own unit within its own department. Every department head is defending his department. We are not working as one. I saw a copy of the recent strategic plan and I brushed through it, because I am not part of the management that wrote it. I foresee a problem for it to succeed, because the organization still has the same mind-set, the same culture, and the same leaders. I was thinking that maybe, such a strategic plan should have come out after the organization has revived itself. Now we are having these solutions, and for what problems, nobody can understand.

The consequence of this phenomenon of culture-scattering (as it is highlighted in the interviewee’s comment above) on the commercialisation process was that, it led to the creation of great deal of problems in relation to empire building (struggle for power) within the organization’s operating environment. In this regard, most staff members were described by the interviewees to have developed the general feeling that their respective units and/or divisions represented their empires. Within this frame, the respective heads of such units and/or divisions were cited by most interviewees to have continued hiring new people into their units and/or divisions. The underlying notion for such hire was that, the larger the size of their population, the more important and powerful was their empire within the organization. Due to the relative entrenchment of this culture, most of the changes in the organization were resisted because of what most interviewees viewed to be the prevalence of the fear of the unknown among the staff members who had become complacently comfortable with the old ways of doing things. The frequent replacements of the organization’s Heads were also perceived by most of the interviewees to have aggravated the scattered nature of the organizational culture, as it is highlighted by the following two comments;

*Interview comment I:*

I want to highlight that the reason why this organization has suffered is due to lack of proper head, because a month after I arrived here, we lost the managing director, and I was very disappointed. Then we got somebody to act. Yet, according to government directives, he could not act above a certain period of time, so he had to leave. Then we were given somebody. Overnight we were given a new head, and that person also was here for only 5 months. He was very suspicious of us, and we
were also suspicious of him, because we did not know him. So there were lots of tensions.

*Interview comment II:*

When we lost our managing director, my understanding was that there were lots of problems that prevailed, but which were not dealt with. It ended up with people forming groups within this organization, so the organization started not to function as one. This resulted in people defending territories. Even when proposing projects, people will defend their territories. I think that is part of the problem, and that is part of what might have caused people into taking projects that did not fulfil the mandate, because they want to be seen to be doing something.

The organization’s board was also perceived by most of the interviewees to be a hindrance to the proper functioning of its management. My understanding here was that, some of the board members had tended to interfere in even micro problems that arose within the organization. The board at the time, as I learnt from the interviews, was made up of individuals some of whom were perceived by the staff as not keen in seeing to the growth of the organization into a commercial entity. Some of the persons who served on the board were said to have made the task of managing the organization a difficult one. In this regard, there was the general impression that the organization did not have the right board due to the fact that the appointment of the members was politically biased. The perceptual cultures and values of individual staff members were also viewed by the interviewees to have represented another factor that contributed to the organization’s failures. In this respect, most of the staff members were perceived to have displayed attitudes which depicted them as individuals unwilling to accept changes within the organization. This mind-set of the staff members was said to have prevailed due to their misunderstanding of the organization’s vision and mission. The management was also viewed to have made minimal effort to impart on the staff such understanding. The impact of this was relayed by an interviewee as follows;

There is nothing like a corporate culture here. They are still struggling to have it here. What they are struggling to find is, ‘where are we?’ and ‘what are we?’ Are we this or that, they do not know that yet. The organization is a bit sick, in terms of socialization. Much as we are professionals, we need to have a social interaction.
It can therefore, be inferred that there was no significant effort by the management to overhaul the organizational structure as well as the operating systems during the various transformation attempts as dictated by the various strategic plans. As such, it continued to retain its identity as a government fully-subvented organization with a weak management system, instead of acquiring the new identity of a commercial-oriented research organization. It can also be deduced that the inability of the management to carve out a new corporate culture required for proper functioning of the organizations community resulted in the loss of direction among the staff members. The consequence of this was the diffuse nature of issues relative to organizational norms, and which led to individual interpretations of organizational values, suspicion, and distrust. This also culminated in the organization’s units and/or divisions competing among themselves for power and supremacy. This phenomenon might have contributed to the situation whereby most of the staff members perceived the managing processes in the organization to have created an internal environmental atmosphere whose trustworthiness was questionable, and as such, not encouraging. A picture of this observation is reflected by the distribution of the relative responses in the questionnaire survey as I have shown in the plot (vii) below.

![Plot (vii)](image)

The distrust in the working climate might have led the staff members to become suspicious of the various ideas conceived by the managements for the implementation of their strategic plans. Such a situation could also have had a relative influence on the retention of the old
cultures and norms, as a way of accommodating the staff members’ mistrust. It thus becomes apparent that the management’s failure to overcome the overriding strength of these elements of segmentation, which appeared to be built around the organization’s old corporate culture (i.e. civil service culture), might have resulted in its inability to effectively introduce a new corporate culture in line with the best management practice model. These developments might have affected the morale of the staff members to the extent that most of them doubted the capabilities of the management to create an enabling atmosphere within the organization. I view this scenario to have further led some staff members to harbour the feelings that the organization’s environment did not provide them with the possibility to enhance their personal growth. The contradictions that emerged in the sub-activity system of the management team as a result of the tensions and disturbances in the organization’s culture are highlighted in figure 39 below.

Figure 39: Management’s sub-activity system due to the values/norms.
As I have highlighted in figure 39 above, the relationships between the different members of the organization’s community (i.e. management team, staff members, and board) were pervaded by significant tensions. These tensions were therefore indicative of an aggravation in the contradiction that existed between the management team (as subjects of the sub-activity) and the community. I view the consequence of this to be the development of further contradictions between the management team, as well as the community, and the best management practices model (instrument) for both governance and personnel management during the commercialisation. This view was corroborated by the participants at the problem-identification workshop who identified the issue of organizational culture as a critical problem. The fact that the staff appeared to misunderstand the organization’s vision and mission is indicative of the contradiction that existed between the community and the instrument (i.e. the best management practices model). By implication, there was a contradiction between the community and the division of labour, on one hand, and between them (i.e. community) and the underlying objective of the commercialisation process (i.e. carrying out commercial-oriented research activity), on the other hand.


My description and analysis of the characteristics of the various elements in the organization’s sub-activity systems have shown that a hierarchical organizational management style was used to guide the organization’s commercialisation process rather than the recommended project-oriented management style. As I have indicated in section 6.3.1, the organization’s institutional and managerial structures were defined by civil service oriented codes. The retention of this character and the hierarchical management style (which is seen as bad from the perspective of the best practice for organizational management) appeared to have allowed those in authority (as individuals) to hold on to their influences and powers (by virtue of their hierarchical positions) in controlling events within the organizations. In this respect, the retention of the hierarchical type of structure can be viewed as a major contributing factor to the difficulties

199 The RTO chief is to be made to nominate people to sit on the board with the owner approving (or rejecting) his/her nominations while the RTO management is to have the responsibility of identifying the needs for change and having the power to address those needs.

200 The emphasis of the best practice for personnel management is that a flexible recruitment system is put in place and which must use input from managers, co-workers and human resources department to select appropriate new staff and promote existing ones.
that was faced by the organization in its efforts to commercialise. This was because the best practice for organizational management required the institution of a project-oriented management style which would have led to the devolution of power from individuals to teams. As I have noted in section 6.3 above, the management board remained as it was constituted under the organization’s old system (see figure 32 in section 6.2, page 202). In this regard, the power to influence activities relative to the commercialisation process was exercised variously by members of both the management and the board not as a collective, but rather as individuals. The constraints in the information flow and communication system within the organization might have also contributed (to a large extent) to the feelings of resentment that existed among a section of the community members. This seems to have also encouraged the practice of segmentation within the division of labour whereby staff members strongly identified themselves with the objectives that were defined by their units and/or division rather than those of the organization. The management’s inability to deal with this issue of segmentation which was strongly built around the organization’s old culture (i.e. civil service culture) was also indicative of its inability to introduce a new corporate culture in line with the best management practices model. These developments might have affected the morale of the staff members to the extent that majority of them doubted the capabilities of the management to create an enabling atmosphere within the organization. The constraints on the organization’s human resource system, marked by a relatively high turnover of skilled manpower and the failure by the management to institute relevant training programmes for the staff, also impacts negatively. As it became obvious, the management did not make adequate provisions to ensure a continued improvement in skills development and capability building for both new and old staff members along the lines of the organization’s new areas of competence. This culminated in the absence of positive collaboration, cooperation and networking among the community members relative to the division of labour. In this regard, individual units and/or divisions carved out different self-identities for themselves and which they each tried to protect. The consequence of this was the generation of tensions and disturbances that were associated with unhealthy competition for same resources, resulting in the erosion of effective project undertakings within the organization’s operating environment. In this respect, most of the staff perceived those in management as failing to put in place clear managing processes to guide the organization’s commercialisation efforts, resulting in the creation of an organizational environment whose fairness they questioned. My overview
of the tensions that are created in the organization’s activity system during the commercialisation process is given in Figure 40 below.

**Figure 40: Tensions present in BOTEC’s activity system during commercialisation.**
The tensions in the rules might have emerged from the perspectives of its contextual and functional incompatibility in a research and development institution. This seemed to have gone a long way to shape the attitude of most of the staff members, resulting in them being influenced by their individual as well as the organization’s history. It also resulted in them judging organizational issues from the perspectives of their personal core values. Thus the management’s inability to succeed in its usage of the best management practice model could be related to its inability of finding a way out for transforming the rules or probably by virtue of its desire to avoid any form of tension within the organization’s community. Aside this, the management also had to deal with the organization’s board whose civil service structural composition was maintained by the government (which is the owner of the organization). This might have also resulted in a situation whereby the board was not in concert with some aspects of the strategic plans, and in effect stalled the management’s efforts. In this context, there seemed to have been elements of suspicion, especially between management and some staff, on one hand, and then both of them with the board, on the other. This show of distrust had also permeated into the organization’s division of labour. It is obvious that some form of walls were built by the respective departments around themselves, which in a way impacted negatively on the pursuance of common projects. This was by virtue of the people inside the respective walls holding on to their different perspectives. This difference in perspectives introduced an activity contradiction in the division of labour.

I therefore view the above observations to reflect the multivoicedness within the organization’s collective activity system which served as sources of trouble, demanding actions of translation and negotiations. Therefore, it can be argued that the inability of the organization’s management to carve out a new corporate culture for the proper functioning of the organization’s community had resulted in the loss of direction among the staff members. This situation, coupled with tensions in the functionality of the institutional rule, had also impacted negatively on the organisation of both work and management activities within the system. This appeared to have contributed significantly to the tensions and disturbances within the community, leading to the generation and subsequent aggravation of contradiction in the organization’s activity system. I have summarised these tensions and disturbances, as they existed within the institutional rules, the division of labour, and the community,
and also the resulting contradictions that in the organization’s collective activity system in figure 41 below.

My overall impression of the organization’s collective activity system with its networks of contradictions and internally tension-laden characteristics is reflected in figure 42 (see next page).
Figure 42: Reflection of tensions behind the contradictions in BOTEC’s collective activity system during the commercialisation.
The contradiction that emerged between the workforce and the rules (best practice guidelines) with respect to governance, organizational management and personnel management might have emanated largely from the non-regulated process of decision-making and for which no major attempt was made to overhaul. This contradiction appeared to have laid the foundation that shaped the attitudes of most of the staff members and also created the condition for them to be influenced by their individual histories, as well as by the organization’s history as a government subvented and non-profit making department. It also seemed to have given rise to the situation in which the staff members judged organizational issues from the perspectives of core values that were shaped by their respective units and/or divisions. I also view the disturbances that surrounded the workforce’s application of the rules to have contributed to the tension within the organization’s community, and also with respect to the way labour was divided. This was reflected by the non-provision of incentives to the staff members due to the organization’s continued reliance on inadequate government subsidies. Also, the rivalry that existed between different units and/or divisions, as highlighted by them competing for equipment and materials for the performance of mostly identical work activity pointed to the contradiction that existed between the workforce and the division of labour. Additionally, the combined influence of the constrained human resource system and the inefficiency of the information flow process and communication system, in addition to the conflicts between the institutional rules and the division of labour resulted in a further contradiction between the workforce and the objective of the organization’s commercialisation process.


By looking at figure 42 above, it is quite obvious to me that the attempt to effect change by the organization with instruments obtained from external sources under the context of its prevailing sub-system instability, resulted in varieties of hindrances. This was reflected by the absence of the requisite synergy among the elements in the organization’s collective activity system. As I have noted in chapter two (sub-section 2.4.1), Engeström’s definition of an activity is that it is a systemic formation unifying the processes of production, distribution, exchange, and consumption as transitions between subject, object, instrument, community, rules and division of labour. By comparing the outlines of this definition (see figure 3a in chapter two, page 52) to the outlines of figure
above, it is obvious that the unifying process that the interfaces of production, consumption, exchange and distribution were expected to create in the organization’s collective activity system was not created. Judging from figure 42, I argue from the perspective of Marx (1979) that by virtue of the tensions that prevailed in the organizations collective activity system, the production (i.e. subject-instrument-object triangular interface) that emerged from the commercialisation process could not create the requisite object which corresponded to the organization’s outline needs. In the same vein, the presence of tensions and disturbances in the distribution element (i.e. community-object-division of labour triangular interface) seemed to have also crippled the exchange factor (i.e. subject-rules-community triangular interface). Similarly, there was no element of consumption (i.e. subject-object-community triangular interface) of the commercialisation process. This was because the production element could not step outside the organization’s social movement to become the direct object and servant of the organization’s needs in order to satisfy its consumption. In my opinion, this observation underlines the significance of the point by Marx (1973) that a definite production determines a definite consumption, distribution and exchange as well as the definite relations that exist between these different interfaces. I therefore argue that as a result of the inability of the organization’s management to ensure the complete overhaul of the previous system prior to the commercialisation programme, its subsequent retention and translation resulted in the corporate image of the organization being defined within the context of its past existence. This is by virtue of the fact that no organizational activity can be completely independent of its history. All these factors might have collectively impacted on the sense and meaning of the organization’s commercialisation process, and which outcome, in my opinion, seems to be unsatisfactory. The consequence being that the organization’s objective of transforming its operations to that of an effective research and

201 Marx has explained that production creates the objects which correspond to the given needs: distribution divides them up according to social laws. Exchange further parcels out the already divided shares in accord with individual needs: and finally, in consumption, the product steps outside this social movement and becomes a direct object and servant of individual need, and satisfies it in being consumed. Thus production appears to be the point of departure, consumption as the conclusion, distribution and exchange as the middle (…).” (Marx 1973: 89)

202 According to Engeström, production is to be always seen as the consumption of the individual’s abilities and, also as the means of production. Correspondingly, consumption is also to be seen as a production of the human beings themselves. Furthermore, distribution is also to be seen as not just a consequence of production, but also as its immanent prerequisite in the form of the distribution of instrument of production and also the distribution of members of the society among the different kinds of production. Finally, exchange too, is found inside the production, in the form of communication, interaction and exchange of unfinished products between the producers.
development institution continues to be a challenge. The sense and meaning of this was that no successful outcome has been recorded, so far as the organization’s commercialisation was concerned. As I have clarified in chapter two (section 2.7) in relation to Engeström’s (2000a) representation of the cycle of learning action (see figure 11 in page 88), the extent of my study is to provide the base for understanding possible developments that the organization has to deal with in its commercialisation effort. I therefore view my descriptions and analyses of the organization’s collective activity system (from section 6.1 to 6.6, and broadly summarised in figure 42 in page 239) as providing an understanding of the organization’s internal environment, and hence in line with my first proposition for this study.

As a recall, I proposed in chapter one (section 1.5) that existing tensions in an RTO’s activity system serve as internal environment factors which influences the extent to which external environment constraints negatively affect the organization’s implementation of Best management practices. I also noted in chapter one (section 1.4) that my findings from an earlier study (Sanda, 2003) points to some external environment factors that constrained the commercialisation process. I therefore view that by cross-analysing the insights that I have provided in this case together with those gained from cases one, and two as well as that to be gained in case four (which I will do later in chapter eight) the requisite platform for modelling new solutions to facilitate the internalisation of the best management practices model in future commercialisation process can be established. By implication, the cross analyses is to signify the possible contribution in the applicative understanding of Engeström’s model and principles of activity theory in relation to my study framework (which I will discuss later in chapter nine) as a template for guiding an organization’s commercialisation process through the zone of proximal development and towards the attainment of a possible expanded activity (i.e. its foreseeable activity system, as I have discussed in section 6.2 and summarised in figure 33, page 202).

203 I have given an overview of such external factors in chapter one, section 1.4, with a tabular summary of their impacts on some organizations (see tables 1 and 2 in pages 25 and 27 respectively).

204 See figure 9 in chapter two (page 83).
7

CASE FOUR

Council for Scientific and Industrial Research
(South Africa)

My motive for selecting this specific case (as I have previously discussed in chapter three, sub-section 3.4.1) is underlined by the fact that the organization was involved in the implementation and internalisation of best management practices which helped its transformation from a fully subsidized institution into a relatively successful income generating organization. My interest in this case (in relation to the three cases I have discussed in chapters four, five and six)\(^{205}\) is to understand the factors that contributed to the success of the organization’s commercialisation. Therefore, in this chapter, I will give an insight of the approach I used to collect empirical data\(^{206}\) on the organization’s commercialisation process from the year 1988 to 2003. I will follow this with a description (based on the analytic approach I have outlined in chapter three, section 3.8)\(^{207}\) of the organization’s activity system\(^{208}\) during the transition period of its attempt to transform from being a non-commercial R&D agency into that of a commercial one.


The empirical data that I used to analyse the organization’s commercialisation process was obtained through structured interviews\(^{209}\) (see appendices II and III for the interview questions guide) with the Head of the organization’s Market and Business Systems (i.e. coordinating Officer for the commercialisation process) and seventeen senior staff...

\(^{205}\) I explained in chapter three (sub-section 3.4.1) that there are variations in my motive for selecting each case in this multiple-case study. My goal is to use the same methodological approach in building a general explanation (Yin, 1994) that will fit the findings of each case.

\(^{206}\) This is based on my methodological approach which I discussed in chapter three (section 3.5).

\(^{207}\) See page 117.

\(^{208}\) My outline of this will be based on the model shown in figure 9 (see page 83) which characterised my study framework as I discussed in chapter two under section 2.6.

\(^{209}\) I have discussed this methodological approach in chapter three (sub-section 3.5.2) in relation to its application in this study.
members (i.e. Directors of Divisions and their programme managers, as well as senior corporate officers) whom I identified as key actors in the commercialisation process. In contrast to the three previous cases (i.e. Ghana, Trinidad and Botswana), I did not conduct a problem identification workshop\(^{210}\) in this case, but rather took part (as a passive participant) in a one-day strategic workshop\(^{211}\) involving representatives from the organization, the South African International Trade and Economic Development Division (DTI), as well as other stakeholders. As I have noted in chapter three (section 3.5), I used this observation approach to also develop an understanding of organizational activities in the organization. In the sections that follow, I will firstly give a profile of the CSIR. This will be followed by a highlight on factors and events that underlined the start of the commercialisation process. I will also carry out in-depth individual functional analyses for the rules, division of labour and the community as they impacted on the organization’s activity system during the commercialisation process.

7.1.1. Profile of the CSIR.

The background information I had on the CSIR indicates that the organization was established in 1945 as a Science Council (i.e. the central scientific research and development resource for South Africa) by an Act\(^ {212}\) of the South African Parliament. It is located in Pretoria, South Africa. The organization’s mission is to foster industrial and scientific development through directed and multi-disciplinary research as well as technological innovation, either by itself, or in partnership with other public and private sector institutions, in order to improve the quality of peoples’ life in the country. By virtue of this mission, the organization

\(^{210}\) I have explained in chapter three (section 3.5) that the rationale for the this workshop is to develop an overview of actors’ perception of key problems associated with the on-going commercialisation efforts of cases such as those I have discussed in chapters 4, 5 and 6.

\(^{211}\) The workshop was highlighted by the following five topical issues:

- The DTI-NEPAD Integrated Trade and Industrialisation Strategy [Note: NEPAD (i.e. New Partnership for Africa’s Development) is a vision and strategic framework for Africa’s renewal].
- Report of the NEPAD Expert’s meeting on market access.
- Issues arising from the deliberations of the NEPAD Market Access, Industrialisation, Intra-Africa Trade, Production and Export diversification workshop.
- Special Report by the WAITRO Africa Regional Focal Point on the application of Best Management Practices by Research and Technology Organizations in Africa.

\(^{212}\) As a statutory research council established by Government, the CSIR is now governed by the country’s Scientific Research Council Act (Act 46 of 1988, as amended by Act 71 of 1990). The organization is listed as a Public Entity in terms of the Public Finance Management Act, (i.e. Act 1 of 1999 which was amended by Act 29 of 1999).
sought to acquire the requisite capabilities that could enable it provide profitable services to potential clients. In this regard, the organization identified the provision of technological solutions and information, the licensing of intellectual property, and the establishment of ventures as key areas of its future growth. Therefore, the organization perceives its mission as remaining relevant and even robust for the years ahead since it envisions global challenges to have become its challenges. It also acknowledges that the relationships with its partners, clients and stakeholders are integral to its success, which is highlighted by its contribution towards the following:

- promotion of competitiveness and employment creation;
- enhancement of quality of life;
- development of human resources;
- working towards environmental sustainability;
- promotion of an information society;
- and commitment to knowledge generation.

Based on the above perspective, the organization views itself as supporting innovation growth in South Africa in order to improve national competitiveness in the global economy. In this context, the organization provides technology services and solutions in support of various stakeholders. It also identifies opportunities for further exploitation and development of new technologies in the private and public sector.

As at the time of my visit, the organization was the largest scientific and technological research, development and implementation entity in Africa (i.e. it accounts for about 10% of the entire African R&D budget). It had a staff complement of approximately three thousand which include some of the top technical and scientific minds in the country, and collaborates in multi-disciplinary teams, to put forward solutions of the highest standard in innovation and excellence.

The organization’s perceived strategy is to accelerate its evolution to a knowledge intensive technology organization which would contribute to the African Renaissance, and thus make it become both internationally competitive and regionally relevant. It has clients in both the private sector (i.e. micro, small, medium and large enterprises; formal and informal), as well as in the public sector (i.e. national, provincial and local government). It also deals with public enterprises and institutions, national safety and security establishments, as well as development structures.
7.2. The Path towards Commercialisation.

The CSIR’s commercialisation process was initiated in 1988 in line with a government policy that sought to cut down the yearly subvention\textsuperscript{213} that the organization was receiving from the government in support of its operation from one hundred percent to thirty percent. This decision was against the background\textsuperscript{214} of the fast changing environment in most developing countries due to economic recession which eventually led to the privatisation of most government agencies. The government’s expectation in this respect was that the organization must acquire the requisite competence that could enable it self-generate the remaining seventy percent. By implication, the organization had to carry out scientific research not only to improve the country’s technological base, but also to be capable of self-generating income from it in order to ensure its (i.e. CSIR) continued survival. In this respect, the organization was to start operating as a commercial agency as opposed to its continued reliance on government subsidies. I interpret this governmental directive\textsuperscript{215} as reflecting a new rule in the government’s activity system (as policymaking subject).

The implication of this governmental directive was that it conflicted with the organization’s activity system which had the object of carrying out scientific research under full government funding in order to improve the country’s technological base. Therefore by considering the object-orientation of the CSIR’s activity system (i.e. to carry out scientific research under full government funding in order to improve the country’s technological base), I view it to have drifted into a dialectic process (i.e. series of conflicts and resolutions) initiated by the government’s policy-producing activity. This dialectics, in my opinion, gave rise to the development of tensions and disturbances in the organization’s activity system. This scenario involving the respective activity systems of the government (as the policy-maker or influencing agent for the change) and the organization (as the subject of change) can be viewed as I have shown in figure 43 (see next page). I have used the dotted arrow to signify the dialectical path.

\textsuperscript{213} I have discussed the circumstances that gave rise to such cuts in subvention by governments in chapter one, section 1.2.

\textsuperscript{214} I have discussed the background to this issue in chapter 1 under section 1.2.

\textsuperscript{215} Some of the interviewees say that this directive was not forced on the organization, but that it was self-imposed by the Head of organization at the time, and in line with his leadership vision.
Figure 43: CSIR’s organizational activity system in conflict with government’s activity system at the start of commercialisation.

Thus driven by the need to address such disturbance, the CSIR shifted in its object-orientatedness by underlining a new expanded object for its activity system (i.e. carrying out commercial-oriented research activity
under reduced government funding, but with the capability to self generate income). By this object expansion, the organization was expected by the government to be capable of generating seventy percent\(^{216}\) of its income and thus reduce its total reliance on the government for financial support. From an activity theoretical perspective, I view the shift in object-orientation\(^{217}\) to imply that the CSIR’s goal of continuing with its scientific research activities under full government funding was short-lived (as noted by Engeström, 2004). In this regard, I perceive the object of the organization’s collective activity system as being expansively transformed (from that highlighted in figure 43 above) to include an element of income generation. Thus, in order for the organization to be able to align itself towards its new object-orientation, it undertook to pursue a commercialisation process under the guise of the best management practices\(^{218}\) model. I have used elements of the best management practices to picture the organization’s anticipated activity system for the commercialisation in figure 44 (see next page).

In the sections that will follow, I will describe and analyse the empirical data that I gathered on events that pervaded the organization’s commercialisation efforts. As I have already noted, this was as a result of the transformation of its activity system from that of a non-commercial R&D agency (figure 43 above) to that of an income generating R&D organization (figure 44 above) through the implementation of the RTO best management practices. Therefore, my analytical approach will be guided by the outline of my study framework which I have previously discussed in chapter two under section 2.6. In this regard, I will draw highlights on the dynamics of the embedded elements in the organization’s activity system based on the characteristics of the rules, the division of labour, and the community (as defined in the study framework\(^{219}\)) during the transition period. In line with Engeström’s first principle\(^{220}\) of activity theory, my units of analysis will be the collective activity system, while group actions will be the subordinate unit of analysis. The specific groups that I identified to constitute the workforce in this organization and whose

\(^{216}\) The remaining thirty percent was provided by the government in the form of annual subvention.

\(^{217}\) As I have previously discussed in chapter two (section 2.6), Engeström has posited that the object is a heterogeneous and internally contradictory, yet enduring, constantly reproduced purpose of a collective activity system that motivates and defines the horizon of possible goals and actions.

\(^{218}\) I have discussed the underlined bases that led to the generation of these practices in chapter one, sub-section 1.2.1.

\(^{219}\) See figure 9 in chapter two (page 83).

\(^{220}\) See chapter two, section 2.6.
respective actions I will subject to analysis are the management team and the staff members. Thus it is obvious to me that the events to be highlighted by my empirical data are reflective of actions that were influenced by group-based actors in the organization.

Figure 44: CSIR’s foreseeable organizational activity system as a commercialised agency.

In section 7.2 above, I gave a summarised insight of the organization’s characteristics before the start of the commercialisation process and the way those characteristics were to be transformed in order to ensure the success of the process. As I have outlined in figure 43 above, the institutional rules which were subject to transformation were characteristic of administrative guidelines for managing government ministries and departments (i.e. civil service codes). These were expected to have been substituted by the new guidelines (see figure 44 above) as provided in the best management practices for governance, organizational management, capability building, personnel management, project management, and business development.

The issue at stake here is for me to analyse the characteristics of the rules that prevailed during the transformational transition. I will start by describing the nature of the organization’s management system as it prevailed during the commercialisation process. This is in line with my earlier discussion in chapter two (section 2.5) in which I related to the explanation by Blackler (1993) that the effective functioning of an organization does not depend on people agreeing on why they are doing something. As he notes, all that is required is that, there is agreement on procedures for determining what should be done. In my opinion, it is such procedural agreement or institutional rules that shape an organization’s management system and dictates the way it functions. In this respect, I view the institutional rules as characterised by regulations, power structures, as well as reward and status systems (as shaped by both explicit and implicit rules that defines social behaviour). In the same vein, the functionality of such a system can be well established by understanding how the rules dictate its structural set-up and also its application as template for managing the psycho-social environment in the organization.

Therefore in the sub-sections that will follow, I will firstly describe and analyse how the management structures in the organization functioned in relation to the institutional rules. I will follow this with a description and analysis of how the institutional rules functioned as the template for managing the psycho-social characteristics of the staff members.

221 I have already discussed these practices in chapter one under section 2, sub-section 1.2.1.
7.3.1. **Functionality of the organization’s management structures.**

Based on the empirical data I collected from the interviews, I learnt that before the commencement of the commercialisation process (i.e. when the organization was fully depended on government funds), the organization’s institutional characteristic was underlined by the classical pyramid type of organizational structure which functioned under the influence of a deep-rooted hierarchical management system. From the perspectives of some of the interviewees, the administrative system that prevailed during this period was quite confusing. Such system was deemed to have had no mechanism in place to manage client-information, given the perceived fact that there were lots of small and medium scale enterprises as well as other clients with whom the organization was trying to work. Additionally, some departments in the organization were also deemed to have had problems in their bid to keep their laboratories properly equipped. Based on this perspective, an impression was created by the interviewees that the need for changes in the organization towards meeting the challenges imposed by the market was initiated by (what interviewees referred to as) the internal leadership. In this regard, the commencement of the commercialisation process was said to have been marked by the complete overhaul of the old organizational structure (consisting of different and semi-autonomous institutes) and replacing them with a new organizational structure (consisting of divisions)\(^{222}\), with emphasis on business management. The rationale for this major institutional overhaul was explained by an interviewee as follows;

We were created shortly after the Second World War to do research on behalf of the government and industry, simply because neither of them have the know-how nor funding to be able to actually do research. Because research was with simple animals, a number of fields at that time could afford to run their own research and development process. Then came a time when we had to transform in order to ensure a balance with the bottom line. This created certain amount of friction between the management and the employees, which went on for quite a long time. Yet still, the transformation went ahead. As a result, our board became very much bottom-line driven, which impacted all the way down to the kind of work that the employees were doing. We were no longer a research organization, but a problem-solving organization. We have the problem now, we solve it now.

\(^{222}\) The previous semi-autonomous institutes were re-oriented into divisions of a single organization.
Therefore, the new organizational structure from the year 1988 was outlined by an executive, the management, the divisional director’s level, as well as the programme manager’s level and the project leader groups. As a result of this major restructuring, the organization was viewed by the interviewees to have had a very clear strategic direction. In this regard, the management was seen to have initiated a very clear managing process by putting in place systems and processes which ensured that whatever the management objectives were, they were well entrenched and thus well supported by the staff members. In this respect, the commercialisation process was also said to have been carried out in what some interviewees referred to as a participatory approach in comparison to the almost top-down approach which initially prevailed. This participatory approach was said to have made the operating environment quite empowering, especially to staff members who operated according to the rules of the game. As it was noted by an interviewee;

To be quite honest, the organization is not a rules-driven organization anymore. You occasionally have some people who argue that there are so many rules and constraints in the organization. On the whole, only few people can argue that they are constrained by all sorts of rules and procedures and so forth. All these are driven by a common belief rather than written rules.

Though the organization was said to have experienced lots of initial conflicts in the internalisation of rules relative to the practice of governance, most of the interviewees emphasized that these were resolved by virtue of the new perspectives with which the board members served it. From the perspectives of most of the interviewees, an important initiative in this respect was the introduction of a formal and structured induction process for the board members, which was said to have been designed to give them an understanding of the organization’s businesses and the risk associated with it. This was deemed to have been necessary and of relative importance to the introduction of effective policies and programmes within the organization as a way of encouraging mutual understanding and cooperation. A formal system was also said to have been put in place to evaluate the performances of the organization’s board members. As it was noted by an interviewee;

Although you might want to implement a good governance structure, you cannot dictate to a minister how a board should be structured. There are always political influences, but to a large extent, they operate on
perceptions. What we have done successfully is aligning our research with the expressed needs of the government of the day. Not in the sense of being in the pocket of the government, but in the sense that there are clearly challenges in the country, and as an organization that gets parts of its fund from government, we aligned our research to their various needs.

Thus I infer that the management of the organization were quick in coming to the realisation that the previous institutional rules with its underlying hierarchical structure and highly bureaucratic management style required complete overhauling in order to ensure a smooth commercialisation process. It was also apparent that the re-orientation of the semi-autonomous institutes into divisions of the organization made it possible for the management to have a firm control of the new organizational system. Within the frame of these actions, it was also obvious that despite the organization’s operating environment being generally perceived by the interviewees to be quite empowering, there were elements of occasional tensions relative to the new rules. What appears evident from the narrations I have outlined above is that the sub-activity system of the organization’s management was not entirely free from tensions, especially as it related to the management (as subjects of activity) and some members of the community, on the one hand, and then some members of the community and the best management practices model, on the other hand. The sense I derive in this regard is that the management did not (and continued not to) allow emerging tensions in their sub-activity system to develop and cumulate into conflicts and disturbances, probably by virtue of their pursuant of the participatory approach, as I have noted earlier on. Based on this perspective, I argue that the organization’s management was able to identify and simultaneously deal with contradictions that appeared to have emerged between it (i.e management) and the community as well as between the community and the institutional rules.

My reflection of these scenarios in the management’s sub-activity system is highlighted in figure 45 (see next page). For the purpose of clarity, I have used a ring to link the two arrows of the contradiction symbol to signify an emerging contradiction that has been simultaneously identified and dealt with within the sub-activity system. As a consequence, the management was able to ensure and sustain the internalisation of the best practices for both organizational management (i.e. project-oriented management style which is based on objectives) and governance. From the perspectives of governance, the organization has in place a legal structure
that enables it to operate under both financial and decision-making autonomy.

Figure 45: Sub-activity system of the management shaped by the institutional rules.

Additionally, a majority of the representatives on its board were also industry clients and the board’s mandate (as I have outlined in sub-section 7.1.1) was defined accordingly to fit the role the organization’s clients serve in the innovation chain. In the same vein, the management was responsible for identifying the needs for change with the power to address those needs.

7.3.2. Managing the organization’s psycho-social environment.

Based on my discussion in section 7.3.1 above, it is obvious to me that the complete overhaul of the old management structure made it easier to institute the regulations, operating assumptions, power structures, as well as reward and status systems defined by the best practice for personnel management which required inputs from managers and the workers alike. As I learnt from the interviews, the organization, by the year 1998, was
successful in discarding away most of its civil service-oriented rules and regulations by replacing them with new internal policies derived from the best management practices model to the acceptance of the staff members. These policies, according to most of the interviewees, related to issues such as the management of the organization’s personnel and finance, as well as the organization’s label. It was also related to the interpretation of new rules (i.e. what the new rules said), and also the reporting procedures for staff members. A collective approach was also said to have been applied by the management in solving organizational problems, especially by involving those at the lower level. This approach was viewed by most of the interviewees to have served as a mechanism which was used by the management to encourage sharing and learning within the organization. Within this context, an interviewee exemplified that, when a project proposal is written by a business manager, it is negotiated first by involving the legal experts in the organization. Through this approach, the managers were said to have learnt very quickly, and with them (i.e. managers) being scientists, it was also perceived to have served as a part of their management learning process. In the management’s bid to encourage this participative approach within the internal operating environment of the organization, they were said to have fought against the culture of paying lip services to events among the staff members. This was put into perspective by an interviewee as follows;

I was in an important programme in which I was the project leader with another guy as the programme manager. I had to lead the people in the project, so I had to count on my experience. I had never done marketing before, but yet still, I had to go out and try to get external income, as well as find contracts and understand how they work, especially when many of the people involved in the project were actually sitting around, saying, “What are we supposed to do?”……………. What the management did was to fight the prevailing lips services that people thought was not visible in the organization. In fact, if you are either a scientist or technologist, or if you are not somebody who really grew up in that part of the lake, you will not really recognise such lip service. But that has now started to change.

Thus it can be deduced that by virtue of the staff members’ acceptance of new policies instituted by the management, an avenue was created for the development of a strong and efficient management system which enhanced the organization’s commercialisation process. In my opinion, the sustainability of this system was by virtue of the management’s ability to simultaneously identify and deal with emerging contradictions within their
sub-activity system, as I have highlighted in sub-section 7.3.1 above. I view this to have contributed greatly in curtailing possible psychosocial tensions that might have arisen between the staff and the management. I therefore, argue that this development contributed in a significant way to the creation of an empowering environment within the organization during the commercialisation process.

7.4. Characteristics of the Division of Labour.

In section 7.3 above, I looked at the characteristics of the institutional rules that prevailed during the organization’s commercialisation process in relation to those underlined by the best management practices. In this section, I will follow a similar trend by looking at the characteristics of the division of labour. In the views of the interviewees, the organization had a good structural system in place prior to the transformation, and whose function was perceived to have been shaped further by the best management practices which guided the organizational transformation process. Within this context, I learnt that the organization’s core technology area was divided into eight business units, with each having a technology manager. According to the interviewees, these technology managers were basically responsible for the implementation and integration of both technology and knowledge management across the organization. Thus for a period of ten years (i.e. between 1988 and 1998) into the commercialisation process, the business units were allowed by the organization’s management to operate very autonomously. Additionally, most of the people who worked in these units were engaged as contractors. As it was emphasized by an interviewee;

The business units are relatively autonomous, since they have their own budgets to manage. They get some internal guidance, and thus are not on their own, or left alone. For example, if you have a contract, the organization signs the contract, and not the business unit. You try to get the legal people involved the whole time.

By virtue of this operational freedom granted the business units, so much pressure was said to have been exerted on these units by the organization’s leadership to become bottom-line driven. This situation, as I understand from the interviews, generated some level of competition among the different units. Such competition was viewed by some of the interviewees to have been translated into the operations of the respective business units, especially among their different programmes. An insight into this
competition scenario is portrayed by the following expression of an interviewee:

In the early days, the emphasis was heavily on securing so-called external contracts, and people did whatever they thought was necessary to achieve that aim. It was more like operating in a small business mode. As such, little programmes will run after a project and if they find one, they keep it to themselves, because the more projects they have, the more the income they generate. Performance rating was based on generated income.

From the perspectives of most of the interviewees, the competition among the various business units to generate income has had its own positive and negative impacts. Even though the interviewees did not provide me with a detailed insight of how this competition negatively impacted on the commercialisation process, they (i.e. interviewees) associated them (i.e. negative impacts) to tensions and conflicts that prevailed during the process as a result of the differences that existed in the operations of the business units. But as I learnt from the interviews, the organization’s management was able to address this issue by recognising the significance of the differences in the operations of the various business units and putting in place different operational systems for them. In this respect, a strategic monitoring and innovation forum involving all the technology managers who had the core responsibility for implementing the best management practices was said to have been set up. This forum was viewed by some of the interviewees to have provided the managers with a common platform for meeting and discussing organizational problems as well as sharing information and ideas on issues deemed to have yielded positive results in individual business units. As it was noted by an interviewee:

We have a forum called the Strategic Management of Innovation Forum (SMIF), that meets every quarter (every eight weeks or so), where all the technology managers come together every two months. We discuss what we have been doing in the business units, and new things that have been implemented (case studies, etc). We also do work with outside organizations. We invite consultants to come in and access what we are doing. We have peer review of international institutions also coming in to see what we are doing. We have opened ourselves up for checking.

Based on this perspective, the differences in fortunes of the different business units were seen by some of the interviewees to have relied more
on market circumstances than on circumstances related to the organization’s internal operating environment. The underlining argument for such observation was that the operations of the business units were facilitated. This was ascribed to the fact that the organization’s transformed institutional rules were made so flexible to the extent that they were able to facilitate the devolution of decision-making within the organizational structure down to the lower ranks. According to the interviewees, the organization instituted an ethic based on which the staff members received remunerations in relation to the value of their contribution. In this regard, there was said to have been no such perception among the general staff as a divisional director doing nothing but getting huge salaries. The absence of such a perception among the general staff, as explained in the interviews, was mostly due to the fact that, right from the onset of the commercialisation process, the directors ensured that whatever it was that they were doing themselves, it was visible to all and sundry. By implication, the directors of the divisions did not handle only administrative processes. They also participated in research work. In this respect, as I learnt from the interviews, the management introduced the concept of teamwork in the operations of some of the business units and which was upheld within the organization as a fundamental principle in project management. Based on this principle, activities in the business units were undertaken by different project teams consisting of up to fifteen people each. Such arrangement was viewed by the interviewees to have allowed the unit managers to do a little bit of technical work aside their administrative functions. This arrangement was also said to have been made in response to a general guideline from the organization’s divisional directors which required all managers of the business units to spend about thirty percent of their time on contract works. The expectation from this arrangement, as explained by some of the interviewees, was that it would keep the managers in touch with the technical nature of the work they were managing, and in the process make their contributions visible to the staff in their units. This form of mutual involvement is highlighted by an interviewee as follows;

In the group that I was in, we were extremely younger, so all along we were enthusiastic, even though we may have been running in different directions. The older people, because of their skills in the practical and applied type of science, were quite comfortable with the kind of work we wanted to do.

And also;
I cannot remember how we did it, but there was the parliamentary grant at that stage, and our external income was still quite high. With these, we kept the staff busy while two of us went out to try and get contracts from the industry. Things did not go on too badly, I think, for the first year or two, but within our specific group, and also that of few others, things got stuck at a certain level.

Therefore, there were quite a number of drivers which were viewed by most of the interviewees to have been associated with the structural orientations of the various outfits of the organization, such as the changes in name from institutes to divisions. In this context, it emerged that under the old organizational structure, the institutes were organised under different technical disciplines, whereas in the new structure, the divisions were organised based on either the state of the country’s economy or the special requirements of the competitive markets. As a consequence, the organization was said to have quickly pitched its own funds. Additionally, the business units, which were viewed by the interviewees to have had a fair degree of autonomy, were also established within the divisions. These units, as I gathered, were actually made to run their own business budgets. As it was pointed out by an interviewee;

I think that when we went into this commercialisation process, we did not make the mistake of thinking that everybody has to get himself transformed. It is not the role for everybody. You need the person that can make the sale, bring in the project, organize it, and help to deliver it. You need a few core people to do that and to take the business leadership side of things as well.

It was also explained in the interviews that since the new institutional rules of the organization were deemed to be very financial driven, they were shaped to conform to the general laws that safeguard public finance management\textsuperscript{223} in the country. Labour laws and a host of other laws based on the constitution of the country, were also seen to have contributed positively towards the commercialisation process. Such laws were viewed by most of the interviewees to have influenced the organization’s operations, especially in relation to the way its business processes were ran. The practice of business units’ reviews was also said to have been introduced into the organization as part of the new rules. This was exemplified by an interviewee as follows;

\textsuperscript{223} As it is noted from official sources, the Public Finance Management Act, No.1 of 1999, as amended by act No. 29 of 1999, came into effect on 1\textsuperscript{st} April 2000 and has had an impact on governance matters, in terms of the regulations of financial management in the public sector.
The organization is now listed as ISO 9001 and ISO 14000. That is one way of our benchmarking against a standard organization. There are also other benchmarking systems, like the review that we just had at the organization as a whole. That was to look at CSIR business and the strategic issues that are important, like the governance issues, state market availability funding, among others. The panel was set up according to certain criteria, for example, looking for people who actually have experience and have proven themselves to be objective. We have two international people and three local people on this panel.

Thus it is evident that the organization was able to streamline its operations by encouraging adequate clarity in its operational processes, which was underlined by the formation of the various business units. I view this to have been possible by virtue of the management’s ability to recognise the conflicts that emerged from the competition among the different units in the organization and the subsequent contradictions they (i.e. conflicts) caused in the management’s sub-activity system. These contradictions, which I perceive to have arisen between the organization’s management and the division of labour, on one hand, and between the organization’s staff (i.e. community) and the division of labour, on the other, were identified and subsequently dealt with by the management. My reflection of these scenarios in the management’s sub-activity system is highlighted in figure 46 below.

Figure 46: Sub-activity system of the management shaped by the division of labour.
As it is obvious in figure 46 above, the management did not (and continued not to) allow the re-emergence of these contradictions in its-activity system by virtue of their (i.e. management) ability to ensure that the staff members (especially, the researchers and managers) internalised the requisite best practices for both project management and business development as well as for personnel management. It is therefore apparent that a healthy competition was encouraged among the different business units with the creation of a common platform for the various managers to network. The involvement of the various managers in technical work, up to some degree, in addition to their managerial functions also appeared to have encouraged the creation of trust among the workforce. It can be argued in this respect that the signs of trust which emerged within the organization’s internal environment were also strengthened by the collective approach adopted by the management as tools for both problem-solving and learning. In this regard, I perceive the division of labour during the transformation process to have been shaped by a high degree of positive collaboration and cooperation among the members of the various units and divisions within the organization.

7.5. Characteristics of the Community.

As I have outlined in the study framework, it is important to look at the organization’s climate and culture in order to gain an understanding of the community’s group characteristics. Therefore in this section, I will describe and analyse the state of the organization’s human resource system as well as the information flow process and communication system that prevailed during the commercialisation process. I will also appraise issues relative to the organization’s values and norms as well as their impact on personnel management.

7.5.1. State of the human resource system.

In the organization’s bid to operate according to sound business practices, it could be described by the interviewees to have shut down some areas within its operational system which were considered as not viable in terms of generating income. As it was explained in the interviews, this action gave rise to a retrenchment exercise (i.e. job losses) which resulted in a reduction of the organization’s staff strength from about four and half thousand to just over three thousand. Aside the organizational down-sizing,
the issue of staff turnover was also said to have arisen, and which according to some of the interviewees, occurred as a result of some staff members holding the view that the management was driving the organization towards a direction that they (i.e. the affected staff members) thought was wrong. This category of staff members were perceived by the interviewees to have felt that the organization’s new initiatives on marketing and training to secure sales were things that they did not want to do. This scenario is reflective of the conflicts that emerged within the organization during the commercialisation process as a result of some staff members dissenting to the business element of its new identity. By implication, a contradiction can be viewed to have existed between the dissenting staff members (as subjects of activity) and the income generation element (i.e. object) of the commercialisation process. As a consequence of these, there also emerged a contradiction between the management of the organization (as subjects of activity) and the dissenting staff (as members of the community). The picture that emerged here was indicative of the fact that a contradiction also emerged between the sub-activity systems of the management and the staff. This development was viewed by the interviewees to have been adequately handled by the management through the establishment of a good recruitment policy, as it was explained by an interviewee in the following expression;

We also went through a very turbulent period during which we had a very high turnover. You must make sure that you have a recruitment policy, such that you don’t recruit people just on their technical skills. You can also, actually take into account the age distribution in the organization and the management capability of people. If you appoint staff from the scientific side only, you will miss out in the leadership and management competences. You need to add that to your recruitment. We have done it successfully going through that turbulent period.

There were also said to have evolved lots of mixed reactions within the organization’s community. While some staff members (especially the old scientists) were described by the interviewees to have felt threatened by the commercialisation process, others (especially the young and newly recruited researchers) were viewed to have seen it as an opportunity. This scenario was highlighted by an interviewee in the following comment;

I think one of the issues was that, if one looks at the top, it was made up of mainly scientist and engineers with technical backgrounds, and that was the big problem. We needed entrepreneurs, business developers, people that can interface with the market and that kind of thing.
Therefore, many quality people lost their positions. Some were offered new positions. There were lots of new faces in the upper management. That was a very powerful signal, I think.

During the early stages of the commercialisation process, one of the strategies used by the organization and which was perceived by most of the interviewees to have made a very important impact was that, lots of young scientists, researchers and technologist were drawn into the management fold. As it was pointed out by an interviewee;

I think that in the beginning, maybe, the managers that were selected were largely young people who wanted to change the world. I think that it is important to have such young fresh blood in a change programme.

Similarly, concurrent events (i.e. education, training and development) relative to the best practices for capacity building and business development were also said to have occurred within the organization. According to most of the interviewees, the occurrence of these events was underlined by the organization’s realisation that one of the key competences it needed (but which it did not have before, by virtue of its university-like orientation) was good project management skills. Within this context, training and development programmes were said to have been immediately put in place. In this respect, the organization was able to put in place the requisite mechanisms for its staff (especially the scientist) to acquire additional skills and competences in areas such as business and marketing. In the opinion of most interviewees, the organization’s management instituted what they (i.e. interviewees) perceived to be a very entertaining training programme in this respect, and for which participation was mandatory for all the staff members. Therefore, all senior staff members (scientist/researchers) in the organization were said to have been compelled by the management to undertake a standard training in marketing. Additionally, the management was said to have appointed marketing professionals (non-scientists) in order to ensure that the organization’s business-oriented focus was ran effectively along the lines of good project management. This action of the management, as I learnt from the interviews, was informed by their desire to ensure that all possible risks associated with project management (as a core activity) relative to the organization’s commercialisation process are covered so that contracting can be carried out soundly. As I gathered from the interviews, the career-development-path of the organization’s senior staff members was oriented towards a management path or a research path. As such, this category of
staff members were accorded the requisite training in order to assist them to become competent in their chosen area. A management model that was said to have been developed in this respect was referred to as the duo-career path. By virtue of this model, I understand that the organization’s staff members were trained to follow either a more scientific route (with performance measured more in terms of the scientific excellence and research papers they produce in peer review journals) or to follow the research management route where they were made to become financially accountable in order to be able to deliver to the client. Based on this philosophy, the organization was said to have trained its scientist to acquire such business skills, as financial management and project management as part of the commercialisation process. Additionally, when new staff members with certain main skills (whether as engineers or scientists) were viewed by the management as having communication difficulties, the organization was said to have provided support by organising courses in communication for such new staff. As it was noted by an interviewee;

Even if new staff members find it difficult to coordinate their marketing activities, we provide a course for them. Now, we also have courses on mentorship, financial management, innovation management, business orientation, as well as leadership and development. All these form part of the CILLA umbrella. Our key job is eighty percent retraining inside the organization. We call that “a whole basket of quality knowledge workers”. By this, we make sure that people do not say no to opportunities, simply because they do not have the skills and the confidence to make them grow in the future.

Reflecting on this, another interviewee also noted that;

In the meantime, I think we have learnt a lot about new career path. We are all making progress and I now think increasingly that some of our good scientist (we have quite a good number of them) are in the right environment. It is great for them, and they are recognized for their efforts and achievements.

On the issue of instruments used for work, the organization was said to have started off with technical information and equipment which rose up

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225 CILLA is described as a human resource development programme of the organization which had been running for four years now. It is growing in terms of the portfolio, in terms of the impact it is making on the organization, and it is also becoming involved nowadays in other cross-cutting activities in the organization, like the quality steering group, life-knowledge management, life-exchange programmes with the World Bank and others. Lots of people went on training courses, such as commercial course and business grew significantly.
during the transition. Along the line, the technical component was said to have been lowered down a bit, while the administrative part was given a rise as a way of ensuring a fair balance between them. A customised medical aid scheme was also said to have been developed and put into practice by the management. The quality of the human resource system was described by an interviewee in the following terms:

We also have a creative management status for innovators. We have quite a lot of autonomy, in terms of the salary that we pay. We have de-linked from the public sector sort of salary scale.

I also learnt from the interviews that one of the key drivers which contributed in counteracting the emergence of any form of draw-back phenomenon during the commercialisation process was the way and manner the reward measurement system functioned. The measurement was said to have been based on group performance in sharp contrast to the previous measures which were based on individual\textsuperscript{226} performances. The organization was also said to have recognised the fact that differences existed in the responses to be derived from rewards, and thus was able to align its reward system in this respect. According to most of the interviewees, the organization also put in place a mechanism which allowed it to assess at a really deeper level, whether awards, prizes and recognition that the staff members received were deemed as adequate and appreciable. This development was highlighted by an interviewee as expressed in the following comments;

I think that the issue of the senior scientists offering resistance to change is a culture issue, which is internal, because the scientist has a different form of response to different form of rewards. For the scientist, a good reward is a peer compliment, recognition in the field, and publication, all of which are encouraged by our organization. We recognise that the normal performance criteria which stimulate the scientist are very different to the kind of performance rewards that stimulates the business person.

And also;

One has to show the staff an honest relationship between the business aspect and the personal issue aspect. We have made moves towards that

\textsuperscript{226} Such individual measures were viewed to have resulted in some people building “walls” around themselves, and yet managed to survive in the organization without actually contributing to its growth.
in our unit, where people have got substantial rewards. In our evaluation of staff, there is a lot of attention in trying to understand the impact of the system on the whole organization. We focus strongly on performance. So if you are really a key person in our organization, if you are really performing well, and you are really making a big impact on the organization, then you get a competitive salary.

It is therefore obvious from the observations I have outlined above that the initial phase of the commercialisation process was highlighted by some tensions that emerged between the management and some members of the staff who dissented to the idea of commercialising the organization’s operations. I perceive this tension to have led to the emergence of contradictions in the sub-activity systems of both the organization’s staff and the management. But as it is also obvious from the narrations I have outlined above, the management was able to simultaneously identify and deal with these contradictions as they emerged in their activity system. My reflection of this scenario is highlighted in figure 47 below.

Figure 47: Sub-activity systems of management and staff due to the human resource system.
The implication here is that the management was able to get the staff to internalise the best practice for personnel management and this resulted in it’s (i.e. management) ability to see to the continuous improvement of the organization’s human resource system, and which consequently heightened the staff members’ motivation and enthusiasm towards the commercialisation process. A major contributing factor in this respect was the management’s institution of the relevant training and re-training programmes for all the staff members, as I have noted earlier on. The impact of this action was that it enhanced the staff members’ development through the continued-acquisition of improved skills and competences in line with the organization’s commercialisation process. Other key factors that seemed to have led to the improvement in the human resource base included the revamping of the organization’s upper management with competent new young faces, the introduction of new reward system, the management’s capability to recognise and exploit useful knowledge within the operating environment, as well as the addition of competence to the skills of both scientists and engineers. This appears to have contributed in the organization’s ability to motivate, and thus re-orient the staff members’ thinking and perceptions positively towards the commercialisation process.

7.5.2. The information flow process and communication system.

There was a general consensus among the interviewees that in the course of the organization’s commercialisation process, communication was one issue that was considered to be of most importance by the leadership. In this respect, the organization’s management was viewed to have ensured the continuous flow of information, which resulted in regular communication within the system. It was also revealed by the interviewees that the staff members had a fairly strong say on the organization’s board. Therefore, the opening up of communication within the organization’s operating environment was viewed by the interviewees to have impacted positively on the commercialisation process. They also perceived this to have contributed in shaping the focus of managers in the organization, transforming them into positively-minded and forward-looking leaders. In the same vein, staff members who were initially perceived by the management as not functioning according to the organizations’ new objectives were also motivated by the continuous information flow. Indications of these are reflected in the following comments by an interviewee;
Before I started with the project, I came to an agreement that there is no taboo and it has to be an open process, and you cannot hold back on anything. There was some agreement that for everything that we put on the pedal, it is not management which will say that, yes we will change this, but rather we would say yes, it will be as this. I think that this happen up till now...... I did communicate back to all the people as part of the process, so I kept them in the loop as well, in order to win their trust when we needed feedback. I think the process was well handled and there was quite a lot of communication continuously.

In order to facilitate the conduction of daily activities in the organization, the management was also viewed by the interviewees to have reinforced the organization’s internal communication system by putting in place an intranet website with enormous volume of information on it. According to the interviewees, this made it easier for the staff members to know outlined strategy of a particular division or even the whole organization. In addition, a regular customer feedback system as well as a regular customer reporting system were said to have been installed. As it was explained by an interviewee;

If I want to know what the strategy of the organization is; it is on the intranet. It is sitting on my personal computer right in front of me. If for any reason I personally feel that what is on the intranet does not answer the question I have, I go up with a slight difficulty to my programme manager to find out what the story is. If he/she is not sure of what the story is, he/she might get in touch with the director.

I further gathered from the interviews that by virtue of the easy and regular access to information within the organization, decision-making became more localised. As a result of this, the organization’s internal environment was also said to have became a source of empowerment to the staff members. The impact of this development, as explained by most of the interviewees, was that the staff members developed positive attitudes toward the commercialisation process. In this respect, an interviewee noted that;

I have been involved in many change processes, and the one that has been successful has very good leadership; has over-communication, that is, nobody can say he or she did not get the message; repeated communication in getting things done, and also intensive training of people so they can make the new concept their own; that they understand what the change is all about; they learn new language almost in terms of the transformation; and the new things they need to do. You
need all those ingredients to make it work. This, in my opinion, our organization managed to do with a relative success.

It can be inferred that the quality of the communication system, which was underlined by an effective information flow process within the organization, was relatively efficient. This seemed to have contributed significantly in minimising the initial feelings of resentment developed by some of the staff members who dissented to the organization’s commercialisation process. This resentment, as I have discussed in subsection 7.5.1 (see figure 47 in page 266) was attributable to some of the staff members’ initial opposition to the organization being transformed into a commercial entity. The facilities put in place to ensure easy and regular access to information sources as well as the feedback mechanism seemed to have also functioned well by ensuring an efficient flow of information inside the organization. This seemed to have also contributed to the creation of the empowering atmosphere within the organization’s internal operating environment.

7.5.3. Orientation of organizational values and norms.

The organization’s management were viewed by the interviewees to have spent enormous amount of time in figuring out how to re-orient the organization’s culture/values towards the commercialisation process. In this regard, the management were said to have been conscious of the fact that the staff members valued certain kinds of attitude a lot more than others. Thus the management was perceived by most of the interviewees to have shown its full commitment towards the commercialisation process. Hence it was able to make lot of people within the organization to realise the need for the change. It is indicative from the interviews that during the commercialisation process, the management realised that some of the activities being carried out in the organization were influenced mainly by scientific interest in contrast to the organization’s commercialisation objectives. According to the interviewees, a number of things happened in this respect and which helped in setting the stage for the organization’s march towards the commercialisation of its activities. I learnt from the interviews that in the early days of the commercialisation, most of the staff members (especially the scientists and researchers) found it very difficult to change and realign to the organization’s new culture. The underlying reason for this difficulty was ascribed by the interviewees to the fact that the affected scientists and researchers continued to seek comfort within the
confinements of the old organizational culture based on the following mindset, as it was recalled by an interviewee;

I am a scientist, leave me alone. I have got job to do. I must carry on, and I am delivering good scientific output. I am producing all the papers, I have seminars, I have added to the value which is knowledge based, I am achieving my scientific priorities almost all changed.

As I understand it, the organization’s old culture was characterised by scenarios that saw most of the staff members withdrawing back and creating their own corners within the organization which they surrounded with what the interviewees described as self-interest protection walls. These observations, in my opinion, are reflective of the tensions and possible conflicts that emanated in the organization’s working environment that led to the emergence of contradiction between the management and the scientists (as part of the community). This could also be viewed to be a result of the contradiction that existed between the scientists themselves (as part of the community) and the division of labour, as shaped by the best practices for project management. But as I understand from the interviews, the management was able to overcome the difficulty it encountered with the scientist/researchers by winning over their (i.e. the scientist/researchers) confidence towards the commercialisation. This development was perceived by most of the interviewees to be one of the biggest issues that the management had to solve in the organization. Thereafter, a new business-oriented organizational culture underlined by teamwork was said to have emerged within the organization (i.e. teamwork was perceived by the interviewees to have been highly valued by the organization’s management as opposed to contribution by individuals). This business-oriented culture was described by the interviewees to have developed quite smoothly (and slowly) over time, and grew from being a very soft client relationship (based on which things were handled quite more easily) to that of the client getting harder, in terms of delivery demands. As such, the organization was viewed to have become very operational with the staff members responding effectively to the needs of clients. As it was recollected by an interviewee;

What struck me at the time was the tremendous hurt felt by people who wanted to stay here. They said we are scientist and we don’t know how to do this commercial thing. It is very difficult and you want us to change ourselves overnight. In any way, they survived. The organization had money to pay the salaries at the end of the month. The people
confronted the issue with determination, because if they had decided to run away, this place would have been closed by now. In more recent years we have experienced actual growth in people and also in our target, and also in attitudinal change where people now see abundance out there in terms of opportunities.

The willingness of the staff to conform to the organization’s new culture/values was credited by the interviewees to the management’s ability to enforce the practice of strategic business planning and development at the organizational level, as well as at the business units and programmes levels. As such, the development of the new organizational culture (i.e. the business culture) was said to have been facilitated by the acquisition of a new mindset by the staff members. This new mindset was perceived to have been shaped by the following thinking, as outlined by an interviewee:

You either have to conform or there is no place for you. So it was quite cut and dry. It was not an optional change. It was communicated as ‘this is the way we are going. Sit in or you would be out’. The new culture is underlined by the questions: How do we do things together? How do we network? How do we share?

I also learnt from the interviews that at the beginning of the commercialisation process, trust was at its lowest point within the organization, with nobody talking to anybody. This phenomenon was viewed by the interviewees to have faded out as the organization grew to maturity with its emphasis on information sharing, collaboration in research, and networking. It also made it easier for the staff in general to observe and recognise colleagues who might be having problems, and thus offer assistance. As it was expressed by an interviewee:

What you’ve got to see is that trust is around in this organization. The interesting thing is; how do you get trust? Trust is not an input function. Trust comes out of the process. It only comes out of dialogue. You only hear it when people start sharing their differences and perspectives of the future. Real values and issues develop a shared understanding of these, and then you get development into the future.

The organization was said to have fully transformed and thus operated under a new dispensation ten years on (i.e. by the year 1998). It was deemed by the interviewees to have been commercialised, in terms of the way it was managed, and also on how it was focused, with respect to
programmes, projects and everything that it did. At the same time, it was viewed to have comfortably embraced its staff members who had fitted into the new organizational environment. As it was noted by an interviewee;

One of the things that keep people here is that ‘your kind of job is interesting and you have the kind of tools you need to do the job’. Where there is trust, there is collaboration. Over the years, intellectually, we have developed a lot of internal relationships. Now we have been successful to a large extent, I will say we are too successful, because now many scientist and researchers are spending more time in the market place, in a sense, looking for business opportunities.

Based on the above observations, I infer that the management was able to identify and simultaneously deal with the contradiction that emerged in its activity system in the course of re-orienting the organization’s values and norms. My overview of this scenario in the sub-activity system of the staff (i.e. scientist/researchers) is shown in figure 48 below.

Figure 48: Staff’s sub-activity system due to the orientation of values.
By virtue of this ability, the organization’s was able to enhance the internalisation a new organizational culture with its underlined values/norms by its staff members in the course of the commercialisation process. It is evident that these new values and norms were strongly shared within the respective divisions of the organization. The slow-time process of change also seemed to have induced in the staff members elements of self-satisfaction and personal commitments to the objectives of the commercialisation process. This might have also coupled with the prevalence of good management to induce in the staff members, loyalty to the organization, resulting in their acceptance of the new organizational values and norms. The ability of these values and norms to prevail and impact positively on the organization’s internal operating environment can also be attributed to the institution of the new performance review and reward systems in line with the new business culture, as well as the good quality of the organization’s management. It can also be deduced that the reorientation of the organization’s institutes (i.e. under the old dispensation) into divisions (i.e. under the new dispensation) with completely new operational identities also helped to encourage the acceptance of the organization’s values and norms by the staff members.


Based on my description and analysis of the characteristics of the various elements in the organization’s activity system, I have shown in section 7.3.1 that a project-oriented management style which is seen as good from the perspective of the best practice for organizational management was used to guide the commercialisation process. This is because the best practice for organizational management requires the institution of a project-oriented management style based on which there will be some devolution of powers from individuals to teams. It is obvious from my analytical descriptions that the devolution of power from individuals to teams really occurred in the organization with those in authority still retaining their individual influences. This observation contrasts the tendency by those in authority to retain the hierarchical management style due to what I presume to be the fear of losing the influences and powers which allow them to dictate events within their organizations as individuals (i.e. by virtue of their hierarchical positions). In another vein, it is also quite obvious that the head of the organization had the requisite authority to operate and take independent decisions in relation to the best management practices implementation under the commercialisation
programme. Thus it is obvious that the power to influence activities relative to the commercialisation process lay within the authority of the head of the organization as well as its governing bodies. This was by virtue of the fact that the organization, in line with the best management practice for governance, had a legal structure that gave it both financial and decision-making autonomies. In the same vein, a majority of its board members were industrial-clients with the mandate to steer the organization in accordance with the interest and expectations of its clients in the innovation chain. This best practice for governance appears to have given credence to the enormous trust in the internal structures of the organization, a factor which can be credited to the development of confidence by the staff members in the management. I view this phenomenon to have also been complemented by the prevalence of an effective information flow process and communication system, as well as the presence of operational transparency within the organization.

As I have reflected in section 7.5, the acceptance of the new corporate culture (i.e. business culture) by the staff at the initial phase of the commercialisation process seemed to have created the avenue for the development and building of an efficient organizational and management system. In this regard, it is obvious that plans for capability building in the organization were carried out based on inputs from the market (industry), the client-majority board, and the management teams. These systems also appeared to have contributed significantly on the organization’s ability to establish a new positive image for itself, and in the processes, enhanced its prospects as a commercial-oriented research entity. As I have discussed in section 7.4, it is evident that the organization was able to streamline its operations by encouraging adequate clarity in its operational processes, as it was underlined by its formation of the various business units. What appeared to have prevailed here was the institution of the best practice for business development, under which a corporate business development group was created to handle awareness and market strategic planning, while the project managers conducted the bulk of the selling activities. It is also apparent that the management encouraged a healthy competition among the different business units with the creation of a common platform for the various managers to meet and network. In this respect, it is indicative from my discussions in section 7.4 that the management perceived as effective, on one hand, the identification of client’s need based on input from staff, board and regular meetings with industry groups, and on the other hand, the offering of rewards for business
development (financial and recognition). My overview of the organization’s activity system during the commercialisation process is given in figure 49 below.

Figure 49: Reflection of CSIR’s activity system during the commercialisation
My impression of the organization’s collective activity system entailing the contradictions that were identified and simultaneously dealt with in the course of the commercialisation process is summarised in figure 50 below.

![Figure 50: Summary of contradictions “identified and dealt with” in CSIR’s collective activity system during the commercialisation.](image-url)

My overall impression of the organization’s collective activity system, as it is characterised by the quality of its respective elements is also reflected in figure 51 (see next page).
Management style is project-oriented and is based on objective.

- Complete orientation of the organization's culture and history. Board, management, and staff cooperate very well. Operational transparency within the organization.
- Management's recognition and exploitation of useful knowledge within the operating environment. Staff commitment impacted positively resulting in apparent show of trust in management decisions and actions.
- Effective information flow process and communication system. Development of trust among staff; old staff fully related to new work culture. New staff saw more room for innovation and growth.

- Divisional functions and roles are clearly defined. Directors of the divisions do not handle only administrative processes, but also engage in the research work.
- Lots of collaboration and teamwork within divisions and their units, and also between divisions.
- Provision of new knowledge to enhance staff performance through skills and competence acquisition.
The involvement of the various managers in technical work, up to some degree, in addition to their managerial functions also appeared to have encouraged the creation of trust among the workforce. In my opinion, this is reflective of the best practice for project management whereby project teams were formed by taking into account the appropriate expertise for each project (regardless of where individuals report in the organization). In this context, the project managers were given the authority and responsibility to manage projects without interference once they had been thoroughly checked by the management. Hence, the division of labour during the transformation can be perceived to have been shaped by a high degree of positive collaboration and cooperation within the organization. Additionally, the quality of the organization’s human resource system seemed to have been immensely improved. The underlying factors for such improvement, as I have discussed in section 7.5, can be related to the institution of relevant training and re-training programmes which ensured the continuance of competence development, improved skills acquisition, as well as capability building for both the new and old staff in the organization. These were in addition to the introduction of new reward systems, management’s recognition of useful knowledge within the system, as well as the addition of competence to the skills of both scientist and engineers. I view these factors to have greatly motivated the staff members and as such contributed to the enthusiasm with which they participated in the commercialisation process.

Therefore, it can be fairly presumed that in the initial phase of the commercialisation process, there was an emergence of multivoicedness within the organization’s collective activity system, but to which the management was able to come into terms with. The emergence of such multivoicedness in the organization’s collective activity system is understandable since it (i.e. the activity system) provides the platform for the expression of multiple points of view, traditions and interests. As Engeström (2001) explains, the multivoicedness is a source of trouble and also a source of innovation, demanding actions of translation and negotiation. In this regard, I perceive the management to have taken remedial actions of translations and negotiations which ensured that the multivoicedness that emerged did not embed itself in the organization’s activity system as a source of trouble, but rather as a source of innovation. In this regard, it can be argued that the evolved feelings of work satisfaction among the staff members resulted in the acceptance of the new organizational values and norms and which went on to improve the quality
of the internal operating environment. It can also be argued that the flexibility of the new organizational structure (i.e. horizontal organizational structure) was by virtue of the organization’s adoption of the project-oriented management style (i.e. base on objectives). I view this structural flexibility to have combined with the organization’s efficient communication system (which was marked by an effective information flow process within the organizational system) to create an empowering environment for both the management and staff members. This feeling of empowerment might have served as the base for the perception held by the interviewees to the effect that the management had in place a clear strategic direction as well as a clear managing process during the commercialisation process.

7.7. Analytic Discussions and Conclusions.

By picturing the entire frame of figure 51 (see page 277), it is quite obvious to me that the effect of change by the organization with instruments obtained from external sources proceeded successfully under the context of a stable sub-system. This is reflected by the presence of the required synergy among the elements in the organization’s collective activity system. As I have noted in chapter two (sub-section 2.4.1), Engeström’s definition of an activity is that, it is a systemic formation unifying the processes of production, distribution, exchange, and consumption as transitions between subject, object, instrument, community, rules and division of labour. Thus by comparing the outlines of this definition (see figure 3a in chapter two, page 51) to the outlines of figure 51 above, it is obvious that the unifying process that the interfaces of production, consumption and exchange were expected to create in the organization’s collective activity system did materialise. This is from the perspectives of Marx’s explanation that while production creates the objects which correspond to the given needs, distribution divides them up according to social laws. Marx also explains that by virtue of exchange, the already divided shares are then parcelled out in accord with individual needs and then in consumption, and as such, the product steps outside this social movement and becomes a direct object of individual need. Based on this perspective, I posit that by virtue of the synergy that prevailed in the organizations collective activity system, the production (i.e. subject-instrument-object triangular interface) that emerged from the commercialisation process was able to create the requisite object which corresponded to the organization’s outline needs (i.e. carrying out
scientific research under reduced government funding, but with capability to self-generate income). In the same vein, the distribution (i.e. community-object-division of labour triangular interface) of activities in the organization towards the realisation of these needs was also visible due to the exchange value (i.e. subject-rules-community triangular interface) of the organization’s activity also materialising. Consumption (i.e. subject-object-community triangular interface) of the commercialisation process was also evident. This is because the production element was able to step outside the organization’s social movement to become the direct object and servant of the organization’s needs, and in the process satisfied its consumption. In my opinion, this observation underlines the significance of the point by Marx that a definite production determines a definite consumption, distribution and exchange, as well as the definite relations that exist between these different interfaces. It also reflects Engeström’s (1987) position that production is to be always seen as the consumption of the individual’s abilities and, also as the means of production. Correspondingly, consumption is also to be seen as a production of the human beings themselves. Furthermore, distribution is also to be seen as not just a consequence of production, but also as its immanent prerequisite in the form of the distribution of instrument of production and also the distribution of members of the organization among the different kinds of production. Finally, exchange too is found inside the production in the form of communication as well as interaction227.

I therefore argue that as a result of the overhaul of the organization’s previous system prior to the commercialisation programme, its community members (i.e. the board, the management and the staff) were able to internalise the practices entailed in the best management practices model. The work environment that emerged from this internalisation created an atmosphere that motivated the community members towards accepting the organization’s drive to commercialise. It is obvious that the institutional rules allowed room for individual growth and personal innovation. The division of labour was able to promote collaboration among differing divisions. It also created platforms for the sharing of experiences and the exchange of ideas within the organization. There was also significant cooperation among the various parties who formed the organization’s community (i.e. a supporting, but not interfering board; management team with power to control the process at its own pace; and a motivated staff).

227 I will expand on these issues in my cross case analysis later on in chapter eight.
Even though, an activity system cannot be seen to be completely devoid of any form of contradiction (Engeström, 1987), it is indicative that the new systems put in place had enabled the management to take continued actions on new developments (as they emerged) in the organization. By virtue of these actions, the synergy that existed within the organization’s collective activity system was retained. All these factors might have collectively impacted on the organization’s commercialisation process and thus contributed significantly to its sense and meaning (since the year 1998) which indicated a successful outcome. In relative measures, the organization was able to self-generate 70% of its annual income. Since the organization was determined to retain this success, the picture of the scenario that I have created so far can be related to Engeström’s depiction of the zone of proximal development. In this respect, the organization can be perceived as attaining its foreseeable activity system from the perspectives of its changed identity. But since an activity system cannot be seen to be completely devoid of any form of contradiction, as I have noted above, it can then be argued that the organization’s commercialisation process has not completely traversed the zone of proximal development. In this regard, the management has to continue managing the organization’s collective activity system (see figure 51 in page 277) in order to improve upon the synergy that prevails among its elements in response to changes in the external environment.

As I have clarified in chapter two (section 2.7) in relation to Engeström’s (2000a) representation of the cycle of learning action (see figure 11 in page 88), the extent of my study is to provide the base for understanding possible developments that the organization dealt with in its commercialisation effort. I therefore view my descriptions and analyses of the organization’s collective activity system (from section 7.1 to 7.6, and broadly summarised in figure 51) as providing an understanding of the organization’s internal environment, and hence in line with my first proposition for this study. As a recall, I proposed in chapter one (section 1.5) that existing tensions in an RTO’s activity system serve as internal environment constraints which influences the extent to which external environment factors negatively affect the organization’s implementation of Best management practices. I also noted in chapter one (section 1.4) that my findings from an earlier study (Sanda, 2003) points to some external environment factors that also constrained the commercialisation process. These included the prevailing socio-economic and legal frameworks.

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228 I have discussed this under theoretical framework. See figure 10 in chapter two (page 88).
influence of consumer and market forces, the pervading political atmosphere, the operating climate, subsystem stability (i.e. operating system), the decision-making approach, the educational background (qualification) of staff members, and also the existing communication interfaces within an organization’s structure. The specific external factors that I identified in this case are highlighted under CSIR in table 1 (see chapter one, page 25). I therefore view that by cross-analysing the insights that I have provided in this case together with those to gained from cases one, two and three (which I will do later in the next chapter) the requisite platform for modelling new solutions to facilitate the internalisation of the best management practices model in future commercialisation process can be established. By implication, the cross analyses is to signify the possible contribution in the applicative understanding of Engeström’s model and principles of activity theory in relation to my study framework229 (which I will discuss later in chapter nine) as a template for guiding an organization’s commercialisation process through the zone of proximal development and towards the attainment of a possible expanded activity.

229 See figure 9 in chapter two (page 83).
CROSS CASES ANALYSIS

As a recall, I proposed in chapter one (section 1.5) that existing tensions in an RTO’s activity system serve as internal environment constraints which influence the extent to which external environment factors negatively affect such organization’s implementation of best management practices. In chapter two, I provided an insight of the theoretical framework within which I outlined a study framework to guide my research. In chapter three (sections 3.2 to 3.3), I gave a highlight of events which informed the “case” characteristics of this study and which also established the requisite need for the involvement of different cases in different developing countries. It is based on these perspectives (as I have discussed in section 3.4) that I selected four RTOs from Ghana, Trinidad, Botswana and South Africa as cases in this multiple-case study. Even though these four cases vary in their details (as I have explained in sub-section 3.4.1), I expect my comparative analysis of their insights (i.e. in this chapter) to lead to the building of a general explanation that will fit the outcome of each of the individual cases, as Yin (1994) has noted. My pursuance of this goal (i.e. in line with the analytic methods of this study as I have discussed in chapter three, section 3.6) started with explanation-building analyses of data at the single-case level and whose individual outcomes I am to cross analyse in this chapter. It is in this respect that I presented the detailed analytic insights of each of the four individual cases in my study, starting with case one (Ghana) in chapter four, case two (Trinidad) in chapter five, case three (Botswana) in chapter six and case four (South Africa) in chapter seven.

In this chapter, therefore, I will firstly recall the key issues reflected in the previous chapters relative to the characterisation and classification of this study and which informed the analytic strategy that I have adopted in the previous four chapters (i.e. analysis at the single-case level) and that which I will adopt in this chapter (i.e. cross-analyses of the single cases outcomes). I will follow this with summaries of the explanation-building analyses of data at the single-case level that I carried out for each of the four cases (i.e. Ghana, Trinidad, Botswana and South Africa). Thereafter, I will pattern-match the single-cases’ analytic outcomes. I will end the
chapter by comparatively analysing the single-cases’ analytic deductions relative to the functionality of their organizational activity systems and also the multivoicedness in those systems.


As I have previously stated, the underlying problem for this research is that despite the successful application of RTO best management practices by such organizations in the developed countries, especially in Europe, the efforts of most RTOs in the industrially developing countries to implement and internalise similar management practices are found to have been constrained by some undetermined environmental factors (Mengu and Grier, 1999). In the pursuit of a possible solution for this research problem, I have been seeking to understand how factors internal to the operating environments of RTOs contribute in constraining their efforts to implement and internalise the best management practices model during their commercialisation process. By virtue of the underlined purpose of this study (which I have noted in chapter one, section 1.3), I have explored and highlighted on tensions and disturbances leading to the emergence of contradictions in the organizational activity systems of RTOs in Ghana, Trinidad, and Botswana. I also explored and highlighted on the extent to which such contradictions were managed as they emerged in the organizational activity system of the RTO in South Africa (i.e. chapter seven). The empirical data that I collected and used in the individual analysis of each of these four cases were not determined by the research problem, *per se*, but rather by a tentative answer to it which is provided by the organizational activity theoretical framework that I have used. The reason for this is that I used a tentative hypothesis (as I have stated above) to give direction to this research. The specific question that emerged in this regard, and whose answers this study seeks to find is as follows: What are the possible influencing factors internal to the RTO’s operating environments that constraint their efforts towards the implementation and internalisation of the best management practices model?

In the subsequent sections, I will seek to answer this question through the creation of a general understanding of the constraining factors within the activity systems of RTOs in developing countries, and which can further contribute towards the attainment of the overall research goal. As I have outlined in chapter one (sub-section 1.1.3), the goal is to find answers to the research question which can lead to the development of a template (i.e.
as a tool for organizational learning) which the RTOs can use as a guide to assess their organizational activity systems for possible contradictions when introducing new practices. Thus by cross-analysing the insights that I have provided in the four individual cases, the requisite platform for modelling new solutions to facilitate the internalisation of the best management practices model in future commercialisation process can be established. By implication, the cross analyses will signify the possible contribution in the applicative understanding of Engeström’s model and principles of activity theory in relation to my study framework (which I will discuss later in chapter nine) as a template for guiding an organization’s commercialisation process through the zone of proximal development towards the attainment of a possible expanded activity (i.e. its foreseeable activity system).

To start with, I will present summaries of the four individual cases I that have already analysed in the previous chapters. Afterwards I will carry out a pattern-matching analysis (Yin, 1994) across these four individual cases. I will then discuss the outcome of this analysis and then seek to draw conclusions from the perspective of analytical generalisation.

8.2. Summaries of the Four Analysed Single Cases.

In my analytical approach for each of the single cases (i.e. Ghana, Trinidad, Botswana and South Africa), I described the characteristics of the institutional rules (i.e. how they shaped each organization’s management structures and also how they impacted on the psycho-social environments of the staff members), division of labour and the community in each organization’s activity system using the actions of the identified groups (i.e. management team, senior staff, and junior staff members) as my subordinate units of analysis. I also analysed and discussed each organization’s activity system, using the collective group (i.e. workforce) actions as my prime unit of analysis.

8.2.1. Analytical summary of case one (Ghana).

In chapter four, I looked at the attempted application of a best management practices model in guiding FRI’s commercialisation process as well as the extent to which the process was affected by factors relative to the organization’s internal environment. I noted that the guidelines provided by the best practices model for governance, personnel management, and
organizational management were not fully utilised. The rules that prevailed were shaped by civil service codes which lacked the requisite flexibility to relate to the requirements of the commercialisation efforts, despite the attempt to infuse it with the best practice for business development. I indicated that governance in the organization was underlined by a bureaucratic organizational structure that remained vertical and hierarchical (based on job description) as against the best practices for organizational management (based on objectives). I then argued that despite the provision of specific guidelines in the best management practices model to enhance the commercialisation effort, the organization’s institutional structure basically remained as that of a government civil service. My appraisal of the division of labour showed that it was not properly oriented to ensure effective coordination of activities within the organization. The changes that were to have been guided by the best management practices for both project management and business development did not occur. I also pointed out the collision that occurred between old ways and new ways of handling projects, as it related to the reluctance of the senior staff (researchers) to accept change.

I assessed the characteristic of the community by looking at how the practice of personnel management impacted on each organization’s climate and culture. In this regard, I appraised the state of the organization’s human resource system, the information flow process and communication system as well as issues relative to the organization’s norms/values. I noted that the organization failed to develop the required competence and/or to provide effective motivators (such as market-competitive salary scales and formal/informal recognition events) needed for the effective functioning of its human resource. I related these failures to the fact that the changes necessitated by the best practices for governance, capability building and project management did not materialise. I also highlighted on the apparent breakdown in the information flow process and feedback mechanism within the organization as well as the absence of regular interaction between those in management positions and the staff members. These gave rise to the segmentation of the workforce and the creation of tensions between the different categories of staff. I also indicated that the management was unable to change the organization’s norms/values in line with the commercialisation process. It retained its old identity as a fully government-subvented organization with a weak management system in contrast to the new identity (i.e. a scientific-oriented research organization with an income generation capability) that it was to acquire. I then
concluded by arguing that the management was not able to change the organization’s civil-service oriented culture into that of a business-oriented corporate culture. I also argued that due to the failure of the organization to completely overhaul its civil-service oriented system prior to the commercialisation process, its subsequent retention and translation made it impossible for the management to effect change because of the enormous tensions and subsequent disturbances that pervaded the organization’s community. I therefore concluded that these factors contributed significantly to the organization’s unsatisfactory ability to self-generate income.

8.2.2. Analytical summary of case two (Trinidad).

In chapter five, I looked at the attempted application of a best management practices model in guiding CARIRI’s commercialisation process as well as the extent to which the process was affected by factors relative to the organization’s internal environment. I noted that during the commercialisation process, the management was able to change some of the organization’s institutional rules in conformity with the best management practices for governance, personnel management, and organizational management. I also explained that the best practice for governance was not used in its entirety, but was rather infused with some civil service-oriented codes that were perceived as important towards the protection of government’s interest. This infusion also created tension within the organization as most of the staff related more to the requirements of the civil service codes. My appraisal of the division of labour showed that it was oriented to ensure effective coordination of activities within the organization. I noted that even though teamwork was evident and functional within individual units, disturbances in the functionality of cross-unit teams was obvious. There were collision between the old way of handling financial aspects of projects and the new one entailed in the best practices for business development. This resulted in the erosion of the synergy that was to have existed among the organization’s specialised units and a new business unit that was formed in line with the commercialisation.

I assessed the characteristic of the community by looking at how the practice of personnel management impacted on the organization’s climate and culture. In this regard, I appraised the state of the organization’s human resource system, the information flow process and communication
system as well as issues relative to the organization’s norms/values. I noted that the management’s handling of issues relative to staff development and remuneration fell short of the requirements underlined by the best practice for personnel management. The capability of the organization to perform was also affected negatively by the low morale that pervaded its operating environment. I then argued that the tension that prevailed in the organization’s human resource affected its bids towards competence development and therefore its ability to improve its manpower base for the commercialisation process. I also highlighted on the apparent breakdown in the information flow process and feedback mechanism within the organization as well as the absence of regular interaction between those in management positions and the staff members. I related these to the stalled functionality of cross-unit teams caused by tensions among different units as a result of the organization’s unsatisfactory communication system.

Furthermore, I made a note of the paradoxical observation for which the organization’s staff appeared to have had no direct conflict with changes in the organization’s norms/values during the commercialisation process, but also appeared to have not fully related to the changes that occurred. I noted that the challenges faced by the management, in this respect, concerned its ability to formalise the new norms/values within the organization. I then argued that these challenges were characterised by the management’s inability to erase the organization’s past image from the perceptions of the staff. I explained that the management’s retention of some civil service-related elements from its previous system during the commercialisation process resulted in the definition of its new corporate image within the context of its past existence. I therefore concluded that even though the organization was able to self-generate a satisfactory level of income, the contribution of these factors ensured that the level of income it self-generated was below its desired expectation.

8.2.3. Analytical summary of case three (Botswana).

In chapter six, I looked at the attempted application of a best management practices model in guiding BOTEC’s commercialisation process as well as the extent to which the process was affected by factors relative to the organization’s internal environment. I noted that there were no changes in the institutional rules as required by the best management practices for governance, personnel management and organizational management. What
pertained was a bureaucratic system with a vertical and hierarchical management orientation as entailed in the government civil service. My appraisal of the division of labour showed that there was no uniform procedure to guide project undertakings. The changes that were to have been guided by the best management practices for both project management and business development did not occur. There were tensions in the working relationship of staff in different units and/or divisions. Therefore, the division of labour was not properly oriented to ensure an effective coordination of activities within the organization during the commercialisation process.

In assessing the characteristic of the organization’s community, I looked at how the practice of personnel management impacted on the organization’s climate and culture. In this respect, I appraised the state of the organization’s human resource system, the information flow process and communication system as well as issues relative to the organization’s norms/values. I noted that the organization was not able to develop the required competence that was needed to ensure the effective functioning of its human resource. I related this to the fact that the changes that were necessitated by the best practices for governance, capability building and project management did not materialise. I also highlighted on the apparent breakdown in the information flow process and feedback mechanism within the organization as well as the absence of regular interaction between those in management positions and the staff members. I also indicated that no serious effort was made by the board and management toward the re-orientation of the organization’s norms/values in conformity with the commercialisation process. It retained its old identity as a fully government-subvented organization with a weak management system in contrast to the new identity (i.e. a scientific-oriented research organization with an income generation capability) that it was to acquire. Based on these observations, I argued that the management was not able to change the organization’s civil-service oriented culture into that of a business-oriented corporate culture. I also argued that the inability of the management to effect change was due to the enormous tensions and subsequent disturbances that pervaded the organization’s community in the course of the commercialisation process.

I therefore concluded that these factors contributed significantly to the organization’s inability to record any successful outcome, so far as its ability to self-generate income is concerned.
8.2.4. Analytical summary of case four (South Africa).

In chapter seven, I looked at the attempted application of a best management practices model in guiding CSIR’s commercialisation process as well as the extent to which the process was influenced by factors relative to the organization’s internal environment. I noted that the guidelines provided by the best practices model for governance, personnel management, and organizational management were fully utilised. The rules that prevailed entail the requisite flexibility in line with the requirements of the commercialisation efforts. In this regard, the best practice for business development is successfully introduced. I also indicated that governance in the organization was underlined by the best practices for organizational management which was based on objectives. I then argued that the organization’s commercialisation effort was enhanced by the overhaul of the organization’s civil service structure using the specific guidelines provided in the best management practices model. My appraisal of the division of labour showed that it was properly oriented to ensure effective coordination of activities within the organization. Changes that occurred were guided by the best management practices for both project management and business development. I also pointed out that the acquisition of new knowledge by the senior staff (researchers) accelerated their acceptance to change and the promotion of teamwork in handling projects.

I assessed the characteristic of the community by looking at how the practice of personnel management impacted on the organization’s climate and culture. In this regard, I appraised the state of the organization’s human resource system, the information flow process and communication system as well as issues relative to the organization’s norms/values. I noted that the organization was able to develop the required competence and also provided effective motivators (such as market-competitive salary scales and formal/informal recognition events) which made the functioning of its human resource very effective. I related these to the fact that the changes necessitated by the best practices for governance, capability building and project management did materialise. I also highlighted on the functional efficiency of the information flow process and feedback mechanism within the organization as well as the presence of regular interaction between those in management positions and the staff members. These gave rise to collaboration among the workforce and the creation of trust between the different categories of staff. I also indicated that the management was able
to change the organization’s norms/values in line with the commercialisation process. It introduced a new identity as a scientific-oriented research organization with a strong management system and the capability to self-generate income.

Based on the developments I have highlighted above, I argued that the management was able to change the organization’s civil-service oriented culture into that of a business-oriented corporate culture. I also noted that the organization was able to completely overhaul its civil-service oriented system prior to the commercialisation process. I then argued that by virtue of this overhaul, the management was able to effect change as a result of the enormous trust and subsequent synergy that pervaded the organization’s community. I therefore concluded that these factors contributed significantly to the organization’s successful ability to self-generate income.

8.3. Pattern-matching of Cases Analytical Outcomes.

My analytical approach for the four cases, whose summaries I have outlined in the sections above, is underlined by the characteristic appraisal of tensions and contradictions in each single-case’s organizational activity system. For each single-case, I appraised the tensions and contradictions that existed between the elements (i.e. institutional rules, division of labour and the community) in the sub-activity systems of its actors (i.e. management and staff) as well as between the sub-activity systems of the different actors. The issue of interest here is to pattern-match the single-case analytical outcomes as characterised by the institutional rules, division of labour and the community.

8.3.1. Comparative appraisal of the cases’ institutional rules.

It is obvious from the appraisal of the cases’ institutional rules (i.e. with respect to how they were shaped by the organization’s management structures and also how they impacted on the staff members’ psycho-social environment) that the guidelines provided by the best management practices (BMP) model for governance, personnel management, and organizational management were not fully utilised by the case in Ghana, and apparently not utilised by the case in Botswana. For these two cases, their attempt to utilise these practices were characterised by conflicts and disturbances that gave rise to the emergence of contradictions in their
respective collective activity systems. With respect to the case in Ghana, it was unable to fully implement and internalise these practices as a result of its management’s inability to manage the contradiction that prevailed between the organization’s workforce and the rules (i.e. best practice guidelines) underlying the practices of governance, organizational management and personnel management. This was largely due to the complex decision-making matrix that binds the organization to a supervisory body, and for which no major attempt was made to overhaul. For the case in Botswana, it was not able to utilise the practices because of the conflicts and contradictions that were associated with its attempt. The presence of contradictions in the sub-activity system of the organization’s management contributed in defining the character of the sub-activity system of the staff. The inability of the organization’s management to manage these contradictions was due to their failure to deal with the tensions that has accumulated both within and between their respective activity systems. Therefore, the rules that prevailed in these two cases were shaped by civil service codes which lacked the requisite flexibility to relate to the requirements of their efforts to commercialise. As such, the practices of governance in these two organizations were characterised by a bureaucratic organizational structure that remained vertical and hierarchical (based on job description) as against the best practices for organizational management which is to be based on objectives.

In contrast to these two cases (i.e. Ghana and Botswana); the cases in South Africa and Trinidad were able to shape their institutional rules in conformity with the guidelines provided by the BMP model for governance, personnel management, and organizational management. While the commercialisation effort of the case in South Africa was strongly enhanced by the overhaul of its civil service structure using the specific guidelines provided in the BMP model, the effort of the case in Trinidad was slightly hampered as a result of the partial overhaul of its civil service structure (i.e. it retained some civil service-oriented codes as a way of protecting the government’s interest in the organization). Thus for the case in Trinidad, its attempt to adapt the best management practices alongside elements from its partially overhauled civil service structure resulted in conflicts and disturbances inside the organization, leading to a contradiction between the management team (as subject of activity) and the institutional rules, but which could not be dealt with.
In comparison, the case in South Africa was able to utilise the guidelines provided by the best practices model for governance, personnel management, and organizational management. This was due to the ability of its management to deal with conflicts and disturbances that emerged in their (i.e. management) sub-activity system. The organization was able to identify and simultaneously deal with contradictions that emerged between the management and the community as well as between the community and the institutional rules. An example in this respect was the way it dealt with the tensions and contradictions that emerged between the sub-activity system of the management and that of the staff members, as a result of the staff members’ initial opposition to the organization being transformed into a commercial entity. As I discussed in chapter seven, the organization was able to manage this contradiction by enhancing the efficiency of its communication system with an effective information flow process. This contributed to the creation of an empowering psycho-social environment in the organization, which motivated the staff members to relate positively to the organization’s commercialisation process. Unlike the cases in Ghana and Botswana (to a large extent), and the case in Trinidad (to some extent), the case in South Africa (through the use of a participatory approach), was able to ensure and sustain the internalisation of the best practices for both organizational management (i.e. project-oriented management style which is based on objectives) and governance. From the perspectives of governance, the organization was able to put in place a legal structure that enables it to operate under both financial and decision-making autonomy. Additionally, a majority of the representatives on its board were also industry clients and the board’s mandate was defined accordingly to fit the role that the organization’s clients serve in the innovation chain. In the same vein, the management was responsible for identifying the needs for change with the power to address those needs. Thus the organization (i.e. South Africa) was able to sustain this system by virtue of its management’s ability to simultaneously identify and deal with emerging contradictions within their sub-activity system.

8.3.2. Comparative appraisal of the cases’ division of labour.

In the appraisal of the cases’ division of labour, it emerged that for both the organizations in Ghana and Botswana, the changes that were to have been guided by the best management practices for both project management and business development did not occur. It is obvious that the division of labour in these two cases were not properly oriented to ensure effective
coordination of activities during the commercialisation process. The severity of the impact created by this phenomenon appears to have weighed more on the commercialisation process of the organization in Botswana than that in Ghana. For the case in Botswana, the tensed working relationship among the staff appears to have made the different units and/or divisions of the organization dysfunctional. Collisions between the old way of handling projects and the new one were clearly visible within the division of labour during the organization’s commercialisation process. The consequence of this was that; the synergy that was to have emerged within the organization’s community did not materialise. What emerged was rather a sense of distrust among different groups and also structural tensions within the organization. This was by virtue of the organization’s inability to deal with the contradiction that emerged in the sub-activity system of the staff as a result of their reluctance to adequately relate to the outlined best practices for project management and business development, both of which define the characteristics of the division of labour. Additionally, the organization was not able to manage a subsequent contradiction that emerged between the staff and the BMP model and this also resulted in the creation of further disturbance and tension between them (i.e. staff members) and other members of the organization’s community. But for the case in Ghana, it is the reluctance of the senior staff (researchers) to accept change that appears to have resulted in such a dysfunctional working relation in the organization. This is due to the contradiction that emerged between them (i.e. senior staff members) and the best management practices model, but which the organization could not deal with. Thus, as it is with the case in Botswana, collision between old ways of handling projects and the new one was clearly visible within the division of labour during the organization’s commercialisation process. The consequence of this was that the synergy that was to have emerged within the organization’s community did not materialise. What emerged was rather a sense of distrust among different groups in the organization.

For the organizations in South Africa and Trinidad, it is evident that their division of labour are oriented to ensure effective coordination by virtue of changes that were guided by the best management practices for both project management and business development. But, unlike the case in South Africa, in which there was a full acceptance to the changes associated with these practices, the same cannot be said of the organization in Trinidad in which the best practices for business development was apparently not fully accepted. Thus, while there was an absolute promotion
of teamwork in the handling of projects, as a result of the synergy within and between different units/divisions in the case of South Africa, what occurred in the case of Trinidad was seemingly not absolute (i.e. teamwork was evident and functional within individual units, but appears to be dysfunctional for cross-unit teams). Generally, the functionality of the division of labour within the organization in Trinidad was negatively affected by conflicts (i.e. on the handling of the business aspect of projects) between its different specialised units and a new business unit created to enhance the best practice for business development. The prevalence of this conflict also contributed to the creation of tensions among the different units themselves and the consequent emergence of contradictions in the sub-activity system of the organization’s management. Since the management was not able to deal with such contradictions, it ended up constraining their (i.e. management) attempt to manage the work functions of the different units in the organization.

Regarding the case in South Africa, the organization was able to streamline its operations by encouraging adequate clarity in its operational processes in line with the guidelines enshrined in the BMP model, especially as it concerns the practices of business development and project management as well as for personnel management. The organization was able to implement these best practices and its staff members were also able to internalise them (i.e. the best practices) by virtue of the management’s ability to recognise the conflicts that emerged from the competition among the different units in the organization and the subsequent contradictions they (i.e. conflicts) caused in the sub-activity system of the management. By implication, the contradictions that emerged between the organization’s management (i.e. as subject of activity) and the division of labour, on the one hand, and between the organisation’s staff (i.e. community) and the division of labour, on the other, were identified and subsequently dealt with by the management. Thus, unlike the cases in Ghana and Botswana (to a larger extent) and the case in Trinidad (to a lesser extent) in which the working relationships among different units were highlighted by tensions, the case in South Africa rather showed the existence of a healthy working relationship among different units with a common platform for the various managers to network. Thus the division of labour during the commercialisation process of the case in South Africa entailed signs of trust as well as high degree of positive collaboration and cooperation among the members of the various units and divisions within the organization.
8.3.3. Comparative appraisal of the cases’ community characteristics.

Based on the appraisal of the community characteristics in the respective organizations, it emerged that the changes necessitated by the best practices for governance, capability building and project management did not materialise in the organizations in Ghana and Botswana, and to some extent, in the organization in Trinidad. For the case in Botswana, it was evidently not able to develop the required competence that is needed for the effective functioning of its human resource system, as a result of the significant tension that pervaded its community (i.e. management team, staff members, and board) and the consequent contradiction that emerged between the management team (as subjects of activity) and the best management practices model, as it relates to the practices for governance, personnel management, capability building and project management.

For the cases in Ghana and Trinidad, their capabilities to perform were rather affected negatively by the low morale that pervaded their operating environment due to the non-availability of effective motivators (such as market-competitive salary scales and formal/informal recognition events) as well as the apparent lack of improvement in their manpower base for the commercialisation process. This was due to the inability of these two organizations’ to deal effectively with the contradiction that emerged between their management teams and the best practice for personnel management. This is highlighted by the inability of the management team in the two organizations to provide effective motivators (such as market-competitive salary scales and formal/informal recognition events) as recommended by the best management practices for personnel management. In comparison to these cases (i.e. Botswana, Ghana and Trinidad), the case in South Africa was able to effect changes necessitated by the best practices for governance, capability building and project management. The organization (i.e. South Africa) effectively developed its human resource system by upgrading the competences of its staff as well as providing them with effective motivators, such as market-competitive salary scales and both formal/informal recognition for achievements. This was a result of the organizations ability to deal with contradictions that emerged between dissenting staff members (as subjects of activity) and the income generation element (i.e. object) of its commercialisation process. As a consequence, the organization was able to manage contradictions that evolved between the management (as subjects of activity) and the dissenting staff (as members of the community). Therefore, unlike the
cases in Botswana, Ghana and Trinidad, the organization in South Africa was able to adequately deal with conflicts and contradictions associated with its human resource development through a good recruitment policy and improvement in staff education, training and development in line with the best practices for capacity building and business development.

It also emerged that the cases in Ghana, Botswana and Trinidad encountered apparent breakdowns in their information flow processes and feedback mechanisms with non-regular interaction between their respective managements and staff members (i.e. there were tensions among the different categories of staff in all the three organizations). The prevalence of such tensions among different groups (i.e. the management team, the senior staff and the junior staff) in the respective communities of these three cases was enhanced by their inability to deal with contradictions that emerged between their management teams (i.e. as subjects of the activity) and the object of the commercialisation processes whose realisation they were spearheading. Thus in these three cases, their staff members harboured the feelings that their working environments did not provide them with the possibility to enhance their individual growths and abilities to become innovative. But, unlike these three cases, the organization in South Africa had an efficient information flow process and feedback mechanism. There was also regular interaction between management and staff members as well as positive collaboration among the workforce in the organization. This was due to the organization’s ability to deal with contradictions that emerged in its activity system as a result of tensions created by the staff who initially dissented to the idea of transforming the organization into a commercial entity. In this regard, communication within the organization was enhanced by putting in place facilities that allow easy and regular access to information. It is therefore obvious that for the cases in Ghana and Botswana, their organizational norms/values were not significantly re-oriented to conform to the commercialisation process. Both organizations retained their old identities as fully government-subsidised entities (with a weak management system) in contrast to the new identities they were to acquire (i.e. a scientific-oriented research organization with an income generation capability). For the case in Trinidad, it was able to re-orient its norms/values to a significant degree but not enough for them (i.e. new norms/values) to be internalised by the entire staff of the organization. With respect to the organization in South Africa, it was able to change its organizational norms/values in line with its commercialisation process by acquiring a new
identity as a scientific-oriented research organization with a strong management system and the capability to self-generate income. But unlike the case in Trinidad, the organization’s (i.e. South Africa) new values/norms were internalised by its entire staff.


In section 8.3 above, I comparatively discussed the analytic outcomes of the four single-cases from the perspectives of the contributing influence of the elements (i.e. the institutional rules, division of labour and the community) in the respective organization’s activity systems. Based on the developments I have highlighted in sub-sections 8.3.1, 8.3.2 and 8.3.3 above, I argue that the managements of the organizations in both Ghana and Botswana were not able to change their organization’s civil-service oriented culture into that of a business-oriented corporate culture as a result of their failures to completely overhaul their organizations’ civil-service oriented systems prior to their respective commercialisation processes. The consequences of these inactions in both organizations are that their respective managements found it impossible to effect change as a result of the enormous tensions and subsequent disturbances that pervaded their organizations communities. In comparison to the cases in Ghana and Botswana, the organization in Trinidad was able to introduce changes that moved it closer towards the acquisition of a business-oriented corporate culture, but its retention of some civil service-related elements from its previous system during the commercialisation process resulted in the emergence of a degree of tensions in its community. In contrast to the three cases above, the organization in South Africa was able to completely overhaul its civil-service oriented system prior to the commercialisation process. Therefore, in the next sub-sections, I will discuss comparatively, the functionalities of the cases’ activity systems and the multivoicedness associated with them, as determined by the cases’ complete overhaul (e.g. South Africa) or partial overhaul (e.g. Trinidad) or non-overhaul (e.g. Ghana and Botswana) of their civil-service oriented system.

8.4.1. Functionality of the organizational activity systems of cases.

As it is indicative from my observations in the previous sections, the functioning of elements (i.e. according to the BMP model) in the collective activity system of the case in South Africa was effective during the organization’s commercialisation process and this appears to have
contributed to the success of the process’ outcome. In contrast, the functioning of the elements in the collective activity system of the case in Trinidad was slightly affected, and this contributed in the commercialisation process of the organization posting an outcome whose success level is quite moderate. The elements in the collective activity system of the case in Ghana was affected to such a degree that it contributed to the organization’s commercialisation process achieving a significantly low outcome. Comparatively, the functionality of elements in the collective activity system of the case in Botswana was significantly constrained to the extent that it contributed to the apparent failure of the organization’s commercialisation process. The general observation that emerges here is that the outcomes of the respective cases’ commercialisation processes are indicative of the extent to which conflicts and disturbances prevailed in their respective collective activity systems. Such relative variation (i.e. associating the degree of outcome to the level of conflicts and disturbances in the activity system), in my opinion, are depicted by the cases in Ghana, Botswana and Trinidad, as I have highlight above. For the organization in Trinidad, it was able to attain a moderate commercialisation outcome because the level of conflicts and disturbances that it had to deal with were reinforced by constraints in the functioning (i.e. according to the BMP model) of the institutional rules and community elements in its organizational activity system. For the cases in Ghana and Botswana, their respective attainment of a relative poor (i.e. Ghana) and poor (i.e. Botswana) commercialisation outcomes could be attributed to constraints (to a larger extent for the case in Botswana) that were associated with the functioning (i.e. according to the BMP model) of the institutional rules, communities and the divisions of labour elements in their respective organizational activity systems. The only difference between these two cases (i.e. Botswana and Ghana) is that, the level of conflicts and disturbances in the collective activity system of the organization in Botswana were of greater magnitude as compared to that of the organization in Ghana. Comparatively, for the organization in South Africa, a contributory explanation to its achievement of a successful commercialisation outcome can be that; the elimination of conflicts and disturbances as well as the prevention of their re-emergence in its collective activity system was ensured by the synergy that was associated with the functioning of all the elements in it (i.e. the collective activity system). By implication, I perceive this observation as clearly pointing to the significance of the interrelated linkages among the elements in an organization’s activity system and whose functions are inter-dependent. It
is by virtue of this systemic character of the activity system that a constraint to the function of one element goes on to constraint the functions of the others, as it is evident in the cases of Trinidad, Ghana and Botswana, in comparison to the case in South Africa. It is therefore obvious that the level of constraints to the functioning (i.e. according to the BMP model) of one element in the organizations’ activity systems also determined the extent to which the functions of the remaining elements were impaired. In this regard, the actions entailed in the organizational activity system of each of these cases could be viewed as collective, artefact-mediated and object-oriented actions, which could also be seen in their network relations to actions emanating from other activity systems. In this respect, I argue that the division of labour in the collective activity systems of the cases in Trinidad, Botswana, and Ghana created different positions for their respective actors, who appeared to hold on to their organizations’ diverse histories for which individualism was an integral component of values and norms. The implication of this was that the requisite communal motives that were to underlie their commercialisation process did not emerge. This is in sharp contrast to the case in South Africa where such communal motive was visible. The presence of such communal motive in the case in South Africa, in line with an argument by Spender (1995), shows that there was widely distributed interaction in the organization between the actors (i.e. the community), structures (i.e. the institutional rules) and actions (i.e. the division of labour) which provided its management with systemic knowledge of how to act strategically, especially in dealing with the multivoicedness associated with the organization’s activity system. The converse appears to have occurred with respect to the cases in Trinidad, Botswana, and Ghana.

8.4.2. Multivoicedness in the cases’ activity systems.

In sub-section 8.4.1 above, I outlined a scenario which reflected the observable conflicts and disturbances (i.e. situated actions) in the respective communities of the cases in Ghana, Trinidad and Botswana. These situated actions, by virtue of them being inherently tension-laden, unstable and open-ended, as Engeström et al. (2003) posit, were reinforced by the adoption of different positions by the actors of the communities of these cases. These conflicts and disturbances were also reinforced by the respective organizations’ own multiple layers and strands of history, which I identified to be engraved in their respective institutional rules and organizational norms, and thus were associated with the multivoicedness in
the organizations’ activity systems. This multivoicedness appears to have
served as sources of trouble, with respect to the operations of these three
organizations during their respective applications of the best management
practices model during their commercialisation processes. These might
have generated the contradictions ((i.e. the misfit between elements of their
activity systems which, in line with Engeström (2001), I have manifested
as problems, ruptures, breakdowns, and clashes)) in their organizational
activity systems, but for which the actions of translations and negotiation
are not realised. It therefore becomes clear that the variability in the
contradictions encountered by the organizations in Trinidad, Botswana and
Ghana in relation to their best management practices model
implementation and the quality of their collective activity systems, are only
understandable against their own history. It is also obvious that the
introduction of a new instrument from the outside by these organizations
into their activity systems led to problems, ruptures, breakdowns, and
clashes (but which events the management could not manage) as a result of
some old elements within their activity systems, specifically, the
institutional rules and division of labour, colliding with the new ones.

Thus the ability of organizations (such as cases in Ghana, Botswana and
Trinidad) to manage such new developments (i.e. emerging conflicts and
disturbances), as it is indicative of the case in South Africa, is dependent to
a large degree on the extent to which they can manage the character of
their communities. This point is underscored by the variability in the
achieved (as compared to the expected) outcomes of the commercialisation
processes of the four cases which is (i.e. the variability) also underlined by
the degree to which the cases were able to manage the conflicts and
disturbances that emerged in their organizational activity systems. In this
respect therefore, I argue that in the application of the best management
practices model (i.e. as instrument of change) by the four cases I have
studied, the orientation of the elements (especially, the institutional rules,
the community and the division of labour) in their collective activity
systems contributed significantly in shaping the respective outcomes of
their commercialisation processes. Therefore, by considering the
orientation of elements in each of the organizations activity systems, I can
(from an organizational activity theoretical perspective) explain the
rationale behind the variability shown in the analytic outcomes of the
cases’ commercialisation processes, as I will do in the next chapter (i.e.
chapter nine).
DISCUSSION AND CONCLUSIONS

In the previous chapter (i.e. chapter eight), I cross-analysed the four cases (i.e. Ghana, Trinidad, Botswana and South Africa) by carrying out a pattern-match of their single-case analytic outcomes. I then proceeded to compare how their (i.e. the cases) organizational activity systems functioned as well as the extent of multivoicedness in those systems. By virtue of this analysis, I argued that; in the application of the best management practices model (i.e. as instrument of change) by these four cases, the orientation of the elements in their collective activity systems (especially, the institutional rules, the community and the division of labour) contributed significantly in shaping the respective outcomes of their commercialisation processes. I also observed that from an organizational activity theoretical perspective, I can offer an explanation on the reason behind the variability shown in the analytic outcomes of the respective cases by understanding the orientation of elements in their (i.e. the cases) organizational activity systems. In this chapter, therefore, I will firstly seek to provide the theoretical explanations on the variability in the cases’ analytic outcomes by discussing the systemic formations in their (i.e. cases) activity systems. I will also discuss the significance of such systemic formations (i.e. in unifying the processes of production, distribution, exchange and consumption as transitions between the subject, object, instrument, community, institutional rules and the division of labour) in the functioning of the cases’ organizational activity systems. This discussion will lead to my derivation of an analytic generalisation to reflect the overall conclusion of this study. Following this, I will give an outline of the learning that emerges from this study, and its (i.e. study) contribution to knowledge. I will also outline some recommendations for future study. I will end the chapter by critically reflecting on the approach I used in carrying out this research, and also on the limitations in my study.


As I have discussed in chapter two (sub-section 2.4.1), Engeström has provided a theoretical understanding of the functional relationships of all
the elements (i.e. the subject, instrument, object, institutional rules, community and division of labour) in an organization’s activity system. In my opinion, this understanding can be used to explain the variability in the analytic outcomes of the four single-cases, as determined by their respective attempts to implement and internalise the BMP model during their commercialisation processes. As Engeström’s notes, the relationship between subject, object and instrument signifies the production element of the activity. Similarly, the relation between subject, community and the rules signifies the exchange element of the activity. In the same vein, the relationship between the community, division of labour and the object signifies the distribution element, while the relationship between the subject, community and the object signifies the consumption element of the activity. In line with this theoretical interpretation, Engeström’s definition of an activity is that it is a systemic formation that unifies the processes of production, distribution, exchange and consumption as transitions between the subject, object, instrument, community, institutional rules and the division of labour. In relation to the variability in the analytic outcomes of the four cases (i.e. Trinidad, Ghana, Botswana and South Africa), I view this definition as providing me with a platform which I can use to understand the systemic formations in the cases’ activity systems. Thus, by comparing the systemic formations in the cases’ activity systems, as underlined by their attempt to implement and internalise the BMP model (i.e. as an instrument of change in the commercialisation process), and understanding the extent to which the processes of production, distribution, exchange and consumption were unified, a theoretical explanation to the variability shown in the cases analytic outcomes can be offered, as I will highlight in the sub-sections that will follow.

9.1.1. Understanding the systemic formations in cases’ activity systems

As a recall, I have observed earlier that the extent to which the cases in Ghana, Botswana, Trinidad and South Africa were able to handle conflicts and disturbances during their commercialisation processes was dependent (to a large degree) on the extent to which they were able to manage the systemic characteristics of their collective activity systems. This therefore dictated the variability in the “senses and meanings” of the commercialisation outcomes for these four cases. For the case in Ghana (as I have highlighted in chapter four), it was able to achieve only six percent

\[230\] This is in relation to the study framework (see figure 9 in chapter two, page 83).
self-income generation out of an expected thirty percent. The case in Trinidad (as I have highlighted in chapter five) was able to achieve up to sixty percent self-income generation out of an expected eighty percent. With regard to the case in Botswana (as I have highlighted in chapter six), it could not self-generate any income. It is only the case in South Africa that was able to self-generate income up to its seventy percent expectation. In line with the theoretical explanation (Engeström, 1987) of the insights gained from these cases, it is worth to note here that the objects that underline the commercialisation processes of these cases (i.e. carrying out commercial-oriented research activity under reduced government funding, but with the capability to self-generate income) is created by the production interface of their collective activity systems. The theoretical expectation here is that such an income-generation oriented object will be divided up by the distribution interface of the cases’ activity systems, after which it is to be parcelled out by the exchange interface in accordance with each case’s collective needs. This is based on the presumption that by parceling the object in accord with a case’s collective needs, the consumption interface of the case’s collective activity will lead to the product stepping outside this social movement so that it becomes a direct object and servant of individual needs within the case. In this respect therefore, the production (i.e. subject-instrument-object triangular interface) aspect of the cases’ (i.e. Ghana, Trinidad, Botswana and South Africa) implementation and internalisation of the best management practices model appears to be the point of departure. The consumption aspect (i.e. subject-object-community triangular interface) also appears as the conclusion, while the distribution (i.e. community-object-division of labour triangular interface) and the exchange (i.e. subject-rules-community triangular interface) aspects are in the middle. Based on this theoretical perspective, an explanation to the outcome variability reflected by the commercialisation processes of the four cases I have highlighted above is that; the unifying process that the interfaces of production, consumption and exchange are expected to create in the collective activity system of the cases either materialised (as it is for the case in South Africa) or did not materialise (as it is for the cases in Ghana, Botswana and Trinidad). In the same vein, the production that emerges from the commercialisation processes of the cases is able to create the requisite object which corresponds to their outline needs (as it is for the case in South Africa) or could not (as it is for the cases in Ghana and Botswana, to a larger degree, and the case in Trinidad, to a lesser degree). Even though an element of distribution seems to be apparent in the collective activity systems of the
cases in Ghana and Trinidad, its exchange did not materialise. For the case in Botswana, there is no element of distribution and consequently no exchange in its collective activity system. The exception here is the case in South Africa in which the distribution of activities is visible and for which exchange also materialised. As Jarzabkowski (2003) explains, the term “distributed”\textsuperscript{231} refers to actors and also to the context and action in which they are engaged. Thus the widely distributed interaction between the actors, structures and actions of an organisation provides systemic knowledge of how to act strategically (Spender, 1996). In this respect, Jarzabkowski view distribution to be a key factor in mediation that enhances shared interpretations and collective action. As such she sees tension to be conceptualised as a generative process of continuity and displacement between old and new players. Within this context, new participants learn from continuing members how to use the practices of the system, and in the process re-socialising the continuing players and reinforcing the existing practices. But as Hutchins (1993), Lave and Wenger (1991) and March (1991) have variously argued, new members, by virtue of their low socialisation to the system, also question the practices. I see this scenario as reflective of the instability caused by the lack of distribution in the organizational activity systems of the cases in Botswana and Ghana. This is based on the perspective (for example, Blackler, 1995; Hutchins, 1993; Weick and Roberts, 1993) that, distribution enables collective action because it allows individual actors to have sufficient knowledge of the other immediate components of an activity, and also be able to conceptualise and respond to actions that are outside, but connected to their own task (as it is obvious in the case in South Africa).

By taking into account all these observations relative to the outcome variability in the cases’ commercialisation processes, it then becomes evident that there is no element of consumption in the underlying objects for the commercialisation processes of the cases in Ghana and Botswana. This is because the production factor could not become the direct object of individual needs in these organizations. With respect to the case in Trinidad, this consumption factor is evident, but it is slightly affected in a negative sense due to the inability of the production factor to totally become the direct object of individual staff needs in the organization. But for the case in South Africa, the consumption factor of its commercialisation process is clearly evident. This is due to the ability of

\textsuperscript{231} Jarzabkowski (2001) discussed the term ‘distributed’ principally as a characteristic of the overlapping knowledge involved in action.
the production factor to step outside the social movement in the organization to become the direct object and servant of individual staff needs. In this respect therefore, and from an organizational activity theoretical perspective, I posit that in the organizations’ pursuit of commercialisation, the production factor of such process should have been seen by each organization as the consumption of their individual staff’s abilities and, also as the means of production (as it is with the case in South Africa). Correspondingly, the organizations should have also seen the consumption factor as a production of their individual staff members and also a key factor for internalisation to occur among the staff (as it is with the case in South Africa). Similarly, the organizations should have seen the distribution factor as not just a consequence of production (as it is with the cases in Ghana, Botswana and Trinidad), but also as its immanent prerequisite in the form of the distribution of the instrument of production as well as the distribution of members of the organization among the different kinds of production (as it is with the case in South Africa). Finally, the organizations should have found the exchange factor inside their production in the form of communication, interaction and exchange (as it is with the case in South Africa).

9.1.2. Explaining the significance of systemic formations and their unifying process in the functioning of the cases’ activity systems

What appears obvious from my discussion in section 8.5.1 above is that the dictating factor in the cases’ implementation and internalisation of the best management practices model during their respective commercialisation processes is informed by their ability or inability to deal with contradictions between the elements in their organizational activity systems. It is these elements which also define the different interfaces of the activity systems. In my opinion, therefore, it is the functionalities of these interfaces (as determined by the relationships between their defining activity elements) which define the systemic function of the organizational activity system and the corresponding output that can emerge from it. Arguing from the perspective of Wallace and Wolf (1991), it is obvious that the derived theoretical explanation on the relationship between elements in the cases’ collective activity systems (i.e. based on my derivations from the analysis of contradiction) is shaped by the conflict theory\(^{232}\) approach to analysing the general structure of the cases.

\(^{232}\) As Wallace and Wolf explain, conflict theorists see an arena in which groups fight for power and the “control” of conflict simply means that one group is able, temporarily, to suppress its rivals.
organizational activity systems. As Wallace and Wolf argue, the distinguishing mark of this analysis is that it identifies economic factors as the fundamental determinant of social structure and change. They note that other spheres of social life and the ideas and values that people hold are seen as shaped by and dependent on the nature of economic production. This observation is quite obvious in my analyses of the cases and which (as Wallace and Wolf put it) play the role of transmission belts, through which the social forces and group interest created by economic arrangement of commercialisation emerge into social life.

On the other hand, the systemic aspect of the theoretical explanation is shaped by Engeström’s use of Parson’s functional theory which look at societies and social institutions as systems in which all parts depend on each other and work together to create equilibrium. In this perspective, the existence of conflict is acknowledged and ways are developed to control it (i.e. the bases for analysis of contradiction). Thus Engeström’s emphasis on the importance of the systemic functioning of an organization’s activity system is underlined by the modern sociological concept of functional equilibrium. As Wallace and Wolf put it, the relationship between equilibrium and functionalism is illustrated by the following definition of “social equilibrium” – that is, “[Social equilibrium is] the concept that social life has a tendency to be and to remain a functionally integrated phenomenon, so that any change in one part of the social system will bring about adjusitive changes in other parts”. The initial change creates an imbalance, but a functional adjustment of the parts occurs to recreate an integrated, adjusted and relatively stable system. This therefore signifies that it is of relative importance to keep sight of the functionality of such activity elements as the institutional rules, the community and the division of labour when using the best management practices model as an instrument of change. This is because many of the analytic strategies for examining mediated action, as Wertsch (1998) posits, are made possible by the fact that the elements of such actions can be isolated. Such isolation allows various specialised perspectives to bring their insights to bear on understanding how change occurs in mediated action. Wertsch also notes that, considering various elements in the mediated action encourages their examination since an analysis that focuses solely on the irreducibility of mediated action as a bounded system all too naturally suggests a static system in which dialectic tension is involved. As Collins et al (2002) point out, the tension that arises between elements of the activity system identifies areas where the system no longer match the activities it models.
As Jarzabkowski (2002) also explains, the routinised nature of practice may be explained by theories of social order, such as structuration by Giddens (1984), in which the interaction between agent and structure is recursive. Structuration examines the relationship between agents and socially-produced structures through recursively situated practices that form part of daily routines. In this respect, structures are the collective systems within which human actors carry out their daily activities. According to Jarzabkowski, structures constrain and enable human action and are also created and re-created by actors who draw upon social structure in order to act. This reciprocity between agent and structure enables the persistence of social order, embedding it in social institutions that endure across time and space. As she further points out, recursiveness is present at three levels (i.e. the actor, the organisation and the social institution). At the level of the actor, the problem is largely a psychological one arising from individual cognition which is subject to structural influences. As such, individual cognition is related to social structure through its manifestation as collective phenomena shared by groups of actors. As it is obvious from my analytic comparison of the four cases, the functionality of these elements was dictated by empirical factors relative to autonomy, cohesion, trust, pressure, support, recognition, fairness, discourse, appropriation and social relations within the respective organizations. The influence of these factors in shaping the attitudes and perceptions of the cases’ community members towards their respective commercialisation processes is also obvious. In the same vein, the organizations’ ability (as it is in the case of South Africa), partial ability (as it is in the case of Trinidad) or inability (as it is in the case of Ghana and Botswana) to implement and internalise the best management practices model was dictated by the prevailing character of each case’s structure, culture, social interaction, commitment, competence, form and medium of discourse\(^{233}\), cooperation, collaboration, networking and the scale of trust as well as the levels of recursiveness among the community members. In this respect, therefore, my cross analysis of the insights derived from the cases in Ghana, Trinidad, Botswana and South Africa points to a deductive pattern which, when reflected generally, provides an overall conclusion to this study, and which I will highlight in the next section.

\(^{233}\) This is in reference to the multivoicedness in meaning. As Wertsch (1991) explains, it is either authoritative (i.e. accept or reject) or persuasive (i.e. dialogue) or combination of both. Based on observations from my empirical data, the form and medium of discourse that I noticed in the four cases can be classified as follows: Authoritative (with respect to the cases in Ghana and Botswana); Persuasive (with respect to the case in South Africa); Combination of both (with respect to the case to the case in Trinidad).
9.2. Overall Study Conclusion.

My overall conclusion to this study, which is reflective of an analytic generalisation, is that; the RTO best management practices (BMP) model can be successfully implemented and internalised by such organizations (i.e. as an instrument of change) if they are able to effectively manage emerging contradictions from conflicts and disturbances in their organizational activity systems in the course of their commercialisation processes. In relation to my research problem, I interpret this conclusion to mean that in the course of the RTOs’ commercialisation processes, the internal factors that seem to have constrained the attempts by most of them (i.e. the RTOs) to implement and internalise the BMP model are (i.e. internal factor) rather unidentified contradictions which are caused by conflicts and disturbances in the organizational activity systems of such RTOs.

As a recall, the outline of my research problem (as I have stated in chapter one, subsection 1.3.1) is that; there is the realization by Mengu and Grier (1999) that despite the fact that the RTO best management practices have been used successfully by companies in the developed countries, especially in Europe, the efforts of most RTOs in developing countries to implement and internalise them are constrained by some undetermined environmental factors. Thus I perceive my interpretation of this conclusion to also provide a relative answer to the second component of my first research question (i.e. why did the efforts of the RTOs to implement and internalise the best management practices end up being constrained? ) as I have outlined in chapter one (subsection 1.3.5). I also perceive it as providing me with the leverage towards answering my second research question (i.e. how can the RTOs learn to deal with such environmental factors and their possible interplay, in order to be able to successfully implement and internalise the best management practices?).

9.3. Learning from Study.

As Engeström et al. (2003) note, historical analysis implies a broad institutional and social framework and a long time perspective, while situated analysis implies focusing on the here-and-now, typically on what can be captured on tape in a given situation or single encounter. In the view of Gunnarsson et al. (1997), the historical and situated construction processes are mutually constitutive. Engeström et al. perceives this view of
Gunnarsson et al as opening up the challenge of finding out how the mutual constitution between historical and situated processes actually happen, as well as how it could be empirically captured. In Engeström’s (2004) view, since history is made in future-oriented situated actions, the challenge here then becomes an issue of how to make the situated history-making visible and analysable. This, according to Engeström, implies that for studies of managerial discourse, one has to look for ways of capturing how managers discursively create new forms of activity and organization. As Engeström (1999b) explains, there are different types of ‘distance’ between practical activity and discourse, but most professional activities fall in the middle where practical activity is accompanied and complemented, but not replaced or accomplished solely by talk.

But in what way does this observation by Engeström relate to the respective commercialisation processes of the four cases (i.e. Ghana, Trinidad, Botswana and South Africa) that I have studied? Though there is no denying the fact that all these four cases are engaged in professional activities, yet, can one perceive the professional activity in each case to have fallen in the middle of discourse and practical activity during their attempts to implement and internalise the BMP model? Based on the empirical data that I used in my historical analysis of each single-case, it is evident to me that in the pursuit of professional activity in the case in South Africa, talk was duly accompanied and complemented by practical activity. The opposite scenario seems to have occurred in the conduct of professional activity in the case in Botswana where it is apparent that talk was not accompanied by practical activity. For the cases in Trinidad and Ghana, the balance between talk and practical activity in the accomplishment of their respective professional activities appears to have tilted more towards talk. Thus, as I have noted in chapter one (sub-section 1.3.2), the goal of my study is to create an understanding with both practical and theoretical values (i.e. from the perspectives of organizational learning) on how RTOs in developing countries can learn to deal with factors constraining the attempts by most of them to implement and internalise a BMP model (as an instrument of change) in their efforts to commercialise. I also noted that the purpose of my study is to develop a framework which can be used by such RTOs as a guide to appraise their prevailing operating environment in order to identify possible constraints to overcome prior to future implementation of similar best management practice. This is to ensure that such organizations are able to confront possible constraints and thus be successful in the future. Based on my
analytical discussions in the sections above, I recognise two distinct forms of learning as emerging from my study.

The first form of learning relates to my application of Engeström’s analysis of contradictions which provided me with the avenue for deep exploration and subsequent understanding of the complexities associated with the functional dynamics of the organizational activity system of each of the four cases whose commercialisation processes I have appraised. I therefore view this learning as indicating that organisational activity theory can be used effectively to study and understand the dynamics of management practices implementation and internalisation in organizations.

The second learning is in relation to the practical significance of the insights that I have gained from my cross case analysis of the analytical outcomes of the four respective cases. In line with my objective for this study (i.e. all constraints preventing the RTOs in most developing countries from being successful in their efforts to implement the best management practices are identified and understood, so that tools for future remedial actions can be developed), internal factors that need to be understood by the RTOs can be outlined. Based on the insights I have provided in this study, it is imperative that a template reflecting the characteristics of an organization’s collective activity system can be designed to highlight those factors whose handling can either facilitate or obstruct the ability of the RTOs to manage contradictions that can emerge in their future attempts to implement and internalise such best management practices model.

As I have shown in this study, the RTOs can learn to deal with the systemic character of their organizational systems in future attempts to implement and internalise the best management practices model. In my opinion, what they might need to do is to really understand the factors (e.g. the visible ones that I collected as empirical data) that can influence the systemic character of their organizational activity systems (especially, the functionalities of the production, distribution, exchange and consumption interfaces of the system). My reflection of the template that the RTOs can use (i.e. when transforming old activities to new ones) as a learning tool to understand, identify and manage contradictions in order to be able to influence collective learning in their organizational activity systems is shown in figure 52 (see next page).
Figure 52: Template (highlighting some study empirical findings) for learning and dealing with systemic character of an organization’s activity system.
As Engeström notes, the production interface only represents the tip of the ice-berg. I view this as understandable because in analysing such phenomena as the implementation and internalisation of a best management practice model (as it is the case in this study) in an organization, any tendency to focus on the production interface alone will result in a limitation to the ability to manage conflicts and contradictions that might possibly emerge. The factors that I have associated with the institutional rules, the community and the division of labour in figure 52 above are reflective of visible factors derived from my empirical data and which can serve as a useful resource for the RTOs in learning to manage their organizational activity systems. In line with Virkkunen and Kuutti’s (2000) perspective on how organizational learning can be understood by focusing on the activity system, I view the implementation and internalisation of the BMP model as a form of organizational learning which entails a complex interplay between individual and collective learning (i.e. actors, intentional actions and given structures and processes), radical and incremental changes, cognitive development as well as the development of new tools and structures.

In this respect, therefore, the RTOs might need a detailed understanding of the contributory interfaces of distribution, exchange, distribution and consumption in order to understand the situated social context within which collective activities are to be carried out in their organizations. For the purpose of practical application of figure 52 above, I have chosen to highlight its components and their associated factors in the subsequent figures that will follow.

The highlight of the consumption interface is shown in figure 52a (see next page). As it is indicative in figure 52a, for the RTOs to understand the systemic contribution of the consumption interface in their future implementation of the BMP model (i.e. as an instrument of change), it is imperative that the subjects of activity (i.e. staff and/or management) are made to understand and relate to the object of the organizational change for which the application of the new instrument (i.e. the BMP) is a pre-requisite. In this respect, therefore, the RTOs can learn to deal with the corresponding changes that the new instrument will require of it’s (i.e. RTOs) community. This therefore requires that the RTOs understand the influence that factors, such as autonomy, trust, pressure, and social relations within their communities can have on their BMP implementation processes.
This learning could be enhanced with the RTOs paying the requisite attention to observable behaviours, both attitudinal and perceptual, within their community and which will allow them to take continual remedial measures as a way of enhancing the consumption interface of their organizational activity systems.
Also, in order for the RTOs to be able to take continual remedial measures, they must understand those factors which, when dealt with, could ensure the effectiveness of the exchange interface of their organizational activity systems. The exchange interface and its associated factors are highlighted in figure 52b below.

Figure 52b: A highlight of the exchange interface in learning template (i.e. figure 52).
In this regards, therefore, the RTOs can learn to deal with the possible influence that the rules entailed in the BMP model can have on the RTOs’ community. In this regard, the RTOs can learn to deal with the changes to emerge in their institutional rules and be able to understand the influence that changes in their organizational structures as well as corporate cultures can have on their community.

For the RTOs to also understand the systemic contribution of the production interface in their future implementation of the BMP model (i.e. as an instrument of change), it is imperative that they understand how to make the subjects of activity (i.e. staff and/or management) in their organizational activity system understand, appreciate and subsequently relate to the object of the organizational change for which the new the instrument (i.e. the BMP model) is a pre-requisite. I have highlighted the production interface in figure 52c below.

![Diagram](attachment:image.png)

Figure 52c: A highlight of the production interface in learning template (i.e. figure 52).

In learning to deal with the distribution interface of their organisational activity systems, the RTOs, in addition to the understanding of their communities, must correspondingly understand those factors that can
affect the functionality of their division of labour, in relation to the objects of their change processes (i.e. commercialisation) and the motive behind activity undertakings by their community members. I have highlighted the distribution interface of the organisational activity system in figure 52d below.

Figure 52d: A highlight of the distribution interface in learning template (i.e. figure 52).
Thus, as I have shown in figure 52d above, in addition to understanding the influence that factors, such as autonomy, trust, pressure, and social relations within their communities can have on their BMP implementation processes, the RTOs must also need to understand the influence of factors relative to their human resource base, as well as issues relative to discourse, cooperation and collaboration among its community members.

Based on the insights that I have provided in this study, it is indicative to me that the template I have shown in figure 52 above can be used as a learning tool to capture the historical and situated processes to be associated with the organizational activity systems of such organizations as the RTOs in the course of their attempts to implement and internalise new management practices in on-going and/or future commercialisation processes. The perspective here is that the template (i.e. figure 52) stands to provide an understanding of the functionality of the mediational elements in the institutional rules as well as in the division of labour. It also stands to provide an avenue for the appraisal of the quality and effectiveness of specific mediational elements required for proper mediational action of the relationship between the organization and the actors constituting its community (i.e. effectiveness of the institutional rule). In this respect, specific mediational elements, such as the organizational structure, corporate culture, form of discourse, trust, social interaction, level of commitment, and degree of competence, could be measured and analysed qualitatively.

In the same vein, the effectiveness and reliability of the mediational elements in the mediational tool dictating the relationship between the actors constituting the organization’s community and the organizational objectives could also be established (i.e. the quality and efficiency of the labour division). In this case, specific elements, such as the human resource base, the medium of discourse, trust, appropriation, cooperation, collaboration, networking, and social relationship could also be measured and appraised qualitatively.

As it is obvious from my discussion in this section, the potentiality of the learning templates can only be ascertained through an empirical investigation, and for which future study I will recommend in the section that follows.
9.4. Recommendations for Future Study.

I will make the following two recommendations which, in my opinion could strengthen the learning that I have underlined in this study.

i. I recommend that the template that I have presented in figure 52 (section 9.3, page 312) should be tested in RTOs whose commercialisation processes are on-going and its usefulness as a learning tool towards identifying and dealing with contradictions assessed.

ii. A further study should be carried out to establish how external factors identified in my first study (i.e. Sanda, 2003) impact on the internal factors that I have highlighted in this study so that a holistic guide for the implementation and internalisation of the best management practices model can be developed to assists the RTOs to be able to effectively deal with internal tensions caused by external environmental changes (for example, their ability to continuously and effectively adjust their internal operating environments in response to variations in the socio-economic, cultural, and political factors).

9.5. Critical Reflections.

In this study, I have used organizational activity theory to understand internal factors that contribute in constraining the implementation and internalisation of a best management practices model (as an instrument of change) in the commercialisation processes of some RTOs. From the perspective of self-criticism, there are three issues of interest relative to my research process that I will discuss in the sub-sections that will follow.

The first issue has to do with the following question; “Could this study have been pursued using a research path that is different from the one that I have used?”

The second issue relates to the following question; “What are the limitations of my study?”

The third issue is also underlined by the following question; “In what ways has my study contributed to knowledge?”
9.5.1. Why my research approach and not the alternates?

Throughout this write-up, I have sought to justify the rationale behind both my theoretical and methodological choices. In doing so, I also took into cognisance the fact that this study could possibly have been carried out using alternate approaches that are underlined by different theories. By this observation, I do not mean to say that different approaches can be used to attain exactly the same insight that I have provided in this study and the learning that has emerged from it. Rather, I am acknowledging the fact that other theoretical and methodological approaches have been used in the past in studies similar to mine and whose outcome have resulted in different forms of organizational learning. A highlight of such approaches and their subsequent shortcomings are given by Virkkunen and Kuutti who wrote that;

Many attempts have been made to identify the root causes of the problems associated with organizational learning and to show a way forward. The vagueness of the key concept “organization” seems to be a major hindrance to progress (Schmidt, 1994). Researchers have tried to cope with this problem in different ways. Some base their argument on mentalistic analogies of individual learning (see Huber, 1991; Dodgson, 1993; Jones, 1995). Others, although speaking about “organizational learning”, focus on a more limited unit of analysis within an organization such as a management team or an organizational routine or concentrate only on a specific aspect of the organization, for instance its corporate culture. Some writers propose that other concepts, such as “knowledge system” (Pentland, 1995), “community of practice” (Brown & Duguid, 1991; Hendry, 1996) or “activity system” (Blackler, 1993; Lowendahl & Haanes, 1997) should be used in analyzing organizational learning. [Virkkunen and Kuutti, 2000, p. 292].

I perceive my approach as an exception from the examples highlighted by Virkkunen and Kuutti in the above quotation, in that the theoretical and methodological approaches that shaped my study have enabled me to identify the root causes of problems associated with the RTO’s effort to implement and internalise the best management practices model and also to show the way forward towards future learning. In this respect, therefore, I view the insights that I have provided in this thesis to have been strengthened by the steps that I took in addressing the issues of reliability and validity, especially as they relate to my methodological approaches for both data collection and data analyses. As I have discussed in chapter three
(section 3.7), I took the requisite steps to ensure the validation of the different phases of this research. Firstly, by arguing from the perspective of Kvale (1996), the validity of my study relative to its thematising is ensured by the soundness of my application of the organizational activity theory whose derivative logic gave credence to my study framework (as I have summarised in section 3.2). In the same vein, by arguing from the perspective of Yin (1994), construct validity is also addressed by my use of the organisational activity theoretical principles underlined by Engeström (as I have discussed in chapter two) and also my use of multiple sources of evidence in my data collection. Secondly, the validity of this study relative to its design is also ensured by the learning that has emerged from it (as I have discussed in section 9.3 above). I also addressed the issue of external validity by virtue of the domain created by my study framework leading to my use of the replication logic tactic in this multiple-case study (as I have discussed in section 3.4), and subsequent generalisation of my study findings.

Arguing from the perspective of Kvale, the validity of knowledge that is produced by my study is guaranteed by the purpose of this study and the methods that I used to collect data (which I have discussed in section 3.5) and also for the analysis of the data (which I have discussed in section 3.6). I ensured the reliability (in line with Yin’s definition) and also the validity (in line with Kvale’s definition) of my interviewing processes by putting in place mechanisms that enhanced the quality of the interviews I conducted, and also the trustworthiness of the information I received from the interviewees. In this regard, I transcribed all the recorded interview conversations exactly as I heard them and sought the clarity of portions that sounded unclear from affected interviewees while on site at each case. Thus, the insights I have provided in this thesis and which

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234 Highlighting on thematising, Kvale notes that the validity of an investigation rest on the soundness of the theoretical presuppositions of a study and on the logic of the derivations from theory to the research questions of the study.

235 Construct validity, as Yin notes, implies the establishment of correct measures for the concepts being studied.

236 As Kvale explains, the validity of the knowledge produced depends on the adequacy of the design and the methods used for the subject matter and purpose of the study. He also argues that from an ethical perspective, a valid research design involves beneficence – producing knowledge to the human situation while minimising harmful consequences.

237 Reliability, as Yin explains, is to demonstrate that the operations of a study – such as the data collection procedures can be repeated, with the same results.

238 As Kvale explains, validity here pertains to the trustworthiness of the subject’s reports and the quality of the interviewing itself, which should include a careful questioning as to the meaning of what is said and a continual checking of the information obtained as a validation in situ.
overall conclusion I have underlined in section 9.2 above is a valid account of the main findings of my study on the commercialisation of the four RTOs from Ghana, Trinidad, South Africa and Botswana.

As a way of validating the results of this study, I also used different platforms to ensure the readership of this thesis (or its various chapters there-of). One of such platforms is my submission to the management of each case a special report based on the single-case analysis for their comments. The feedback I received from each organization showed that they were in agreement with the content of my report and thus the validation of my findings. I reinforced this validation by expanding the readership of this thesis through seminars and presentations at different international conferences and workshops (as I have noted in the foreword to this thesis) which also created avenues for me to get additional constructive feedback from academia.

9.5.2. Limitations in my study.

As it is with all research, there are limitations in this thesis relative to the theoretical framework, methodology as well as my interpretation of the results and the subsequent conclusions (i.e. as an analytic generalization) based on the outcome of the single-cases that I analysed. In the theoretical section (i.e. chapter two), I scrutinised five existing organizational activity theoretical models relative to the work of Engeström (1987), Blackler (1993), Blackler et al. (2000), Jarzabkowski (2003) and Thompson (2004), in my attempt to develop a study framework. The limitation here concerns the possible existence of other organizational activity theoretical models whose exploitation could have impacted on the character of my study framework and the way I used it to guide the conduct of my research. Even, with the five models that I appraised, though I view my scrutiny of their theoretical assumptions as well as their strengths and weaknesses as relevant, I do not, however, wish to argue that my review offers an exhaustive account of their underlying assumptions, strengths and weaknesses. Rather, my appraisal was aimed at increasing my understanding of some of the underlying key assumptions, weaknesses and strengths of these models, and which enabled me to appropriately position myself towards the development of the study framework that guided my conduction of this research. The point here is that by taking into account the conceptual differences associated with these models, I was able to utilise their potentials to develop an effective study framework which I
viewed as a contextualised representation of Engeström’s model. It is this framework that facilitated the design of my data collection (i.e. in relation to my use of it to identify data points) as well as my in-depth analytic exploration of practice implementation in the different organizations I discussed in chapters four, five, six and seven. Thus I view my contextualisation of Engeström’s model into a study framework as making it possible (even in the face of interpretational limitations) for me to overcome the difficulty that is perceived by others (as I have discussed in chapter two under section 2.3)\(^{239}\) to be associated with the application of the model (i.e. Engeström’s model) in its original form.

With respect to the methodological part (i.e. chapter three) in which I outlined the various approaches I used in my data collection, the limitations that can arise here is informed by the fact that the quality of the data I collected from all the organizations (i.e. the cases in this thesis) were highly dependent on my skills as an interviewer. Since the data I collected were qualitative and based on the interpersonal exchanges that occurred between me and the respondents, there is the likelihood that a number of variables may have influenced the quantity and quality of information given by the respondents. A variable that I view as a limitation here is the time factor. Since all the cases are outside Sweden and required expensive travelling cost, the time factor during the data collection process was an important variable. In this regard, the data I used in this thesis were collected during a single visit of two weeks duration to each country (one week in South Africa). In order to be able to interview the seventeen persons I targeted in each organization, and also be able to cross check the interviewees’ comments while on site, I had to limit the interview duration for each person to forty-five minutes (maximum one hour). Lastly, the number of cases that I used in this study (i.e. four organizations) is apparently too low for it to be representative of the population of RTOs in developing countries. This low number of cases can also be perceived as introducing a limitation to the generalised conclusions I have drawn in section 9.2 above. But as I have discussed in chapter three (section 3.3) and in agreement with the views of Yin (1994), Stake (1995) as well as Feagin \etal. (1991), the use of sampling in determining the number of cases is inappropriate, and this makes the typical criteria regarding sample size to be also irrelevant. Even though the four cases I used have enabled me to maximize what was learnt in the period of time available for my study, I still view it of relevance to consider the possibility of a limitation to the

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\(^{239}\) See footnote 32.
study conclusions, and for which account (i.e. potential limitation) I have made the recommendations in section 8.8 above for future study.

These limitations notwithstanding, I perceive my study as contributing to knowledge in variety of ways, as I will highlight in the next sub-section.

9.5.3. Study’s contribution to knowledge: In what ways?

As a recall, I discussed in chapter two (section 2.5) the varying positions reflected in the different models by Blackler240 (1993), Blackler et al.241 (2000), Jarzabkowski242 (2003) and Thompson243 (2004) in relation to Engeström’s (1987) model244 prior to my derivation of a suitable framework for this study. In the pursuant of my appraisal of these models, I made the observation that the premises for their developments were strongly influenced by organization theorising. I also noted that the models have some conceptual differences from the perspective of the organizational theoretical thinking that the respective authors’ adopted in their interpretations of an organizational activity theory. Even though I indicated my recognition of the relevance of the contributions by Blackler et al, Jarzabkowski, and Thompson, I also made a portrayal of their frameworks as depicting conceptual generalisations which make their application difficult from the perspective of modelling a suitable framework to guide the study of an organization’s activity system. My argument in this regard, is that a theoretical framework must have the capability of providing avenues for accessing and analysing the requisite elements in an organization’s activity system so as to provide meaning to a phenomenon under study. It is by virtue of this argument that I used the model by Engeström (see figure 3 in chapter one, pages 51/52) as a dynamic base to outline my study framework245. In the same vein, I also took into consideration the following comment by Engeström in relation to the adaption of his model;

……..I maintain that with the help of this model, activity can be analysed in its inner dynamic relations and historical change. However, this claim must be substantiated by using and transforming

240 See chapter two, sub-section 2.4.2.
241 See chapter two, sub-section 2.4.3.
242 See chapter two, sub-section 2.4.4.
243 See chapter two, sub-section 2.4.5.
244 See chapter two, sub-section 2.4.1.
245 As I have discussed in chapter two (see figure 9 in page 83).
the model in the analysis of the development of concrete activities (Engeström, 1987, p. 81-82).

Thus, by calling for the need to substantiate his claim on the versatility of his model, as it is reflected in the expression above, Engeström appears to say that his model is not a rigid one and that it is flexible enough to allow for what I term as the “adaptable transformation of the model to fit a study context”. I also view his expression to reflect the debate on the complexity of his model (i.e. by virtue of its strong emphasis on the application of conflict theory within a functional theoretical perspective) and the difficulty that can emerge in its application. It is based on this perspective that I highlighted on the relevance of some of the conceptual issues raised by Blackler, Blackler et al, Jarzabkowski and Thompson in the outline of my study framework. What appears obvious to me now, as a result of the expositions from this study, is that these authors have in their own approaches added to the understanding of factors that can be associated to the emergence of conflicts and disturbances in an organization’s collective activity system. As this study has shown, it is such conflicts and disturbances that generate the contradictions which impact on the functionalities of the specific interfaces (i.e. distribution, exchange, and consumption) in an organization’s activity system. In this respect, therefore, and based on the learning from this study, I perceive the conceptual base that underlies the development of Blackler’s model (see figure 4 in chapter two, page 59) to have been strongly oriented towards understanding the functionality of the exchange interface of an organization’s activity system. Similarly, I view the conceptual arguments that Jarzabkowski has provided in her model development (see figure 6 in chapter two, page 67) to have provided an insightful understanding of the functionalities of both the distribution and exchange interfaces of the activity system. In the same vein, I perceive the conceptual approaches that informs the development of Blackler et al’s model (see figure 5 in chapter two, page 63) to have emphasize much on the functionalities of the exchange and consumption interfaces of the activity system. Lastly, the conceptual base that underlies Thompson’s model (see figure 7 in chapter two, page 70) derivative also has its focus on the provision of an understanding to the functionality of the consumption interface of the activity system. As I have also discussed in this chapter earlier on (i.e. in sub-section 9.1.2), the system characteristics of Engeström’s model, when viewed from a contemporary sociological perspective, is a derivative of Parsons’ functional or action theory. In their outline of this theory, Wallace
and Wolf (1991) notes that Parsons’ action theory starts with an *actor*, who could be either a single person or a collectivity. Parsons sees the *actor* as motivated to spend energy in reaching a desirable goal or end, as defined by the cultural system which includes *means* (facilities, tools, or resources) and *conditions* (obstacles that may arise in the pursuit of the goal). In this context, as Wallace and Wolf explain, the actors cannot ignore the rules of the game. The implication being that the rules define their ends and how they behave. In this regard, normative expectations must be fulfilled by any actor who is motivated to pursue a goal. Thus if the norms are internalised by the actor, he or she is motivated to act appropriately and vice versa. This explanation appears to be in congruence with the findings of my study which relates the appropriateness of collective actions in an organization to the internalisation of the practices being implemented by actors.

In sub-section 9.5.2 above, I discussed the limitations of my study, in relation to the theoretical framework and the methodology as well as my interpretation of the results and the subsequent conclusions I drew (i.e. as an analytic generalization) based on my findings from four cases. The limitations notwithstanding, the findings made in this study and the consequent learning that emerges from it, in my opinion, stand to provide (i.e. to the scientific community) an added beneficial insight to the use of activity theory in the study of organization-related phenomenon. As I have highlighted in the study conclusion (section 9.2 above), the internal organizational factors that appear to constrain attempts by most organizations (RTOs in this study) to transform their “old ways” of doing things into “new ways” (by implementing and internalising the BMP model in this study) are rather unidentified contradictions which are caused by conflicts and disturbances in their organizational activity systems. By virtue of this conclusion, as supported by the analytical findings, my study can lay claim to an added methodological contribution in the way internal organizational phenomenon is analysed using the “analysis of contradiction” approach. An added perspective to this approach is the symbolic representation of a “contradiction that has emerged, but which has been managed”. In this respect, therefore, my study has provided an added beneficial insight on the use of organizational activity theory in understanding problems that are associated with the transformation of activities in organizations (i.e. changing from old ways of doing things into new ways), not only by using the BMP model (as it is with my study), but also with the use of other forms of “new practice” models that are
transferred from one organizational context to another. I perceive this insight to be characterised by the organizational learning template (see figure 52 in section 9.3, page 312) which provides a new perspective on the way an organization’s activity system is to be viewed in organizational activity theory, and by extrapolation, within the field of macroergonomics. As I have previously pointed out in chapter one (i.e. section 1.1), macroergonomics is concerned with the analysis, design and evaluation of work systems (with the term work referring to any form of human effort or activity, and the term system referring to sociotechnical systems which can be a single individual using a hand tool or as complex as a multinational organization). In this respect, Hendrick (2002) explains that a work system consists of two or more persons interacting with some form of job design246, hardware and/or software247, internal environment248, external environment249, and an organizational design250 (i.e. the work system’s structure and processes). Therefore, I view the learning underlined by my study findings to be indicative of the fact that since the notion of interrelatedness suggests a social system (Kast and Rosenzweig, 1985), organizations must be viewed as consisting of goal-oriented arrangements (i.e. containing people with a purpose), psychosocial systems (i.e. with people interacting in groups), technological systems (i.e. with people using knowledge and techniques), and an integration of structured activities (i.e. with people working together in patterned relationships). From the perspectives of macroergonomics, I view this description of an organization to be of relevance, and thus stand to offer a good reflection of an organization’s activity system, as reflected by the learning templates. Thus, the learning templates do not only provide an empirical-based contextualised perspective of organizational activity systems, but also stand to serve as a useful methodological framework (i.e. to the scientific community) for exploring the dynamics of transformational activities in organizations. I also perceive the learning templates as a representation of

246 This includes work modules, tasks, knowledge and skill requirements, and such factors as the degree of autonomy, identity, variety, meaningfulness, feedback and opportunity for social interaction.

247 This typically consists of machines or tools.

248 This consists of temperature, humidity, illumination, noise, air quality, and vibration. It also includes psychosocial factors.

249 This consists of those elements that permeate the organization to which the organization must be responsive to be successful. Included are political, cultural, and economic factors. Of particular importance is the degree of stability or change of these external environment factors and, taken together for a given work system, the degree of environmental complexity they present to the organization.

250 This consists of the organizational structure and the processes by which the work system accomplishes its functions.

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practical tools that managers in the RTOs (as well as in other organizations) can use as a practical resource for understanding the functionalities of their organizational activity systems. Based on these perspectives, therefore, my study can also make a claim to a contribution, not only in the production of practical knowledge, but also in the production of theoretical knowledge.
REFERENCES


ISCAR (2005). *ISCAR News, Volume 3, No.6 (Special Issue).*


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Appendix 1

RTOs Studied in WAITRO Best Practices Project
(Source.: Mengu & Grier, 1999)

<table>
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<tr>
<th>S/no</th>
<th>Country</th>
<th>RTO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Egypt</td>
<td>Central Metallurgical Research and Development Institute (CMRDI)</td>
</tr>
<tr>
<td>2</td>
<td>Egypt</td>
<td>Electronics Research Institute (ERI)</td>
</tr>
<tr>
<td>3</td>
<td>Ghana</td>
<td>Food Research Institute (FRI)</td>
</tr>
<tr>
<td>4</td>
<td>Ghana</td>
<td>Industrial Research Institute (IRI)</td>
</tr>
<tr>
<td>5</td>
<td>Ghana</td>
<td>Scientific Instrumentation Centre (SIC)</td>
</tr>
<tr>
<td>6</td>
<td>Ghana</td>
<td>Forestry Research Institute of Ghana (FORIG)</td>
</tr>
<tr>
<td>7</td>
<td>Ghana</td>
<td>Building and Road Research Institute (BRRI)</td>
</tr>
<tr>
<td>8</td>
<td>Kenya</td>
<td>Kenya Industrial Research and Development Institute (KIRDI)</td>
</tr>
<tr>
<td>9</td>
<td>Kenya</td>
<td>International Centre of Insect Physiology and Ecology (ICIPE)</td>
</tr>
<tr>
<td>10</td>
<td>Tanzania</td>
<td>Tanzanian Engineering and Design Organization (TEMDO)</td>
</tr>
<tr>
<td>11</td>
<td>Tanzania</td>
<td>Centre for Agricultural Mechanization and Rural Technology (CAMARTEC)</td>
</tr>
<tr>
<td>12</td>
<td>Tanzania</td>
<td>Tanzanian Industrial Research and Development Organization (TIRDO)</td>
</tr>
<tr>
<td>13</td>
<td>S. Africa</td>
<td>Council for Scientific and Industrial Research (CSIR)</td>
</tr>
<tr>
<td>14</td>
<td>Zimbabwe</td>
<td>Mining Research Institute (MRI), University of Zimbabwe</td>
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### Appendix 1 (continued)

**ASIA**

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<td>National Chemical Laboratory (NCL)</td>
</tr>
<tr>
<td>2</td>
<td>India</td>
<td>Shriram Institute for Industrial Research (SRI)</td>
</tr>
<tr>
<td>3</td>
<td>India</td>
<td>Regional Testing Centre, Calcutta (RTC)</td>
</tr>
<tr>
<td>4</td>
<td>India</td>
<td>Central Leather Research Institute (CLRI)</td>
</tr>
<tr>
<td>5</td>
<td>India</td>
<td>The Automotive Research association of India (ARAI)</td>
</tr>
<tr>
<td>6</td>
<td>Japan</td>
<td>Iwate Biotechnology Research Centre (IBRC)</td>
</tr>
<tr>
<td>7</td>
<td>Japan</td>
<td>Iwate industrial Research Institute (IIRI)</td>
</tr>
<tr>
<td>8</td>
<td>Japan</td>
<td>Kanagawa Academy of Science and Technology (KAST)</td>
</tr>
<tr>
<td>9</td>
<td>Japan</td>
<td>Fukushima technology Centre (FTC), Koriyama</td>
</tr>
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<td>10</td>
<td>Japan</td>
<td>Kyoto Prefectural Comprehensive Centre (KRPC)</td>
</tr>
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<td>11</td>
<td>Malaysia</td>
<td>Standards and Industrial Research Institute of Malaysia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(SIRIM)</td>
</tr>
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<td>12</td>
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<td>Nepal Bureau of Standards &amp; Metrology (NBSM)</td>
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<td>Nepal</td>
<td>National Productivity and Economic Development Centre</td>
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<td></td>
<td></td>
<td>(NPEDC)</td>
</tr>
<tr>
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<td>Industrial Technology Development Institute (ITDI)</td>
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<td>Metal Industry research and Development Centre (MIRDC)</td>
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<td>17</td>
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<td>18</td>
<td>Thailand</td>
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<td>Denmark</td>
<td>Danish Technological Institute (DTI)</td>
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<td>2</td>
<td>Germany</td>
<td>Steinbeis Foundation, Stuttgart (SF)</td>
</tr>
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<td>3</td>
<td>Germany</td>
<td>German Federation of Industrial Research Associations</td>
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<td></td>
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<tr>
<td>4</td>
<td>Netherlands</td>
<td>The Netherlands Organisation for Applied Scientific</td>
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<td></td>
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<td>Research (TNO)</td>
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<td>5</td>
<td>UK</td>
<td>PERA International, Leicestershire</td>
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<tr>
<td>6</td>
<td>Sweden</td>
<td>Swedish Production Engineering Research Institute (IVF)</td>
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### NORTH AMERICA

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<td>Centre de Recherche Industrielle du Quebec (CRIQ)</td>
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<tr>
<td>2</td>
<td>Canada</td>
<td>ORTECH Corporation (ORTECH)</td>
</tr>
<tr>
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<td>Canada</td>
<td>Saskatchewan Research Council (SRC)</td>
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<td>Canada</td>
<td>Alberta Research Council (ARC)</td>
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<td>Canada</td>
<td>Prairie Agricultural Machinery Institute (PAMI)</td>
</tr>
<tr>
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<td>Canada</td>
<td>Pulp and Paper Research Institute of Canada (Paprican)</td>
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<td>7</td>
<td>USA</td>
<td>Energy and Environment Research Centre (EERC)</td>
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<tr>
<td>8</td>
<td>USA</td>
<td>Southwest Research Institute (SwRI)</td>
</tr>
<tr>
<td>9</td>
<td>USA</td>
<td>Institute of Gas Technology (IGT)</td>
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<td>10</td>
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**LATIN AMERICA & The CARIBBEAN**

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<td>Centro de investigacion y asistencia tecnica a la industria (CIATI)</td>
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<tr>
<td>2</td>
<td>Brazil</td>
<td>Packaging Technology Centre (CETEA) of Food</td>
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<td></td>
<td></td>
<td>Technology Institute</td>
</tr>
<tr>
<td>3</td>
<td>Brazil</td>
<td>Andre Tosello Research and Technology Tropical Foundation (FPTP)</td>
</tr>
<tr>
<td>4</td>
<td>Columbia</td>
<td>Instituto de Capacitacion del Plastico y del Caucho (ICIPC)</td>
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<td>5</td>
<td>Chile</td>
<td>Industrial Technology Institute (INTEC)</td>
</tr>
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<td>6</td>
<td>Dominican Republic</td>
<td>Dominican Institute of Industrial Technology (INDOTEC)</td>
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<td>7</td>
<td>Guatemala</td>
<td>Central American Institute for Industrial Research and Technology (ICAITI)</td>
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<td>8</td>
<td>Jamaica</td>
<td>Scientific Research Council, Jamaica (SRC)</td>
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<td>9</td>
<td>Mexico</td>
<td>Instituto de Investigaciones Electricas (IIE)</td>
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<td>10</td>
<td>Trinidad</td>
<td>Caribbean Industrial Research Institute (CARIRI)</td>
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APPENDIX II
Appendix II

STRUCTURED INTERVIEW QUESTIONS
(Chief Executive Officer/Executive Director)

Factors Constraining the Implementation of “Best Management Practices”
Case of Research and Technology Organizations in Developing Countries
(PhD Research Project)

By
Mohammed-Aminu Sanda
(PhD Student)
Division of Industrial Work Environment,
Department of Human Work Sciences
Luleå University of Technology,
Sweden

1. Based on an earlier survey I carried out on the subject of this research, most of the organizations noted that it agreed, but with reservation, to the following observation;

“...that there is no significant difference in the type of organizational and management problems faced by RTOs, whether in the industrially developed or developing countries”.

Does your organization also agree to this observation?

i. If YES, could you kindly elaborate on what those “reservations” are and why?

ii. If NO, could you kindly explain why your organization does not agree?
Appendix II (continued)

2. During the best management practice implementation processes, did your organization have to work in cooperation with other parties external to it?
   
i. If YES, how did this community functioned, and the influence it had on both management and work organization?

   ii. If NO, could you, kindly explain why?

3. How would you define the division of labour in the community (if any), on one hand, and within the organization, on the other, during the best practice implementation efforts?

4. Benchmarked best practices are mostly guided by their own set of implementation requirements, which may run contrary to what pertains in most organizations trying to implement these practices.
   
i. Did your organization have to contend with such problems as, resistance (openly or secretly), to the acceptability of new operating rules and also the possibility of partial or selective application of such new rules?

   ii. If YES, how were you able to contend with such events in your organizations desire to press ahead with its implementation of best practices?

5. In relation to the implementation approach of best practices, Most of the organization’s either “adopted” or “adapted” most of them.
   
i. Could you comment on your organization’s motivational approach in this respect, as it relates to the prevailing management and work organization issues?
Appendix II (continued)

ii. How did you resolve problems of non-conformity of activity rules, if any, between best practices being implemented and the prevailing practices to be reformed, in relation to their effects on both management and work organisations during the “adaption” process?

6. How would you define the division of labour in the community (if any), on one hand within the organization, on the other, during the best practice implementation efforts?

7. In most organization’s view, “best practices are not the preserve of RTOs in rich countries, and thus can be transferred across national and organizational boundaries”.

i. Does your organization’s share such holistic view?

ii. Could you, kindly, elaborate on why you have this conviction?

8. From most organization’s viewpoint, factors, such as consumer and market forces, socio-economic and legal issues, political atmosphere, communication interfaces, subsystem stability, culture and climate influences as well as decision-making, in some ways, create what I might term “barriers to successful best practice implementation”.

i. Is your organization in agreement with some or all of these viewpoints?

ii. If in agreement, could you kindly comment on how these “barriers” influenced some management and work activity undertakings, within your organization?
Appendix II (continued)

iii. In your estimation, how did these “barriers” threatened the required level of divisional cohesion and positive cooperation from the perspectives of issues relating to trust, pressure, support, recognition, fairness, level of formalization, participation and innovation from elements within your organization?

9. Based on the level of informed knowledge and understanding of staff about the organizational changes (best practices implementation) for which they, as strategic actors, were putting into practice,

i. Have you, at any point in time, develop the impression or made an observation to the fact that these staff might have, possibly, carried out some aspects of their activities in a way they believed to be best for the organization, but for which outcome, in reality, could have proved to be contrary to the organization’s expectation?

10. It also appeared that the level of cooperation received from the staff has a direct relation to the level of their informed knowledge and understanding.

i. How would you classify the transition of staff’s attitude prior to the introduction of the best management practices to date?

ii. How was these translated in their approach towards work organization activities?
APPENDIX III
Appendix III

STRUCTURED INTERVIEW QUESTIONS
(Key Actors/Staff members)

Factors Constraining the Implementation of “Best Management Practices”
Case of Research and Technology Organizations in Developing Countries
(PhD Research Project)

By

Mohammed-Aminu Sanda
(PhD Student)
Division of Industrial Work Environment,
Department of Human Work Sciences
Luleå University of Technology,
Sweden

1. How will you classify the attitude of the staff, either as individuals or a group, towards the organization’s transformation process, as it relates to the activities that they perform?

2. From your observation, do you think that your organization’s staff, whether as individuals or as a group, innocently operated in a way that seems to slow down the organization’s transformation process, from the perspectives of its desired objectives of achieving a desired outcome?

3. What is your impression about the quality of administrative, as against technical instruments and materials used by your organization to perform activities (i.e. anything that is needed or useful for your workers when performing their activities), in relation to the outcome expectations of the transformation process?
Appendix III (continued)

4. What are your opinion on the influence of existing institutions (such as formal and informal internal rules at the management and workplace levels, as well as shared values, attitudes and perceptions) on the staff, and its possible impact on the organization’s transformation process?

5. How do you view the division of labour (especially between the different categories of human actors, on one hand, and between the human and non-human actors, on the other, involved in, or interacting with organizational activities) and its impact on work organisation and management during the transformation process?

6. How did you perceive the reactions of the surrounding society, as well as the prevailing market and their possible impacts on your organization’s transformation efforts, from the perspectives of the following?

- Strength
- Direction
- Breadth
- Height
- Localization
APPENDIX IV
Appendix IV

GENERAL SURVEY QUESTIONNAIRE

Factors Constraining the Implementation of “Best Management Practices”
Case of Research and Technology Organizations in Developing Countries
(PhD Research Project)

By

Mohammed-Aminu Sanda
(PhD Student)

Division of Industrial Work Environment, Department of Human Work Sciences
Luleå University of Technology, Sweden

In your organization bid to improve upon the profitability of its services and outputs, it has undergone several transformations, with the implementation of best practices to help strengthened the organization’s management capabilities. I would, therefore, be very grateful if you could kindly participate in this research project, by giving your current and personal assessment on the factors listed in the questions below, as they relate to your work.

1. Do you have freedom to carry out your tasks without interference?

☐ I have ☐ I never had ☐ before, but not now.


Appendix IV (continued)

2. How cohesive is your working team?

☐ Strong ☐ Weak ☐ No Team Work

3. How do you view the level of trust in the working climate?

☐ Trustworthy ☐ No Trust ☐ Difficult to Judge

4. How is the level of pressure on your daily task schedule?

☐ No Pressure ☐ Manageable ☐ Too Much Pressure

5. How do you view the level of support from colleagues?

☐ No Support ☐ High ☐ Not Encouraging

6. How do you perceive the level of support from management?

☐ No Support ☐ High ☐ Not Encouraging
Appendix IV (continued)

7. How do you view performance recognition from colleagues?
   - No Recognition
   - High
   - Not Encouraging

8. How do you view performance recognition from management?
   - No Recognition
   - High
   - Not Encouraging

9. How do you view the level of fairness within the organization?
   - No Fairness
   - High
   - Not Encouraging

10. How do you view the possibility of personal growth and innovation?
    - Not Possible
    - High
    - Not Sure

THANKS VERY MUCH FOR YOUR KIND ASSISTANCE
APPENDIX V
Appendix V

CONDUCTION OF
“FUTURE WORKSHOP”

User’s Guide for Workshop Leaders
Adapted from Recommended Techniques of Professor Houshang Shahnavaz

Prepared By

Mohammed-Aminu Sanda
Ingegerd-Skoglind Öhman
Professor Houshang Shahnavaz

Department of Human Work Sciences
Luleå University of Technology,
Sweden

October, 2002
Appendix V (continued)

A. PREPARATION PHASE (leaders)

1. Develop and agree the theme for the workshop.
2. Theme should be acceptable to all.
3. Theme should be;
   i. Clear;
   ii. Short;
   iii. Challenging; and
   iv. In the form of question or statement
3. Theme should not be too narrow or diffuse.
4. Theme could be completed later with “sub-themes”.

PREREQUISITE FOR SUCCESS (leaders)

- Motivated participants (15 to 25)
- Flexible and informal condition and atmosphere.
- Access to refreshment.
- Access to material for visualizing the workshop output.
- 2 neutral persons as workshop leaders.
Appendix V (continued)

B. EXPERIENCE (CRITIC) PHASE (participants)

1. Participants to concentrate on negative side of workshop theme.
2. Irritations and problems (small or large) experienced by participants relating to theme should be highlighted.
3. develop complete “problem catalogue”

PREREQUISITE FOR SUCCESS (leaders)

- Provide each participant with block of paper to write his/her critic.
- Each participant describes, in short, a concrete problem he/she experienced.
- Workshop leaders write all statements (exactly as expressed) with a running number on a block of large paper.
- Rounding continues until all participants have emptied themselves of all critics.
- Allow a short pause so that participants can continue to fill in the problem catalogue.
Appendix V (continued)

VOTING THEN TAKES PLACE (leaders)

i. Workshop leaders distribute “VOTING” papers to participants.

ii. Each participant has 7 points (credit) to give the problems (critical points).

iii. Each participant then distributes the 7 credit points to three (3) listed problems in the catalogue which he/she thinks to be important.

- Two (2) problems should be credited with 3 points each.
- Remaining one (1) problem should be credited with only 1 point.

GIVE PARTICIPANTS A REST PERIOD (leaders).

WORKSHOP LEADERS THEN CALCULATE THE VOTING CREDITS.
RESULTS COMPILATION (leaders)

1. Problems with highest ranking are picked.
2. Workshop leaders then try to define 3 to 5 “MAIN THEMES” that will cover all problems that have received highest ranking.
3. Workshop leaders write on separate large papers the title of each theme. This is followed by problems that belong to the theme.

REST PERIOD OVER (leaders)

1. Participants asked to discuss freely the different themes.
2. Participants certify if their expressed problem is under the correct theme.

AFTER PARTICIPANTS HAVE APPROVED BOTH THE MAIN THEMES AND BELONGING PROBLEMS. (leaders)

1. Workshop leaders invite participants to select a theme that they may like to work with.
2. Different groups are built, accordingly.
3. No group should have less than 3 persons or more than 7 persons.
   - This allows for good environment for discussion.
Appendix V (continued)

C. PHANTASY PHASE (participants)

1. Participants to come out of the daily limitations which usually lead to.
   - Restraints;
   - Traditional thinking; and
   - Acting.

2. Many new ideas that participants have in their unconsciousness will pop up by thinking over their daily limitations. Everything is possible in this phase;
   - No barriers;
   - No economic limitations;
   - No personal limitations;
   - No technical limitations,
   - No organizational limitations.

3. Idea is to develop “FUTURE VISIONS” that have enough power to solve all the critical problems that the groups have decided to work with.
Appendix V (continued)

APPLICABLE RULES (participants)

- It is not possible to do this,
- It is too expensive,
- This we have tried and it did not work,
- Management would never accept this
- This is a ridiculous idea, etc.

DISCUSSION GUIDE FOR GROUP (participants)

- Each member’s fantasy should only be discussed in the group with regards to its ability to solve one or more of the problems that the group is working with under each specific theme.
- Disagreement within the group is allowed and accepted.
- Groups should encourage its members to use pen and paper to note their ideas and discuss it with other members of the group.
Appendix V (continued)

NOTE (participants)

As all the material that are produced in each group will be used to write the final report of the workshop, it is important that;

- Each individual’s fantasy is written clearly under the proper theme with a running number.

NOTE (FW leaders)

After all group members have expressed their fantasies in concrete terms;

- Write down all the fantasies on a block of large paper.
- All participants from the various groups come together again.
- Each group presents its fantasy solutions to the other groups.
- Participants then decide which part of the fantasy solutions should be realized by each group during the next phase.
Appendix V (continued)

D. STRATEGY PHASE

1. Go through all written fantasies.

2. Find all barriers that are existing; for the realization of the fantasies. Groups should consider such factors as;
   
   • Economic,
   
   • Technical;
   
   • Organizational; etc.
   
   • Realities that are existing in the organization;
   
   • Realities that are existing in the society

3. Participants to discuss in group basis whether any of the real barriers could be removed.

4. Each group should try and prepare a plan or a programme for change
   
   • In order to realize the fantasies that the group has decided should be realized.
5. Group can start discussing if a hindrance is insurmountable.
   - If not, group should consider how it could be removed, and when.

6. Write down all plans and programmes discussed on large block of papers.

7. All groups meet again and discuss the various plans and programmes that have been developed by each group.

**NOTE (participants)**

Groups can use the different techniques as listed below to develop feasible strategy and solution to the problem on hand.

- Cause and Effect diagram;
- Desirability and Possibility assessment.
- Circle model.
- Triangular model.
E. **ACTION PHASE (leaders)**

1. Prepare complete report which includes the following:

   - All critical problems;
   - Fantasies;
   - Programmes and plans proposed by participants.

2. It is important that report become an “IDEA CATALOGUE” for future actions and a receipt (feedback) for participants to see how hard and intensive they have worked.

**NOTE (leaders)**

A Future Workshop is sometimes the direct and immediate solution to problems. However, most of the times, it prepares the foundation for;

   - New perspectives;
   - Future vision; and
   - New ideas for solving problems.

The ultimate aim is to realize all the expressed fantasies through co-operation by using group member’s potentials and capabilities.
APPENDIX V (continued)

TRIANGULAR MODEL

INSTRUMENT

SUBJECT = PROJECT LEADER

OBJECT = GOAL

REGULATIONS  NETWORK  WORK ORDER
CAUSE & EFFECT DIAGRAM
(Fish-Bone Diagram)
Appendix V (continued)

DESIRABILITY & POSSIBILITY MODEL

Desirability

Possibility

0 50 100

0 50 100
Appendix V (continued)

CIRCLE MODEL

EVALUATING

TRYING IT IN PRACTICE

DEVELOPING NEW INSTRUMENT

VISION

DESCRIPTING THE PROBLEM

HISTORICAL ANALYSIS

CURRENT SITUATION ANALYSIS

NEAREST DEVELOPMENT ZONE