Effects of Planning systems of Universities on Management Control Systems and Organizational Performance
A case study at KTH

W.R.S.M.U.A Higgoda

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Abstract

Planning systems which can be considered as modules of an Enterprise Resource Planning system play a vital role in different types of organizations. The effects of the planning systems towards the Management Control Systems and organizational performance are less investigated in the context of not-for-profit/service providing organizations. This study sheds light on the effects of the planning systems on informal management controls and non-financial organizational performance by investigating the Swedish university sector through a case study performed at the Royal Institute of technology where the data were gathered using semi-structured interviews from different administrators using the planning systems. The study presents the effects of ten planning systems towards personnel controls, cultural controls and planning & decision making controls. It further examines how the planning systems affect the personnel development, workplace relationships, employee satisfaction and other type of organizational performance measures. In this endeavour, the results of this study shows how the personnel controls affects the personnel development, cultural controls affects the workplace relationships and planning & decision making controls affects the employee satisfaction, all in the light of different planning systems. Furthermore, it was also found out how different planning systems affect different organizational performance measures, namely, quality and efficiency of processes, quality of staff, employee health & safety, gender equality, premises and infrastructure, student attractiveness, quality assurance, research & education and external professional relationships. Finally this study generalizes the results found through investigating each planning system, which can be applied to the university sector/not-for-profit organizational sector in Sweden.

Key-words

ERP, ERPS, MCS, Cultural controls, Personnel controls, Organizational Performance, Not-for-profit organizations, KTH
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This thesis is carried out as fulfilling a requirement of the subject ME200X: Thesis in Industrial management and as a requirement to conclude my master's degree in Computational and systems Biology-2012 at the Royal Institute of Technology, Stockholm, Sweden.

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1. INTRODUCTION

1.1. BACKGROUND

1.1.1. ENTERPRISE RESOURCE PLANNING SYSTEMS

ERP is an acronym for Enterprise Resource Planning. ERP Systems' (ERPS) primary scopes of usage are to administrate wages, ledgers, billing, personnel and purchasing. The main reasons for the companies and organizations for implementing ERPS can be primarily linked to the benefits it offers such as integration of financial information, integration of customer orders, standardization and optimization of manufacturing processes, possibility of reducing capital needs and standardization of human resources information. The ERPS that exist on the market today are assembled by a set of modules, which in their turn are supporting a given set of business processes.

Some of those biggest providers of ERPS today are SAP AG, Microsoft, Oracle, Jeeves and IFS. Open-source alternatives are for instance OpenBravo, Compiere and OpenERP. The technical complexity of an ERPS may therefore vary depending on the provider and the client as well as the needs of customization. It is normal that an ERPS is connected to one shared database which in its own turn is connected in such a way that every part of a company or organization is able to use the particular database source. This will enable information being shared and updated in real-time.

The history of the modern ERPS begins in the early 90s. The Gartner Group was first to employ the acronym ERP (Wylie, 1990). The rapid growth of ERPS under the 90s was primarily due to the introduction of the EURO currency and the Y2K problem (Ellen and Wagner, 2006). Those early ERPS were initially focused on back office functions, which mean that they did not affect front office functions directly. The modern ERPS are often very technically sophisticated and affect almost every function in an organization aforementioned.

Enterprise Resource Planning (ERP) is a widely researched domain in different contexts. Most of prior studies focus on ERP or implementation of the same (Schlichter and Kraemmergaard, 2010). The aforementioned ERP concepts can be categorized according to Schlichter et al. (2010) in the following manner; implementation, optimization of ERP, ERP tool, ERP & supply chain management, study of ERP, education, and ERP market & industry. Furthermore, there has been more research conducted focusing on ERP which cannot be categorized under the previously mentioned sections. In this endeavour, very few researchers have investigated the post era of the ERP implementation of an organization.

The ERP systems contain different modules integrated to them. These different modules are addressed as planning systems in this report.
1.1.2 MANAGEMENT CONTROL SYSTEMS (MCS)

Management Control systems (MCS) in this context refers to systems which collects information to evaluate performances of several resources of an organization. Horngren, Sundem and Stratton (2005) define a management control system as an integrated technique for collecting and using information to motivate employee behaviour and to evaluate performance. Management Accounting, Management Accounting Systems, Management Control Systems and Organizational Control are sometimes used interchangeably (Chenhall, 2003). To be more specific, in the university and higher education establishments, MCSs are perceived as broad based systems that go beyond management accounting systems to embrace behavioural and cultural aspects of controls (Kober, Ng and Paul, 2007).

1.1.3 ROYAL INSTITUTE OF TECHNOLOGY

The Royal Institute of Technology (KTH) is a university situated in Stockholm, Sweden, which is the largest provider of technical/engineering education at a university level in Sweden. The following details are extracted from the KTH Management report (2010).

- Education: 14,073 full time students and 1,683 active research students in Architecture and 16 engineering programs (in natural sciences, industrial management and urban planning)
- Finances: SEK 3,674 million in total turnover
- Employees: 4,276 employees, the equivalent of 3,157 full time positions, of which: 1,088 women, 2,069 men, 287 professors (including 23 visiting professors and 29 women professors), 38 adjunct professors (individuals) and 207 associate professors (including 3 assistant professors and 39 women professors)
- Campuses: Main campus at Valhallavägen and other campuses situated in Kista, Haninge, Flemingsberg and Södertälje

There are 10 different schools/departments at KTH and the University administration is done from the Main campus.

1.2 PROBLEM

Universities and higher education establishments can be viewed as business organizations with respect to their internal processes and organizational structures. In this endeavour, educational establishments should theoretically work in the same line as business organizations. However, the nature of these higher education environments lead to more distinct problems, which need to be addressed through well implemented planning systems. This poses an interesting question concerning the university sector which should be answered in the light of KTH, *what effects do the planning systems at KTH have on organizational performance?* This question is answered in the
following study, by looking into the non-financial performance and informal management controls in the organization, which will be elaborated in chapter 2.

1.3 PURPOSE

The purpose of this research is to enrich the knowledge in the area of the planning system's connection with MCSs and organizational performance in the Swedish university sector/not-for-profit organizational sector.

1.4 DELIMITATIONS

Due to the limitation of the time available for this research, and since three major areas (planning systems, MCS and organizational performance) are covered in this project to a sufficient extent, one may not be able to obtain a complete knowledge on each segment considered in this research. However, the most vital areas of the three major segments will be covered, allowing future researchers to go in depth, investigating each segment.

Since this is a case study, the obtained knowledge cannot be applied universally and will be further bounded by the knowledge and the understanding of the interviewees about the investigated aspects.

MCS is a broad area, and this study will investigate only the controls which exist around different planning systems which fit them into different departments of the organization. Furthermore, since this study is carried out in the Swedish university/not-for-profit organizational sector only the MCSs which are unique to these types of organizations are used in this study.

1.5 VALIDATING THE RESEARCH

This study is formulated and referenced to considerable amount of peer reviewed journal publications. To be more specific, it can be seen from the table no. 1 (page 6) the different journal publications and references used in constructing the framework for this study.

In order to validate the results of this study, a similar study should be conducted under the same settings in another Swedish university which should generate the same results as this study. But, in interpretivistic studies like this it is the common belief that researchers influence their research, therefore making it difficult to conduct an identical study at a later time (Collis and Hussey, 2009).

This study generalizes the specific findings at KTH, so that it can be applied to the planning system administrators in the Swedish university/not-for-profit organizational sector. According to Normann, cited by Collis & Hussey (2009), it is in fact possible to generalize from a few or even a
single case if the measures accurately reflect the phenomena under study, though requiring deep understanding of it.

1.6 STRUCTURE OF THE REPORT

The structure of the report is as follows,

- **Literature review**
  This chapter starts by presenting the foundation study for this research. Next, it highlights the differences between not-for-profit and for-profit organizations. Thereafter, it presents specific facts pertaining to the university as a service providing/not-for-profit organization. Then follows the chapter which presents the planning systems used at KTH, MCSs in the light of the university sector and finally the performance measures used in the university sector.

- **Methodology**
  This chapter starts by presenting the paradigm used in this research. Next, it explains the methodology used and justifies the choices made in selecting the methodology. Thereafter, it presents the framework used to gather data and then explains how the analysis of the gathered information is carried out using contingency theory and the framework for analyzing the fit between the planning systems and MCSs. Next, this chapter explains the framework for organizational performance analysis and finally concludes by explaining the limitations of the research design.

- **Findings and results**
  This chapter starts by explaining how the gathered data are presented. Next, it presents how the data are analyzed and then explains how the results are presented; firstly in a planning system-wise manner and secondly in an overall manner considering the findings of all the planning systems, which is finally presented as a generalized description applicable to the Swedish university/not-for-profit organizational sector.

- **Conclusion**
  This chapter starts by presenting a summary of the results and then goes on to highlight the author's contribution to the knowledge. Next, in this chapter is the discussion of limitations of the research and suggestions for future research. This chapter concludes by presenting the implications of the research for practice.
A comprehensive literature review on ERP conducted by Schlichter et al. (2010) has managed to identify the evolution of ERP related journal publications throughout a decade. This has managed to identify the current state of ERPS. The major areas of concern have been classified into several categories by Schlichter et al. (2010), namely, implementation, optimization of ERP, ERP tool, ERP & supply chain management, study of ERP and ERP market & industry. Thus, the research conducted by Schlichter et al. (2010) shows that there is a certain gap between the concerns of ERP with that of the post ERP implementation era. Comparatively a small number of publications have managed to dedicate its findings in this area. The following table shows the framework used in this chapter.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERPS, MCS and organizational performance</td>
<td>The foundation of this research is based on the study carried out by Kallunki et al. (2011)</td>
</tr>
<tr>
<td>Not-for-profit and for-profit organizations</td>
<td>Compare and contrast the two types of organizations using Merchant and Van der Stede (2007)</td>
</tr>
<tr>
<td>University as a service providing/not-for-profit organization</td>
<td>Highlights the features necessary for this research using Modell (2003;2005), Teichler (2003), Whitchurch (2007) and Kezar &amp; Eckel (2004)</td>
</tr>
<tr>
<td>Planning systems</td>
<td>Highlights the planning systems used at KTH using interview results (Appendix A)</td>
</tr>
<tr>
<td>MCS in the university sector</td>
<td>Highlights the MCSs used in this research using Merchant and Van der Stede (2007) and Kallunki et al. (2011)</td>
</tr>
<tr>
<td>Performance in the university sector</td>
<td>Highlights the derived performance measures for the university sector using, Kallunki et al. (2011), KTH management report (2010), Quality Audit in the Nordic Countries (2007), and Ranking of universities and higher education institutions for student information purposes? (2009)</td>
</tr>
</tbody>
</table>

TABLE 1: FRAMEWORK OF LITERATURE SURVEY
2.1 THE RELATIONSHIP BETWEEN ERPS, MCS AND ORGANIZATIONAL PERFORMANCE

The ERPS when implemented leads to productivity and quality improvements in organizations (Hunton, Lippincott and Reck, 2003). It is also the case that this will lead to better designed information systems (Arnold, 2006), where the firms would be able to translate the benefits of the implemented systems into better financial and non-financial performances. Furthermore, these performances can be achieved by the use of Management Control Systems (Chapman 2005; Chapman and Kihn 2009). Kallunki et al. (2011) have proposed a path model connecting ERPS, MCSs and organizational performance, which is then tested against survey data from 70 Finnish business units which is shown in figure 1.

![Figure 1: Path model showing organizational performance affected by ERPS mediated through MCS (Kallunki et al., 2011, page 23)](image)

Kallunki et al. (2011) have identified a significant path from formal MCS which are linked to the non-financial performance. They have also found that there is no direct correlation between ERPS and non-financial performance. To elaborate, Kallunki et al. (2011) have identified that formal MCS fully mediate the positive lagged effects of ERPS on non-financial performance. These results also show that the non-financial performance is positively related to financial performance. However, Kallunki et al. (2011) have failed to find informal MCS that mediate the effects of ERPS on non-financial and financial performances. The study by Kallunki et al. (2011) can also be viewed as an extension of the work carried out by Chapman (2005) and Chapman and Kihn (2009) by arguing that MCS acts as mediating variables between ERPS and organizational performance, where formal controls are identified as useful tools which help managers to develop a rational approach to planning and control, and also help the organizations they work in to achieve better organizational performance.
performance (Chenhall and Morris 1995; Widener 2007). On the contrary, Kallunki et al. (2011) have identified that informal MCS as a mediating variable between ERPS and non-financial performance has no significant relationship. At the same time the study highlights that the results obtained will only lead the researcher to realize the less importance of informal MCS comparatively to the formal MCS and suggests that a more focused qualitative study will reveal the significance of the former.

This opens up an avenue to conduct further research, by looking beyond the existing relationships taking a qualitative approach and exploring the roles of formal and informal management controls which leads to both financial and non-financial performances in an organization in the light of ERPS. When the organization in concern is a university or a higher education establishment, it further adds constraints to the proposed research. Even though, a university or a higher education establishment should theoretically work in line with a business organization with respect to its organizational structure and internal processes, there are distinct characteristics which differentiate business organizations from universities.

Universities in Sweden, including KTH, are funded by the state government (List of universities in Sweden, 2012). Since these public universities are focused more towards providing a service than raising profit, they fall under the organization type not-for-profit organizations. It is therefore necessary to understand the main differences and similarities between the profit-oriented business organizations and not-for-profit service providing organizations.

### 2.2 NOT-FOR-PROFIT AND FOR-PROFIT ORGANIZATIONS

Merchant and Van der Stede (2007, page 781-782) states that, the main difference between for-profit and not-for-profit organizations is the mission or the goal of the organization. The primary purpose of a not-for-profit organization is not to make profit but to provide public service. Not-for-profit organizations do not seek any outside equity since most of them are funded by the government. But like other for-profit business organizations these institutes also generate revenues for survival.

Goal ambiguity is a problem which exists in not-for-profit organizations (Merchant and Van der Stede, 2007, p. 782). On the other hand, for-profit organizations have clearly defined goals and explicit performance measures such as stock performance in the stock market. There is also a goal conflict in not-for-profit organizations, since different parties engaged in such organizations might have different interests which may conflict with each other. Consider the case of a public university, where the government might be interested in working within the budget goals, the university staff might be interested in introducing new pedagogical approaches involving new technology, and the students might be interested in the conventional ways of learning. The previous example clarifies
generally inevitable goal complexities which arise in not-for-profit organizations, which needs special decision making mechanisms.

Smith (1993) states that, even if the goals of a not-for-profit organization are clear to all, the managers of these organizations do not possess a single, quantitative bottom-line performance indicator like the for-profit organizations. Thus, the degree of achievement of goals and the quality of the services provided cannot be measured accurately in financial terms (Merchant and Van der Stede, 2007, page 783). Furthermore, Merchant and Van der Stede (2007, page 784) states that, in not-for-profit organizations, it becomes difficult to hold the managers accountable for specific areas of performance which relate exactly to the organizational goals and compare performances of subunits performing dissimilar activities. As a remedy, to improve efficiency and effectiveness of these not-for-profit organizations, managers are exposed to external pressure by government reforms, which allow democratic societies to access information within the public organizations (Merchant and Van der Stede, 2007, page 787).

*Characteristics of employees* is another important aspect which differentiates not-for-profit organizations from its counterpart. Even though the managers of not-for-profit organizations address the same control problems like for-profit organizations, which are, lack of direction, lack of motivation and lack of ability; command-and-control style of management becomes ineffective and special attention should be set by the managers in encouraging open decision making processes to build consensus (Merchant and Van der Stede, 2007, page 788). This is because the success of not-for-profit organizations heavily relies on strong cultures maintained within the organization.

### 2.3 UNIVERSITY AS A SERVICE PROVIDING/NOT-FOR-PROFIT ORGANIZATION

The preceding section highlighted the main differences between for-profit and not-for-profit organizations. This section emphasizes the specific features pertaining to the university sector, which is a sub domain of not-for-profit and service providing organizations.

- **Political influences**
  
  Modell (2005) describes the political interplay between different actors in the Swedish university sector by highlighting the different reforms brought by the government and the problems faced in translating the notion of *students as consumers* to performance management practices. Furthermore, it sheds light on the fact that the Swedish universities face external pressure from the government and institutions like Swedish National Agency for Higher Education.

- **Public information**
  
  The *Freedom of the Press* act of 1766 enabled information pertaining to universities in Sweden publically accessible (Sweden, 2012). In this endeavour, KTH produces two main reports annually, which are the KTH annual report and the KTH management report. These two documents give a
detailed picture of the organization to the public, to conduct any assessment, to draw conclusions about the standard of the organization.

- **Performance measurement**

Modell (2003) describes the evolution of performance measurement in the Swedish university sector in the light of goal directed and process-oriented institutional perspectives. Modell (2003) uses comparable Performance Indicators (PIs) proposed by the Swedish National Agency for Higher Education. These PIs enable to conduct a macro level survey amongst different universities and gives an indication about the performance of the same.

- **Academic Administration**

Academic administration is a separate section of a university which contains employees who are responsible for maintenance and supervision of the institution and its processes, and can be differentiated from academic personnel even though some may have joint responsibilities.

The key responsibilities of the academic administration are as follows (Key responsibilities, 2012),

- Managing admission
- Supervision of institutional affairs (hiring, promotion, evaluation and quality assurance)
- Maintenance (official records, updating documents/information, financial records, buildings, premises)
- Safety and security
- Supervision and maintenance of information systems and facilities
- Research administration (grants /contract administration and institutional compliance with state regulations)
- Handling public affairs (relations with media, community and government)
- Preparation of reports (required by the government and the other interested parties)

Teichler (2003) states that the administration of the higher education in Europe has steered away from the strong state supervision of policies and procedures along an academic self-regulation path towards the managerial university which is characterized by the following,

- Reduced procedural controls and increased strategic steering by the government
- Increased resource allocation powers
- Increased managerial powers within the higher education institutions- growing power of executives
- Growing number of professionals together with reduction of the role of the academic profession
- Growing roles of the mechanisms for evaluation and reporting
Governance

The essence of governance pertaining to the higher education sector has changed during the last decade by mainly focusing on high stake issues and the less collegial approach taken in making decisions (Kezar and Eckel, 2004). As Kezar and Eckel (2004) states, the reasons for these adaptations are due to the devalued notion of participation, increased external pressure for accountability and the demands for quicker decisions which are made through the means of bureaucracy.

Whitchurch (2007) states the following points about the professional managers engaged in the academic administration.

- Official descriptors and categories available for the description of professional managers are inadequate
- Unclear view of the roles of professional managers (with respect to traditional specialist and generalist, or those that cross into academic territories)
- Professional managers are creating new space in the university engaging in new forms of management

2.4 PLANNING SYSTEMS

Mentioned below in the table no. 2 (page 10) are the main planning systems employed at KTH (found in Appendix A). This list of the planning systems at KTH was obtained after interviewing a top level administrator from the IT department. It should also be noted that three additional planning systems (KTH-Res, KTH-Lokaler and KLARA) were added to this list after interviewing a top level administrator from the Human Resources department. The details of these systems are discussed in chapter 4. There are many other planning systems employed at KTH, but this study is confined to the following planning systems, due to the limitation of time allocated for this study.

<table>
<thead>
<tr>
<th>Name of the system</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRESSO</td>
<td>Financial system</td>
</tr>
<tr>
<td>HR+</td>
<td>Human resource Planning system</td>
</tr>
<tr>
<td>W3D3</td>
<td>Legal records management system</td>
</tr>
<tr>
<td>LADOK</td>
<td>Academic records management system</td>
</tr>
<tr>
<td>COGNOS</td>
<td>Representation of data warehouse</td>
</tr>
<tr>
<td>KTH-RES</td>
<td>Travel system</td>
</tr>
<tr>
<td>KTH-LOKALER</td>
<td>Site management system</td>
</tr>
<tr>
<td>KLARA</td>
<td>Chemical handling system</td>
</tr>
<tr>
<td>KOPPS</td>
<td>Courses and programs planning system</td>
</tr>
<tr>
<td>UG</td>
<td>Users and groups system</td>
</tr>
</tbody>
</table>

TABLE 2: PLANNING SYSTEMS EMPLOYED KTH
2.5 MCSs IN THE UNIVERSITY SECTOR

Due to the nature of mass higher education, it is impractical to avoid the means of bureaucratic management and organization, which does not mean the idea of completely ignoring the informal discipline and the profession based authority in the internal governance of the university sector (Dearlove, 1997). Thus, there are models presented for university governance by considering the positive aspects of corporate and collegial approaches (e.g. Lapworth, 2004).

MCSs are perceived as broad based systems that go beyond management accounting systems to embrace behavioural and cultural aspects of controls, e.g. in the university and higher education establishments (Kober et al., 2007). In this endeavour, to understand the management controls pertaining to the university sector, first it is necessary to shed light on personnel and cultural controls.

---

### 2.5.1 PERSONNEL CONTROLS

Merchant and Van der Stede (2007, page 83) states that personnel controls are built upon to control or to motivate employees by themselves, under three basic purposes; to help employees understand the organizational expectations, to ensure that the employees have the required capabilities, and to enable self-monitoring, where the organizational goals are realized through self-satisfaction and self-respect. These purposes are secured by implementing personnel controls through (a) employee selection and placement, (b) training, and (c) job design and provision of necessary resources (Merchant and Van der Stede, 2007, page 84-85). The objective of implementing personnel controls is to make the best fit between an employee and the organization. Thus, in this research context it is necessary to identify the fit between the planning system and the personnel using the same.

---

### 2.5.2 CULTURAL CONTROLS

Cultural controls are sets of written and unwritten rules, which governs the behaviour of a group of employees, encouraging mutual monitoring, enabling them to work in a synergistic fashion (Merchant and Van der Stede, 2007, page 85). Imposing codes of conduct is one way to impose cultural controls in an organization, and it should be supported by strong leadership (Merchant and Van der Stede, 2007, page 88). Encouraging group rewards, intra-organizational transfers, physical arrangements and tone at the top are other ways of imposing cultural controls (Merchant and Van der Stede, 2007, page 88-90).

Table no.3 (page 12) shows how personnel and cultural controls together can be used to address the control problems. Merchant and Van der Stede (2007, page 92) states that personnel and cultural controls have become important in recent years, since organizations have become flatter.
and leaner. The bureaucracies have been dismantled and replaced with empowered employees, where organizational values are emphasized, enabling employees to work in congruence with the organization's best interest. Thus, it is necessary to focus on the effects of planning systems on MCS through cultural and personnel controls.

<table>
<thead>
<tr>
<th>Control Problem</th>
<th>Lack of direction</th>
<th>Lack of motivation</th>
<th>Personnel limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ways of effecting personnel controls</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selection and placement</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Training</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Job design and provision of necessary resources</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Ways of effecting cultural controls</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Codes of conduct</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Group-based rewards</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Intra-organizational transfers</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Physical arrangements</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Tone at the top</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

**TABLE 3**: CONTROL PROBLEMS ADDRESSED BY THE VARIOUS WAYS OF EFFECTING PERSONNEL AND CULTURAL CONTROLS; **SOURCE**: (MERCHANT, 1998, PAGE 130)

Table no.3 (page 12) shows how different aspects of personnel and cultural controls are used to eliminate the controls problems; lack of direction, lack of motivation and personnel limitation. Thus, it can be clearly seen that each aspect of personnel and cultural controls are important since each of them have an individual role in eliminating a certain control problem. Thus, in order to obtain proper personnel and cultural control in an organization all the elements shown in table no.3 (page 13) should be considered.

**2.5.3 CONTROLS RELATED TO PLANNING AND DECISION MAKING**

Decision making, planning and evaluation are crucial processes in an organization which rely highly on the quality of the information generated through MCSs (Merchant and Otley, 2006). These processes help the organization by controlling the decisions made and by guiding the behaviour throughout the organization to achieve the organizational objectives (e.g. Anthony and Govindarajan, 2007; Bhimani et al, 2008). In this endeavour, it is necessary to lay much emphasis on the controls pertaining to decision making processes. Furthermore, it is necessary to understand the nature of the decision making processes adopted by various departments of an organization,
employing different planning systems. Thus, this study uses the informal MCS pertaining to planning and decision making highlighted in the study by Kallunki et al. (2011).

Kallunki et al. (2011) in their study highlights the informal MCSs mainly relating to planning and decision making, namely, consensus seeking (whether emphasis is laid on consensus seeking in discussions), adoption and repeatability (whether past experience is taken into account and used effectively by sharing knowledge with others), communication, information flow in the environment (open channels of communication and free flow of information), availability and accessibility (informal access to manager), innovation and thinking out-side the box (managers encourage to develop new ideas even if they fall outside the individuals responsibility), tolerance and learning by mistakes (tolerating the manager’s mistakes and learning & sharing lessons learnt from them) and top to bottom information flow (managers share information with their employees).

2.6 PERFORMANCE IN THE UNIVERSITY SECTOR

Performance of the universities can be measured in financial terms, which is not the focus of this research. On the other hand, performance of a university is mostly dealt with indicators reflecting the quality of the undergraduate and postgraduate education provided to its students. In Sweden, these financial performance indicators and the comparable performance indicators reflecting the quality of the education are drafted and assessed by the Swedish National Agency for Higher Education or Högskoleverket.

It can be clearly argued that the planning systems which are accommodated in a university affect the financial performance indicators in a direct or in an indirect way. Considering this as a fact and by focusing towards the posed research question, the performance is defined only in a non-financial perspective. To be more specific, the performance at KTH, in this study, is derived using four main sources namely, Kallunki et al. (2011), KTH management report (2010), Quality Audit in the Nordic Countries (2007), and Ranking of universities and higher education institutions for student information purposes? (2009).

Kallunki et al. (2011) discusses many non-financial performance measures, out of which four main non-financial performance measures were identified by the author which are applicable to this study, namely, personnel development, employee satisfaction, workplace relationships and employee health & safety.

KTH management report (2010) also highlights several non-financial performance measures which were identified by the author, namely, education, research, internationalization, collaboration, staff and premises & infrastructure.
Quality Audit in the Nordic countries (2007) also highlighted several non-financial performance measures which were identified by the author, namely, quality assurance, gender equality, evaluation and follow-up, external professional relations and academic leadership.

Finally, Ranking of universities and higher education institutions for student purposes? (2009) highlighted the non-financial performance measures which are applicable to this study, identified by the author, namely, student attractiveness, teaching resources, teacher qualifications, attractive research for companies, efficiency of research programs and research productivity.

These identified non-financial performance measures are utilized in this study to examine how the planning systems at KTH affect the same, using the information obtained by the interviewees. It is also clearly visible that the areas of performance mentioned above are defined in a broad manner and some areas overlap with each other. Thus, it should be noted that these were extracted as it is and were not presented in a collectively exhaustive and mutually exclusive manner. The idea is to create a framework which will help the reader to comprehend and focus on the research content, and to utilize these to investigate more into the areas in chapter 4-Findings & Results. Furthermore, it is also expected to encounter different aspects/areas which affect the organizational performance, apart from what is mentioned above, when the research is carried out, based on the information obtained through the interviewees.
3. Methodology

In this chapter the author discusses the used research paradigm, the methodology and its justification, the framework used for data collection, analysis of the gathered information and the limitations of the research design.

3.1 IDENTIFICATION OF PARADIGM

The research paradigm can be identified as interpretivistic. This is clearly evident since this research gathers qualitative data and is carried out in the form of a case study which then leads to an induced theory. This is in accordance with what Darke et al. (1998) have mentioned in their study.

3.2 METHODOLOGY AND JUSTIFICATION OF CHOICE

Based on the objective of this research, a university which employs planning systems was selected in order to conduct the study. In this endeavour, the Royal Institute of technology (KTH), Stockholm, Sweden, holding the 150th place in the world, according to the QS top universities ranking (Management report, 2010), which employs latest technology to perform most of the organizational tasks (Appendix A), was selected as the organization in concern for this research.

In order to reach the purpose of this research, a thorough understanding is needed about the planning systems, MCSs and organizational performance aspects. Rich data, which are gathered around the units of analysis leads to clear understanding of the concepts, when analyzed properly. Thus, it is necessary to find a methodological approach to gather data for analysis. It is evident by the posed research question that this study needs rich qualitative data to find answers to the same. Considering all these factors, this study was restricted to gathering data from one organization and was carried out in the form of a case study (Collins & Hussey, 2009, page 82). The case study was conducted according to the guidelines proposed by Collins & Hussey (2009, page83). Furthermore, based on the posed research question the study is categorized as an explorative study which leads to an induced theory (Collins & Hussey, 2009, page 82).

This explorative study used semi-structured interviews, which is a method of gathering qualitative data when conducting research in the form of case studies (Collins & Hussey, 2009, page 144). The data were gathered using two main phases.

The first phase focused on gathering information about the planning systems employed by different departments at KTH. This phase mainly aimed at building contacts with personnel from different departments through face-to-face meetings using semi-structured interviews (Appendix B) and to
obtain a clear understanding about the planning systems and their functionality. The selection of personnel for the interviews was done though the KTH website and based on the recommendations by the interviewees following two main criteria, a) the personnel must be actively using the system at the time the research was conducted and b) the personnel must hold an administrative/managerial position at KTH. For each planning system considered in this research, one person who was selected based on the aforementioned criteria was interviewed twice (with the exception for LADOK and KOOPS planning systems due to the busy schedules of the administrators). The details about the second phase are mentioned in the following paragraph.

The second phase started by analyzing the data obtained in the first phase. Having a prior understanding about each planning system, enabled and posed questions about the involved management controls pertaining to the planning system and the possible effects towards organization performance indicators. Based on this understanding the questionnaire (Appendix C) was prepared linking the planning systems with the management controls together with the aspects affecting organizational performance. This questionnaire was sent out to the prospective interviewees beforehand, so that they could discuss with the group members to give the best possible answer representing the whole group, when the interview was conducted. But this was not mandatory and the decision whether to discuss with the group members or not was up to the interviewee. Another intention of exposing the interviewees to the questionnaire beforehand was to encourage them to familiarize and prepare for the interview with a clear and confident answer, which improves the reliability and the validity of the obtained data. The fact that all the interviewees were Swedish citizens was also a reason for this action. This questionnaire was then used as the base for the semi-structured interviews to obtain answers. Additional questions were raised to clarify answers wherever it was necessary. The obtained answers were then analyzed to clarify or understand the effects of the planning systems on the MCSs and on organizational performance.

The guidelines proposed by Collins & Hussey (2009, page 144-146) were used as the source when designing the questions and conducting the semi-structured interviews to obtain reliable and valid data.

### 3.3 FRAMEWORK FOR DATA COLLECTION

Using the information presented under chapter 2-Literature survey, a framework was formulated to gather data. To elaborate, this framework was developed by merging the frameworks of Merchant and Van der Stede (2007) and Kallunki et al. (2011). The constructed framework mainly consists of three sections, namely, personnel controls, cultural controls and controls pertaining to planning and decision making. All these three sections are aligned with a planning system. In other
words, this framework is constructed to gather data from the administrators who have their roles based centrally to a planning system, where it can be the owners of the planning system or the system level administrators. The personnel controls and the cultural controls were aligned with a planning system using the framework of Merchant and Van der Stede (2007). To elaborate, personnel controls were analyzed through the aspects, namely, job design, resource allocation, selection, placement and training. The cultural controls were analyzed through the aspects, namely, knowledge about codes of conduct, group work, change of responsibilities, physical arrangement and tone at the top. The controls pertaining to planning and decision making were drafted using the framework used by Kallunki et al. (2011) which highlights the aspects of consensus seeking, adoption and repeatability, communication, information flow in the environment, availability & accessibility, innovation and tolerance & learning. These two frameworks were combined to construct a single framework which connects personnel controls, cultural controls and planning and decision making control aspects in relation to a planning system. Thereafter, organizational performance measures were combined with the constructed framework using three main non-financial performance measures obtained from the framework of Kallunki et al. (2011), namely, personnel development, workplace relations and employee satisfaction. Finally, open ended questions were drafted to obtain other possible organizational performance measures affected by the planning system. The figure 2 shows how the different concepts discussed above (personnel, cultural, planning & decision making) were used to create a framework to gather data. Hence, the questions used in the second phase of the interviews were drafted using this framework (which is based on Kallunki et al. (2011) and Merchant and Van der Stede (2007)). These questions can be found in the appendix C.
3.4 ANALYZING THE GATHERED INFORMATION

This chapter discusses the approaches taken towards analyzing the information which was gathered using the framework for data collection. It also discusses the theories used in analyzing the information. To be specific, this chapter presents the theory used in analyzing the information then the framework created for analyzing the fit between the planning system and the MCSs. Finally it presents the framework and the approach taken in analyzing organizational performance.

3.4.1 CONTINGENCY THEORY

The contingency theory falls into the class of behavioural theory which explains that there is no single best way of organizing or leading, and that organizational or leadership styles which are successful in one situation might not be successful in another (Fiedler, 1964), where the optimal means of organizational or leadership styles are contingent upon different internal and external constraints. Contingency theory is formulated around four main subordinating ideas, which are; a). There is no single best way to manage a situation b). The design of an organization and its subsystems must 'fit' into its environment c). Effective organizations have proper 'fit' not only between the environment, but also between its subsystems d). The requirements of an organization are better satisfied when the organization is properly designed and the management style is appropriate both with the tasks undertaken and the nature of the work group.

3.4.2 FRAMEWORK FOR ANALYZING THE FIT BETWEEN THE PLANNING SYSTEM AND MCS

As mentioned earlier in this chapter, a framework was drafted to analyze the gathered data pertaining to MCSs in relation to planning systems. The framework for analysis of the data was drafted using the data obtained in the 2nd phase of the interviews (see figure 2, page17) and was carried out in the following manner,

- Categorization of the data

The 2nd phase interview data was categorized (Klake, 1996) into three main sections and each section was categorized further into several subsections. The three main sections are personnel controls, cultural controls and planning & decision making controls. The subsections of these three main sections are elaborated in chapter 3.3-Framework for data collection.

After the categorization of the interview data into three main sections and further into subsections the author was able to further identify two categories within each sub section (e.g. Personnel controls (main section) -> Job design (subsection)-> identified two categories ). It was observed that in each subsection (e.g. Job design under personnel controls) the unit of analysis (MCS) was
either strongly related to the planning system by supporting the same or loosely related to the planning system. Thus, it was necessary to assign a “fit” measure, based on each observed level of unit of analysis (MCSs in this case)

- Assigning the “fit” measure

As mentioned above it was necessary to assign a “fit” measure to analyze the fit between the different MCS aspects (subsections e.g. Job design) and the planning system as posed by the above mentioned contingency theory. In this endeavour, two measures were selected as “loose” and “tight”, where “loose” denoted the loose coupling between the planning systems and the MCSs and “tight” denoted the strong coupling between the same. Next, for each subsection (e.g. personnel controls -> Job design) the common criteria used in the analysis of all the planning systems for “loose” and “tight” measures were drafted under the respective columns (see table no. 4, page19). The criteria shown in the table no.4 (page 19) for “loose” and “tight” measures were drafted after going through the interview transcripts and clearly identifying the two categories (loose and tight) of each subsection for different planning systems. The criteria used for each subsection for all the planning systems can be found in table no.4.

<table>
<thead>
<tr>
<th>MCS</th>
<th>Loose</th>
<th>Tight</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personnel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job design</td>
<td>Vaguely assigned job responsibilities/ No specific job description</td>
<td>Clearly assigned job responsibilities</td>
</tr>
<tr>
<td>Resources</td>
<td>Can be improved</td>
<td>Satisfied and sufficient</td>
</tr>
<tr>
<td>Selection</td>
<td>Not based on competencies</td>
<td>Based on competencies</td>
</tr>
<tr>
<td>Placement</td>
<td>Not based on past experience</td>
<td>Based on past experience</td>
</tr>
<tr>
<td>Training</td>
<td>Basic level training &amp; self learning</td>
<td>Basic-Advanced level training &amp; self learning</td>
</tr>
<tr>
<td><strong>Cultural</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Codes of conduct</td>
<td>General awareness and work without referring to them consciously</td>
<td>Full awareness and referring to them consciously</td>
</tr>
<tr>
<td>Group work</td>
<td>No shared responsibilities/ (Working alone) poor communication</td>
<td>Shared responsibilities &amp; good communication</td>
</tr>
<tr>
<td>Change of responsibilities</td>
<td>Same system &amp; same responsibilities</td>
<td>Same system (different versions) &amp; different responsibilities</td>
</tr>
<tr>
<td>Physical arrangement</td>
<td>Improvement needed</td>
<td>Satisfied and sufficient</td>
</tr>
<tr>
<td>Tone at the top</td>
<td>Exemplary in managerial &amp; administrative areas (no significant contribution to the area of work)</td>
<td>Exemplary in managerial &amp; administrative areas including knowledge and experience in the area of work</td>
</tr>
<tr>
<td><strong>Planning and decision making</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seeking Consensus in discussions</td>
<td>Sometimes (some decisions are)</td>
<td>Always</td>
</tr>
</tbody>
</table>
This method of drafting a framework after going through the interview transcripts is useful since this is an interpretivist, exploratory study which generates lots of qualitative data and demands a good control over the immense data in order to reach its purposes. Thus, this method leads to draft a well fitting framework for the data, both for presenting the findings and analyzing the results.

This framework shown in table no.4 (page 19) will be used in the next chapter 4-Findings and Results to analyze each planning system and to present its findings. It is visible when going through the table no.4 the difference between the “loose” and the “tight” measures, which were identified from the interview data. Furthermore, it should be highlighted that it is the interviewee’s voice which has been categorized as “loose” and “tight”.

**3.4.3 ORGANIZATIONAL PERFORMANCE ANALYSIS FRAMEWORK**

The effects on the organizational performance by each planning system are analyzed in two different ways;

a). The effects on organizational performance measures (personnel development, workplace relationships and employee satisfaction) based on the evaluated tightness between the planning system and the MCSs. The section a also emphasizes the loose fitting aspects between the planning system and the MCSs, by doing so, it helps the reader to understand the deviations from the
generalization results (framework constructed from the findings) which is presented at the latter part of the chapter 4 –Findings and Results.

There are two categories used to identify different levels of organizational performance for each performance measure (personnel development, workplace relationships and employee satisfaction), namely, “low” and “high”. The criteria for deciding whether a specific performance measure is “low” or “high” can be found in the table no.5 (page 21).

<table>
<thead>
<tr>
<th>Organizational performance measurement</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel development</td>
<td>Less learning of new concepts more engaged in routine tasks</td>
<td>Learning new aspects regularly, dynamic and challenging environment</td>
</tr>
<tr>
<td>Workplace relationship</td>
<td>Nothing to complain, but could be improved</td>
<td>A great understanding and supporting each other within the work group/friendly environment</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>Less satisfied and could be better</td>
<td>Fully satisfied and enjoy working</td>
</tr>
</tbody>
</table>

**TABLE 5: FRAMEWORK CREATED FOR ANALYSIS OF PERFORMANCE MEASURES**

These criteria were drafted after going through the interview transcripts for different planning systems and clearly identifying the two main categories which were embedded in the interviewee’s responses. As mentioned in the previous section of this chapter drafting a framework after observing the interview transcripts yields a well fitting framework for the immense amount of qualitative data generated and helps to achieve the purpose of the study by controlling the scope of the same. It should be highlighted again that it is the voice of the interviewees which are depicted through the framework which was drafted after going through the interview transcripts.

b). The effects on other means of specific organizational performance measures by the planning system (Section b).

It should be noted that point b, refers to the specific means of affecting the organizational performance by each planning system found through the interview data (e.g. HR+ executes payroll processing which is a crucial administrative task in the organization, which maintains the quality of the process, thus improves the quality assurance measures within the HR department at KTH). The idea of including section b is to emphasize the specific means of affecting the organizational performance by each planning system other than the three common performance measures (personnel development, workplace relations and employee satisfaction).
3.5 LIMITATIONS OF THE RESEARCH DESIGN

In this explorative study, which leads to an induced theory, the investigated world was not completely viewed as it is. In other words, it was restricted by a framework due to the time limitations. To be more specific, the MCSs investigated pertaining to the planning systems were mainly derived based on cultural controls, personnel controls and controls pertaining to decision making and planning. Even though, as mentioned in the earlier chapters, this approach is logically true for not-for-profit service providing organizations, this restriction might have led to oversee important controls specific to the university sector. But the effect of this implication was minimized by introducing open ended questions. It should be understood that this remedy might not completely eliminate the aforementioned problem, since the interviewee might have restricted him/herself to a psychological boundary based on the questions posed earlier.

Another limitation of this research design is that the selected administrative/managerial staff member for each system might not possess a good wealth of knowledge on how the system affects the organizational performance. Even though this might have been the case, it was observed that in some cases the selected personnel represented the group using the same planning system, since it was understood from the initial discussions that the presence of the interviewer was known by the other members of the group and prior discussions have taken place so that there is one voice over the raised issues. Furthermore, in order to eliminate bias and to introduce triangulation to this research to improve reliability and validity of the answers, the interviewees were encouraged in the second phase to discuss with other group members about the raised issues before the interview. It should be noted again that this was not compulsory.

All the interviewees who were involved in this research were Swedish citizens. Thus, it was observed in some cases that the interviewees had difficulty of finding the appropriate English words to complete their answer. In such cases their answers also accompanied the interviewers help suggestions. Thus, there was an intervention by the interviewer to influence to the respondent's statements. This might not bring out the exact meaning of what the respondent him/herself was trying to express.

Since this is a qualitative study, where the data is gathered from different personnel through interviews, the validity of the research is highly dependent on the views and the knowledge that the interviewees bare on the investigated topics. According to Collis & Hussey (2009) the reliability in interpretivist studies like this tends to be low as different results are common when repeating the research. In this endeavour, to overcome these common drawbacks inherited due to the nature of the setting of this study special focus has been laid in improving both reliability and validity of this study by using techniques like prior preparation of the interviewees and encouraging them for pre
discussions with colleagues on the investigated aspects which are mentioned above in a detailed manner.

Finally, it should be noted that the potential problems faced when gathering data using the method of interviews as described by Collins & Hussey (2009, page 147) are inevitable. Hence, efforts were taken to minimize the same by adhering to the guidelines when designing, structuring the questions and conducting the semi-structured interviews to secure the reliability and validity of the gathered data as proposed by Collins & Hussey (2009, page 144-146).
4. FINDINGS AND RESULTS

This chapter focuses on three main sections; it discusses and presents the information gathered through the interviews, analyzes them using the frameworks discussed in chapter 3-Methodology and finally presents the results. These three sections are somewhat merged to improve the reader’s comprehension of the presented context. The following sections will discuss each of these in a greater detail.

4.1 PRESENTATION OF THE GATHERED INFORMATION

As mentioned in the Chapter 3-Methodology, the interviews were held in two main phases where the first interview with each administrator led to gathering information pertaining to the specific planning system and the second was to investigate its effects on organizational performance via MCS. Both interview phases were held in a semi-structured manner which led to a collection of rich information.

The information gathered in the first phase can be found in the Appendix B in a more detailed manner. It must be noted that the information is presented in the Appendix B using the narrative structuring method (Klave, 1996). Thus, this type of presentation leads to more details, whereby the reader is encouraged to refer to Appendix B whenever a clear picture is needed about a specific planning system, presented in this study. On the other hand, by looking at the scope of this study, information to such an extent (presented in Appendix B) is not necessarily needed to meet the objectives. Thus, in order to grab the reader's interest and maintain presented facts within the scope of this study, only the important features of each planning system are presented below (e.g. see the column "planning system" in table no.6, page 26). These features were extracted from Appendix B, using the method of meaning condensation (Klave, 1996). The method of meaning condensation involves in summarizing the expressed meanings of the interviewees into more meaningful facts. This was conducted after going through the interview transcripts (Appendix B) several times, to obtain more meaningful facts from the ideas expressed by the interviewees.

The information gathered about the MCSs in relation to the planning systems (see table no.6, page 26) is presented using categorization and meaning condensation methods (Klave, 1996). The categorization of the information to main sections (e.g. personnel controls) and further into subsections (personnel controls -> job design) was made easy due to the measures taken in formulating the semi-structured interviews. In other words, the categorization of the information was made easy due to the framework used in data collection, where questions were arranged in such a way that it would be easy to categorize the information into different sections when
analyzing the interviews. The method of meaning condensation (Klave, 1996) was used when presenting the interviewee’s responses (e.g. see column “remarks” in table no.6, page 26).

The information relating to the organizational performance is presented using the method of meaning condensation (e.g. see the column “remarks” in table no.7, page 28), categorization (e.g. see the column “organizational performance measurement” in table no.7, page 28) and interpretation methods (see section B in 4.3.1- HR+ system) as discussed by Klave (1996).

All in all, it must be noted that it is the interviewee’s voice which has been brought out using a format of a table (e.g. see table no.6, page 26 and table no.7, page 28) to present the immense amount of qualitative data generated through the interviews, in an appealing and a legible way to the reader.

4.2 ANALYZING THE INFORMATION

The analysis of information is carried out in two stages, namely, the analysis of the fit between each planning system and MCSs and the analysis of the level of organizational performance.

The analysis of the fit between each planning system and MSCs were carried out in the following manner,

- Listening to the interview recording of each planning system and preparing interview transcripts.
- Using the framework for analysis (table no.4, page 20) to compare the interviewee’s response in the transcript with the criteria mentioned in the table no.4 and state whether it is a “loose” measure or a “tight” measure (e.g. see the column “status” in table no.6, page 26) in front of each MCS.
- Specifying further supportive information provided by the interviewee, in support of the decision made by the author for the fitness measure (e.g. see the column “remarks” in table no.6, page 26). The “remarks” columns in the tables (e.g. table no.6, page 26) were kept blank when the interviewee gave direct answers and did not provide any further supportive information.

Analysis of the level of organizational performance was carried out in the following manner,

- Listening to the interview recording of each planning system and preparing the interview transcripts.
- Using the framework for analysis (table no.5, page 22) to compare the interviewee’s response in the transcripts with the criteria mentioned in the table no.5 and state whether the specific measure is at a “low” or “high” level in front of the organizational performance measure (e.g. see the column “status” in table no.7, page 28).
• Specifying further supportive information provided by the interviewee, in support of the decision made by the author for the performance level measure (e.g. see the column “remarks” in table no.7, page 28). The “remarks” columns in the tables (e.g. table no.7, page 28) were kept blank when the interviewee gave direct answers and did not provide any further supportive information.

By using these analysis methods, the author was able to highlight the specific information pertaining to each planning system.

### 4.3 PRESENTATION OF THE RESULTS

The results are presented in two different ways, first is, the results shown under each planning system (planning system-wise results which emphasizes the specificities using the loosely fitting aspects of MCSs to the planning system) and the second is, the over-all analysis of results considering all the planning systems (where the findings are generalized and discusses only the common areas for all systems ignoring the specificities). The results are presented as a framework which is shown at the latter part of this chapter.

### 4.4 PRESENTATION OF INFORMATION, ANALYSIS AND RESULTS (SHOWN AS PLANNING SYSTEM WISE)

The following sections present the gathered information, the analysis and the results. In order to secure the anonymity of the relevant administrator, he/she is addressed in the proceeding text as the X administrator where necessary (relevant planning system is denoted by X; e.g. administrator interviewed for the HR+ system will be termed as HR+ administrator). Furthermore, specific responsibilities of the interviewed administrator are not mentioned in the “remarks” column (under job design-> “remarks”) in order to secure the anonymity of the interviewed personnel.

As mentioned in the previous sections, it is the interviewee’s voice which has been brought out using the form of tables in the proceeding sections. Thus, the discussions pertaining to the results, in the following sections, are based on the information presented in the two tables for each section.

#### 4.4.1 HR+ SYSTEM

The following table presents the gathered information and the analysis for the HR+ system.

<table>
<thead>
<tr>
<th>Planning system</th>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR+</td>
<td>Personnel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human resource</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>planning system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at KTH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job design</td>
<td>Loose</td>
<td></td>
<td>No job description in writing</td>
</tr>
</tbody>
</table>

26 | P a g e
Contains two main parts, salary system, human resources system

Stores information of employees at KTH (My pages for employees is part of the HR+)

Generating reports to conduct statistical analysis (also receives data from COGNOS-data warehouse to generate reports)

Payroll files are sent to the financial system (AGRESSO) twice a month

Dealing with expenses by handling invoices

Handling vacation requests and approvals

Includes a web based interface (enabling employees outside the department to use HR+)

Features which are to be developed near future: Personnel development tracking, recruitment process and authentication for all employees to log in and change the personal details (e.g. address)

HR+ is linked with KTH-Res (Travel system) where payments are done to the latter by the former

<table>
<thead>
<tr>
<th>Resources</th>
<th>Tight</th>
<th>Lack of time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selection</td>
<td>Tight</td>
<td>No IT competencies</td>
</tr>
<tr>
<td>Placement</td>
<td>Loose</td>
<td>Having an own salary system was introduced since 2001, so started from scratch</td>
</tr>
<tr>
<td>Training</td>
<td>Loose</td>
<td>Learning by communicating with other universities having HR+</td>
</tr>
</tbody>
</table>

**Cultural**

<table>
<thead>
<tr>
<th>Codes of conduct</th>
<th>Loose</th>
<th>KTH rules for user group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group work</td>
<td>Tight</td>
<td>Meetings held everyday</td>
</tr>
<tr>
<td>Change of responsibilities</td>
<td>Tight</td>
<td>New system and developments to the system trigger new responsibilities</td>
</tr>
<tr>
<td>Physical arrangement</td>
<td>Loose</td>
<td>Working group not in the same building/ open offices and environment preferred</td>
</tr>
<tr>
<td>Tone at the top</td>
<td>Tight</td>
<td>Professional &amp; very good</td>
</tr>
</tbody>
</table>

**Planning and decision making**

<table>
<thead>
<tr>
<th>Seeking Consensus in discussions</th>
<th>Loose</th>
<th>Knowing the one’s required expectations leads to work alone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adoption and repeatability</td>
<td>Tight</td>
<td>Helping others by sharing the knowledge within KTH</td>
</tr>
<tr>
<td>Communication</td>
<td>Tight</td>
<td>Meetings held every day</td>
</tr>
<tr>
<td>Information flow in the environment</td>
<td>Tight</td>
<td></td>
</tr>
<tr>
<td>Availability and accessibility</td>
<td>Loose</td>
<td>Get attention when needed/ not in the same building</td>
</tr>
<tr>
<td>Innovation and thinking outside the box</td>
<td>Tight</td>
<td>But not always due to the monetary limitations</td>
</tr>
<tr>
<td>Tolerance and learning by mistakes</td>
<td>Tight</td>
<td>Having a good relationship/ open space for dialogue</td>
</tr>
</tbody>
</table>
TABLE 6: PRESENTATION AND THE ANALYSIS OF THE HR+ SYSTEM

ORGANIZATIONAL PERFORMANCE
SECTION A

The following table presents the gathered information and the analysis of the organizational performance measures for the HR+ system.

<table>
<thead>
<tr>
<th>Organizational performance measurement</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel development</td>
<td>High</td>
<td>New government laws and developed the system from the scratch</td>
</tr>
<tr>
<td>Workplace relationship</td>
<td>High</td>
<td>Good results from the KTH survey/ Hangouts and dinners with staff members/ lots of laughter together with work</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>High</td>
<td>Fantastic/educating/stress free job</td>
</tr>
</tbody>
</table>

TABLE 7: ANALYSIS ON ORGANIZATIONAL PERFORMANCE OF THE HR+ SYSTEM

Personnel controls: The HR+ administrator stated that there is no job description in writing which specifically relates to the HR+ system which means that the employees are not strictly directed towards the organizational objectives. This might have caused the lack of time and need for prioritizing the tasks where a heavy burden is laid on a single employee as mentioned by the HR+ administrator. Requiring no special IT competencies and working in a self-learning environment through experimenting (new HR+ system developed from the scratch) as mentioned by the HR+ administrator, poses threats to the short term organizational objectives but might payoff in the long run. Thus, it is important to transfer the acquired knowledge by the employees about the planning system in order for the sustainability of the organization.

Personnel controls -> Personnel development

It is important to observe the dynamic environment faced by the HR+ administrators due to the new governmental regulations and the development of the HR+ system from scratch. This yields an employee a perfect space for learning and improvement. The above mentioned less strictly imposed personnel controls results in high personnel development, since it requires a lot of learning and facing challenges in order to survive in the aforementioned dynamic environment.

Cultural controls: The less importance given for the codes of conduct, which is observed through the responses given by the HR+ administrator, may trigger undesired behaviours within the organization; this might be due to the heavy work load, which is not assigned in a strict order, due to loose personnel controls. Thus, there is an overlapping area where the effects of personnel and
cultural controls interact to effect organizational performance. The working group not residing in the same building as mentioned by the HR+ administrator can affect the informal communication drastically; where much emphasis will be laid on scheduled meetings. Thus, the physical separation of the employees will lead to deterioration of the informal interactions between the employees which affects the culture in a negative manner. This leads to the understanding that there is also an overlapping area between the cultural and planning & decision making controls which interact to affect the performance of the organization.

Cultural controls -> Workplace relationships
Even though the section above highlights the loose aspects pertaining to cultural controls the analysis shows a high level for workplace relationships. This is mainly due to the nature of the physical arrangement of the staff as mentioned by the HR+ administrator. To elaborate most of the system level administrators and their immediate managers reside in the same building, which creates a strong sub culture via different means of informal interactions which leads to enhanced workplace relationships through reducing the power distance between the managers and the system level administrators.

Planning & decision making controls: Sometimes employees tend to work and make decisions alone knowing one’s required expectations by the organization as mentioned by the HR+ administrator; but this might cause the "free-rider" issue and also one will be working in an isolated static framework where the environment will be dynamic. This might affect the evolution of the organization and its performance. The accessibility and availability are also important aspects, specifically when working in the same building, since sometimes important decisions are best made at informal (unarranged) meetings where an employee can walk in to the manager's office to resolve the issues then and there.

Planning and decision making controls -> Employee satisfaction
There is a high level of employee satisfaction when considering the responses of the HR+ administrator. This is observed mainly due to the good understanding maintained through proper confrontation of conflicts by open space for argument, strong relationships with other departments at KTH to share knowledge and due to the availability of sufficient information for making vital decisions, as mentioned by the HR+ administrator.

SECTION B
Quality and efficiency of crucial administrative processes
The HR+ administrator stated that, HR+ system mediates in fulfilling the payroll process in a fast and efficient manner, which eliminates manual entries/recording of payments. The immense amount of personnel information and the salary details (taxes paid etc.) which are crucial for
preparation of the pension schemes, are stored over the years in an electronic format (saves space) and a secure environment. Thus, HR+ system can be categorized as a system, which is designed to maintain the quality and efficiency of crucial administrative processes pertaining to human resource management at KTH.

Quality of the staff
The HR+ system, as stated by the HR+ administrator, helps to make strategic decisions utilizing the information generated through the system (e.g. how often employees get sick/are on leave). There will be features added to the HR+ system in the near future which guides the recruitment processes (storing and tracking CVs) which will enable to track the credentials of an employee and a feature to track personnel development.

It was stated by the HR+ administrator that the HR+ system does not directly contribute to the welfare of students or the revenues at KTH, but certainly helps to optimize all the processes and improve the performance within the area of Human Resources Management (HRM) at KTH.

4.4.2 KTH-RES SYSTEM

The following table presents the gathered information and the analysis for the KTH-Res system.

<table>
<thead>
<tr>
<th>Planning system</th>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KTH-Res</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The planning system which handles the travel issues at KTH</td>
<td><strong>Personnel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Booking &amp; making travel requests online through KTH travel agent</td>
<td>Job design</td>
<td>Tight</td>
<td>Not defined in a broad sense</td>
</tr>
<tr>
<td>Accepting/rejecting travel requests</td>
<td>Resources</td>
<td>Tight</td>
<td>Can be requested whenever needed</td>
</tr>
<tr>
<td>Booking hotels and means of transport</td>
<td>Selection</td>
<td>Loose</td>
<td>To know about the government regulations for travelling, payments and taxing/ no IT competence</td>
</tr>
<tr>
<td>Creating travel bills for claiming purposes</td>
<td>Placement</td>
<td>Tight</td>
<td>Another system from the current supplier</td>
</tr>
<tr>
<td>Linked with the system of the travel agency</td>
<td>Training</td>
<td>Loose</td>
<td>Learning through problems reported by people using it</td>
</tr>
<tr>
<td>Sends information twice a month to the payroll system</td>
<td><strong>Cultural</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Codes of conduct</td>
<td></td>
<td>Loose</td>
<td>Grown into common knowledge</td>
</tr>
<tr>
<td>Group work</td>
<td></td>
<td>Tight</td>
<td>Only two employees in the team</td>
</tr>
<tr>
<td>Change of responsibilities</td>
<td></td>
<td>Tight</td>
<td>Additional responsibilities added</td>
</tr>
<tr>
<td>Physical arrangement</td>
<td></td>
<td>Tight</td>
<td>Nice environment</td>
</tr>
<tr>
<td>Tone at the top</td>
<td></td>
<td>Tight</td>
<td>Respects the manager due to the qualities that he/she possesses</td>
</tr>
</tbody>
</table>
Communicates with the financial system to Obtain the accounts to be used in the transactions

Able to generate statistics on travel patterns

Records and updates information to report taxes

### TABLE 8: PRESENTATION AND THE ANALYSIS OF THE KTH-RES SYSTEM

<table>
<thead>
<tr>
<th>Planning and decision making</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeking Consensus in discussions</td>
</tr>
<tr>
<td>Adoption and repeatability</td>
</tr>
<tr>
<td>Communication</td>
</tr>
<tr>
<td>Information flow in the environment</td>
</tr>
<tr>
<td>Availability and accessibility</td>
</tr>
<tr>
<td>Innovation and thinking outside the box</td>
</tr>
<tr>
<td>Tolerance and learning by mistakes</td>
</tr>
<tr>
<td>Top to bottom information flow</td>
</tr>
</tbody>
</table>

**ORGANIZATIONAL PERFORMANCE SECTION A**

The following table presents the gathered information and the analysis of the organizational performance measures for the KTH-Res system.

<table>
<thead>
<tr>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel development</td>
<td>High</td>
<td>Develop lots of contacts and personality development</td>
</tr>
<tr>
<td>Workplace relationship</td>
<td>High</td>
<td>Support rendered eagerly whenever needed/ good atmosphere even though there are lots of women employees</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>High</td>
<td>Working for long time period at KTH, since satisfied with work</td>
</tr>
</tbody>
</table>

**TABLE 9: ANALYSIS ON ORGANIZATIONAL PERFORMANCE OF THE KTH-RES SYSTEM**

**Personnel controls:** The assigned responsibilities pertaining to the KTH-Res system are clearly defined and understood as stated by the KTH-Res administrator. This may be due to the fact that only two personnel are engaged at the moment handling the responsibility for the KTH-Res system. Thus, the responsibilities are clearly defined. This is a desirable in an organizational design point of view. Another important point is that there are no special competencies required apart from the awareness of the government travel policies and tax issues as stated by the KTH-Res administrator. In other words, there are no clearly defined criteria for selection of personnel specifically to work with the KTH-Res system, but the experience in a similar system has built a good wealth of knowledge and confidence in the KTH-Res administrator. Since smooth functioning of the KTH-Res...
system requires handling of complaints, the administrator has to maintain good contacts with the supplier which is an external service provider to meet the demands of the KTH clients. Thus, the prior experience at KTH enables to handle both internal and external personnel in an appropriate manner strengthening the relationships between internal (users) and external (service providers) parties.

**Personnel controls -> Personnel development**

It is important to note that the administrator requires constant engagement in updating the knowledge about the governmental laws pertaining to travel, the information about the taxation and travel payments. This enables one to improve the knowledge within the area of work. Another noteworthy point is that the administrator learns through fixing the problems reported by the KTH-Res users, despite the lack of training gained within the system the administrator works in a challenging environment which moulds his/her personnel development. It was mentioned by the administrator that working with KTH-Res system requires maintaining good contacts with various parties both internal and external to the organization. Dealing with other parties also contributes to one’s personnel development.

**Cultural controls: An important point to notice here is, as stated by the KTH-Res administrator, that there is no special reference to the codes of conduct within the organization but they have become the "common knowledge" through the extensive experience in the field. This can be both positive and negative in an organizational behaviour perspective, since the most used codes of conduct will be translated to common knowledge where the less used ones will eventually be ignored with time.**

**Cultural controls -> Workplace relationships**

The extensive experience the KTH-Res administrator possesses within KTH has managed to drive the codes of conduct to common knowledge. Thus, special effort is not needed to consciously apply them when performing day-to-day tasks. But as mentioned above, the ignorance of the less used ones with time will lead to undesired organizational behaviours affecting the group work, inter-personnel relationships and also affects the relationship with the managers. Thus, bringing a negative impact on workplace relationships.

**Planning & decision making: This area of MCS can be observed as quite aligned (tight) with the KTH-Res system. This may be due to the fact that only two personnel share the main responsibilities pertaining to KTH-Res. The decisions are made after consulting the users of KTH-Res within different schools to find the optimum solution, as stated by the KTH-Res administrator. Thus, the aforementioned strong relationship between the internal and external personnel helps the quality of the decisions made at this point. It is also noteworthy to mention the experience at KTH which helps the KTH-Res administrator to realize the organizational needs and finding the best ways in meeting them, when it comes to planning and decision making. It is also important to note that the**
KTH-Res administrator uses the experience and the support of the reference group, colleagues and *ebuilder* (KTH-Res supplying company) to resolve problems, but there is no proper documentation of them for later usage.

*Planning and decision making controls -> Employee satisfaction*

The KTH-Res administrator is satisfied with most of the aspects pertaining to planning and decision making processes at KTH, which enables him/her to freely contribute to the development at KTH. In fact, this satisfaction has led the KTH-Res administrator to retain at KTH for longer periods.

**SECTION B**

*Quality and efficiency of crucial administrative processes*

KTH-Res system saves time and improves the quality of the administrative work procedures related to travels at KTH, as stated by the KTH-Res administrator. The KTH-Res administrator mentioned that all the requests were filled using the pen and paper before the system was introduced. Thus, it makes the employee's life easier by bringing a fast and a convenient service (by also enabling to book hotels, taxis etc.). It should also be mentioned that the introduction of the system has made the tax declaration process far more convenient than before.

*Employee health and safety*

As stated by the KTH-Res administrator, KTH-Res also improve the safety of the employee by enabling to track the passenger's destination and provide the necessary support and assistance in the case of a natural disaster.

*Gender equality*

It was mentioned by the KTH-Res administrator that the workplace relationships are tight even there are lots of women employees working within the same department. This gives an indication of the priority given to the gender equality at KTH.

### 4.4.3 KTH-LOKALER

The following table presents the gathered information and the analysis for the KTH-Lokaler system.

<table>
<thead>
<tr>
<th>Planning system</th>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KTH-LOKALER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Also known as the site management/space management system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manages the premises belonging to KTH</td>
<td><strong>Personnel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Job design</td>
<td>Loose</td>
<td>No job description/lots of responsibilities in a wide scope</td>
</tr>
<tr>
<td></td>
<td>Resources</td>
<td>Loose</td>
<td>Supporting systems have different representation of the same information/ lack of time</td>
</tr>
</tbody>
</table>
Table 10: Presentation and the Analysis of the KTH-Lokaler System

**Organizational Performance**

**Section A**

The following table presents the gathered information and the analysis of organizational performance measures for the KTH-Lokaler system.

<table>
<thead>
<tr>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel development</td>
<td>Low</td>
<td>Learning in different areas to a limited extent</td>
</tr>
<tr>
<td>Workplace relationship</td>
<td>High</td>
<td>Enjoying working with different groups</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>High</td>
<td>Room to bring new ideas and implement them</td>
</tr>
</tbody>
</table>

Table 11: Analysis on Organizational Performance of the KTH-Lokaler System
Personnel controls: The KTH-Lokaler administrator stated that there is no specific job description and has been entitled with lots of responsibilities in different areas. This may be due to the fact of reducing the number of employees to reduce the expenses incurred by KTH. Thus, encouraging an employee to be an all-rounder to survive in a dynamic environment and to replace another personnel whenever necessary. This helps the employees to gain knowledge in different disciplines within the organization.

Personnel controls -> Personnel development
It can be clearly seen by the responses of the KTH-Lokaler administrator that the personnel controls do not fit well with the KTH-Lokaler system, thus allowing the administrator more room to find and execute the necessary responsibilities. It should be also stated that even though the responsibilities are not assigned in a strict order they flow into the relevant personnel since the work group is small and inside this work group everyone is specialized towards executing certain tasks as stated by the KTH-Lokaler administrator. So, once the group receives a certain responsibility there is a higher possibility for ending it up at the correct employee's table. So the KTH-Lokaler administrator has used this opportunity to fetch different responsibilities which he/she thinks capable of performing. Thus, this has made him/her an all-rounder who involves in different areas of responsibilities. This overburden, has led to a low level of personnel development since there is always a chance of a trade-off when involved in many areas, which also limits the depth of knowledge gained in the different areas.

Cultural controls: Working within several areas apart from the planning system (KTH- Lokaler in this case) requires learning codes of conduct in the respective areas. In this case, with lots of responsibilities imposed on the KTH-Lokaler administrator and with limited time he/she tends to learn by trial and error and uses the his/her own experience to survive in the dynamic environment, as mentioned by the KTH-Lokaler administrator. This is not desired in an organizational point of view since it will lead to undesired behaviour which might affect the culture of the organization. It is also important to note that, as mentioned by the KTH-Lokaler administrator, change of responsibilities helps to develop new contacts within different areas of the organization. This as mentioned before will help an employee to merge into both the organizational culture and sub-cultures within different departments.

Cultural controls -> Workplace relationships
The most important thing to note in this section is that the strong workplace relationships built with different work groups, which are created through new responsibilities added in different working areas, as stated by the KTH-Lokaler administrator. This not only helps the KTH-Lokaler administrator to merge in the main culture at KTH, but also understand the working procedures and sub-cultures within KTH.
Planning & decision making controls: As mentioned by the KTH-Lokaer administrator, there is ample room for developing new ideas and implementing the same. This can be viewed as an opportunity given to develop ideas at a macro level taking the advantage of the knowledge possessed by the KTH-Lokaler administrator in different disciplines.

It is also important to note how the different representations of the same information can hinder the performance within a department, by leading to wrong interpretations, as pointed out by the KTH-Lokaler administrator. In other words, it is important that everyone working within a department to have the correct representation of the same information, which will otherwise hinder the quality of the decisions and sometimes deteriorate the development process within a department by giving rise to interpersonal conflicts and loss of mutual-respect.

Planning and decision making controls -> Employee satisfaction

It can be clearly seen by the responses of the KTH-Lokaer administrator that the employee satisfaction remains at a high level, since he/she is able to actively engage in the development process for KTH, by bringing new ideas and implementing them. Thus, the KTH-Lokaer administrator is satisfied and builds self esteem due to the contribution he/she has made to KTH.

SECTION B

Quality and efficiency of crucial administrative processes

The KTH-Lokaler administrator did not relate any specific effects of the KTH-Lokaler system to the performance at KTH. But the author’s interpretation, which is supported by the facts presented by the KTH-Lokaler administrator about the system (see column “planning system” of the table no.11, page 35), is such that, KTH-Lokaler system functions as a supportive system which reports and stores some of the crucial information required by the other departments in order to complete administrative tasks. Apart from that, it also functions as a system which publicizes information.

Premises and infrastructure

KTH-Lokaler system provides valuable information for making vital decisions pertaining to development and maintenance of the infrastructural facilities at KTH. The necessary renovations and constructions at KTH are decided and planned using the information obtained through this system as stated by the KTH-Lokaler administrator. The architectures at KTH works in collaboration with the administrators involved with KTH-Lokaler to make necessary decisions.

<table>
<thead>
<tr>
<th>Planning system</th>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
</table>

4.4.4 UG (USERS AND GROUPS)

The following table presents the gathered information and the analysis for the UG system.
<table>
<thead>
<tr>
<th>UG (Users and Groups)</th>
<th>Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identity management system at KTH</td>
<td>Job design</td>
</tr>
<tr>
<td>Control information of different personnel at KTH (employees and students)</td>
<td>Resources</td>
</tr>
<tr>
<td>Setting access rights for users of different applications (including information systems) at KTH</td>
<td>Selection</td>
</tr>
<tr>
<td>Creating/adding new users and setting privileges for outside personnel (e.g. consultants)</td>
<td>Placement</td>
</tr>
<tr>
<td>Blacklisting personnel</td>
<td>Training</td>
</tr>
<tr>
<td>Tracking the logs of the users for different information systems at KTH</td>
<td>Cultural</td>
</tr>
<tr>
<td>Has control over the mail groups</td>
<td>Codes of conduct</td>
</tr>
<tr>
<td></td>
<td>Group work</td>
</tr>
<tr>
<td></td>
<td>Change of responsibilities</td>
</tr>
<tr>
<td></td>
<td>Physical arrangement</td>
</tr>
<tr>
<td></td>
<td>Tone at the top</td>
</tr>
<tr>
<td>Planning and decision making</td>
<td>Planning and decision making</td>
</tr>
<tr>
<td>Seeking Consensus in discussions</td>
<td>Adoption and repeatability</td>
</tr>
<tr>
<td></td>
<td>Communication</td>
</tr>
<tr>
<td></td>
<td>Information flow in the environment</td>
</tr>
<tr>
<td></td>
<td>Availability and accessibility</td>
</tr>
<tr>
<td></td>
<td>Innovation and thinking outside the box</td>
</tr>
</tbody>
</table>
ORGANIZATIONAL PERFORMANCE
SECTION A
The following table presents the gathered information and the analysis of organizational performance measures for the UG system.

<table>
<thead>
<tr>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel development</td>
<td>Low</td>
<td>Performing routine tasks within the system</td>
</tr>
<tr>
<td>Workplace relationship</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>High</td>
<td></td>
</tr>
</tbody>
</table>

TABLE 13: ANALYSIS ON ORGANIZATIONAL PERFORMANCE OF THE UG SYSTEM

Personnel controls: Since the UG administrator is engaged in leading projects and development, the responsibilities are defined in a broad sense. Furthermore, since the UG administrator is involved in the development area it further loosens the constraints to define a specific job description. Thus, this cannot be viewed as a hindrance factor on organizational design which ultimately affects the organizational performance. It should be also noted that, as stated by the UG administrator, the lack of time and the need for prioritization of certain tasks is partly caused by the usage of numerous planning systems to perform different tasks. Thus, integration of certain tasks performed by logging into different planning systems is desired as stated by the UG administrator, in order to improve the convenience and efficiency for the planning system users.

Personnel controls -> Personnel development
It can be seen by the responses of the UG administrator, that he/she gains low personnel development through using the system, since most of the work involves performing routine tasks. This is observed mainly due to the nature of the planning system (UG). Working with some planning systems requires lot of time and effort to obtain the appropriate output, whereas others require performing routine tasks and might become less challenging for a dynamic employee who needs a challenging working environment. It is important not to under utilize one's capacity, since it can be used to improve the performance of the organization.

Cultural controls: It is desired in an organizational perspective for the manager to be in a upper level preferably both in the managerial and technical areas, which will otherwise affect the organizational culture leading to undesired behaviours. The manager and the employee being on the same page (as stated by the UG administrator), might induce undesired organizational behaviours.
Cultural controls -> Workplace relationships
No sufficient information gained through the UG administrator to establish the relationship.

Planning & decision making controls: It was mentioned by the UG administrator that he/she sometimes needs to make an effort to obtain the appropriate information without allowing information overload. This information overload may drastically affect the decision making process, sometimes leading to wrong conclusions. Moreover, it can reduce the efficiency within an organization by disturbing the focus of an individual.

Planning and decision making controls -> Employee satisfaction
Since the UG administrator works in the area of projects and development there is ample opportunity for him/her to contribute to the development at KTH. Furthermore, the organizational development controls are tight which suggests that its effects will be translated effectively with the anticipated outcomes. Thus, it can be seen that the UG administrator has a high level of satisfaction with regard to his/her work due to the opportunity given to contribute to the development process at KTH.

SECTION B
Quality and efficiency of crucial administrative processes
It was mentioned by the UG administrator that the UG system helps to improve the administrative performances within the organization. In other words, it helps to reduce the paper work, saves a lot of man hours and reduces the administrative costs. This is mainly highlighted in the process of batching the new students into the UG system, where email accounts and passwords are delivered to them in an efficient manner. It was also mentioned by the UG administrator that the above mentioned process could be further improved by making use of the account, used by the student when applying to the university, to administer the delivering of email addresses and passwords.

Student attractiveness
The delivery of information to the KTH-Social (Social network at KTH) was also highlighted by the UG administrator, where it improves the communication and sharing of information within KTH in a more attractive and a convenient manner. Furthermore, this will also affect to develop a strong culture within KTH by enhancing the interaction between the academic staff, administrators and students.

Quality assurance
In author's interpretation which is supported by the facts presented by the UG administrator (see column "planning system" of the table no.13, page 38), UG also acts as a tool which controls the information system environment at KTH. Thus moulds the behaviour of the system users (students
and employees) in a desired way for KTH, which will not lead to misusing of systems or information and assures quality of the same.

### 4.4.5 AGRESSO

The following table presents the gathered information and the analysis for the AGRESSO system.

<table>
<thead>
<tr>
<th>Planning system</th>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRESSO</td>
<td>Personnel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the financial system at KTH supporting the finance departmental procedures</td>
<td>Job design</td>
<td>Loose</td>
<td>Responsibilities in a wide range</td>
</tr>
<tr>
<td>EFH is the web interface used to access the AGRESSO system</td>
<td>Resources</td>
<td>Tight</td>
<td>Lack of time</td>
</tr>
<tr>
<td>Feature to handle details regarding how the research funds are utilized</td>
<td>Selection</td>
<td>Tight</td>
<td>Accounting knowledge, business administration, SQL programming</td>
</tr>
<tr>
<td>Handling accounts receivables and payables</td>
<td>Placement</td>
<td>Tight</td>
<td>Prior version at KTH which is much more simpler than the current system</td>
</tr>
<tr>
<td>Communications with LADOK and also sends information to COGNOS</td>
<td>Training</td>
<td>Loose</td>
<td>Mostly self learning to find solutions (from simple SQL to complex SQL programs)</td>
</tr>
<tr>
<td>Handling fixed assets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feature to handle projects at KTH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handling invoices for different projects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generate reports</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salary transactions are imported through HR+ system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handling transactions and approving them</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Includes a budget planning module</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Includes a general ledger in the system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning and decision making</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seeking Consensus in discussions</td>
<td>Tight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adoption and repeatability</td>
<td>Loose</td>
<td></td>
<td>Most of the other universities learn from KTH</td>
</tr>
<tr>
<td>Communication</td>
<td>Tight</td>
<td></td>
<td>RSS feature embedded but everyone doesn’t use it</td>
</tr>
<tr>
<td>Information flow in the environment</td>
<td>Loose</td>
<td></td>
<td>There are specific networks (for specific system users) to update certain information</td>
</tr>
<tr>
<td>Availability and accessibility</td>
<td>Loose</td>
<td></td>
<td>Lots of meetings throughout the whole day</td>
</tr>
</tbody>
</table>

40 | Page
Innovation and thinking outside the box | Tight | But lots of assessments and surveys conducted beforehand

Tolerance and learning by mistakes | Tight | Weekly meetings

Top to bottom information flow | Tight | Weekly meetings

TABLE 14: PRESENTATION AND THE ANALYSIS OF THE AGRESSO SYSTEM

ORGANIZATIONAL PERFORMANCE SECTION A

The following table presents the gathered information and the analysis of organizational performance measures for the AGRESSO system.

<table>
<thead>
<tr>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel development</td>
<td>High</td>
<td>Dynamic, fixing bugs and broad understanding and knowledge gained in different fields</td>
</tr>
<tr>
<td>Workplace relationship</td>
<td>High</td>
<td>A good team</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>Low</td>
<td>More involvement in different types of projects which are interesting so at times dissatisfied for the lack of involvement as desired and lots of room for new developments and implementations</td>
</tr>
</tbody>
</table>

TABLE 15: ANALYSIS ON ORGANIZATIONAL PERFORMANCE OF THE AGRESSO SYSTEM

Personnel controls: It is quite interesting to note that the wide range of competencies required by the AGRESSO system users as stated by the AGRESSO administrator. The employees at a lower hierarchical level are specialized in different areas and their managers have a broad understanding in all the respective areas as stated by the AGRESSO administrator (in this case knowledge on accounting, business administration and SQL programming). This type of selection is necessary and desired in the organizational design process which ultimately affects the performance of the organization. Learning by finding solutions to the problems encountered, as stated by the AGRESSO administrator can be considered as an effective type of training since it helps to improve the fit between the planning system and the personnel engaged in the process.

Personnel controls -> Personnel development

It is important to note, that the AGRESSO administrator has high a level of personnel development which can argued as to be caused by the wide range of responsibilities possessed by the administrator and the dynamic learning environment which is depicted through solving problems by programming simple –complex SQL codes. The wide range of responsibilities assigned pertaining to the system enables the administrator to learn different and new concepts in a regular fashion.

Cultural controls: Imposing lots of responsibilities on a single person may lead to the ignorance of the codes of conduct practiced at a certain department/organization. Thus, less priority is given to
them and it becomes more of the “common knowledge” as stated by the AGRESSO administrator. In other words, this poses a threat to an organization where an employee is not fully aware of the codes of conduct, which will be reflected through undesired behavioural patterns within the organization.

It was also mentioned by the AGRESSO administrator that the learning gained by one’s manager is more in the area of leadership and control, when he/she is holding a position in the upper levels of hierarchy of the organizational structure.

Cultural controls -> Workplace relationships
It was mentioned by the AGRESSO administrator that there is a high level of workplace relationship existed among the employees at the department. This can be interpreted as to be caused by the less emphasis on codes of conduct and effective group work. When the codes of conduct are referred to as “common knowledge” it adds a certain form of informality to the working place controls by allowing the employees to be less stressful when performing duties. When there is effective group work in such an environment it can lead to develop strong work place relationships.

Planning & decision making controls: Being one of the top universities in SWEDEN may at times hinder the learning process in the organizational point of view. To elaborate as mentioned by the AGRESSO administrator it is the other universities that learn from KTH. Which also meant that very little support is gained from other universities in sharing the lessons learnt. In this case it is necessary to have some other sources of reference for effective development in the areas which requires adoption and repeatability to improve the quality and the efficiency of tasks performed through the planning systems.

Another important fact is that, as stated by the AGRESSO administrator, there are specific networks to share specific information, which means not every employee in the department will know all the information which flows into the department. This may have both negative and positive impacts towards organizational development aspects, since it is always the same set of employees who receives the same information, where views on others will be eventually ignored in the process.

Planning & decision making controls -> Employee satisfaction
It was mentioned by the AGRESSO administrator that there is somewhat a low level of satisfaction even though there is ample room for new developments and implementations. This is due to the fact that the administrator is involved in different types of projects which are interesting altogether and at times this leads to the lack of involvement as desired for certain projects. Thus, there should be a control on the number of development projects imposed on an employee both in order to improve his/her satisfaction and to utilize ones capabilities to a maximum level to benefit the organization.
SECTION B

Quality and efficiency of crucial administrative processes

It was mentioned by the AGRESSO administrator that, with comparison of the previous financial system at KTH the current system has helped a lot in numerous ways. To elaborate the processes have being made more efficient and convenient. Unlike in the past, nowadays different people/parties request more detailed information specifically pertaining to the research budgets (how they have been spent in a greater detail which affects Research and education). In this endeavour, the AGRESSO system provides an efficient and a convenient service in meeting the demands of the relevant parties by handling the information in a timely and a sufficient manner to generate the requested reports (affecting External professional relationships). It was also mentioned that this system provides the foundation for the business administrative purposes.

Quality assurance procedures

Another important point is that this system enables to keep track of every transaction which leads to detailed statistics even within finer areas, thus helping the decision making and planning process at KTH, as stated by the AGRESSO administrator. In other words, it could be stated that the AGRESSO system directly affects the quality assurance procedures at KTH, since most of the aspects comes to financial terms in the end, as stated by the AGRESSO administrator.

4.4.6 W3D3

The following table presents the gathered information and the analysis for the W3D3 system.

<table>
<thead>
<tr>
<th>Planning system</th>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>W3D3</strong></td>
<td><strong>Personnel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can be considered as the legal document handling system at KTH</td>
<td>Job design</td>
<td>Tight</td>
<td>Budgeting and resource managing for W3D3</td>
</tr>
<tr>
<td>Designed to preserve the cases (official records like research contracts, president’s decisions etc.) pertaining to KTH for long periods</td>
<td>Resources</td>
<td>Tight</td>
<td></td>
</tr>
<tr>
<td>Transferring mail into the system to register them</td>
<td>Selection</td>
<td>Tight</td>
<td>Legislations/laws concerning public documents, theories about archives and record management, basic IT knowledge</td>
</tr>
<tr>
<td>Transferring mail into the system to register them</td>
<td>Placemnet</td>
<td>Tight</td>
<td>Older version of the current system</td>
</tr>
<tr>
<td>Transferring mail into the system to register them</td>
<td>Training</td>
<td>Loose</td>
<td>Followed a short course</td>
</tr>
<tr>
<td><strong>Cultural</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registering cases and attaching papers to each case</td>
<td>Codes of conduct</td>
<td>Tight</td>
<td>Not everyone adheres to them actively</td>
</tr>
<tr>
<td>Managing permission levels</td>
<td>Group work</td>
<td>Tight</td>
<td>Good understanding</td>
</tr>
<tr>
<td>Managing permission levels</td>
<td>Change of responsibilities</td>
<td>Tight</td>
<td>Added responsibilities</td>
</tr>
</tbody>
</table>
for viewing the documents for different personnel

Physical arrangement

Tight

Tone at the top

Loose

Less expertise in the records management areas

Planning and decision making

Seeking Consensus in discussions

Loose

Depends on the issue at hand

Adoption and repeatability

Loose

Sometimes over do by referring to past experience rigorously without having a new angle on the problems

Communication

Tight

Informal short discussions

Information flow in the environment

Loose

Sometimes the information gets locked at certain places due to ignorance or lack of knowledge of the personnel

Availability and accessibility

Tight

Innovation and thinking outside the box

Tight

Depends on the magnitude of impact of the issue towards the organization

Tolerance and learning by mistakes

Tight

Top to bottom information flow

Tight

But, meetings not held on a regular basis

TABLE 16: PRESENTATION AND THE ANALYSIS OF THE W3D3 SYSTEM

ORGANIZATIONAL PERFORMANCE

SECTION A

The following table presents the gathered information and the analysis of organizational performance measures for the W3D3 system.

<table>
<thead>
<tr>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel development</td>
<td>High</td>
<td>Learning the important aspects pertaining to cases</td>
</tr>
<tr>
<td>Workplace relationship</td>
<td>High</td>
<td>Employees can express ideas freely and everyone respects them</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>High</td>
<td>Challenging and exciting</td>
</tr>
</tbody>
</table>

TABLE 17: ANALYSIS ON ORGANIZATIONAL PERFORMANCE OF THE W3D3 SYSTEM

Personnel controls: It is evident that most of the aspects in the area of personnel controls are thoroughly connected with the W3D3 system. Thus, it is possible to anticipate the outputs of the system might positively affect the performance at KTH. It is important to note the competencies required to work with the W3D3 system (as stated by the W3D3 administrator; Knowledge on
legislations/laws concerning public documents and theories about archives and record management) positively affect W3D3 system to increase the quality of the throughput of the same.

**Personnel controls** -> **Personnel development**

It can be seen from the table 18 (page 45) that the W3D3 administrator has a high level of personnel development which is caused by the continuous learning process with respect to the cases at KTH.

It was also stated by the W3D3 administrator that one has to possess knowledge about the legislations/laws concerning public documents and theories about archives and records management. In this endeavour, it can be interpreted that a W3D3 administrator will be able to utilize and enhance the knowledge in the aforementioned areas which will lead to improvement in his/her personnel development.

**Cultural controls:** As mentioned in some of the earlier planning systems, this planning system too possesses the aforementioned characteristics for tone at the top (Managers have less expertise on the relevant field and more on managing and leadership). This can affect the decisions made by the upper management and also produce less exemplary characters to the lower management, which will induce lack of respect and understanding within the department. Thus, these deteriorations of the culture might cause lasting negative impacts on organizational behaviour.

**Cultural controls -> Workplace relationships**

It is important to note here that a high level of workplace relationship exists within the department since there is effective group work with shared responsibilities and good understanding between each other as stated by the W3D3 administrator. This has caused the employees to freely express their ideas and also created a situation where everyone respects them. Thus, the strength of group work has lead to develop strong interpersonal relationships which ultimately develop a strong culture.

**Planning & decision making controls:** It can be seen that it is not always necessary to seek consensus in making vital decisions, as stated by the W3D3 administrator, but this confidence of baring the responsibility comes through experience gained working for a long period in the respective area. Considering the adoption and repeatability, learning by past occurrences may sometimes oversee new efficient solutions as mentioned by the W3D3 administrator. Thus, there should be a trade-off in considering the past experience and should always welcome new ways of looking at a certain problem to find the best for the organization.

**Planning & decision making controls -> Employee satisfaction**
It is mentioned by the W3D3 administrator that the satisfaction pertaining to the work remains at a high level which he/she further explains by stating challenging and exciting. This can be said to be caused by the freedom given to execute new ideas and to contribute to the development of KTH.

SECTION B  
Quality and efficiency of crucial administrative processes

It was mentioned by the W3D3 administrator that the information is more valuable nowadays than in the past. In the past, only the person or limited number of people/parties who were related to a certain case refereed the preserved information (archives). But nowadays, this information is made public and more people/parties are interested in obtaining the information for various purposes (affecting the External professional relationships). In this endeavour, the quality of the information has to be maintained to certain standard to serve its necessary purpose. In other words, by law there are certain guidelines and procedures to follow in conducting a certain task and these tasks needs to be supplemented by having an official form of recording procedure (recording the cases). Thus, this is a crucial process needed to administer the organization. This system can affect the key performance indicators like research, quality assurance, student attractiveness and the quality of the education in an indirect way, since it provides the back bone for initiation and execution of certain decisions made, as stated by the W3D3 administrator, affecting the above mentioned performance indicators.

4.4.7 KLARA

The following table presents the gathered information and the analysis for the KLARA system.

<table>
<thead>
<tr>
<th>Planning system</th>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KLARA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Managing the database of chemicals at KTH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Checking whether an inventory has been done and importing the chemicals into the program to register them</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicating with the personnel who are editing the chemical lists</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Checking quality and the details of all the chemicals at KTH, by department wise or by geographic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Personnel</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job design</td>
<td>Loose</td>
<td>Broadly defined responsibilities around KLARA</td>
<td></td>
</tr>
<tr>
<td>Resources</td>
<td>Loose</td>
<td>Lack of time, no assistance to transfer the knowledge</td>
<td></td>
</tr>
<tr>
<td>Selection</td>
<td>Loose</td>
<td>Knowledge about chemicals up to a certain extent, no IT competence required</td>
<td></td>
</tr>
<tr>
<td>Placement</td>
<td>Loose</td>
<td>Not worked with a similar system before</td>
<td></td>
</tr>
<tr>
<td>Training</td>
<td>Loose</td>
<td>Self-learning emphasized</td>
<td></td>
</tr>
<tr>
<td><strong>Cultural</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Codes of conduct</td>
<td>Loose</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The following table presents the gathered information and the analysis of organizational performance measures for the KLARA system.

<table>
<thead>
<tr>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel development</td>
<td>High</td>
<td>Learn a lot about the system and gathered a lot of IT knowledge and knowledge about chemicals</td>
</tr>
<tr>
<td>Workplace relationship</td>
<td>Low</td>
<td>New to the current workgroup and needs time to merge into the workplace, thus could be better</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>High</td>
<td>Exciting work and enjoys the responsibility imposed</td>
</tr>
</tbody>
</table>

**TABLE 18: PRESENTATION AND THE ANALYSIS OF THE KLARA SYSTEM**

**ORGANIZATIONAL PERFORMANCE**

**SECTION A**

The following table presents the gathered information and the analysis of organizational performance measures for the KLARA system.

<table>
<thead>
<tr>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel development</td>
<td>High</td>
<td>Learn a lot about the system and gathered a lot of IT knowledge and knowledge about chemicals</td>
</tr>
<tr>
<td>Workplace relationship</td>
<td>Low</td>
<td>New to the current workgroup and needs time to merge into the workplace, thus could be better</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>High</td>
<td>Exciting work and enjoys the responsibility imposed</td>
</tr>
</tbody>
</table>

**TABLE 19: ANALYSIS ON ORGANIZATIONAL PERFORMANCE OF THE KLARA SYSTEM**
Personnel controls: It is quite visible when analyzing this section that KLARA, even though a crucial planning system for KTH, loosely fits to the personnel controls. It should be also mentioned that the KLARA administrator is the only person responsible for the system and possess a good wealth of knowledge pertaining to the system and its procedures. The KLARA administrator has learnt about the system and its procedures mainly through self-learning. At present, the administrator fits well with the system, but in an organizational design perspective there is a disparity between the planning system and the controls around the personnel. In other words, the loose personnel controls have made the administrator to find his/her own ways of conducting different procedures. It might have been the case that, there was no prior experience with a similar system to design personnel controls for KLARA system. Due to these reasons the planning system might not yield the anticipated outcomes, thus affecting the performance in a negative manner.

Personnel controls -> Personnel development
It can be noted that the KLARA administrator has gained a high level of personnel development by working with KLARA. This is obvious due to the loose personnel controls imposed which have lead to the vast amount of knowledge and experience gathered to improve the compatibility with the planning system. Thus, it is evident that in some cases loose personnel controls also lead to high levels of personnel development.

Cultural controls: It can be seen that the above mentioned loose personnel controls have translated into the cultural controls also, by defining own ways of doing certain tasks and making decisions by own. The managers on the other hand, have less expertise to guide the KLARA administrator. There is no knowledge sharing which will pose a serious threat to the organization in the absence of the respective KLARA administrator. Thus, there should be a group, both to share and learn from the centralized knowledge base, so that there won’t be any drastic effects on the organization in the absence of the respective KLARA administrator.

Cultural controls -> Workplace relationships
It was stated by the KLARA administrator that he/she is less satisfied with the workplace relationships. A new work place can always be challenging even to an experienced employee of an organization. It takes time before a person fits into a work group and develops good relationships within a department. But, continuous changes of roles (same responsibilities but under different managers) within short periods of time may not leave enough time for a person to develop good interpersonal relationships with his/her subordinates, as mentioned by the KLARA administrator. This will affect the culture within an organization. Furthermore, the cultural controls are loose, and do not supports the development of a strong culture (e.g. administrator working alone and no expertise/advice given pertaining to KLARA).
Planning & decision making controls: Since the KLARA administrator is the only expert regarding the KLARA system at KTH most of the decisions are made without seeking consensus. It was also mentioned by the KLARA administrator that more guidance and collaboration is preferred to optimize the output of this valuable tool and thereby help KTH to make effective decisions which will have lasting effects on the organization.

Planning & decision making controls -> Employee satisfaction
It was mentioned by the KLARA administrator that he/she has a high level of satisfaction with respect to the work carried out. The KLARA administrator further stated that the work he/she was carrying out was exciting and enjoys the responsibilities imposed. Even though the KLARA administrator is the only person responsible for the work carried out with KLARA, he/she gains support by the collaboration of other universities in solving problems encountered pertaining to the system. It is also important to note that he/she is the only person who figures out the developments and improvements for the system. This level of contribution to the development within the KLARA system has made employee satisfaction to remain at a high level, despite the fact that the some of the organizational development controls are loosely fitted to the administrator.

SECTION B
Quality and efficiency of crucial administrative processes
KLARA, in short, gives a better view about the chemicals at KTH. It acts as a quality control system which also handles the inventory of the chemicals (Quality assurance). This system helps to publicize rich information. The importance of KLARA is emphasized through the health and safety benefits it brings to students, employees and the environment (Employee health and safety). All the chemicals which are ready to use (having the complete security data set pertaining to the chemical) can be located as to where they are stored and the responsible parties for the same. This geographical and other relevant information are used by the fire department in the case of an emergency. Furthermore, since the chemical storage locations can be tracked for several years, this information can be used to assess any potential threats to human life or the nature (whether the chemicals have caused some kind of disease patterns in the specific area etc). To be specific, KLARA is engaged in the quality assurance and standardizations of chemicals at KTH, as stated by the KLARA administrator. Furthermore, this valuable information generated through the system could be utilized in planning when making vital decisions at KTH. It was also mentioned by the KLARA administrator that, since KLARA deals with chemicals it affects the quality of research (conducted with chemicals) in an indirect way, which is a key performance indicator at KTH (Research). Finally it was stated that KLARA could be developed to provide a service to publish the new regulations and news about chemicals at KTH.
The following table presents the gathered information and the analysis for the LADOK system.

<table>
<thead>
<tr>
<th>Planning system</th>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| **LADOK** *(LADOK, 2011)*  
Included modules: Undergraduate & masters level education  
Study elements (course contents, study Programs)  
Studies; commitments and leaves of absence  
Module for handling students who are admitted to study programs (containing information about admissions, education plans etc.) and courses | **Personnel**  
Job design | Loose  
Responsibilities in a wide range/ development                                                                                           |                 |
| Resources | Loose  
Need to develop more statistics for management reports/ lack of time                                                                                                                       |                 |
| Selection | Tight |
| Placement | Tight   
Use of large IT systems                                                                                                                     |                 |
| Training | Loose |
| **Cultural**  
Codes of conduct | Tight   
Sometimes trade-off between personnel integrity and regulations                                                                                     |                 |
| Group work | Tight   
System integrity/ specialized personnel with authorizations                                                                                         |                 |
| Change of responsibilities | Tight   
Working with many systems                                                                                                                      |                 |
| Physical arrangement | Tight   
Open offices preferred/ sitting to gather with admission and degree officers                                                                 |                 |
| Tone at the top | Loose |
| **Planning and decision making**  
Seeking Consensus in discussions | Tight   
Strong collaboration with national group/ often the first to come up with a specific problem/ on the go visits                                                                 |                 |
| Adoption and repeatability | Tight |
| Communication | Tight |
| Information flow in the environment | Loose   
Web pages are not up to the standard                                                                                                          |                 |
| Availability and accessibility | Tight   
But bit busy/ good at answering emails                                                                                                          |                 |
| Innovation and thinking outside the box | Tight   
Sometimes, not always                                                                                                                         |                 |
| Tolerance and learning by mistakes | Tight   
Could be better if opens up a bit more                                                                                                          |                 |
| Top to bottom information flow | Loose |

**TABLE 20: PRESENTATION AND THE ANALYSIS OF THE LADOK SYSTEM**
ORGANIZATIONAL PERFORMANCE

SECTION A

The following table presents the gathered information and the analysis of organizational performance measures for the LADOK system.

<table>
<thead>
<tr>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel development</td>
<td>Low</td>
<td>Working with staff/consortium/governmental departments and updating about laws and regulations</td>
</tr>
<tr>
<td>Workplace relationship</td>
<td>High</td>
<td>A bit of hard work</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>High</td>
<td>Ample opportunity for improvements and problem solving</td>
</tr>
</tbody>
</table>

TABLE 21: ANALYSIS ON ORGANIZATIONAL PERFORMANCE OF THE LADOK SYSTEM

**Personnel controls:** It can be noted in this case also that the assign responsibilities are not specific and vaguely designed when the administrator resides at up in the hierarchical structure. It was also mentioned by the LADOK administrator that since LADOK is one of the most important planning systems at KTH which contributes a lot to its performance, it is needed to generate more statistics for the KTH management report. Thus, more personnel would be desired to conduct this process in a more efficient manner.

**Personnel controls -&gt; personnel development**

It can be noted that the LADOK administrator has low personnel development with respect to the work with the system. But, it was mentioned that working with the staff, consortium and governmental bodies improves contributes to the personnel development. Also the necessity to be updated about the laws and regulations pertaining to education improves the knowledge within the field. It can be seen how the freedom imposed (vaguely designed responsibilities) by the personnel controls contributes to one’s personnel development.

**Cultural controls:** It was mentioned by the LADOK administrator that personnel integrity is equally important when working with respect to the codes of conduct, thus at times there should be a trade-off between personnel integrity and regulations to find the best situational option.

The group work, as stated by the LADOK administrator, not only improves interpersonal relationships but also leads to system integrity by connecting the specialized personnel who perform specific tasks with the others which lead to sharing of knowledge and develop synergy between the group members. This cohesion between the employees will lead to develop a strong culture within the department.

**Cultural controls -&gt; Workplace relationships**
It was stated by the LADOK administrator that the workplace relationships are at a high level. This may be an effect which is translated through having an effective group work environment with strong interpersonal relationships and understanding. Since the group work brings all the specialists together covering all the processes within the department there is mutual understanding of roles and sharing of knowledge which enhances the mutual respect and improves synergy within the group.

**Planning & decision making controls:** It was mentioned by the LADOK administrator that information flow could be improved by improving the standard of the web pages since sometimes it becomes a tedious process to fetch the necessary information. It was also emphasized that more information was needed from the top by opening up, so that it will help to make more clear decisions regarding improvements and development.

**Planning & decision making controls -> Employee satisfaction**

There is a high level of satisfaction for the LADOK administrator with the work in concern. This was mainly due to the opportunity that he/she has to contribute to the improvements and solving problems within the department. Thus, it could be said that the well-fitting controls pertaining to the organizational development has enabled to drive the administrator to contribute to the development within KTH as anticipated.

**SECTION B**

**Quality and efficiency of crucial administrative processes**

LADOK is an important planning system which brings students, teachers, administrators, government and other external organizations together. It serves them by creating a single platform where the decisions could be drawn at various levels by the information generated through the same. Thus, it serves the administrative processes in a wide range. One such example is generating statistics which is required by the KTH management and government. It was stated by the administrator that *mypages* which is a part of LADOK could be further improved to enhance the convenience for both the students and staff and reduce administrative costs (e.g. course registrations could be done through *mypages* affecting *Quality assurance*). It was also emphasized the importance of having the control over COGNOS to produce sensible statistics for the organization.

In the author’s opinion, LADOK contributes to the performance at KTH in numerous ways. Apart from what is mentioned above, this planning system helps to improve the performance measures of *student attractiveness, Education and research, external professional relationships, Evaluation and follow-up, academic leadership, internationalization, staff, collaboration, teaching resources and teacher qualifications* (based on the information from column “planning system” table 21, page 51). It should be noted that these performance measures are affected by the statistics and the
information generated through the LADOK system and sometimes might have an indirect impact rather that a direct one.

### 4.4.9 COGNOS

The following table presents the gathered information and the analysis for the COGNOS system.

<table>
<thead>
<tr>
<th>Planning system</th>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personnel</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job design</td>
<td>Tight</td>
<td></td>
<td>Maintaining, developing COGNOS and obtaining feedback from users</td>
</tr>
<tr>
<td>Resources</td>
<td>Tight</td>
<td></td>
<td>Obtaining consultancy supports</td>
</tr>
<tr>
<td>Selection</td>
<td>Loose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Placement</td>
<td>Tight</td>
<td></td>
<td>Have prior programming experience</td>
</tr>
<tr>
<td>Training</td>
<td>Loose</td>
<td></td>
<td>Mostly self-learning/ general teachings into the system</td>
</tr>
<tr>
<td><strong>Cultural</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Codes of conduct</td>
<td>Loose</td>
<td></td>
<td>Commonly knowledge</td>
</tr>
<tr>
<td>Group work</td>
<td>Loose</td>
<td></td>
<td>Not sharing responsibilities/specialized</td>
</tr>
<tr>
<td>Change of responsibilities</td>
<td>Tight</td>
<td></td>
<td>More added responsibilities</td>
</tr>
<tr>
<td>Physical arrangement</td>
<td>Tight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tone at the top</td>
<td>Loose</td>
<td></td>
<td>Both good and bad</td>
</tr>
<tr>
<td><strong>Planning and decision making</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seeking Consensus in discussions</td>
<td>Tight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adoption and repeatability</td>
<td>Tight</td>
<td></td>
<td>Collaboration with other parties/sometimes keeps records of past occurrences</td>
</tr>
<tr>
<td>Communication</td>
<td>Tight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information flow in the environment</td>
<td>Tight</td>
<td></td>
<td>Part of the job</td>
</tr>
<tr>
<td>Availability and accessibility</td>
<td>Tight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovation and thinking outside the box</td>
<td>Tight</td>
<td></td>
<td>No encouragement given monetary wise</td>
</tr>
<tr>
<td>Tolerance and learning by mistakes</td>
<td>Tight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top to bottom information flow</td>
<td>Tight</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TABLE 22: PRESENTATION AND THE ANALYSIS OF THE COGNOS SYSTEM**

**ORGANIZATIONAL PERFORMANCE**

**SECTION A**
The following table presents the gathered information and the analysis of organizational performance measures for the COGNOS system.

<table>
<thead>
<tr>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel development</td>
<td>High</td>
<td>More knowledge gained in the particular area</td>
</tr>
<tr>
<td>Workplace relationship</td>
<td>High</td>
<td>Good environment/ everyone is nice</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>High</td>
<td>Like the imposed responsibilities and the atmosphere in the university sector</td>
</tr>
</tbody>
</table>

**TABLE 23: ANALYSIS ON ORGANIZATIONAL PERFORMANCE OF THE COGNOS SYSTEM**

**Personnel controls**

It can be seen from the table no. 24 (page 54) that the selection and training are loosely coupled with the COGNOS system. In other words the selection of the COGNOS administrator has not been made based on competencies and the training has only covered general aspects to give an introduction to the system.

**Personnel controls -> Personnel development**

The COGNOS administrator’s responsibilities are maintaining, developing and obtaining feedback from the users (see table no. 23, page 54). The COGNOS administrator also stated that there is a high personnel development, since more knowledge is gained in the working area. The knowledge gained through working with the system (the reason for high personnel development as stated by the COGNOS administrator) can be mainly traced as a consequence of the imposed personnel controls; to be specific is due to the responsibilities imposed on the COGNOS administrator.

**Cultural controls**

It can be seen from the table no. 24 (page 54) that codes of conduct, group work and tone at the top elements are loosely coupled with the COGNOS system from what is stated by the COGNOS administrator. It is important to highlight the element of group work where the COGNOS administrator stated that there is no sharing of responsibilities and everyone within the group are specialized in some work.

**Cultural controls -> Workplace relationships**

The COGNOS administrator stated that there is a high level of workplace relationships since he/she likes the working environment and the co-workers within the department. This good working atmosphere is induced through the less stringent codes of conduct, which has become the common knowledge and resulted in high workplace relationships, since there is no strict/ stressful working environment, as stated by the COGNOS administrator.

**Planning and decision making controls**

All the elements under the planning and decision making controls are tightly coupled with the COGNOS system, from what is stated by the COGNOS administrator.
Planning and decision making controls -> Employee satisfaction

No sufficient information obtained through the COGNOS administrator to establish the relationship.

SECTION B

Quality and efficiency of crucial administrative processes

Reports are generated through COGNOS revealing information pertaining to economy, following up students and researches, in a timely and efficient manner, as stated by the COGNOS administrator. Thus, COGNOS acts as a tool for decision making at KTH. Furthermore, the COGNOS administrator stated that COGNOS provides some of the information which affects key performance indicators such as, teacher quality assurance (whether teachers are qualified by following the necessary courses and how many teachers have reached the 15 credits level) and also provides figures to the KTH management report. Thus, COGNOS affects both staff development and ensures quality assurance at KTH, as stated by the COGNOS administrator.

It was also stated by the COGNOS administrator that there is lot of knowledge sharing and a nice working environment despite the fact that there is lot of women administrators in the department. Thus, it can be seen that COGNOS affects the gender equality at KTH.

4.4.10 KOPPS

The following table presents the gathered information and the analysis for the KOPPS system.

<table>
<thead>
<tr>
<th>Planning system</th>
<th>MCS</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KOPPS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course programming and planning system at KTH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Publishes study programs to the KTH website and other relevant sites (e.g. antagnin.se, nya and studera.nu)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Editing details pertaining to course information through KOPPS (teachers responsible, offering dates, programs which includes the course, course overview etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Personnel</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job design</td>
<td>Tight</td>
<td></td>
<td>Obtaining feedback from users and developing the program</td>
</tr>
<tr>
<td>Resources</td>
<td>Loose</td>
<td></td>
<td>More time needed/ better if had more heads</td>
</tr>
<tr>
<td>Selection</td>
<td>Loose</td>
<td></td>
<td>No IT knowledge required, interacting with users and programmers</td>
</tr>
<tr>
<td>Placement</td>
<td>Loose</td>
<td></td>
<td>Have experience in LADOK</td>
</tr>
<tr>
<td>Training</td>
<td>Loose</td>
<td></td>
<td>Self-learning only</td>
</tr>
<tr>
<td><strong>Cultural</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Codes of conduct</td>
<td>Loose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group work</td>
<td>Loose</td>
<td></td>
<td>No shared responsibilities shared- work is specific to the system</td>
</tr>
<tr>
<td>Change of responsibilities</td>
<td>Tight</td>
<td></td>
<td>New responsibilities added</td>
</tr>
<tr>
<td>Physical arrangement</td>
<td>Tight</td>
<td>Good leadership and technical knowledge obtained</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>-------</td>
<td>-----------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Tone at the top</td>
<td>Tight</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Planning and decision making**

<table>
<thead>
<tr>
<th>Seeking Consensus in discussions</th>
<th>Tight</th>
<th>Very important when making changes to the system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adoption and repeatability</td>
<td>Loose</td>
<td>KOOPS is specific to KTH and no documentation</td>
</tr>
<tr>
<td>Communication</td>
<td>Tight</td>
<td></td>
</tr>
<tr>
<td>Information flow in the environment</td>
<td>Tight</td>
<td>Lot of effort needed to go to the people and fetch information</td>
</tr>
<tr>
<td>Availability and accessibility</td>
<td>Tight</td>
<td>Sometimes the manager is bit busy</td>
</tr>
<tr>
<td>Innovation and thinking outside the box</td>
<td>Tight</td>
<td>Open for development and improvements and manager supports immensely towards achieving targets</td>
</tr>
<tr>
<td>Tolerance and learning by mistakes</td>
<td>Tight</td>
<td></td>
</tr>
<tr>
<td>Top to bottom information flow</td>
<td>Tight</td>
<td>Lot of information from the nearest boss but needed to know what happens at the top</td>
</tr>
</tbody>
</table>

**Table 24: Presentation and the Analysis of the KOPPS System**

**Organizational Performance**

**Section A**

The following table presents the gathered information and the analysis of organizational performance measures for the KOPPS system.

<table>
<thead>
<tr>
<th><strong>MCS</strong></th>
<th><strong>Status</strong></th>
<th><strong>Remarks</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel development</td>
<td>High</td>
<td>Meeting new and lot of people in a wide scope of thinking</td>
</tr>
<tr>
<td>Workplace relationship</td>
<td>High</td>
<td>Open relationships, strong connections and helping each other</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>Low</td>
<td>Initiating developments but time management is important and lots of simultaneous work where focus on a certain processes may be improved, sometimes it’s a tradeoff (needs time for a certain activity at a stretch where focus is on the particular work)</td>
</tr>
</tbody>
</table>

**Table 25: Analysis on Organizational Performance of the KOPPS System**
Personnel controls
It can be seen that several elements (resources, selection, placement and training) of personnel controls are loosely coupled with the KOOPS system, from what is stated by the KOOPS administrator. It was stated that more time and more number of people would have made his/her work more efficient. The selection is made not based on the competencies and there is no IT knowledge required. The KOPPS administrator’s role involves more of interaction between the programmers and the users. It was further stated that the placement is not based on past experience but the KOPPS administrator possess working with the LADOK system. The KOOPS administrator further stated that the learning is mostly made through self-learning.

Personnel controls -> Personnel development
It was stated by the KOOPS administrator that the personnel development is at a high level since he/she is able to meet a lot of people having a wide scope of thinking whereby he/she is able to derive optimum and efficient solutions pertaining to the KOOPS system. Thus, it can be seen that the responsibilities imposed on the personnel through job design affects the personnel development of the KOOPS administrator.

Cultural controls
Based on what is stated by the KOOPS administrator the codes of conduct and the group work elements are loosely coupled with the KOOPS system. It was further stated regarding the group work that there is no shared responsibilities pertaining to the KOOPS system.

Cultural controls -> Workplace relationships
It was stated by the KOOPS administrator that the workplace relationships are at a high level further stating, that there is free and open relationships between co-workers and a mutually helping environment. The clear guidance given by the top in both technical and leadership areas has contributed to maintain good workplace relationships with proper mutual understanding and respect.

Planning and decision making controls
Adoption and repeatability is the only loosely coupled element to the KOOPS system, from what is stated by the KOOPS administrator. KOOPS being a specific system to KTH adds constraints to the learning process which is strengthened by consortiums composed by other universities. Furthermore, it was stated that there is no proper documentation of the past occurrences and mistakes pertaining to KOOPS and also stated that it will be implemented in the near future.

Planning and decision making controls -> Employee satisfaction
The KOOPS administrator stated that the employee satisfaction is at a low level since he/she has to sometimes focus on time management rather than focusing on the problems at hand. It was further
stated that there is lots of simultaneous work taking place and sometimes he/she has to prioritize work. In other words the KOOPS administrator stated that it would have been efficient if he/she is given time at a stretch for a certain activity (without interruption) where he/she could produce more quality output. It can be seen from the table no.25 (page 57) that most of the elements are tightly coupled with the KOOPS system (from what is stated by the KOOPS administrator) and this tightness which ensures quality throughput of the KOOPS system affects the employee satisfaction which poses critical time management and tradeoffs to produce the required output.

SECTION B
Quality and efficiency of crucial administrative processes

The KOOPS administrator stated that the KOOPS system helps to deliver information in an efficient and a convenient manner to the relevant parties. It was further stated that it minimized the usage of pen and paper.

Student attractiveness

It was stated by the KOOPS administrator that the information generated through the KOOPS systems helps the first and second cycle students to get prior understanding about the subjects offered by KTH. It was further stated that KOOPS also provides information to the outsiders and increases the student attractiveness.

4.5 PRESENTATION OF INFORMATION, ANALYSIS AND RESULTS (OVERALL)

The preceding chapter emphasized the specific information, analysis and results pertaining to each planning system in greater detail. This chapter aims at presenting the results in a macro perspective. In other words, it aims at presenting the details by taking all the planning systems into consideration, whereby the patterns are identified by generalizing the findings. The following table (table no. 27, page 59) presents the findings of all the planning systems from the interviews conducted.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>MCS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HR+</td>
</tr>
<tr>
<td>Job design</td>
<td>L</td>
</tr>
<tr>
<td>Resources</td>
<td>T</td>
</tr>
<tr>
<td>Selection</td>
<td>T</td>
</tr>
<tr>
<td>Placement</td>
<td>L</td>
</tr>
<tr>
<td>Training</td>
<td>L</td>
</tr>
</tbody>
</table>
TABLE 26: OVERALL ANALYSIS OF THE FINDINGS

<table>
<thead>
<tr>
<th>Cultural Codes of conduct</th>
<th>L</th>
<th>L</th>
<th>L</th>
<th>T</th>
<th>L</th>
<th>T</th>
<th>L</th>
<th>L</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group work</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>L</td>
<td>T</td>
<td>L</td>
</tr>
<tr>
<td>Change of responsibilities</td>
<td>T</td>
<td>T</td>
<td>L</td>
<td>L</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td>Physical arrangement</td>
<td>L</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td>Tone at the top</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Planning and decision making</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeking Consensus in discussions</td>
</tr>
<tr>
<td>Adoption and repeatability</td>
</tr>
<tr>
<td>Communication</td>
</tr>
<tr>
<td>Information flow in the environment</td>
</tr>
<tr>
<td>Availability and accessibility</td>
</tr>
<tr>
<td>Innovation and thinking outside the box</td>
</tr>
<tr>
<td>Tolerance and learning by mistakes</td>
</tr>
<tr>
<td>Top to bottom information flow</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel development</td>
</tr>
<tr>
<td>Workplace relationship</td>
</tr>
<tr>
<td>Employee satisfaction</td>
</tr>
</tbody>
</table>

The findings presented in the table no.26 (page 58) were further analyzed to draw the following results (see chapter 4.5.1, page 59), which are shown as to how the planning systems in the university sector affect the MCSs and organizational performance. It should be noted that the results are generalized so that it applies to the whole university sector in Sweden which are derived from the specific findings at KTH.

4.5.1 GENERALIZED RESULTS FROM THE FINDINGS

This chapter presents the generalized results from the specific findings at KTH, which applies to the whole university/not-for-profit organizational sector in Sweden. However, it should be noted that these results are only applicable to the administrators using the planning systems in the Swedish university/not-for-profit organizational sector. The results are shown by considering each element of the personnel, cultural and planning & decision making controls. The table no.26 (page 58) provides the supportive information for this chapter (the reader is encouraged to go through the specific rows of the table no.26 to find the relevant patterns discussed below and further refer chapter 4.4 to obtain details specifically pertaining to L, H, L conditions).

Personnel controls

Job design
• There are no specific and descriptive job descriptions (denoted by L in the row “job design” table no.26, page 58), but in some cases the responsibilities pertaining to the relevant planning system are assigned in a somewhat clear manner (denoted by T in the row “job design” table no.26, page 58). Such cases have the following aspects in common (KTH-Res, W3D3, COGNOS & KOOPS),
  ➢ The work group in relation to the planning system is composed by a small number of group members (below 5 members), where each administrator is clear with his/her responsibilities with respect to the planning system.
  ➢ The planning system in consideration is small and less complex (comparing with the other planning systems having many functions and features)

• The responsibilities assigned to an administrator with respect to the considered planning system varied according to the hierarchical position. Administrators in a managerial level have more vaguely assigned responsibilities than the administrators working in a lower hierarchical position (in a system's level- refer chapter 4.4 for further details).

Resource allocation
• Planning system administrators are mostly satisfied with the physical resources provided (denoted by T in the row “resources” table no.26, page 58), but drastically affected by the insufficiency of time. Most administrators who mentioned that the resources can be improved (denoted by L in the row “resources” table no.26, page 58) suggested more number of employees to satisfy the organizational needs.

Selection
• The planning system administrators require the knowledge about the laws (both internal and external to the organization) pertaining to the area of work they are engaged in, but competence in IT is not a compulsory requirement (exception: the planning systems which require programming knowledge).

Placement
• Past experience in the relevant field or a similar field is necessary (denoted by T in the row “placement” table no.26, page 58). This criteria is disregarded when introducing new systems into the organization to meet the government regulations (e.g. HR+, KLARA & KOOPS) and the competitiveness, where the respective personnel is required to gather experience and knowledge by own through working with the planning system.

Training
• Only basic level courses are offered and most of the learning is done through self-learning (denoted by L in the row “training” table no.26, page 58).
Effects of personnel controls on personnel development

There is mostly a high level of personnel development in the administrators who work with the planning systems in the university sector (denoted by H in the row “personnel development” table no.26, page 58). This is due to the reason that, organization is not designed well (personnel controls) to fit with planning systems, where the administrator/s have to improve their compatibility with the planning systems, in a dynamic and a challenging environment, mostly through self-learning (see personnel controls in each planning system in chapter 4.4).

Cultural controls

Knowledge about the codes of conduct

- There is mostly a general level of awareness about the codes of conduct (denoted by L in the row “codes of conduct” table no.26, page 58) and most of them are considered to be the common knowledge either gathered through experience or by intuitive thinking (see codes of conduct in each planning system in chapter 4.4).

Group work

- The responsibilities are mostly shared amongst the group members and a good level of communication is maintained (denoted by T in the row “group work” table no.26, page 58). The planning system administrators who stated that there are no shared responsibilities; are specialized in the work they perform or either worked alone (denoted by L in the row “group work” table no.26, page 58).

Changes of responsibilities

- The responsibilities stay locked-in with the planning systems. However, as time passes, there are more responsibilities added with the same / with new versions of the planning systems (denoted by T in the row “change of responsibilities” table no.26, page 58).

Physical arrangement

- The planning system administrators are satisfied with the physical arrangement with respect to their working environment (denoted by T in the row “physical arrangement” table no.26, page 58). But, more open space offices are preferred to improve the cohesion between the employees.

Tone at the top

- The administrators at the lower hierarchical levels (working at the planning system's level, not at the managerial level) have a lot to learn from their managers both in the managerial and technical concepts (denoted by T in the row “tone at the top” table no.26, page 58), but the administrators at the upper hierarchical levels do not learn much from their managers.
and the learning process is often restricted to the managerial and leadership context (denoted by L in the row “tone at the top” table no.26, page 58).

Effects of cultural controls on workplace relationships

The workplace relationships are strong (denoted by H in the row “workplace relationships” table no.26, page 58), which shows the strong governance of the culture within an organization. The emphasis on informality, group work, homely atmosphere and the less power distance contributes to the development of strong bonds between the employees, which ultimately defines a strong culture (see cultural controls in each planning system in chapter 4.4).

Planning and decision making controls

Consensus seeking

- Consensus seeking is mostly emphasized in making decisions (denoted by T in the row “seeking consensus in discussions” table no.26, page 58) with the exceptions; depends on the decision at hand and staff is competent enough, since they are specialized in the relevant areas (denoted by L in the row “seeking consensus in discussions” table no.26, page 58).

Adoption and repeatability

- Adoption and elimination of problems are mostly dealt with strongly, through collaboration with other universities by sharing knowledge and lessons learnt (denoted by T in the row “adoption and repeatability” table no.26, page 58). This is mostly not observed when the planning system in consideration is specific to KTH (denoted by L in the row “adoption and repeatability” table no.26, page 58) or when KTH being the university which often helps other universities by identifying the problem at the first place (e.g. see AGRESSO system chapter 4.4).

Communication

- Communication is mainly done through emails, informal discussions and in the form of regular meetings (denoted by T in the row “communication” table no.26, page 59).

Information flow in the environment

- There is free flow of information in the working environment, but often, an effort has to be taken to fetch the necessary relevant information (denoted by L in the row “information flow in the environment” table no.26, page 59). Mostly, the necessary information flows to the relevant person (denoted by T in the row “information flow in the environment” table no.27, page 59) when the administrator in concern has a specialized role (e.g. see COGNOS in chapter 4.4) or the planning system in consideration is less complex in functionalities and
has few assigned system administrators (e.g. see KTH-Res, KTH-Lokaler & KOOPS in chapter 4.4).

- Information flow from top to bottom in the hierarchy is sufficient (denoted by T in the row “top to bottom information flow” table no.26, page 59).

**Availability and accessibility**

- Managers are available most of the time and the employee can simply walk into the office, when a necessity occurs to discuss matters then and there (denoted by T in the row “availability and accessibility” table no.26, page 59). But sometimes, the upper management is very busy and hard to meet without prior appointments (denoted by L in the row “availability and accessibility” table no.26, page 59), but once met through an appointment the administrator gets the fullest attention by the upper management.

**Innovation**

- Managers encourage their employees to think about the necessary developments to the planning systems and their work procedures (denoted by T in the row “innovation and thinking outside the box” table no.26, page 59), but often met with budget restrictions and rigorous pre-assessment processes. Thus, most often the ideas are not executed (see planning and decision making controls in each planning system in chapter 4.4).

**Tolerance and learning**

- Confrontation of conflict and learning by mistakes are handled well using the space for dialogue and mutual respect (denoted by T in the row “tolerance and learning by mistakes” table no.26, page 59).

**Effects of planning and decision making controls on employee satisfaction**

The employee satisfaction in the university sector remains at a high level (denoted by H in the row “employee satisfaction” table no.26, page 59), which reveals that the administrators feel that they are contributing to the development of the organization to a sufficient capacity. Mitigation of encountered problems through staff participation and sharing of knowledge, making strategic decisions by clear communication and confrontation of conflict and improving the awareness through actively gathering information makes an employee’s work satisfaction to remain at high levels (see planning and decision making controls in each planning system in chapter 4.4).
5. CONCLUSION

This chapter concludes the study by summarizing the results found out in relation to the research question. Thereafter, it focuses on the author’s contribution to the knowledge, discusses limitations of the research and also provides suggestions for future research. Finally this chapter presents the implications of the research.

5.1 SUMMARY OF THE RESULTS

This chapter summarizes the results obtained in relation to the posed problem or the formulated research question which is, what effects do the planning systems at KTH have on organizational performance? Thus, it was found out how the planning systems at KTH affect the organizational performance through personnel controls, cultural controls and planning & decision making controls. Different planning systems at KTH were also found to affect different measures of organizational performance based on the information gathered through the interviews. The study also found out how planning systems at KTH affected personnel development through personnel controls, workplace relationships through cultural controls and employee satisfaction through planning and decision making controls. The latter findings of this study are presented in a detailed manner under each planning system in the chapter 4.4 and the former findings of the study can be summarized and tabulated in the following manner which shows how each planning system affects the different performance measures at KTH. The table no.27 (page 64) was derived based on the information gathered through the conducted interviews.

<table>
<thead>
<tr>
<th>Performance measures</th>
<th>HR+</th>
<th>KTH-Res</th>
<th>KTH-Lokaler</th>
<th>UG</th>
<th>AGRESSO</th>
<th>W3D3</th>
<th>KLARA</th>
<th>LADOK</th>
<th>COGNOS</th>
<th>KOPPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality and efficiency of processes</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
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<td>Quality of staff</td>
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<td>Employee health and safety</td>
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<tr>
<td>Gender equality</td>
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<td>Premises and infrastructure</td>
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<td>Student attractiveness</td>
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<tr>
<td>Quality assurance</td>
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<td>√</td>
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<tr>
<td>Research and education</td>
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<td>√</td>
<td>√</td>
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<td>√</td>
<td>√</td>
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<tr>
<td>External professional relationships</td>
<td>√</td>
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</tr>
</tbody>
</table>

TABLE 27: ORGANIZATIONAL PERFORMANCE MEASURES AFFECTED BY EACH PLANNING SYSTEM

It can be clearly seen from the table no.27 (page 64) how different planning systems at KTH affects different performance measures. It should be noted that these results were derived based on the information gathered in the 1st and the 2nd phases of the interviews conducted with the planning
system administrators at KTH. The table no.27 (page 64) is a summarization of the results presented under each planning system in chapter 4.4.

As mentioned above, chapter 4.4 highlights the effects of planning systems on personnel development, workplace relationships and employee satisfaction via MCSs in a greater detail. Shown below is a summarized and generalized text of what is presented in chapter 4.4 which is applicable to the planning system administrators in the Swedish university/not-for-profit organizational sector.

**Effects of personnel controls on personnel development**

**Result:** Administrators working with the planning systems have high levels of personnel development.

**Why:** The organizational design controls (personnel controls) do not fit well to the planning systems.

**How:** The administrators have to improve their compatibility with the planning systems mostly through self-learning by constantly engaging in a dynamic and challenging environment.

**Effects of cultural controls on workplace relationships**

**Result:** Strong workplace relationships existed for most of the planning system administrators.

**Why:** Due to the governance of a strong culture.

**How:** Through emphasis on informality, group work, less power distance, mutual respect and understanding which creates strong bonds between the employees.

**Effects of planning and decision making controls on employee satisfaction**

**Result:** The employee satisfaction among the planning system administrators remain at high levels.

**Why:** Employees think that they contribute to the development of the organization to a sufficient extent, thus satisfied.

**How:** By resolving problems through staff participation and sharing knowledge, strategic decisions made through clear communication and effective confrontation of conflict and improving awareness through effective gathering of required information to execute assigned tasks or to make vital decisions.

**5.2 CONTRIBUTION TO KNOWLEDGE**

In most cases, planning systems are taken for granted due to the organizational policies pertaining to continuous improvements or governmental regulations, which encourage simply to use the planning systems without realizing how and what effects it brings upon the organization to improve its performance. It is only if one knows how planning systems affect the performance of an organization where one will be able to improve the benefits which are translated through the same.
In this endeavour, this study enriches knowledge about how the benefits of the planning systems are translated to realize organizational performance.

This study contributes to the knowledge in the area of how information systems affect an organization in a MCS perspective. To elaborate, this study enhances the knowledge in the area of information system’s interaction between organizational design (through personnel controls), organizational behaviour (through cultural controls) and organizational development (through planning and decision making controls). To be more specific, this study brings out the characteristics of organizational governance in the university sector/not-for-profit organizational sector in Sweden.

Finally, this study also contributes to the knowledge in the post era of implementation of planning systems, where the other two being the prior implementation era and the time period during the implementation of the planning systems.

5.3 LIMITATIONS OF THE RESEARCH AND SUGGESTIONS FOR FUTURE RESEARCH

This study utilizes condensation and interpretation methods (Klave, 1996) when analyzing the interview data, which might have caused to overlook at important aspects when using the method of condensation and misinterpret data in using the method of interpretation.

This study uses the data gathered from administrators who work in a system’s level and higher up in the hierarchical structure. Thus, it could have gained more consistency if the administrators who were interviewed held the same hierarchical positions with respect to the planning system.

There are many overlapping or grey areas between the personnel, cultural and planning and decision making controls, which at times act interdependently. In other words, there are no clear cut boundaries between these three types of MCSs. This effect has been neglected in this study deliberately, with the intention of establishing clear relationships between organizational performance and different aspects of MCSs.

This study uses only three comparable performance measures common to all the planning systems (personnel development, workplace relationships and employee satisfaction). This could be further extended by introducing more sensible, comparable performance measures which relates to all the planning systems. Furthermore, it should be noted that there could be many other organizational performance measures which are affected by the planning systems discussed in this study, since this study heavily relied on the data gathered from the administrators.
One suggestion for future research on this study is to conduct a quantitative analysis using the results obtained through the analysis. In other words, a statistical analysis could be conducted on the data obtained by several universities to establish a statistical correlation between different relationships which are constructed in a qualitative manner through this study. Furthermore, the same statistical analysis could be conducted for different industries to unveil the characteristics of the organizational governance aspects in Sweden.

As mentioned earlier, one limitation of this study is the emphasis on three comparable organizational performance measures (personnel development, workplace relationships and employee satisfaction) and study about the effects towards the same through MCSs. This limitation could be eliminated by conducting further research taking the knowledge from this study as a priori to focus on establishing relationships between the MCSs and the organizational performance measures shown in table no. 27 (page 64).

5.4 IMPLICATIONS OF THE RESEARCH FOR PRACTICE

As mentioned above, this study is carried out in a university, not-for-profit, public organization in Stockholm, Sweden. Furthermore, it should be kept in mind that these research outcomes are crafted by the nature of the organization (i.e. KTH being a top ranking university in the Nordic region) which could yield different results if conducted in any other university. In this endeavour, since this is a case study carried out at KTH necessary precautions must be taken when applying these results to different industries or different universities in other parts of the world. It should be clearly noted that this study was specially crafted for not-for-profit organizations and the applications of the results should strictly be within that domain. Furthermore, it should be highlighted that these results are only applicable to the planning system administrators within the aforementioned domain.
• Almgren E., Ranking of universities and higher education institutions for student information purposes?, Swedish National Agency for Higher Education, 2009.
• Chapman C.S., (2005), Not because they are new: developing the contribution of enterprise resource planning systems to management control research, Acc Organ Soc, 30, pp.685–9.


• KTH Management report, Royal Institute of Technology, 2010.


APPENDIX A - PLANNING SYSTEMS AT KTH

KTH doesn’t accommodate an ERP system but uses different planning systems for various purposes which can be considered as modules of an ERP system. These different systems are as follows,

- LADOK is a national system which is linked to my pages for employees and for students.

- UG which is the abbreviated form of Users and Groups keeps track of every employee and student at KTH including external parties engaged in university activities. It is also called the Identity management system at KTH. Web mail and KTH Social are linked with UG where the information is transferred between the UG system to these web based applications.

- HR+ from Bluegarden company manages the payroll, stores personnel details, leaves etc., Basically it manages all the activities related to human resources management at KTH.

- AGRESSO is the economy system at KTH. EFH - Electronic Invoice System is the web view of the AGRESSO system.

- W3D3 is the archiving system which is used to store the legal documents at KTH. Thus it can be considered as the legal system.

- COGNOS is a system which is used to make different representations of the data obtained by the systems which are linked to it. It is mainly used in the preparation of the annual reports at KTH. This system can also be called a reporting tool.

- KOPPS which is the courses and programs planning system at KTH delivers XML files to the antagning.se where the public can view the different courses and its structure offered by KTH. KOPPS is linked with LADOK.

APPENDIX B - FIRST ROUND OF INTERVIEWS - FUNCTIONS AND FEATURES OF THE PLANNING SYSTEMS

AGRESSO system (Financial system)
AGRESSO is the planning system used by the financial department at KTH. It has many built-in features which are utilized to support many functions carried out by the Finance department at KTH. EFH can be identified as the web portal which is added to supplement the AGRESSO system enabling various authorized personnel to access the system from anywhere in the world.

KTH as an organization needs sources of income in order to continue providing the service to the public at large. In financial terms, the most important sources of income for KTH are the monetary funds gained for research. Furthermore, it covers 2/3rd of the total income at KTH. These research funds are mainly donated by the government and the private sector. In return, these various parties who fund different research at KTH need detailed reports showing how these funds were utilized. AGRESSO has a feature to handle these research details and the ability to send these details to the common data warehouse which is known as COGNOS, where the details can be shared with others.

AGRESSO also has a feature called accounts receivables and accounts payables which enable tracking down any payment made (or received) to (or from) any other party. This is the main feature which engages in handling tuition fees paid by the students, which was introduced recently. The AGRESSO system also communicates with LADOK system by sending information whether a
particular student has made any payment to the university and vice versa where a student is paid by university in case of a scholarship.

KTH possesses a large sum of fixed assets. AGRESSO also has a feature to handle these fixed assets. It should be also noted that there are lots of different types of projects carried out at KTH. Thus, AGRESSO also has a module for handling projects where all the information pertaining to a project is filled and reported into the system. It even has the feature to handle invoices for different projects. As mentioned before, through the EFH facility provided with AGRESSO enables any personnel with the authorization to log in to the system and approve or reject an invoice. The privileges to access the system vary for different personnel; but the personnel at the financial department possess more privileges than the other personnel.

The off-the-shelf systems like AGRESSO are made in such a way that the people who use it can customize the system to suit their processes. In this endeavour, different programs can be developed which can be integrated into AGRESSO. So, personnel at the Finance department have used this feature and implemented a program using SQL to generate reports through AGRESSO.

This system also has the ability to handle personnel details. Thus, many personnel details are imported to AGRESSO. Every salary transaction is imported to AGRESSO through HR+ system. Thus, AGRESSO handles transactions and approves them, and it is specialized for that.

Apart from the above mentioned features AGRESSO has a budget planning module and a implemented feature which shows details like how the projects are co-financed by EU and how a project contributes to its own department, school and the university. Pre-planning of a project beforehand is possible due to this feature. Apart from this it also has a general ledger in the system.

The AGRESSO system is not fully compatible with the controls at the department and needs some more implementations to meet the limitations. One such example is that this system doesn’t contain all the information regarding the research projects and most of them are with the researches. Thus, some improvements are necessary to find the full compatibility to meet the needs of the department.

**HR+ system (Human resources planning system)**

HR+ is the human resource planning system at KTH. It basically contains the salary system and the human resources system. This system stores information of all the permanent employees, part-time employees and scholarship holders. The system has the feature to store information like employee information which includes personnel information, address, different types of jobs done at KTH and social security number, the amount of the salary paid, taxes paid, leaves of absence etc., But it doesn’t any information about the job description, which will be integrated into the system in the coming years. It is also important to note that Mypages for employees is a part of HR+ system. At the moment there isn’t any CV storage feature or an application tracking feature in the system. More work is carried out at the moment to integrate useful modules into the HR+ system.

The most important feature of the HR+ system can be identified as the payroll processing module. All the payroll files which contain the transactions are sent to the AGRESSO system two times per every month.

Report generation is one of the main tasks at the Human resources department. HR+ is a useful tool in generating reports and doing statistical analysis (e.g. What is the men/women distribution for employees at KTH for different types of years); but COGNOS is the main system used in doing so, since it is much easier to extract numbers from COGNOS than form HR+. HR+ system does not directly interact with LADOK and AGRESSO thus it receives data via COGNOS.

As mentioned before salary system is one of the main features in the HR+ system. It also stores information about the benefits received by employees. This information has to be stored in the
system for all time since the pension scheme is decided upon using after analyzing the amount that the employee has been paid in cash. Furthermore, HR+ system doesn’t store and keep track of the soft benefits given to an employee (e.g. one week per year given for extra education). This system also deals with expenses through handling invoices.

HR+ also has a web based system. In other words, web interface to supplement the system. The employees (approximately 30) at the human resource department work with the client system. Employees outside use the web based system where they are able to see all the pages likewise in the client system.

There is also a possibility to track personnel development through the system and this module will be developed in the coming future. At the moment there are plans to implement a feature, where all the employees at KTH will be able to log into HR+ and edit their personnel information (e.g. address). HR+ system is also capable of handling vacation requests, which includes the facility for the applications to be filled up and send for approval.

HR+ system has connections with KTH-Res (Travel system) and the payments are done through the HR+ system to the KTH-Res system.

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**KTH-RES (Travel system)**

The KTH-RES system is a facility which enables all the employees (permanent employees including professors and sometimes part-time employees) at KTH to book and make their own travel requests online directly through the agent of the KTH.

There is a home page for this system where the employees can log in and it is in both languages Swedish and English. When an employee makes a travel request, he/she should first receive the permission from his/her boss in order to proceed. Thus, when a travel request is made through this system the respective person having the permission granting authority (boss) will receive a notification via email (with a link) where he/she can accept or reject the proposed travel request. Next, when this is done the requester will receive an email stating decision made by his/her boss and if accepted he/she can log in again and start booking the hotels and other means of transport (e.g. trains/taxis). The employee can create a travel bill to claim all the expenses by recording all the expenses and system will calculate based on the information entered into the system. The travel bills have to be saved in the original form for reviews, at least 20 years. If a person is using a credit card for his/her payments the respective party can make an acknowledgement to the credit card company and send all the expenses through the credit card company to KTH-RES system where all the information will be included to the travel bill.

When the booking is made through the system the travel agency will send an invoice directly to KTH. Thus KTH-RES system is connected with the travel agency system. This system also sends information twice a month to the payroll or the salary system. KTH-RES also communicates with AGRESSO to obtain information about the accounts to be used in the transaction.

KTH-RES is not designed to generate reports but it has the ability to generate some statistics like how many times and employee has travelled to a certain country, the number of travels and how many times the same project number has been used. Basically it can provide information based on the person and the project number. This system is also used to record and update information to report taxes.

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**W3D3 system (Legal system)**

This system is specialized to preserve documents for long periods fulfilling the requirements of the Swedish law. To be more precise, W3D3 system handles legal documents pertaining to different cases. To elaborate, it stores official records at KTH like research contracts, decisions of the president and all other necessary documents important for running the organization. Technically
the system can store any type of document, but it is used only to store important documents as mentioned above (only the cases at KTH e.g. if you order something to buy a computer and receive an invoice it is not a case. But requesting a scholarship and the decision it takes authorizing or rejecting the same is considered as a case).

This system is a standalone system and can transfer mail from outlook to register them into the system. The work in the system is carried out as attachments. There is a possibility to register a case and attach the papers pertaining to the case to files in the system.

There is only a small core of people working with the system at the moment (3 archivists and couple of technicians). There are approximately 350 registered users in the system but not all of them are active (about 100 people work with the system daily). This system was started in 2007, with only 160 users with different levels of permission to register cases, add documents etc., and form different schools.

Managing permission levels is a crucial part of this system.

**KTH-LOKALER (Site management system)**

KTH-LOKALER is also known as the site management system or the space management system. Basically it deals with managing the premises which belongs to KTH. The system has two main sections. One section of the system is used for administrative purposes and the other for designing and editing information.

KTH-LOKALER system stores all the plans of the buildings which belongs to KTH. Each building or to be more specific each room in a building has an assigned number to it. This number is used when viewing information through the stored data. Every room has an owner and a specific rent price is also assigned to the same.

This system is been updated whenever a change is reported (e.g. local changes like employees moving from one work place to another). The system is also used to report the rent price of each room to the financial department where the necessary payments will be done to Akademiska Hus, who owns the buildings at KTH. The system also stores information such as the area of a specific room, owner of the room not only for the current year but also for the years gone by. This information is made public through the system.

As mentioned earlier, the other section of the system involves in editing or creating plans of the buildings. This section provides sketches of different buildings of all campuses which belongs to KTH. It is also able to edit or create new plans using this section of the system. In other words, it is used when changes of a certain building takes place where the necessary changes are updated in the database.

**KLARA (Chemicals handling system)**

KLARA meaning “ready” in Swedish somewhat explains the objective of this system. This system is used to manage the database of the chemicals used at KTH. In short it acts as a quality control program specifically meant for dealing with chemicals. Authorized personnel can view all the lists of chemicals both here at KTH and other universities.

There are different personnel who have been given the authority via KLARA to update the inventory of the chemicals into the system. This person should enter details specified in the system (e.g. security data sheet, chemical name, volume etc.). Next, the based on the entered information the program decides whether a chemical is listed under the green, yellow or red colour. The chemicals specified under the green colour meaning all the information pertaining to that specific
chemical is entered into the system are allowed to be published (ready to use) to a database where the public can view them. All the rest should be completed by filling up the missing information.

Thus, this program allows authorized personnel to do perform following actions,

> Checking whether an inventory has been done and importing the chemicals into the program to register the same

> Communicating with the personnel who are editing the chemical lists

> Checking quality and the details of all the chemicals at KTH, by department wise or by geographic location wise

> Adding necessary information to make a red/yellow status chemical to a green status

> Checking the history of the chemicals and contacting the person who has done the inventory

> Checking the responsible person for the chemicals at each department

> Giving different personnel the read/write authority of the system

> Assigning responsible personnel for each department and providing them the usernames and passwords

> Enabling personnel to copy chemical lists from the previous years, excluding their amounts (volume)

> Generating reports about the chemicals with their details (symbols, names, registered dates etc.)

> The ability to conduct a risk analysis before starting a new laboratory (Name of the lab, chemicals used, protection tools, pictograms, equipment, personal safety equipment, describing the technical equipment and the responsible parties)

> Storing the chemicals in the database for long periods (more than 10 years)

**COGNOS (Data warehouse)**

COGNOS is a system where the data can be used from different other systems to represent them in meaningful terms (e.g. in creating annual reports). It can be also called as the common data warehouse. As mentioned before, it is used to create reports using the inbuilt feature called “Cubes”. These “Cubes” can be accessed by the authorized personnel and used to generate meaningful representations of data, if used sensibly. It is possible to add new features or to take away the existing ones in the COGNOS system, making it possible to control the usage of the system for different personnel.

The “Cube” includes data from LADOK (which is updated every night), HR+ (which is updated monthly), AGRESSO (which is updated every night), annual reports, planning & budgeting system, management reports and information coming from the library about articles.

It is possible to extract data by schools, different categories of the staff, sex and different hierarchy levels, by month, effective working hours, account numbers and project numbers. Thus, it is very flexible in generating reports. The information cannot be edited but there is a special tool with authorization to edit the data within the system. It also has the query function where one can extract all the information which is a tool inside COGNOS used by the administrators.

There are only few licenses which allow using the “Cubes”. Running reports can be done by any user working in a project/administrative sector. The COGNOS system stores all the information since 2002.
UG (Users and Groups)
UG system is also known as the Identity management system at KTH. As the name implies it is used to obtain and control information relating to different personnel engaged to KTH.

The system shows one's designation, email address/es, personal numbers, the courses followed (if the person is a student) and payments done by KTH etc. It also shows one's membership groups at KTH. The local system groups show the different tools which one can use for different applications. In other words, it shows one's role in different IT groups and acts as an authorization tool to control different applications (setting access rights for different users).

UG is also able to create a new user outside KTH (e.g. consultant with different access rights), blacklist personnel by restricting their privileges. It is also able to track the logs of the users to different systems (e.g. student registering for a certain course at LADOK). Furthermore, it also has the control of the mail groups at KTH.

APPENDIX C- INTERVIEW GUIDELINE FOR THE SECOND ROUND

GUIDE FOR THE INTERVIEW-Round 2

Note: These questions are sent to you prior to the interview as a guideline for preparation, to improve the validity of the data obtained. There might be additional questions which arise during the course of the interview, based on your given answers. You are welcome to discuss these questions with your colleagues before the interview; but not mandatory. The confidentiality and the anonymity of the interviewee will be safeguarded and the interview will be recorded and only be used for the data analysis of this research (i.e. the person interviewed for each system will remain anonymous).

Even though there are 25 questions some of them are dealt with shortly. The expected duration for the interview is less than 60 minutes.

“the system” in the following text is referred to the planning system you are working with at the moment.

1. What are the responsibilities imposed on you by your job description?
2. What do you think about the resources provided to you, to fulfill your duties?
3. What are the special competencies you require to work with the system?
4. Do you encounter any difficulties when working with the system?
5. "Working with the system", does it help you for personnel development?
6. Have you been given a special training to work with the system? Or did you learn "on the fly"?
7. Are there any specific guidelines to adhere when you are using the system?
8. Do you work within a team?
   • If yes,
     Are the tasks or the duties shared amongst the team members?
What do you think of working within a team?

- If no,

What do you think about working within a team to perform the same duties assigned to you at the moment?

9. From the day of the appointment to the current job position, do you work with the same system?

10. What do you think of the physical arrangement of your working environment?

11. Do you think that your manager/s behave in such a way that they set an example to you?

12. Do you think the current culture encourage informal signaling of possible problems?

13. Do you try to reach a consensus in your discussions and involve other staff members when making decisions?

14. Do you take past experience into account to make necessary corrections, when you work with the system?

15. Do you think that there is free flow of information and open communication in your work environment?

16. Do you think that you have easy and informal access to your manager?

17. Does your manager encourage you to develop new ideas even if they fall outside your responsibility?

18. Do you to tolerate your manager's mistakes and learn and share the lessons learnt from them?

19. Does your manager share information with you and other colleagues?

20. Do you react fast to take advantage of an unexpected opportunity?

21. How do you think the system you are working with, help to improve the performance at KTH?

22. Do you think the system you are working with affect the key performance indicators at KTH?

23. What do you think about your level of satisfaction with regard to your current job position?

24. What do you think about the work place relations?

25. Do you have any further comments?