Measuring and analyzing the continued innovation capability in Guizhou Huagong Tools Company

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Abstract

Just as the innovation is one of the key elements in organization, therefore the continued innovation capacity will derive organization successful. Whilst, measuring and analyzing CI capacity in organization is an important activity. The primary goal of this paper is to audit and analyze the continued innovation (CI) capacity in Guizhou Huagong Tools Company with the innovation model developed by Bessant&Tidd (2005). This research includes literature study and case company investigation, both quality and quantity research is used in this thesis in order to obey the deductive logic. The finding of this thesis showed that Huagong Tools Company relying on a series of innovation mechanism has been an advance innovation but not the best one, this is due to a paucity of radical innovation and capture ability from innovation, furthermore, an ill-defined innovation strategy has been incriminated as one of this circumstances, depending on that, authors briefly summarize suggestions for the problems. At last but not least the discussion about innovation theory expounded in the end.

Key words: CI capacity, Innovation, Huagong Tools Company
Acknowledgement

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1 Introduction

Does innovation matter? Of course yes. In recent analysis of economic history, innovation has been accepted around the world. It has become part of country culture. Moreover, Innovation is not only at the level of the individual company but also increasingly as the wellspring for national economic growth. (Tidd & Bessant 2009) Recently, Boao Forum pointed out that’ Innovation will motivate the economic growth in the world.’ Therefore, innovation has become the hard-core of the economic policy in the world.

According to the economic history of China, There are two simple words to describe it which are breakthrough and innovation. There are the two important development stages in China. In the early stage of China organization reform, the aim of this stage is to break the underlying rules of planned economy. For a while, the purpose of organization is changed from breakthrough to innovation. The majority of organizations focus on innovative technology, innovative management and so on. Hence, innovation is becoming a central plank of organizations in China.

Innovation represents the core renewal process in any organization (Bessant & Lamming et al., 2005). But in organization, innovation is not an automatic mechanism to drive organization develop and this process should be enabled through sophisticated and active management (Bessant & Lamming et al., 2005), and this process can be seen as an linear process ((Daft, 1978). In recent researches, much more researchers consider innovation as a process, it was based on the linear model to deduce it, and numerous researchers accept the definition of innovation by UK Department of Trade and Industry’s (DTI 1998,) a process to successful exploitation of new ideas.

Innovation is not simply related to technology innovative. For an organization the most important activity is continued innovation (CI), because the economic performance affected by Continue Innovation, also reflects the necessary activities for an organization and this ongoing process of operating and improving existing, and developing and putting into use new configurations of products, market approaches,
processes, technologies and competencies, organization and management system (Boer, H. & Gertsen. F., 2003), so for an organization the most important business is measure and analysis of the CI capability, especially in today’s complex environment. Management research confirms that innovative firms are those that are able to use innovation to improve their process or to distinct their products and services-outperform their competitors, measured in team of market share, profitability, growth or market capitalization (Tidd, 2000)

Generally, There are different kinds of acceptable frameworks for measuring innovation in organizations (Adams et al., 2006), such as innovation radar by Mohanbir Sawhney, innovation framework by pentathlon and innovation auditing tools by bessant and Tidd. Likewise, the purpose of these frameworks is to measure and analyze the innovation ability in organizations. In this paper innovation audit tools will be introduced and use in the case company in order to conduct an innovation audit identified in an organization’s strengths and weaknesses from an innovation perspective and to collect ideas on how to make improvements (Gotfin K. & Mitchell R., 2005).

2 Research problem/ purpose

The main purpose of this paper is to audit and analyze the continued innovation (CI) capacity in Guizhou Huagong Tools Company with the innovation model the developed by Bessant&Tidd (2005). Based on the result of this analysis some questions will be answered:

1 How is innovation managed in these companies?
2 What are the strong sides in this company in innovation aspects?
3 What is the development potential of this organization and how to improve it?
4 Discuss the Bessant&Tidd’s theory using own data.
3 Methodologies

3.1 Overview

This research includes literature study and case investigation. The methodology that is used is quality research and quantity research. These activities obey the deductive logic. To begin with literature study; the literature source covered materials both in English and Chinese. Also includes course of innovation management. They contain scientific articles, scientific books, information and public statistics available on the Internet. Then; it is a necessary work to collect data which are come from China. Furthermore, analysis can be conducted if the information acquired from the case company complies with the literature. (Keuzenkamp & Hugo, 2000). In this research Guizhou Huagong Tools Company can be selected to analysis the CI capacity. The main information of this company comes from official website of case company and interview.

3.2 Literature study

To establish the correct connection between theory and practice is the first step, the basic thought is to seek for the model that is suitable for the firm. Recently, more and more researcher give a lot of scientific theories about innovation, and the core theory comes from John Bessant, Je Tidd and Pentathlon. All of them give innovation model and innovation audit tools. However, deeply analyze it, the auditing tools from Pentathlon is little mass and complex comparing with the previous one. This tool formulates sets of innovation audit questions and it is also from the fives area to audit the innovation but the questionnaire are little much. It is unfit for interview.

In this paper some models are chosen to analyze case companies which are Innovation model and innovation audit tools developed by John Bessant and Je Tidd. These models structured the frame to do this research and also conduct this research. The definition of innovation is explained simple and clear. It could be understood more easily. More than that, there is clearly relationship between these two models. Therefore, it is easy and effective to combine the case and theory to analyze it, furthermore, this research will be in line with scientific and logically research and these models also provide series questions to interview.
3.3 Interview

This work includes interview with the manager and operator who work in case company based on Bessant&Tidd’s questionnaire and interview question (fig 1). This interview activity has been done on July 15, 2009 by interview the CEO and four main departments which are R&D, product department, comprehensive information department and marking department. The main purpose of this work is to evaluate the innovation management program in Huagong Tools Company.

A telephone interview has been done on June 10, 2009 by interview manager on telephone call to case company. Before about forty conducting interview questionnaires were sent to inform the interviewees about the intention of interview and the context of discussion (the questionnaire is in the appendix). Finally about thirty questionnaires has been returned, among which about twenty five are from operator and five questionnaires replied from managers and CEO who working in case company.

![Fig 1 Interview structure](image)

3.4 Data analysis

Then, to narrow it up, author found out the right model for this firm to diagnose for
them. And we turn to the practice part. Finally after the analysis of the case company, the main question will be answered in the conclusion part. The ultimate findings of this thesis are based on a comparison between theory and data.

3.5 The reason of case company selection

There are four primarily reasons that make the company suitable to be selected in this research.

1 Guizhou Hua Gong Tools Company is a most development company in the south west of China, It is a representative sample.
2 This company reformed after 2007. After that, this company is growing rapidly based on the strong innovation ability.
3 It becomes important strength in promoting the economy to grow in Guizhou province (Southwest of China).
4 This Company is planning to cooperate with EU Company to develop new technology.

4 Limitations

This thesis is focus on measuring and analyzing the CI capacity in case company, so the results of the questionnaire are important material for analysis, because of the time limiting and confidentiality issues, we would not get more opportunities that should be taken in other department and get more data, which makes some result seems not comprehensive and objective. Moreover, before interview the company, we would like to get more information from the website in order to learn more about the company. But there almost no information except company introduction, therefore it imitated us to clearly understand the strategy about this company. Finally there are four departments interviewed, during the interview, we just connect the manager of product department, then he would help us communicate with the managers in other department, because we cannot find any contact information online. There are the limited numbers of literatures in this case study. The authors believe that some literatures need to be fulfill further more. The comments on the generally accepted model have to be found out more.
5 Theoretical frameworks

In this part authors will give some basic concepts about innovation. What is innovation, how to define the degree or types of innovation in organization and how to audit CI capacity in organization. Based on these definitions of innovation and the innovation models to analyze the CI capacity ability in case company.

5.1 Innovation

5.1.1 Definition of innovation

What is innovation? There are different kinds of concepts about innovation. For organization innovation is the performance to maintain strong economic growth. Generally Innovation is the motor of the modern economy, turning ideas and knowledge into products and services. (UK Office of Science and Technology, 2000) In the early times innovation as activity and this activity with some typically feature such as linear sequence. This is early information about innovation and in this linear sequence model of innovation it needs pull and technology push to motives it, “but successful innovation requires an interaction between the two” (Joe Tidd, 2006).

In recent research innovation is defined a process. It was deduced from the linear model and compared to the pervious definition this one of innovation is more systematic and reasonable. Innovation was a process from the book of innovation and entrepreneurship by John bessant and Joe tidd gives a clearly definition about it which are innovation was a process of turning ideas into reality. And in this process there are three core stages. Firstly, generate new idea. Secondly, selecting the good ones and thirdly, implementing them. Figure2.
Innovation is not an easy. Successful innovation is up to two key elements which are resources and the capabilities in organization to manage it. (Bessant and Tidd, 2006) But it was not a simple work. And previously researcher is working on it, to find and research some method and shortcut to handle it. Generally for manager successfully innovation should be clearly understand 4 key elements which are understand what we trying to manage; understand the how-creating the condition to make it happen; understand what, why and when of innovation activity; understand that it is a moving target. (Bessent & Tidd, 2006). After thinking deeply, combine with the innovation model figure 3 draw the outline of what is manager supposed to do in innovation process.
Innovations were a multidimensional and complex work. In the organization there are different kind of issue should be consider. If innovation is only seen as strong R&D capability, it will cause technology which fails to meet user demands and also may not accept by market that means the customer is lost. Like waifs if innovation just pays attention on advance along technology the consequence could be lost market position of product or services. On the contrary if innovation is only seen as understanding and meeting customer needs the result could be lack of technical progression, leading to inability to gain competitive edge. (Tidd, Bessant and Pavitt, 2005) As well as innovation are not easy and simplex works. It was a multidimensional and complex work.

5.1.2 The Innovation type
How to define the type of innovation? Mostly innovation could be equally the ability to capture where the new market is and how to create it. (Tidd and Bessant, 2008) The Model T is a great example in this area. Henry Ford who developed an approach in order to grew the mass market for human transportation. This model was based on previous one, the key elements was synthesizing largely existence old one into a new one((Tidd and Bessant, 2008) and there are number of example in this area such as online shopping. Likewise innovation could supply some new ways or method in order to serving established and mature ones low-cost airlines is a typically example. Furthermore innovation is not just referring manufacture, in the most economies the service sector accounts for vast majority of activity.( Tidd and Bessant, 2008). The online product are conform this feature such as Skype, Amazon, Online backing and so on.

Deeply in innovation definition includes radical innovation and increment innovation (Figure 4). These two types of innovation give a degree of innovation, increment innovation just do something better off exist product, process or organization. But radical innovation is doing something completely differently. And for innovation we need to think about innovation being those Russian dolls ---we can change things at the level of components or change the architecture of the whole system.figure 4 gives clearly types of innovation and also include how to definition the innovation types.
“4Ps” model are define by Bess, J in order to classify the innovation forms. 4Ps is shortening of product innovation, process innovation, position innovation and paradigm innovation. These four aspects had been formulated for “innovation space” (figure 5). Innovation can take place along all aspects of a business and process innovation is changed in many ways in which things are created and delivered. Product innovation concerns the change of what is offered by the company while Position innovation can take place by the repositioning of the company in the context. Finally, changes in Paradigm innovation can be triggered by many different things and concerns the underlying mental models which constitute what the company does.
5.2 SECI

SECI model of the origin Ikuijiro Nonaka and Hirotaka Takeuchi’s SECI model based on Polanyi (1983) that classified the tacit knowledge and explicit knowledge, and start from the management of Japanese culture perspective, then put forward a new understanding about knowledge creation and knowledge management. Explicit knowledge, can be codified, that is expressed in numerical, textual or graphical terms, and therefore is more easily communicated; for example, the design of a product (Bessant&Tidd, 2008). Tacit or implicit knowledge, is personal, experiential, context-specific and hard to formalize and communicate; for example, how to ride a bicycle. (Bessant & Tidd, 2008)

5.2.1 Definition of SECI model

Japan’s well-known professor of management Ikuijiro Nonaka and Hirotaka Takeuchi believe that the model of knowledge creation processes must be depth understanding on the dynamic characteristics of the knowledge creation, and the need to effectively manage on process itself, based on these two points, they put forward the SECI model. SECI model consists of three components: 1 SECI, 2 Ba, 3 Knowledge Assets.

Knowledge creation is stored in tacit knowledge and explicit knowledge between an ongoing, interactive process, and to spiral, and the formation of the four models.
When the upward leap in scale, the spiral of knowledge creation will also become larger and larger, at the same time trigger a new spiral of knowledge creation (Figure 6)

![Figure 6: The SECI model (from: Nonaka & Takeuchi, 1986)](image)

Socialization-tacit to tacit knowledge, in which the knowledge of an individual or group is shared with others. Culture, socialization and communities of practice are critical for this.

Externalization-tacit to explicit knowledge, through which the knowledge is made explicit and codified in some persistent form. This is the most novel aspect of Nonaka’s model. He argues that tacit knowledge can be transformed into explicit knowledge through a process of conceptualization and crystallization.

Combination- is explicit to explicit knowledge, where different sources of explicit knowledge are pooled and exchanged. The role of organization processes and technological systems are central to this.

Internalization- is explicit to tacit, whereby other individuals or groups learn through practice. This is the traditional domain of organization learning. (Bessant & Tidd, 2008)

Ba is a shared platform and place in which the knowledge be shared, created and used
Figure 7 shows the four different types of Ba, the process of knowledge creation exist in various stages of SECI

For example as the most successful convenience stores”seven-eleven" in Japan

1. the origin of Ba: the shops of public space in which people communicate with each other, exchange of staff and customers.
2. dialogue Ba: staff, through dialogue, exchange of tacit knowledge, resulting in sales forecasts
3. the system Ba: the accuracy of sales forecasting sales results through the test, and shops and provide feedback to staff.
4. contact Ba: get the information from the exercise and compared with the actual situation, staff could continuously improve the capability of analysis and the predictive power.

![Figure 7: four categories of ba (from Nonaka & Takeuchi 1986)](image)

5.2.2 Knowledge Assets

This is the value of the company in order to achieve the necessary creation of unique resources. In the value creation process which is a component input, but also the output components or reconcile the forces.

Although knowledge assets can be classified, but some unrealistic, because knowledge assets are dynamic, the new knowledge assets would be created from existing knowledge assets. (Ikuijiro Nonaka, Ryoko Toyama and Noboru Konno,2000)
5.3 Definition of Continuous Innovation

For the organization how successful manage innovation? Clearly how to audit the CI is a good way to manage it, after review and audit the CI capacity in organization, it will be a guide for organization to manage it.

CI is a shortening of Continuous innovation is an ongoing process of operating and improving existing and developing and putting into use new configurations of products as well as all relative in the organization. In other words, continuous innovation is the ongoing interaction between operations, incremental improvement, learning and radical innovation aimed at effectively combining operational effectiveness and strategic flexibility, or ‘exploitation and exploration’ (Boer, H. & Gertsen. F,2003). Clearly continuous innovation as a deeply understand of innovation but compare with innovation CI include more means.

5.4 CI capacity auditing tools

John bessant and Joe tidd devoted themselves to research innovation management for many years, they have a very rich experience on it, and they developed the scientific method to measure a company's ability of innovation management. It contains five dimensions model and forty questions. The five dimensions contain: strategy, processes, organization, linkages and learning.
In every category, certain numbers of questions which gain scores (from 1 to 7, score 1 = not true at all, score 7= very true) are organized to make judgment to see the current innovative ability of one innovation firm. It is a clear tool to define the advantage and shortcoming of the innovative organization. In this way, the diagnosis is checked to the point.

5.4.1 Strategy
First of all, the innovation strategy has to be well designed which is completely complied with the development strategy of the whole corporation? What's more, all the staffs including top management and workman have the clear idea of the context, content and the effects of the innovation strategy. Last but not the least, the whole processes in place is to review new developments of market and technology and what they mean to the strategy.

5.4.2 Processes
The processes is designed and revised anytime to meet the requirement of continuous innovation. In the same time, the company has the effective mechanisms for managing change from idea through to successful implementation. This mechanism is in place to ensure the involvement of all the departments in developing the new products or processes. The choice of right projects is from the system as well.
5.4.3 Organization
The organization structure is designed to make the context and environment to make new idea happen and innovation launch. People work under this structure emphasis on the communication to help cross-functional work. The climate was made here to encourage innovation since it will be rewarded. Teamwork is needed in the new launched projects.

5.4.4 Linkages
Innovation happens both through internal and external linkages. People working for innovation are taken the right training to encourage internal linkages with innovation way of doing work. Meanwhile, the firm establishes many external linkages to gain innovation information flow. The connection with universities, institutions, customers and other firms are quite useful to make innovation happen.

5.4.5 Learning
Learning would happen anytime and anywhere. Through the linkages, firm learns from the suppliers, customers and so on. Also, the innovative company learns from itself. For example, useful experience gives us the right ideas of how to deal with the similar projects. Or, what we lose last time reminds us of the same trap.

This innovation audit tool brought forth new method to measure innovation capacity in organization. More than that, there exists relation between innovation model and innovation audit tool. The key element of this innovation audit tools is that organization should be complete understand themselves. In each category of this model Joe and John gives five core questions which are;

Do we have effective enabling mechanisms for the innovation process-to search, to select, to implement? 
Do we have a clear innovation strategy and are it communicated and deployed effectively? 
Do we have an innovative organization, one which provides a supportive climate for innovation? 
Do we build and manage rich external linkages to enable ‘open innovation’? 
Do we capture learning to help us develop improved innovation management capability? (Bessant & Tidd, 2009)
According to this five questions and innovation model (fig 9), this measure tools include the entire key step of innovation. And also there are exist a clear link between each other, for example in first question author focus on the innovation process which are how to search new idea, how to select it and how to implement it. Moreover; the core step of innovation is search, select and implement. This process is help organization to develop new product or project effectively from idea to lunch, so it was easy to relate each other. Likewise, author focus on the innovation strategy in second question. ‘How to built innovation organization’ and ‘how to build or manage external linkages’ expounded in third and fourth question and about ‘how to learning from innovation’ author refer it in the last question. Each of these questions represents the five dimensions contain of innovation audit tools.

5.5 Groups of firms according to innovation capability

After innovation audit, for firm, how to learn from innovation and how to manage innovation better? John bessant identify a ‘road-map’ to thinking it.(figure 10).This ‘road-map’ gives 4 types which are unaware, reactive, strategic and creative, each of them are “indicate a simple typology, ranging from firms which are unconsciously ignorant through to high-performing knowledge-based enterprise” (John bessant,Joe Tidd 2009).

The firms of type A is defining as unaware, basically, they are short of innovation ability. Such as what is they need to change, what, where and how they might improve even about how to get the technology or market. So they might get wrong kinds of innovation. Finally all this ability is cost the fortune of company.

Compare with type A, type B recognize what they need to change, but they still unclear how to get the process. This situation may result from the company lack of internal resource and external networks, therefore, they lack skill or experience to get technology and market, also organization has to absorb the external threats.

Type C organizations have an unambiguous strategy to innovate. What they need to change, where, when and by whom, all of these questions is already being answered
in the innovation strategy. In addition, they have strong capacity to search, acquisition, implementation and improvement of new knowledge; furthermore, they have a highly capable in project management to ensure the project from idea to lunch. Also “they take a strategic approach to the process of continuous innovation.”(John bessant and Joe Tidd 2009). Nevertheless, they still miss radical innovation.

“Type D firms operate at the international knowledge frontier and take creative and proactive approach to exploiting technological and market knowledge for competitive advantage and do so via extensive and diverse network. And strong internal resources are coupled with a high degree of absorptive capacity which can enable diversification into other sectors” (John bessant and Joe Tidd 2009). Consequently, it is easy to bring the innovation strategy into reality also make firm get dominant position in the market such as rewrite the rules of competition. That is why John bessant define this type is creative.

Fig 10 Group of firms according to innovation capacity (Hobday, M, H. Rush & Bessant, 2005)
6. Case description

6.1 Background

Guizhou Huagong Tool and injection molding Company composed of six companies which are Guiyang tools factory, Guizhou Hua Chang company, Guizhou Xingneng development company, Heye technology company, Huixing company (Chongqing, a province in China) and JiangXi Huachang automobile company. These company register in 2007 years September 21 and set up a joint-stock company which is Guizhou Huagong Tool and injection molding Company. The authorized capital of this company was originally 2.5 hundred million Yuan and the value of merchandise production about 3 hundred million Yuan in each year. The company set up board of directors, board of supervisors and managers, and many centers such as: technology centers, a comprehensive information center, marketing center, the market center and so on. It was the largest professional producer of automotive plastic model, automotive tools and injection model in Guizhou province. (Huagong Tool company, 2009)

In this company there are 1380 employees, of whom 260 were scientists and technicians, and with more than 30 patented technologies. The core busies is produce various tools also include some tools technology. The main products include metal cutting tools, automobile injection and machine tool and so on. And this company is the provincial advanced enterprises. Meanwhile company get honor which is “Provincial Quality Management Award” by Guizhou grovement. Meanwhile company sign a technology import contract with the foreign party to import some advance technology and equipment. Meanwhile they holds own R&D department to do some new product research. (Huagong Tools company, 2009.)

6.2 How Do They Manage?

6.2.1 Total Quality Management

In order to ensure the quality of products and give better service to the customers, following the PDCA cycle in daily quality management, huaguang Tools Company pursues the target of zero defect product quality. According to international and national standards the company has established complete quality certification system and passed ISO9000, ISO9001, ISO1400, CQC and products 3C authentication.
6.2.2 Supply chain management.
The company takes concentrate management of material purchasing and supply. as an approval centure, the company make decision for every purchasing program, it take public bidding, sentinel procurement, small random procurement purchase and so on in foreign and domestic market.

6.2.3 Product Management.
The main products in Huagong Tools Company are the mental-cutting tools, automobile parts, molds, technology equipments, exclusive-use machine tools and so on. According to the different features of the products, the product management can be summarized as three approaches: Firstly, to enhance the continuous improvement of the original products; secondly, to completely replace the original products; and thirdly, to develop the new, creative products.

Based on the unique feature, product managing could be divided into three ways. The first is to manage the product like medal sharpener tools, which need to keep proving their moto-power, performance and appearance to satisfy customers’ requirement as well as the long-time demand of the market. The second way is about the component of automobiles for instance. Such product has a certain cycle-life, so the market forecast could follow this principle to indicate what could be produced, how many could be stored and when the new one could be manufactured, and so well as to bring in the news and bring out the olds to the market. Getting enough information, however, is also important to managing this kind of products. And the last way could be used for the new-made, which have to consider of the facts such as raw material suppliers, sellers and the production conditions before its developing. After that, the new product would be put in testing production, small-lot production and mass production. Thus, it could be identified as belonging the first way or the second way.

Market forecasting and market assessment is considered as the most important part of product management. An effective analysis of market information feedback will help the companies avoid the risks of product innovation. The company has established a market analysis department, which is in charge of the real-time prediction and
analysis, in order to provide references for the management decision-making and avoid the market risks of product innovation effectively.

7 Analyses

7.1 Innovation in Huagong Tools Company

To describe the innovation process in Huagong Tools Company, it is better to combine the innovation model (fig 3) to describe it. Generally, the beginning of innovation is searching new idea, in Huagong Company, the main novel idea about innovation comes from internal, such as operator, manager, technicist also include some external resource. Then, How to select these novel idea is next important step, making decisions of this kind is not simple because of the potential uncertainty involved such as approaches, tools and techniques can we bring to bear?(Tidd & Bessant 2009).

Huagong Tools company have comprehensive and scientific quantity method and qualitative method also includes market prediction and forecasting to assess these new ideas, and some committees of experts and management committees have been set by company to systemic analyze and assess it, after that, the best option has been send to the top manage team, basically, they have the last word. Finally, the best decision will be implementing by project manager. Professor Tidd &Bessant believe that the implementation phase have three core elements: acquiring knowledge, executing the project and sustaining innovation. Huagong Company has a comprehensive management system to manage product development from idea to launch; this system has all kinds of mechanism to ensure product development such as effective incentive mechanism for the process. Investigation of product development, information, and feasibility analysis, project development, process control, assurance system and so on. All of these mechanisms help to create good conditions for product development. In addition, about last step of capture, In Huagong Company is not complete clear.

The purpose of innovation is rarely to create innovation for their own sake rather than capture some kind of value from them (Tidd & Bessant 2009), this part is weakening in Huagong Tools company. From interview of manager, this is hided in some manage mechanism or system but not complete and clear. In the subconsciously of manager and top manager, they understand that the ability of capture is helpful for the product
development but they do not exactly know how to manage it.

The following results were gathered from an interview with the CEO of the company. From 4Ps model perspective, innovation in Huagong Tools Company can be seen as shown in figure 11.

<table>
<thead>
<tr>
<th>Innovation activity</th>
<th>Product</th>
<th>Process</th>
<th>Paradigm</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Get ISO900,ISO9001,ISO1400,CQC and product 3C certification</td>
<td>Radical innovation</td>
<td>Radical innovation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on the internal and external operation to improve the product</td>
<td>Incremental innovation</td>
<td></td>
<td>Incremental innovation</td>
<td></td>
</tr>
<tr>
<td>Based on the market and introduce foreign party technology and equipment to develop the new product and technology.</td>
<td>Incremental innovation</td>
<td>Incremental innovation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovation of enterprise system and management to ensures the efficiently management.</td>
<td>Incremental innovation</td>
<td></td>
<td>Incremental innovation</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 11 Innovation in Huagong Tools Company from 4Ps perspective*

7. 2 innovation auditing analyze

The authors do the interview with four departments of the company; there are R&D department, product department, comprehensive information department and marking department. Twenty five of the questionnaires from different department operator and four questionnaires are come from the different manager and one from the CEO of Huagong Tools Company. The total average data are show in appendix 3. Figure13 gives the average between the manager and the operator in each department. Figure 12 draw the outline of innovation audit in Huagong Tools Company.
7.2.1 Strategy
There is top management commitment and support for innovation in Huagong Tools Company and the top team have a shared vision of how the company will develop through innovation. Employees and manager may encounter with innovative ideas while working and then these generated ideas will be discussed during the monthly and weekly meeting and prioritization are given to them. Furthermore, there innovation strategy is not clearly communicated so most operator does not know the targets for improvement and do not know what their distinctive competence is- what gives their competitive. The score of 4.75 demonstrates that they are feeble at strategy processes. (Fig 13)
7.2.2 Process
As mentioned, this company designed applicable mechanism to implement their innovative projects. However they can benefit from this mechanism by the control of their projects, there is actually a well-designed process the help they manage new products effectively from the idea to launch. In reality, they had systematic search for new concepts, process or services. Investigation of product development, information, and feasibility analysis, project development, process control, to ensure system, trial and the entire process of production with an effective mechanism to ensure that all aspects of the project manager of an independent coordinating body under the authority of the implementation of effective, independent, general manager responsible for directly managers. The grade of 6.375(Fig 13) indicates that they are strengths in their innovative process and it well done on systematic concepts to implement their innovative process.

7.2.3 Innovative organization
In Huagong Tools Company innovative ideas from internal staff, managers and external, these ideas are brought together on the company's economic operations department, then they classify it, according to the classification of different evaluation methods and standards. In this company operators can show their creativities and innovation both individually by installing some boards through production area, and in form of group, by having monthly and weekly sessions. They can share their innovative ideas to each other and also with their managers. As before mentioned these ideas will be analyzed by technical managers, then give the report to Committee of Experts and Management Committee which will decide that its method of scoring (quantity) and qualitative method (quality), finally, high-level meeting by the high manager of the company decided to adopt it or not, also they are ready for listening to innovative ideas and problem solving concepts in the flexible environment for their employees. This work has been made in the company's role and good effectiveness. The appropriate point of 5.5(Fig 13) can demonstrates that they are good at making innovative organization.
7.2.4 Linkage
In finding proposed that there is not a strong commitment to training and development of operators. They spend much time on developing new products, so they neglect take time to review their projects to improve their performance next time. During the interview we could not find other information except company description on the website, it is really very poor on the network of the company, so it limited they try to develop external networks of people who can help their, for example, with specialist knowledge. So in this part the score is lower than organization that is 5.18(Fig 13)

7.2.5 Learning
Setting up the win-win relation and sharing the ideas with other Companies and with customers, supplier and end-user are done in Huagong Tools Company. There are good at understanding the needs of their customers/end-users. There is measured tools to help identify where and when they can improve their innovation missions. They share their technologies and experiences with other companies to help they learn and also there are good at learning from other organization which can make use of it. But all of this relation is not carried out in systematic way. They do not compare systematically their services, products and processes with other firms and the score of 5.3125. (Fig.13)

7.2.6 SECI in Huagong Tools Company

<table>
<thead>
<tr>
<th>Socialization</th>
<th>Externalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share with others.</td>
<td>Use the feedback to improve the product.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Internalization</th>
<th>Combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apprenticeship</td>
<td>Cooperate with others.</td>
</tr>
</tbody>
</table>

Fig 14 SECI in Huagong Tools Company

“Innovation is driven by knowledge creation and knowledge management”(Lars bessant, 2009,innovation lecture) therefore, how organization create and manage
knowledge has great significance to innovation. According to the SECI model developed by Ikuijo, there are four main parts; each of them transforms two types’ knowledge which are tacit knowledge and explicit knowledge. This process is defined as “knowledge conversion” (Ikuijo Nonaka, Ryoko Toyama and Noboru Konno 2000.). For case company the SECI model is embed in it. Generally, the “knowledge conversion” in case company also includes four parts (fig14) which are:

Socialization: An individual or group in Huagong Tools Company is shared technology or experience with others.

Externalization: Update their product though gets the feedback from communicates with customers.

Combination: Cooperate and exchange with university, institute or other company, then develop the new product.

Internalization: Trannning for new employees, old operator teach a part of the technical knowledge to fresh operator.

Clearly, these four parts is a continuous and increasingly process of dynamic interactions between tacit and explicit knowledge.

7. 3 Group of case company according to innovation capacity

Bessant (2005) provided a simple typology (Fig 10) from firms which are “unconsciously ignorant” through to high –performing knowledge-based enterprises. (Hobday.M & Bessant 2005). Innovation capacity could be defined as a series of stages in development. According to the innovation audit in Huagong Tools Company, this company has a development sense in internal organization. Top manage team clearly understand what they need to change and how to change, because the aim of the series mechanism and the strong internal capability is to ensure in both technical and managerial areas can implement changes timely. This is based on the systemic and strategic process in innovation management from searching, selecting and implementation. But as previously mentioned that Huagong Tools Company has not clearly ideas about how to capture the benefit from innovation and according to the figure 11, and this company also lacks the capabilities of radical innovation to redefine the market through new technology, creating new market opportunities included. Consequently, these shortages will lay an embargo on the company’s future prosperity despite them held advance technology and market opportunities efficiently within the boundaries of the industry. Finally they are limit in their traditional
business and they all with competition at the boundaries of existing industry this may cause company are into the “trapped” in a mature (Bessant, 2009).

8 Conclusions

This research has been done to investigate how the tools company is managing innovation. In order to achieve the target the literature reviews in contexts of innovation, in library, on website are extensive, it is auditing find the assessment model to help analysis the case company. The data from Huagong Tools Company supports this analyzes. Though the investigation, the four following questions will be answered by authors:

1 How is innovation managed in these companies?
2 What are the strong sides in this company in innovation aspects?
3 What is the development this organization and how to improve it?
4 Discuss the innovation theory.

8.1 Manage innovation in Huagong Tools Company

To answer research question NO.1 about how they are managing innovation in organization, discussion on concepts will be enough. Combine the innovation model fig 15 shown the main innovation process in Huagong Tools Company. Generally there are three key steps which are searched, selected and implement. Searching new idea about innovation from internal and external source, based on comprehensive, scientific quantity method and qualitative method, include market prediction and forecasting to assess these new idea included, after that, the best option has been send to the top manage team to get best decision. Finally the best decision will be implementing by project work team.

Huagong Tools Company has a comprehensive management system to manage product development from idea to launch; this innovation process scientific match the innovation theory develops by Bessent& Tidd. All of these mechanisms help to create good conditions for organization development. But the last step of capture is not clearly in Huagong Tools Company. It will be a limited organization development
8.2 What are the strong sides in case company in innovation aspects?

As it is shown in previous the model proposed by Bessant and Tidd, it contains five aspects to analyze the case company; there are strategy, innovation organization, processes, linkages and learning. According to interview the manager and operators and after data analysis, the process is the company’s strength. The company has a comprehensive management system from product development to the successful implementation; it has an effective incentive mechanism for the process. Their systematically searching for new product ideas and they understand what are customers need. They have a clear system for choosing innovation projects and the innovation idea should be discussed in the department, then the manager would give the report to the higher manager, finally it decided on board of directors, and their innovation projects are usually completed on time and within budget.

8.3 Group of case company according to innovation capacity

As it is shown in previous analyze part which is 7.3 innovation types, Huagong Tools company has a development sense in organization, based on the systemic and strategic framework in innovation management from searching, selection and implementation and the series mechanism and strong internal capability to ensure in both technical and managerial areas and can implement changes with skill and speed.
Top manager clearly understand what they need to change and how to change. But as previously mention that Huagong Tools Company are not clear about how to capture the benefit from innovation, some department managers have sense to capture it, however, not fully understand why and how. Meanwhile, from Figure 11 Innovation in Huagong Tools Company from 4Ps perspective, this company also lacks the capabilities of radical innovation to redefine the market through new technology also includes creating new market opportunities. Therefore, combine the innovation typology (fig 10) develops by Bessent, Huagong Tools Company has been defined in type C which is strategic.

According to the fig 10, type C firm is limited in knowing where and how to acquire new knowledge beyond the boundaries of their traditional business (Tidd &Bessent 2009), hence, Huagong Tools Company is an advance innovation organization but not the best innovation organization. The basic reason is lack of radical innovation to exploiting technological. For Huagong Tools company should improve innovation in systems and mechanisms in order to capture the benefit from innovation. Fully utilize the international knowledge frontier to bring forth new ideas in technology and approach. Building flexible innovation organization or strategic frameworks for innovation and take it upon themselves to “rewrite” the rules of competitive game (Tidd &Bessent 2009).

8.4 Innovation theory discussion

As Nandani lynoton (Nandani Lynton 2006.) mention that Innovation is the buzzword in China. After 2010 year China will be an innovative society just after The U.S. But in the early stage of China, innovation was an uncharted territory. After 1970 China enjoyed rapid economic growth by the stimulus of gradual economic reforms policy. It is worthwhile to note that this economic expansion stage have not touched on the innovation aspect. Generally speaking, the sparkling economic growth in China was due to an enormous cheap labor pool.

As above mentioned, the great majority of organization shifts the purpose from breakthrough development to innovation development after economic reforms in China. Despite it makes progress but it just relates to technology innovation, such as
Huawei Company relies on advanced specialists and business incitement policy to become an excellent technology innovation organization. Furthermore, powerful R&D department is one of the main elements which motive Haier to success. In addition, Alibaba, UT-Starcom also are great technology innovation companies in China. But innovation dose not simple account for technological innovation, like as Nandani lynoton mention(Nandani Lynton 2006.) that “real innovation depends on several interlocking factors. It includes having talented people—not only scientists but also entrepreneurial thinkers.” According to international enterprises, they dose not only pay attention to develop technology but also emphasize on management innovation and cultural innovation such as 3M, GE and TOYOTA. In comparison with that, the cognition and application of innovation theory are still in infancy stage in China. It is worth notice that, Innovation theory is mature model in EU country, Professor Roy Rothwell provided a useful historical perspective on innovation management which is ‘Fifth-generation innovation’, this model describe the innovation process has evolved from simple linear models (characteristic of the 1960s) to increasingly complex interactive models.(Tidd, bessant and Pavitt, 2005 P4 innovation model). But in China the research of innovation theory still a blank space, therefore much more china organization just rely on these EU innovation theory to develop their business.

Whether this model is suit for the organizations in China? After this research, we found some gap between company in this case and innovation theory. The first topic is “work in groups”, this is regard as an evaluation stander by Tidd and bessant in CI audit tool. They propose that “work in groups” will make production more efficient. But majority of operator in the company work separately, and they are able to finish work efficient without partner. For these operators, “work in group” is unnecessary, and in most Chinese organization, the managers prefer to arrange everything by themselves, and the employees just act as performers.

The second topic is “Funding”. the company is a traditional manufacture factory in China. because of some political problem or any other reason, the funding of innovation project is the most important elements which is always considered in daily operation, furthermore, the funding must be ensure to properly and effectively used before innovation project implementation. Just as most Chinese neither approves nor accepts excessive consumption, in another words use future money is contrary to
Chinese traditional ideas which is thrift, after deeply think that the different background cultural has been incriminated as one of this circumstance. Just as Trompenaars mention that culture issue has been seen as a major role in different country. (Trompenaars and Hampden-Turner, 1998,) Different regions and different environment will be a unlike background of culture. As a result, understanding of different cultures and different management characters has a practical value in innovation aspect.
9 References


Nandani Lynton, *China’s Innovation Barriers,* Nandani Lynton of Thunderbird says the obstacles include a monolithic, hierarchical culture that frowns on boundary-breaking [http://www.businessweek.com/globalbiz/content/dec2006/gb20061215_816544.htm](http://www.businessweek.com/globalbiz/content/dec2006/gb20061215_816544.htm) (Access July, 16st 2009)

Interview People

- Zhou sheng, CEO, Huagong Tools company, interviewed 2009-07-15, during 2 hours.
- Gao shiqiang, Product manager, Huagong Tools company, interviewed 2009-07-14, during 1 hour.
- Li jianhua, R&D manager, Huagong Tools Company, interviewed 2009-07-14, during 1 hour.
- Tang shiguo, comprehensive information department manager, Huagong Tools Company, interviewed 2009-07-14, during 1 hour.
- Cheng tieding, marking department manager, Huagong Tools Company, interviewed 2009-07-14, during 1 hour.
10 Appendix

10.1 Interview question

Strategy
1. What are the advantages of innovation procedures in Huagong Tools company?
2. Do you have an innovation strategy?
3. What themes do you focusing on the innovation strategy?
   a) Innovation target.
   b) How to select the innovation idea? How to judge which one is good or bad.
      Based on any innovation strategy or any other, and where does these
      innovation idea from, the manager or the employee?
4. How to forecast the future risks or opportunities? related to innovation strategy
5. If a new innovation should be performed, firstly how would you get support? With
   the team of top management or be discussed by the group? Does the management
   support innovation and how?
   How do the employees to reach consensus of how the company will develop
   through innovation?
6. How to review the product with new technological or the market development?
7. How to handle the gap between different ways of doing business and innovation?

Processes
1. If there some process to help organization effectively manage the product
   development from idea to launch, how it work?
   a) Is there some effective mechanism for managing process that change from
      idea through to successful implementation?
2. How do you manage innovation project? Select, budget handle. And is the
   innovation usually completed on time?
3. Is there some effective mechanisms in the organization to make sure everyone
   understand customer needs? And how does it work?
4. How to search new idea or what is the innovation source.
   Do you have a knowledge management model or ideology?
5. How do you enable the process of innovation?
6. Are there some mechanisms to ensure early involvement of all departments in
developing new products or process and how does it work?

7. Are you having some sufficient flexibility in your product development system? How does it work?

**Organization**

1. What is your organization structure? This structure is match to innovation management?
   1.1. Does this organization structure help innovation leaders to take decisions rapidly? How and why?
   1.2. How do you communicate in the company about innovation ideas?

2. In your organization, do employees work together across department boundaries? And do you think it is good or bad? Why

3. Are people involved in suggesting ideas for improvement of product or process? And how do you motivate to people involved in this suggesting activity?

4. Are there any reward and recognition system support to innovation? Describe this?

5. Is there a supportive climate for new ideas?

6. Do you in any way avoid people leaving the company to motive their own ideas in another company?

**Linkages**

1. How to training operators?

2. How does the company link with universities and other research centers to develop knowledge?

3. Have you worked close to local or national education system to communicate problem? How?

4. How do you link with customer?

5. Have you worked with lead users to develop or innovate new products and services? How?

6. Does the company collaborate with other organization to develop new products or process? How?

7. Have you developed some external network to help the organization? For example with specialist knowledge.

**Learning**
1 Is there a good “win-win” relationship with suppliers? How?
2 Do you clearly understand the needs of customers? How to handle this information from customers? What is your method to judge it?
3 If some mistake happen how to face it? How to cope with it?
   a) Does the operator take time to review mistake of errors? How? Or any other……
4 Is there a strong ability to study other organization? Compare product or process?
   Or share the experience with other firms to help each other? Or any others.
5 Is there a good ability to learn from other organization? How would you describe that ability?
6 Having good capturing to learning good knowledge from other organization? And after that is there having good strategy to motive it that happens in organization?

7 What is your an innovation measure tool or methods to identify where and when need for improvement is?

8 Is the knowledge of an individual or group shared with others?

What mechanisms that might stimulate knowledge creation according to the Socialization, Externalization, Internalization and Combination?
10.2 Questionnaire

This simple self-assessment tool focuses attention on some of the important areas of innovation management. Below you will find statements which describe ‘the way we do things around here’ – the pattern of behaviour which describes how the organization handles the question of innovation. For each statement simply put a score between 1 (= not true at all) to 7 (=very true).

<table>
<thead>
<tr>
<th>Statement</th>
<th>Score 1=not true at all to 7=very ture.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  People have a clear idea of how innovation can help us compete</td>
<td></td>
</tr>
<tr>
<td>2  We have processes in place to help us manage new product development effectively from idea to launch</td>
<td></td>
</tr>
<tr>
<td>3  Our organization structure does not stifle innovation but helps it to happen</td>
<td></td>
</tr>
<tr>
<td>4  There is a strong commitment to training and development of people</td>
<td></td>
</tr>
<tr>
<td>5  We have good ‘win-win’ relationships with our suppliers</td>
<td></td>
</tr>
<tr>
<td>6  Our innovation strategy is clearly communicated so everyone knows the targets for improvement</td>
<td></td>
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<tr>
<td>7  Our innovation projects are usually completed on time and within budget</td>
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<tr>
<td>8  People work well together across departmental boundaries</td>
<td></td>
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<tr>
<td>9  We take time to review our projects to improve our performance next time</td>
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<tr>
<td>10 We are good at understanding the needs of our customers/end-users</td>
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<td>11 People know what our distinctive competence is – what gives us a competitive edge</td>
<td></td>
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<tr>
<td>12 We have effective mechanisms to make sure everyone (not just marketing) understands customer needs</td>
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<tr>
<td></td>
<td>People are involved in suggesting ideas for improvements to products or processes</td>
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</tr>
<tr>
<td>14</td>
<td>We work well with universities and other research centres to help us develop our knowledge</td>
</tr>
<tr>
<td>15</td>
<td>We learn from our mistakes</td>
</tr>
<tr>
<td>16</td>
<td>We look ahead in a structured way (using forecasting tools and techniques) to try and imagine future threats and opportunities</td>
</tr>
<tr>
<td>17</td>
<td>We have effective mechanisms for managing process change from idea through to successful implementation</td>
</tr>
<tr>
<td>18</td>
<td>Our structure helps us to take decisions rapidly</td>
</tr>
<tr>
<td>19</td>
<td>We work closely with our customers in exploring and developing new concepts</td>
</tr>
<tr>
<td>20</td>
<td>We systematically compare our products and processes with other firms</td>
</tr>
<tr>
<td>21</td>
<td>Our top team have a shared vision of how the company will develop through innovation</td>
</tr>
<tr>
<td>22</td>
<td>We systematically search for new product ideas</td>
</tr>
<tr>
<td>23</td>
<td>Communication is effective and works top-down, bottom-up and across the organization</td>
</tr>
<tr>
<td>24</td>
<td>We collaborate with other firms to develop new products or processes</td>
</tr>
<tr>
<td>25</td>
<td>We meet and share experiences with other firms to help us learn</td>
</tr>
<tr>
<td>26</td>
<td>There is top management commitment and support for innovation</td>
</tr>
<tr>
<td>27</td>
<td>We have mechanisms in place to ensure early involvement of all departments in developing new products/processes</td>
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<tr>
<td>28</td>
<td>Our reward and recognition system supports innovation</td>
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<tr>
<td>29</td>
<td>We try to develop external networks of people who can help us - for example, with specialist knowledge</td>
</tr>
<tr>
<td>30</td>
<td>We are good at capturing what we have learned so that others in the organization can make use of it</td>
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<tr>
<td>31</td>
<td>We have processes in place to review new technological or market developments and what they mean for our firm's strategy</td>
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<td>32</td>
<td>We have a clear system for choosing innovation projects</td>
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<tr>
<td>33</td>
<td>We have a supportive climate for new ideas - people don't have to leave the organization to make them happen</td>
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<td>34</td>
<td>We work closely with the local and national education system to communicate our needs for skills</td>
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<td>35</td>
<td>We are good at learning from other organizations</td>
</tr>
<tr>
<td>36</td>
<td>There is a clear link between the innovation projects we carry out and the overall strategy of the business</td>
</tr>
<tr>
<td>37</td>
<td>There is sufficient flexibility in our system for product development to allow small ‘fast-track’ projects to happen</td>
</tr>
<tr>
<td>38</td>
<td>We work well in teams</td>
</tr>
<tr>
<td>39</td>
<td>We work closely with ‘lead users’ to develop innovative new products and services</td>
</tr>
<tr>
<td>40</td>
<td>We use measurement to help identify where and when we can improve our innovation management</td>
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</tbody>
</table>
### 10.3 Result of questionnaire

#### Strategy

<table>
<thead>
<tr>
<th>Department Name</th>
<th>R&amp;D department</th>
<th>Product Department</th>
<th>Comprehensive information Department</th>
<th>Marking Department</th>
<th>CEO</th>
<th>Total</th>
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#### Processes

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