How to enhance innovation management in manufacturing companies

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First, we appreciate our supervisor Lars Steiner, he gave us so many supports and suggestion to complete thesis, without his help and patient, we can’t finish our work. Thank you, dear Lars.

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Thank you for your help everyone, it will be a good experience in our lives.

Lingxi Zhou

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Abstract

This thesis aims at how to enhance innovation management in the companies. Collecting the data by surveys which we have sent to five Swedish companies. Through studying the theories and analyzing the data, then we got a new model about how to enhance innovation management.

Through the survey and literatures studies, we found that innovation was the most important for an enterprise; it is a power of enterprise survival and development. To enhance the innovation capability, enterprises must strengthen their innovation management.

How to enhance the innovation management effectively? With this purpose question, we have analyzed it through management idea innovation, technology innovation and culture innovation. Through the survey analysis and the theories study, there are 9 factors should be considered when the innovation management has launched. the company should know how to balance the dilemma of innovation, moreover, leader own the open views and offer a loose and free environment to the employees, then choosing a right partner and gain more support in form of fund and technology and so on. At last, we created a new model about enhancing innovation management. In conclusion, innovation management should be taken be an active state in organization operation with the management idea innovation, technology innovation and culture innovation.

Keywords: management idea innovation, technology innovation, culture innovation.
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1. Introduction

In the contemporary world, innovation is familiar to us. Innovation is a mindset, a pervasive attitude, or a way of thinking focused beyond the present into the future vision (Kuczmarski 2003). Innovation is about a new idea, new device and novelty. Innovation is the management about activities involved in the process of idea generation, technology development, manufacturing and marketing of a new product, manufacturing process or equipment (Trott 2005). Many researchers have defined it, but there is a common factor, that is innovation is “new”. There are some authors to discuss innovation. It should be a series of processes, involve strategy, benchmark, a cross-functional team and a new-to-the world process (Kuczmarski 2003). Pay attention to strategic innovation, in order to understand innovation as a strategic problem (Dreier 2006). To enhance innovation, knowledge management support innovation through high level of individual knowledge and learn from other competitors (Carneiro 2000).

Nevertheless, we want to see the internal quality of companies, to understand how to enhance innovation management in manufacturing companies. By the tendency of globalization, informational integration, meanwhile intense competition circumstance is also a threat for companies, especially in manufacturing companies which are less competitive compared to bigger companies. If an enterprise wants to survive, it must keep continual innovation. Innovation management is a central issue. We have been interested in it during our study in Sweden and have done a survey through the manufacturing industry companies in Sweden as the cases. Analyzing innovation management depends on three aspects, idea innovation management, culture innovation management and technology innovation management that we will introduce in the theoretical framework part. If one enterprise wants to strengthen its innovation management, it must focus on these three aspects. Because in this challenged external environment, the enterprises must create and use the new innovation management ideas to guide the enterprise management, and find the new ways to achieve innovation. The innovation management idea is the base. The
technology innovation is the key element in innovation management. Only having the technology supporting, the innovation management can be implemented. So innovating technology can help enterprise solves the new problems and meet the demands of customers in time. The environment is very important in the process of innovation management, so culture innovation can help an enterprise to establish a good environment. The enterprise culture can make the enterprise keeping longer competition. Culture innovation can inspire employees to learn new things and create new ideas of innovation management.
2. Purpose and Research Questions

The purpose of this paper is to be discussed not only refer to implement innovation management, but also focus on how the innovation management improve enterprise competitiveness.

We have done the survey through the manufacturing industry companies as the case to analyze what they want to do for innovation management and discuss how these three aspects are necessary to enhance the innovation management efficiently. In order to explain the purpose of our thesis, we have posed the following research questions:

- Why and how the companies think the aspects are important in the innovation management. (management idea innovation, technology innovation and culture innovation)
- How the companies utilize these aspects to enhance their innovation.
3. Approach

3.1 Data collection

In the whole process of our research, the process of collecting and searching for data is based and guided by the type of method used. The reasons for choice the way to collection the data and analysis methods are determined by what you want to find out, and the particular characteristics of our research problem and the sources of information (Walliman 2008). We look for useful data based on the aim of our research, it likes the lighthouse to guide us to achieve the all the research.

Quantitative and qualitative methods are useful for the whole study. We have send surveys about our thesis topic to five companies by survey, and then we collected the respondents to analyze it. It takes nearly one and half months to finish it. It was a precious experience for us to explore the knowledge about innovation in Sweden and grasped the opportunity to finish our thesis.

3.1.1 Literature study

In order to our research achieve the ability of reliability and directivity. At first, we chose the innovation theories as the foundation of deeper research, as a result of having learned innovation management course in University of Gävle, we have known about more and displayed the interesting about innovation, especially, Swedish innovation capability is stronger than Chinese. Basis of this, we have studied some literatures about innovation through books and articles from library and the databases, such as Academic Search Elite, Emerald and Ebrary which is a database about e-book in English. Besides that, we have read some articles form Chinese authors which have interesting views about innovation, combining with both together enable to us to understand innovation better. Depending on the whole study, we have generalized three aspects about innovation management so that utilizing it to analyze innovation management in manufacturing companies in Sweden. There are management idea
innovation, culture innovation and technology innovation. Because they are easy to understand and operate in reality, before there are so many research about analysis innovation management by the continual innovation model, or auditing innovation management, so we want to consider innovation with a new way. Besides, those literatures are clear and easier to gain the aim of the research.

3.1.2 Survey

In our thesis, we collected the data through doing questionnaire. We uploaded our questionnaire to the web called eSurveyspro (an online survey software). Then we send the connection to the Sweden companies to get their answers. In our questionnaire, we have 18 questions, 10 multiple-choice questions and 8 opening questions. Through the opening questions, the companies can write their own opinions according to their practical situation, and we can compare different opinions from different companies. The all questions are about the innovation, management idea innovation, technology innovation and culture innovation. We can know what these companies have done or had the special opinions in these aspects through these questions. That would help us to get our conclusion. In a word, we aimed at knowing about how to enhance innovation management in manufacturing companies.

3.2 Why we chose manufacture companies in Sweden

There are primary reasons to choose these manufacturing companies in Sweden.

First, due to our interesting about Swedish companies, we desire to know about the capability of innovation in Swedish companies, thought our study to explore our experience for future study.

Second, these companies are famous in the world. Meanwhile, they refer to manufacture, innovation is as vital element in this area, because the capability of innovation is considered a part of competitiveness.

Third, we hope we can learn some new things about innovation from these companies, and give good advices about how to enhance innovation management for
Swedish or Chinese companies.

### 3.3 The introduction of the five companies

We choose five Swedish companies to do the surveys. They are KGC Verktyg & Maskiner AB, Alf Alaval, AP&T Group, Cargotec, Syntzonic.

The KGC Verktyg & Maskiner AB company is a Swedish-owned wholesaler. They have a complete range of ergonomic and functional tools, machines and accessories, foremost used by bricklayers and tilesetters.

Sytronic AB who is a prominent engineering design house specializing in the design and development of electronics, electro-mechanics, technical and administrative software.

Alfa Laval’s products and solutions are used in areas of vital importance for humanity such as food and water supply, energy production and economizing and environmental protection.

AP&T designs, manufactures and markets automation, presses, tools and complete production lines for the sheet metal and tube forming industry. They are experts in forming technology and automated processes, and we deliver complete production systems where we assume complete supplier responsibility.

Cargotec is the world’s leading provider of cargo handling solutions whose products are used in the different stages of material flow in ships, ports, terminals and local distribution. It has a branch office in Sweden.

### 3.4 Validity

Internal validity refers to the confidence we place in the cause-and-effect relationship. It addresses the question; to what extent does the research design permit us to say that the independent variable. In this thesis, we take a cautious attitude, continually questioning in analysis. The explanations are proposed in this thesis
between that three aspects and enhancing innovation management that lead to corresponding recommendation.

External validity is the validity of generalized (causal) inferences in scientific studies. In this thesis, we chose five companies to do the questionnaire to collect the data in order to analysis these data then get the new model. Because the results of the survey are related to theories we learnt, it generalizes and expands theories.

3.5 Reliability

In our thesis, we collected the data through doing questionnaire. We uploaded our questionnaire to the web called eSurveyspro (an online survey software). So the all survey can be checked through the eSurveyspro. Moreover, the reliability is increased by our results of the questionnaire. It is difficult to repeat this study with exactly the same results.
4. Theoretical framework

In this part, there are some introductions about innovation and innovation management concepts which refer to our research that is used as a foundation for the survey from manufacturing companies. These theories presented the main three aspects, idea innovation management, culture innovation management, technology innovation management, which we have taken to analyze the companies.

4.1 The definition of innovation

Authors define innovation in different ways. Innovation has been regarded as a kind of strategy, it is also as an ability to create and develop the market and the competitiveness of companies, strategic innovation is concerned with developing the entire company (Dreier 2006).

In addition, some authors distinguish innovation as ideas of new inventions. Rogers and Shoemaker (1972) defined that it is about ‘new’ in the context of innovation, the idea seems new and different for personal. Meanwhile, innovation is a mindset, an attitude, or a way of thinking focused beyond the present into the future vision (Kuczynski 2003). Others think it is important for company, such as Branson (1998) and Porter (1990) consider innovation is a way to achieve competitive advantage, it is a good idea to motivate employees and to understand what your customers’ needs. According to the Kuczynski (2003), innovation should be a process, a strategy, benchmark, a cross-functional team or a new-to-the world process. Through that, the company has developed a mindset that impacts every aspects of its business. The view is stated that effective innovation is a key to gain competitiveness.

Through the Chinese literatures study we have found some interesting theories about innovation management. For innovation, it can not achieve the traditional management functions, such as planning, organization, conduct, coordination and control. It is hard to plan and control when the innovation will happen, also it is hard
to anticipate exactly whether innovation activities will be successful (Chen Jing 2003). Besides, thinking about the aim of innovation is to meet the value of people and increase of social welfares.

4.2 Innovation management

4.2.1 Characteristics of innovation management

To understand innovation management better, the best way to know about it from the characteristics of it.

**Dynamic adaptability.** To achieve innovation, external conditions must be considered, the one purpose of organization management is to adapt the external changes, in order to promote changes or innovation within the organization, so the innovation management is dynamic adaptability (Peng Can 2002).

**Durative.** Innovation is as a sustainable condition in organization operation (Peng Can 2002).

**Comprehensive.** Comprehensive innovation management does not mean that organization need to innovate in all aspects, it means each aspects of organization should support innovation (Peng Can 2002).

**Structured.** The structured innovation management means innovation management should have a flexible management structure, it can self-adjust and adapt to the changes, or even can take a proactive improvement (Peng Can 2002).

**Innovations.** The most important feature of the innovation management is innovation. It shapes a new management mechanism, but it also innovate new management theory, methods, organization, culture and structure by itself (Peng Can 2002).

4.2.2 Innovation model

Successful innovation management is not an easy process, it includes some key
routines during the process of innovation management, with the description from Tidd and Bessant (2009) who have built a simple model and use it to pay attention to key aspects of innovation. There are four steps of this model, every step associates and interacts with each other.

First step is to search. It means that to know about how we can find chance for innovation. In this step, some signals which have the potential for change, these present like the new technological opportunities, new parts of market or change requirements are important (Tidd & Besant 2009). Actually, the firms just expect to find something helpful signals and to understand what factor will benefit for the competitive and continual changed environment.

The second step is to select. To understand what are we going to do and why? The aim of this step in innovation management is to find some useful inputs which will benefit innovation and can be improved through development organization (Tidd & Besant 2009).

The third step is to implement. During this step, it is essential elements to grasp the user’s needs and know about how to meet it with an appropriate way of innovation, that have been a critical determinant of innovation management (Tidd & Besant 2009).

The last step is to capture how we are going to get the benefits from innovation, it is important to share the knowledge and get the useful information to achieve innovate.

All of the steps should be combined with each other, if a firm wants to achieve a successful innovation management. Seeing the figure 1

Figure 1: The model of innovation (Tidd & Besant 2009)
4.2.3 A framework of the innovation management

This framework concludes three elements: marketing, research and manufacturing and business planning, and each element has a few factors to influence the innovation management, all the factors are interactive and connected, it draws into the figure 2 (Trott 2005). It is easy to know that innovation management is not a simple process, involving the ability of complex management, all the factors should be considered when the firms start to launch innovation, the external inputs and external inputs are both important.

Figure 2: The framework of innovation management
Consequently, innovation management is a process which through building a platform to support innovation in an organization, and to achieve the value of people and increase of social welfare (Chen Jing 2003). Innovation management is the establishment and governance of a new organization, it is a culture atmosphere. The purpose of innovation management is to establish a supporting system of innovation, and shape innovation collaborative mechanism (Xu qingrui Zheng gang Yu zida & Shen Wei 2003).

4.3 Management idea innovation

The process of management involves organization, conduct, control. Otherwise the new management idea is a core of innovation management, it means that without innovating idea management and exploring some new management methods, the enterprise management can’t continue innovation (Chen Jing 2003). Meanwhile the leaders devote their intelligence and energy to strengthen innovation management. It is necessary for them to explore the new methods and development direction and grasp the development tendency and new demands of innovation management (Yan Hongwei 2009).

First, the management idea innovation is necessary to start from the leader. The innovation not only presents just in marketing or new product development, but also presents the leaders must learn to inspire their organizations to new levels of inventiveness in everything that they do (Leavy 2005).

Second, it is necessary to turn ideas into commercial reality, but that requires persistence and discipline, and depending on leaders have the capability to balance between corporate creativity and efficiency (Leavy 2005).

Third, innovation management depends on idea, and the innovative idea is offered mostly by talented individuals (Leavy 2005). Moreover, the talents should own the different characters that enable to drive the innovation idea. It is a core for leader to foster the ‘flexible open staffing system’ which has been quoted on 3M company, it means that offering an open environment, encouragement employees explore and play
with ideas, provision resource support for innovators who want to take an idea forward (Tidd Bessant & Pavitt 2005).

4.3.1 The dilemma of innovation management

There is vital element for the companies to consider carefully, usually, the organization should consider the dilemma between the need of creativity and requiring of stability to accomplish daily tasks efficiently and quickly (Trott 2005). It doesn’t be ignored as a leader, to find the appropriate place to balance between corporate creativity and efficiency (Leavy 2005). We can see the figure 3:

<table>
<thead>
<tr>
<th>Efficiency gains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization</td>
</tr>
<tr>
<td>The efficient day–to–day operations within an organization require stable routines. This is usually achieved in stable and controlled environments.</td>
</tr>
<tr>
<td>The development of new products and services requires creativity and room to try out new ideas.</td>
</tr>
</tbody>
</table>

Figure 3: The dilemma of innovation management

4.3.2 Leader’s characters

As a leader of the company, there are some norms to guide the leader access to the innovation. Because of idea management refers to what way and how the way the leaders adopt to instruct the organization and inspire the employee. According to the Leavy (2005), he said “in creative organizations, shared obsession and pride of association provide the main cohesion, not amiability”. Balance between innovation and efficiency also require a balance act between play and discipline, practice and process, it is important for firms to learn how to control which hide creativity, and where creativity come out and gets nothing to market. In addition, leaders should
establish a right balance to consider the innovation process whether it is efficient and reliable, to build a primary function within the organization to develop innovation (Leavy 2005).

4.4 Technology innovation

Technology innovation means that adopting new knowledge, new technologies, new production methods and operation management models to produce new products, providing new services and exploring new markets to achieve market profits (Zhang Huasheng & Xue Lan 2002). Technology innovation is a key element of industrial structure and long-term economic growth. To refine technology innovation, Lv Xianghui (2009) and Sun Wenxu (2009) gave some advices to introduce technology innovation:
- Create a favorable environment for technology innovation.
- Establish and improve the incentive mechanism.
- Construct a harmonious technological innovation system.
- Choose the right partners and capture the opportunities.
- Pay attention to the continual development of technology, keep the competitive advantage.

4.5 Organizational culture

Mats (2002) is referring to organizational culture is about system of common symbols and meanings, organizational culture offers an affective and cognitive aspects of membership in an organization, and they are shaped and expressed (Kunda 1992). Schein (1986) states the organizational culture as following:

Culture is the part of basic assumptions that the group has invented, discovered or developed in learning to cope with its problems if external adaptation and internal integration, and that have worked well enough to be considered valid.
Further it is suggested that the corporate culture should present honest that enable to promote the firm’s competiveness and keep the trust from the employees and customers. Meanwhile, achieve it by paying attention to straight talk and reward integrity (Johnson & Phillips 2003). The appropriate organizational culture focuses on deeper cognitive layers; it enables members knowing about culture with the correct way and solving the problem which they face (Schein 1986). Meanwhile it plays deferent role in different organizational phase. Thus, it is voluble for managers to know about what the culture strategy, systems, not just people and style.

4.6 Culture innovation

To explore the culture innovation, there is a vital thing to be distinguished at first; culture is not easily changed, but it is necessary to be innovated. The management cannot directly change culture, but it can intervene at the level of artifacts (Bessant & Tidd 2008).

Culture innovation is a process which embodies the enterprise values into enterprise culture and continues innovation and development according to its own characteristics, in order to make the development of enterprise match with the external environment (Xu qingrui Zheng gang Yu zida & Shen wei 2003). The essence of enterprise culture innovation is to break the rigid cultural ideas and views bound which are not match with the enterprise actual operation management (Peng Can 2002) then transfer into a new operation management way which run through the whole innovation process. Culture innovation can affect the ideas and ways of thinking of people directly, and then it will affect the behaviors (Chen Jing 2003). If an enterprise does not renew its enterprise culture on time, it will lose the power of innovation and this enterprise will die at last.

Successful organizations enable to grasp the innovation and put it into the organizational culture and management processes of the organization (Brooke Dobni 2008). Ahmed (2008) generalizes the cultural norms about innovation, to achieve the innovation culture, there are some norms, such as share success stories are designed
and celebrated; showing the leadership commitment to employees, give employees freedom and risk-taking chance to execute their own work, and so on.
5. Results

We choose five Swedish companies to do the surveys, in order to analyze our model and get our conclusion. They are KGC Verktyg & Maskiner AB, Alf Alaval, AP&T Group, Cargotec, Syntzonic. In a word, there are 18 questions in this questionnaire which about innovation, innovation management idea, technology innovation and culture innovation. We followed the theories have mentioned above to create the survey and we look forward to finding how to with the three aspects to enhance innovation management.

5.1 Innovation

First, the all five companies pay attention to their innovation and they had done some innovation in the past. Some of them gave us successful examples in innovation. The Mats Engqvist who is Product manager of KGC Verktyg & Maskiner AB company answered us in the survey that they had done some innovation and some are successful, for example, New Business, New Offerings, New Ways of working, New Competence, New solutions (products or technologies), New or adapted IPR like Patents, "Trademarks", "Copyrights" or even Academic Papers. And another company Syntronic said in its past innovation, it through innovating new technology and new market (customer or partner) get the profit. This is its success example.

About the innovation process forest whether from top-down or bottom-up? Most companies’ answer is from bottom-up.

![Image of Figure 4]

Figure 4
So many factors will impact innovation. There are two kinds of facts, one is internal facts, and the other one is external factors. According to the survey, we conclude that the internal factors usually include the funds of the company, the technology support and the personnel allocation. The main external factors are competition and customers’ needs. In external factors, the customers’ needs are the most important factor. The company must according to the customers’ special demands to implement the innovation in order to satisfy the customers.

5.2 Management idea Innovation

Innovation needs new idea. So what kind of talent will bring new idea into innovation?

![Figure 5](image)

Figure 5

Obviously, passionate and curious are agreed that they are the most important factor to bring new idea into innovation. One specifies the experience and competence are important for talent.

If an enterprise wants to continual development, it is necessary to innovate management idea and explore some new management methods, then utilize the new management idea to instruct enterprise management (Chen Jin 2003). So we have a question in the survey is “Would you describe your companies’ management ideas for innovation?” We get an answer from Alfa Laval company, “Alfa Laval based on three key technologies: heat transfer, separation and fluid handling. The technology innovation is important, and about 2.7% sales are invested to R&D. Meanwhile, we notice the need of customers and offer good service.” Another answer is from KGC Verktyg & Maskiner AB company, “Our company works with Research and
development for many different high technology companies. Innovation or using of new technology is every day work for us in our projects. With regards to the business we have overtime developed our offerings in small steps is adding new services and business models mainly driven by customer requirements and very hard competition from our competitors. Therefore we have been very innovative in combination of different services and also business models to create new businesses and solutions/offerings to our customers.” The Syntronic answered “Technology innovation but also considering the other parameters.” Through the answers, we can see they all have specific management idea of innovation. They put the technology and service as their innovation management idea and in according these to implement their innovation. Because of these ideas, the company can explore the new methods and development direction and grasp the development tendency and new demands of innovation management. We can see it is necessary for enterprises to have their own innovation management idea.

How to get new management idea in your company?

11. How to get new management idea in your company?

<table>
<thead>
<tr>
<th></th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learn from other companies</td>
<td>25.00%</td>
</tr>
<tr>
<td>Self-reliant innovation</td>
<td>0.00%</td>
</tr>
<tr>
<td>Learning and share in the company</td>
<td>50.00%</td>
</tr>
<tr>
<td>Other (Specify)</td>
<td>25.00%</td>
</tr>
</tbody>
</table>

**Figure 6**

The most companies will chose learning and share in the company. Some company will establish an innovation organization. The employees in the organization can communicate and learn with each other about their new discoveries and ideas. Some company would like to learn from the competitors. The other one specifies the need of customers who are the God in these fields.

When one new management idea has been planed and decided, next step is to implement it. Sometimes, it is hard to implement a new management idea for innovation, it will meet some difficulties. So what is the difficulty? The company of Syntronic answered “Number one is to work out a business case as support for the
ideas. You should be able to present some targets figures in volume and money/profit.” The Alfa thinks it is difficult but it is necessary. The new idea must adapt the competition and it is advantage for company, it takes time and discussion to finish it. The company named Cargotec thinks “It depends on how you implement a new management idea. A remarkable change without previous reminding would definitely receive more reluctance from employees. From a psychological prospective, each employee needs a period of time to be adoptive in new environment.” Through these answers, we can see the business case as support for the idea; fund, time and new environment which the employees need to adopt are their problems. But one company said innovation and creating new offerings and business is a must to survive for their business. If you gather great people and create the necessary infrastructure and tools (environment) to make innovation possible, things are likely to happen.

In the process of innovation management, we can use many ways to implement it. Every company will choose the suited ones which can benefits its innovation management.

<table>
<thead>
<tr>
<th>4. What kind of ideas do you think benefits innovative management?</th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>The innovate technology support</td>
<td>12.50%</td>
</tr>
<tr>
<td>New parts of market</td>
<td>6.25%</td>
</tr>
<tr>
<td>The way to inspire employees to find ‘new’ things.</td>
<td>31.25%</td>
</tr>
<tr>
<td>The talented individuals offer good advices.</td>
<td>18.75%</td>
</tr>
<tr>
<td>Make open environment to employees to learn from each other</td>
<td>25.00%</td>
</tr>
<tr>
<td>Other (Specify)</td>
<td>6.25%</td>
</tr>
</tbody>
</table>

**Figure 7**

As figure 7 shows, we can see to inspire employees to find ‘new’ a thing is 31.25% of respondents. “Make open environment to employees to learn from each other” has 25.00% of respondents. So we can see employee play a very important role in the innovation management. Employee is the key who play and implement the innovation management. Therefore, if one company wants to benefits its innovative management, it needs to inspire employees to find ‘new’ thing and learn from others that can innovate some new ideas and technologies.

But it is unavoidable that employees will make some mistakes when they try to
create ‘new’ thinks.

![Figure 8](image.png)

Most of these companies choose “encouragement”, “control” and “tolerant” when employees make mistakes in order to reduce the loss which caused by these mistakes. Obviously, no one will punish the employees who make mistakes.

5.3 Technology innovation

Technology innovation is a key element of industrial structure deepen and long-term economic growth. All companies focus on innovating technology, through it they can create profit. In what way and for what can the technology innovation be used to create profit? KGC Verktyg & Maskiner AB answered “firstly, it meets the external customer’s need, and the new products from new technology leads the main market.” And the Alfa Laval said “New products and solutions leads to new offerings and businesses. In some cases new technology can lead to lower product cost or lower ‘end user’ or life time cost.” We can see the two companies through innovation technology to produce new products, and then extend the market to create profit. This is the final purpose of innovation in an enterprise. In our survey, we can through another question to conclude that new technology, new knowledge, and new service are key element in the innovation management. We can show it in figure 9:
The five companies all choose the new technologies to be a mechanism for innovation; obviously, technology innovation is not only a key element but also is an effective method in the innovation.

The technology innovation is not simply, sometimes it can not just finished by one company, so it needs a partner. Is it important to choose a right partner to develop technology innovation? Which aspects do you consider? Obviously, the first answer is certainly. The five companies all agree find a right partner is very important. “Important, reliable and the competence we consider.” The KGC said. “Competence, and they can deliver what they promise.” This is from Alfa. “Yes, Reliable partner with high competence.” The AP&T Group company said. A right partner can help to reduce the cost and shorten the process time, it can provide some technical supporting and solution.

Technology innovation is very important, so need to pay more time and money to implement it. “How do you finance technology innovation?” In our survey, KGC answer this question, “According to the internal found and the customer’s need.” Another answer from Alaf, “External customer projects mainly but also in some cases internally funded. We have one project which is to 50% funded through a national government funded agency called VINNOVA.” All most companies according these own found to innovation technology. Sometimes, when they can not offer by themselves, they can find some government program assistances or cooperate with some partner to solve the finance problem.
5.4 Culture innovation

We have mentioned that the culture innovation is a process which embodies the enterprise values into enterprise culture and continue innovation and development according to its own characteristics, in order to make the development of enterprise match with the external environment. We also survey that what the five companies think the corporate culture innovation. The Syntronic answered that “It is important to learn and understand other cultures and use of equipment.” The KGC think the corporate culture innovation is necessary for its survival. Because you have to be open to new ideas, new solutions and new knowledge and so on. Another company Cargotec said “It is also important to corporate culture innovation. In sum, a technology innovation sometimes should go with culture innovation. An appropriate culture background could enhance the diffusion of new technology.” Whatever how to understand the culture innovation, the companies all think that it is important for the innovation management.

There are some factors will impact the culture innovation. We can see the figure 10 and figure 11.

<table>
<thead>
<tr>
<th>17. How would internal factors impact culture innovation?</th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managers’ own qualities</td>
<td>12.50%</td>
</tr>
<tr>
<td>Employees’ cognition about innovation</td>
<td>25.00%</td>
</tr>
<tr>
<td>The learning ability of innovation among employees.</td>
<td>37.50%</td>
</tr>
<tr>
<td>Other (Specify)</td>
<td>25.00%</td>
</tr>
</tbody>
</table>

**Figure 10**

There are three main internal factors will impact culture innovation. Among these, “The learning ability of innovation among employees” is thought the most important one. They need to communicate with each other, and it is important for them to learn new things then they can create new things.
The external factors include challenge from the competitors, change of the external environment, the need of development of companies and others. As the figure 11 shows, change of the external environment and the need of development of companies are essential. The companies all focus on it. Then the change of market demand will cause the demands of customers to change. For meet the customers’ needs, the companies should change their culture innovation. The external environment change means the market demand change. Only if they follow these changes, they can implement a right and suited innovation management to survival in the challenge environment.

**Figure 11**

The external factors impact culture innovation:

| Challenge from the competitors | 22.22% |
| Change of the external environment | 33.33% |
| The need of development of companies | 33.33% |
| Other (Specify) | 11.11% |
6. Discussion

6.1 Why and how the companies think the three aspects are important in innovation management

First of all, the surveys have shown that they had done some successful innovation examples. These companies pay attention to the innovation in the business area. New competence, new products, new technologies, new business model and new market, moreover the patents, all of these are good ways to benefit innovation management.

There are some external and internal factors could impact innovation, companies always consider the funds, technology support and the demand of customer.

So why and how the companies think the three aspects are important in innovation management?

6.1.1 Management idea innovation

Five companies have described their management idea, such as the new technology innovation idea, new knowledge and gathering talent to create environment (tool or fund) to make innovation possibly. Meanwhile, it is need to pay attention to the adaption of employees. The way to get the new management idea, in the from of learning from competitors to explore new view in the market and inspiring employees to find ‘new’ thing, then providing technology support to benefit innovation management. Besides, meeting the demand of customers is also essential.

The difficulty of implementing management idea for companies should be considered. As the result sector ’s statement, to find a support like successful business case for the idea and the new management idea should adapt the competition and the development of companies. At the same time, it should consider the time of employees’ adaption when the new management idea has implemented. But it is necessary to innovate and create new business for companies’ survival. Obviously,
without innovating idea management and exploring some new management methods, the enterprise management can’t continue to innovation (Chen Jing 2003).

As the statement from Leavy (2005), the leader should know how to inspire their organizations. Especially, from the respondents of survey, the innovation process forest from bottom-up, the employees are the key role to implement innovation idea, so leader should present encourage attitude without punishment to treat employees who are making mistake when they try to create ‘new’ thing for business, and well controlling in order to reduce the loss is also necessary.

Talented individuals offer good ideas for innovation management, and the different experience and competence ability are important for talent. The talent who own passionate and curious character always can discover problems and new things for companies.

6.1.2 Technology innovation

Most companies use new technology as the mechanism for innovation. Offering new technology to produce new products, it is in order to lead lower cost. Companies focus on competitive advantage by development of technology that has been mentioned by Xiaohui (2009) and Wenxu(2009). Meanwhile, technology innovation must meet the customer’s need, by this way, produce new products to gain profit in the market.

The technology innovation is a key element of long-term economic growth. Sometimes it is important to choose a right partner to develop technology innovation, because some complicated innovation can’t be finished just depending on one company. Reliable and strong competence partner should be considered that they could provide the funds and technology support to companies.

6.1.3 Culture innovation

The companies have form or project team which has mixed and different competence partners to discuss new views or new work for employees’
communication. That needs an open and flexible environment.

Culture innovation refers to learn and understand other culture and how to use equipment. It is important for company to keep the survival condition by the open ideas, new solutions and new knowledge.

The survey shows that culture innovation must match with the eternal environment and internal condition. Leaning among the employees could impact culture innovation in company, plus change of the external and need of development of companies, they both impact companies culture innovation. In particularly, culture innovation can affect the idea and ways of thinking of people directly, and it affects the behaviors (Chen Jin 2003). An appropriate culture could support the innovation management. In sum, a technology innovation sometimes should go with culture innovation. An appropriate culture background could enhance the diffusion of new technology. Whatever how to understand the culture innovation, the companies all think that it is important for the innovation management. A nice enterprise culture is established, it can provide the power for innovation and development of enterprise.

6.2 How to use the three aspects to enhance innovation management

Through the study includes theories and survey research, we have learned some experience from it, and we have tried to develop a new model to describe how to enhance the innovation management. By the investigation and data analysis, all the theories are taken as our theoretical base for the survey even this thesis, the management idea innovation, technology innovation and culture innovation which three aspects interact and interrelate. Because of the successful innovation management is not single process, according to the description from Tidd and Bessant’s (2009) innovation model.

We can see the figure 1 which shows the four steps of innovation management, the first is search, the second is select, the third is implement, the forth is capture. It offers processes about manage innovation. To some extent, there is an inspiration from learning the innovation model, we have thought the way to enhance the innovation
management compare with the innovation model, this innovation model is abstract, just to describe what the innovation management model is, but it is lacking of introducing about how to do and in what way to achieve the successful innovation, it just presents that how the general innovation management occurs from step to step.

So focus on the three aspects, the management idea innovation, technology innovation and culture innovation, and it is easy to see the data from the survey, the three aspects are important for the innovation management.

We have found 9 factors should be considered when the companies want to enhance innovation management.

**Funds**

It may be the internal or external support. Especially, it needs enough funds to explore new technology to implement innovation, and offer new products or new services to customer. The funds could be offered by the appropriate partner, government fund agency or big customers who need special service to meet their special demand.

**An appropriate partner**

Reliable and abundant competence partner are important for companies. The supports from government program assistances or cooperating with other companies could solve the finance problem to gain the win-win situation. A good partner can help to reduce the cost and shorten the process time; it also can provide some technical supporting and solution.

**Balance the dilemma of ‘new’ work and the daily work**

This view is stated by the Leavy (2005). It could not be ignored for leaders when they want to development of new products and new services requires. From the survey, we can see that management idea innovation, technology innovation and culture innovation are all ‘new’ work which needs an open and loose environment in the company. This is a problem to finance technology innovation and other innovation works. Not only the innovation works can create profit, but also the daily works cover companies’ business to gain the fund and technology basis to support the innovation work.
**The leader’s quality**

In the companies, final decision would be made by the leader, so leader must own special quality. Firstly, choice an encouraging attitude to treat the talented or employees who have taken mistakes when they are creating ‘new’ for company. Secondly, the leader needs the ability to inspire the employees and organization to achieve the innovation management together.

**A loose and flexible environment**

Learning in company or learning from other competitors are both as methods to get a new management idea. We can see the figure 11. The employees in the loose organization can communicate and learn with each other about their new discoveries and ideas. Employee is the key who play and implement the innovation management. If the employees of one company only insist on antiquated idea and knowledge but not learn some news things and communicate with others, obviously, it can not do any innovation. They can present straight talk about the new changes of economic environment and market. So that they can conclude new management idea of innovation then devote it to new strategy of company. After that, the leaders put the new management methods and development strategy in innovation management then implement it.

**Labs**

Verification labs offer the technology support to the new products research. This factor is mentioned by Trott (2005), showed by figure 2, the research and technology part. It must consider university departments’ support. Labs can be understood as the university research department or institute which verifies the reliability of new products.

**Demand of customer**

Follow the demand of customer when companies launch innovation. By this way the technology innovation can create the profit and take advantage of market.

**Competitors**

Learning from competitors in the business can promote the new management idea, also competitors as a factor could impact the culture innovation. Business market
can’t ignore the affection of it, the one who know the competitors first will win first.

**Talent**

Creative idea is offered mostly by talent (Leavy 2005). In fact, abundant experience and strong competence are important for the talent, as well as the passionate and curious characters could bring new idea into innovation.

It is clear to see in the figure 12, the new model of enhancing innovation management.

![Figure 12 to enhance innovation management](image)

**Figure 12 to enhance innovation management**

Pay attention to the three aspects, they are interact and interrelate. It means that all of them are supposed to launched and considered to achieve enhance innovation management. Because of the model is a circle, each aspect interacts and promotes other aspects. Management idea innovation, technology innovation, culture innovation, when these aspects are used to enhance the innovation management, the 9 factors should be considered, by this way to interplay each aspects and achieve the innovation management.
7. Conclusion

7.1 The new finds

Through collecting the data from questionnaire, then analyzing these data and results and comparing with the theories, we find some new things in innovation management.

Partner

Sometimes it is difficult to implement an innovation by one company. So it is necessary to choose a right partner to cooperate. Reliable and strong competence partner should be considered that they could provide the funds and technology support to companies. A good partner can help to reduce the cost and shorten the process time. It also can provide some technical supporting and solution, and will help the company to gain effort halved, result doubled.

Leadership

Most times, the employees are deemed as the key role in the innovation management, obviously, it is right. But the importance of leader is often ignored. Actually, leaders are a key role in the innovation management too. They are innovation management executors; their new ideas can lead one innovation. They are collector, to collect the employees’ new ideas to make a plan. They are deciders, which innovation ideas will be chose and how to implement the innovation will be decided by them. The leaders need the ability to inspire the employees and organization to achieve the innovation management together. And they also need a competence to control the situation and reduce lose when the employees make mistakes. So leadership is very important in the innovation management. A leader can lead their team to make the innovation successful, or he also can destroy the whole innovation.

Learning

Regardless of being the employees or leaders, they all need to continual learning. They need to learn new knowledge by themselves in order to improve their own
qualities. They need learn and communicate with each other, and then they will create some new ideas and learn new technology to implement innovation management. They also need to learn from competitor, so that they can know their competitor and are unlikely falling behind their competitor. New knowledge and new technology can bring new ideas to achieve innovation management, so the employees and leaders need to focus on continual learning.

7.2 The importance about innovation and innovation management

Achieving innovation depends on innovation management, but how to achieve the innovation management? The essence of achieving innovation management is to establish the innovation organization. The establishment of innovation organization is to build a platform to support innovation.

To achieve innovation management, the companies need to focus on three elements: management idea innovation, technology innovation and culture innovation. If an enterprise wants to continual development, it must innovate its management idea and explore some new management methods, then utilize the new management idea to instruct enterprise management. Technology innovation is a key element of industrial structure deepen and long-term economic growth. Culture innovation can affect the ideas and ways of thinking of people directly, and then it will affect the behaviors. If an enterprise does not renew its enterprise culture on time, it will lose the power of innovation and this enterprise will die at last. So a nice enterprise culture innovation can benefit the whole enterprise.

Innovation is a power of the enterprise survival and development. For an enterprise, management is an eternal theme and the foundation of enterprise development. Based on this, we think modern enterprisers must grasp the developing tendency and demand of innovation management, practice the innovation continuous, in order to enhance the key competition and achieve the sustainable development.
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Appendix

The survey questions

1. Would you describe your companies in management ideas for innovation? (Open question)

2. What is the successful example in innovation? (Open question)

3. Do you use any of the mechanism for innovation? Which one or several?
   a) New knowledge
   b) New technologies
   c) New production methods
   d) New services
   e) Exploration new market
   f) Other ___________________________________________

4. What kind of ideas do you think benefits innovation management?
   1) The innovation technology support
   2) New parts of market
   3) The way to inspire employees to find ‘new’ thing.
   4) The talented individuals offer good advices.
   5) Make open environment to employees to learn each other
   6) Other (specify)

5. Does the innovation process foster from top-down or bottom-up oriented?
   1) From top-down
   2) From bottom-up

6. How do you treat the employees’ mistakes when they try to create “new things”?
   1) Tolerant
   2) Control
   3) Encouragement
   4) Punishment
   5) Other(specify)

7. Is it hard to implement a new management idea for innovation? What is the difficulty? (Open question)

8. What external factors do you think impact innovation?
   1) Competition
   2) Political influences
   3) Customers need
   4) Costs and input prices

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5) Suppliers and partners  
6) Distributors  
7) Other(specify)  

9. Do you use any way of organizing that improves innovation? (Open question)  

10. What kind of talent will bring new idea into innovation?  
   1) Passionate and curious  
   2) Different education background  
   3) Skeptical and objective  
   4) Brave to challenge the authority  
   5) Other(specify)  

11. How to get new management idea in your company?  
   1) Learn from other companies  
   2) Self-reliant innovation  
   3) Learning and share in the company  
   4) Other(specify)  

12. How do you finance technology innovation? (Open question)  

13. Is it important to choose a right partner to develop technology innovation? Which aspects do you consider? (Open question)  

14. In what way and for what can the technology innovation be used to create profit? (Open question)  

15. In your own opinion, what do you think the corporate culture innovation? (Open question)  

16. Do you have an organization for employees to communicate and learn the innovation ideas from each other?  
   1) No  
   2) Yes(explain)  

17. How would internal factors impact culture innovation? (Please explain it)  
   a) Managers’ own qualities.  
   b) Employees’ cognizance about innovation  
   c) The learning ability of innovation among employees.  
   d) Other (specify)  

18. How would external factors impact culture innovation? (Please explain it)  
   a) Challenge from the competitors  
   b) Change of the external environment  
   c) The need of development of companies
c) Other (specify)