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MST-80433 Thesis Management Studies

**FACTORS THAT ENHANCE
THE POST MERGER INTEGRATION (PMI)
PROCESS IN RELATION TO INNOVATION
PERFORMANCE**

Myra Micheline Widjaja

Reg No. 810705-949-040

MSc. Food Technology

Specialization: Food Innovation and Management

Supervisor. Dr. E. F. M. Wubben

Co-reader. Ir. M. H. Batterink

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Preface

This report is my end project in order to graduate for my master study in Food Technology, with specialization in Food Innovation and Management at Wageningen University.

First of all, I would like to thank my supervisor, Dr. E.F.M. Wubben, for his support, guidance, and constructive feedbacks during this whole research project. I really appreciate the time that has been given in order to help me accomplish this research. Thank you also for my co-reader, Ir. M.H. Batterink for giving me feedbacks.

At last but not least, this research has a significant role not only in enriching my knowledge, particularly about M&A, but also my personal development.

Myra Micheline Widjaja

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Executive summary

This research investigates the factors that enhance the PMI (Post Merger Integration) process in relation to innovation performance. Studies have shown that rapid technological change, growing technological complexity and shortening product life cycles increasingly force companies to source technologies externally. One option to obtain these sources of technology is by engaging in Merger and Acquisitions (M&A). By engaging in M&A, companies may be able to build up competencies and fostering innovation based on external sources. This papers aims to answer the following Research Question: Which factors enhance the PMI process in relation to innovation performance?

Before engaging in an empirical research, this study presents an extensive literature review of M&A and innovation management. The literature on M&A has been used to find the factors that enhance the PMI process, while the innovation management literature has been scrutinized to find the factors that enhance the innovation management performance. This study is limited to the organizational factors.

Before finding the relevant PMI factors, a review of integration approaches has been done. Five integration approaches were found, four of which have been investigated further in this study, namely; preservation, absorption, symbiotic, and transformation. These integration approaches have an impact on the PMI process and the innovation management factors.

Furthermore, three studies have been used as a foundation in finding the relevant PMI factors. The following seven factors were found enhancing the performance of PMI process; (1) *having clear and precise vision before the deal is done*, (2) *continuous focus on employee*, (3) *managing cultural differences*, (4) *speed in implementation*, (5) *strong integration team*, (6) *adequate multidirectional communications*, and (7) *continuous focus on customers*. As mentioned above, these PMI factors are affected by integration approaches. However, more research is needed to investigate both the impact of integration approaches on these factors, and to define the extent of the impact.

After reviewing the M&A literature, the innovation management literature has been studied to find the innovation management factors that will enhance the performance of innovation. There are two kinds of factors. First, the organizational factors and second factors related to the development funnel that manages the innovation process from idea to realization. We found twelve organizational factors: 1) *leadership by top management team*, (2) *linking the organization structure and the managing process*, (3) *having complementary networks*, (4) *having key employees*, (5) *provide training and continuous development for the employee*, (6) *having continuous improvement capability*, (7) *forming cross functional teams*, (8) *building a creative climate in the organization*, (9) *focus on customers*, (10) *building extensive multidirectional communication*, (11) *having absorptive capacity*, and (12) *manage the knowledge within the organization*. In addition, this study has examined the development funnel. This funnel is typically used by larger companies to manage their innovation process,

and is also affected by integration approaches following M&A. Again, more research is needed to find the extent of how the integration approaches affect the innovation management factors.

After reviewing the PMI and innovation management factors, an analysis has been done to find the relation between M&A, PMI process and the innovation performance. As many studies have shown, M&A can hurt innovation. However, this study has shown that with proper treatment of the right PMI factors and innovation management factors, the PMI process can be executed properly, which may result in a good innovation performance. Based on this outcome, a framework has been constructed.

Empirical research was the next step taken in order to test the literature research. We have chosen for a case study approach with documentation as the source of information. The chosen company for the case study is Cisco Systems, a company in the global internet industry that is renowned for having acquired and integrated many small companies. The case study describes the history of Cisco, the acquisition process of Cisco, and the managing process of its acquisitions. After that, the PMI factors and innovation management factors that were found in Cisco were analyzed. Furthermore, conclusions are drawn based on the empirical research. Six of the seven PMI factors from the literature research have been found in the case of Cisco. We did not find the factor having clear and precise vision before the deal is done. However, Cisco uses due diligence extensively. Therefore this factor seems to replace the having a clear and precise vision factor. Furthermore, some of the innovation management factors have also been found in Cisco. Finally, Cisco uses some kind of development funnel to manage its innovation process from idea to realization. Next, an analysis of the relation between PMI factors and the innovation performance of Cisco has also executed. The innovation performance of Cisco was analyzed by using several performance indicators, such as net sales, R&D expenditure, number of acquisitions, and number of employees. The analysis based on the case study showed that Cisco is quite successful in acquiring and integrating companies. That success resulted largely from the fact that Cisco uses the due diligence to find fit, before it decides on acquiring companies. Furthermore, a relation between the PMI process and the innovation performance has been indicated based on the case study. However, more research is needed to validate the results of the empirical research since the result of this study is based on one case study only.

This study shows that it is possible to have a good innovation performance by using the right PMI factors to manage the PMI process, and by using the innovation management factors to enhance the innovation performance. In other words, the management of the PMI process may affect innovation positively, as found earlier by some studies. While research has primarily been on the negative effects on M&A, more researchers should study the possibility to achieve the expected synergy from M&A. It is hoped that this study represents a step in that direction, prompting further research which will provide a better understanding of the factors that may enhance the PMI process in relation to innovation performance.

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1. Introduction and Research Design

This introduction chapter starts with the research background in paragraph 1.1. Then the conceptual research design is presented in paragraph 1.2. At the end, the technical research design is addressed in paragraph 1.3.

1.1 Research Background

Mergers and Acquisition continue to be a popular means of combining organizations and creating new ones. Many companies see this way as a one big step to grow. This activity is driven by some factors, ranging from increasing profitability and market share, to extend product lines, enhance the innovation activities, and reduces costs (Salama et al., 2003; De Noble et al., 1988). According to Thomson Financial, European announced M&A volume reached US\$905.9 billion for the first half of 2006. This represented a significant increase from the US\$515.3 billion recorded in the first half of 2005. In 2005, the Dutch M&A market showed clear evidence of a pick-up in completed transactions, according to KPMG. The market has become more bullish as they expect a significant increase in number of transactions in 2006. KPMG estimates the total value of M&A deals in the Netherlands will reach 325 million euro or 238 deals per year (KPMG, 2006). This huge amount shows that there are still many companies who carry out this activity despite the fact that many M&A activities are doomed to failure.

There are some studies done to find what the causes are of failed M&A activity. It is crucial to know what underlies them. One explanation lies in the problems of combining separate organizations with different organizational cultures and management process systems (Quah, et al. 2005). This combining process called as integration process. Integration process is believed as one of the most important factor to achieve long-term merger success. But still there are many companies undermine the integration process. They often fail to give adequate attention to the post-merger or post-acquisition integration (hereafter: PMI) issues (De Noble et al., 1988; Epstein, 2004). This PMI issue also can be found in the research done by Christensen, K.S. (2006). She found that even though the resources and skills of the two companies are complementary and the competencies of the acquired organisation are intact, efforts are needed to make the energies of the two organization act in tandem. Thus, the post integration phases of a M&A seem to be of paramount importance. A deeper insight into integration process is therefore important for success implementation of PMI in a company.

As said above, one of the many reasons for companies engaging M&A is to be innovative. However, in a review of the literature, Man and Duyster (2005) find that companies engaging in M&A activities generally face a decline in innovation. M&A often serve as a substitute for innovation, which may cause further neglect of internal research and development (R&D) programs (Hitt et al.,1991). They tend to focus more on the M&A process and the resulting conditions after the M&A affects managerial commitment to innovation (Hitt et al., 1990). Because of all the reasons named above, this research will investigate the factors that may enhance the PMI process in relation to innovation performance. This research will show that by using the proper PMI factors, and the proper innovation management factors, M&A may enhance innovation, instead of hurting innovation. First, a literature research will be done in M&A literature to find out

the PMI factors. Then, the innovation management factors that can enhance the performance of innovation will be elaborated as well. At last, the relation between PMI and innovation performance will be established. This relation will affect the innovation management factors as well. Beside the literature research, a case study will be carried out as well to test and support the literature research. Moreover, no distinction will be made between merger and acquisition in this research. Literature in both processes will be used. Furthermore, this research will take a part in NWO (Dutch scientific organization) project, which is investigating the impact of M&A-driven market dominance on innovation dynamics (Schenk, 2005).

1.2 Conceptual Research Design

Conceptual design is the part of research design which gives information about what, why and how much of a research. It consists of 4 elements, which includes research objective, research framework, research issue, and definition of concepts.

1.2.1 Research Objective

The research objective is to investigate the possibility of M&A giving positive influence on innovation performance

1.2.2 Research Framework

By using the following research framework as a tool, the clarity of the research process will have a concrete structure.

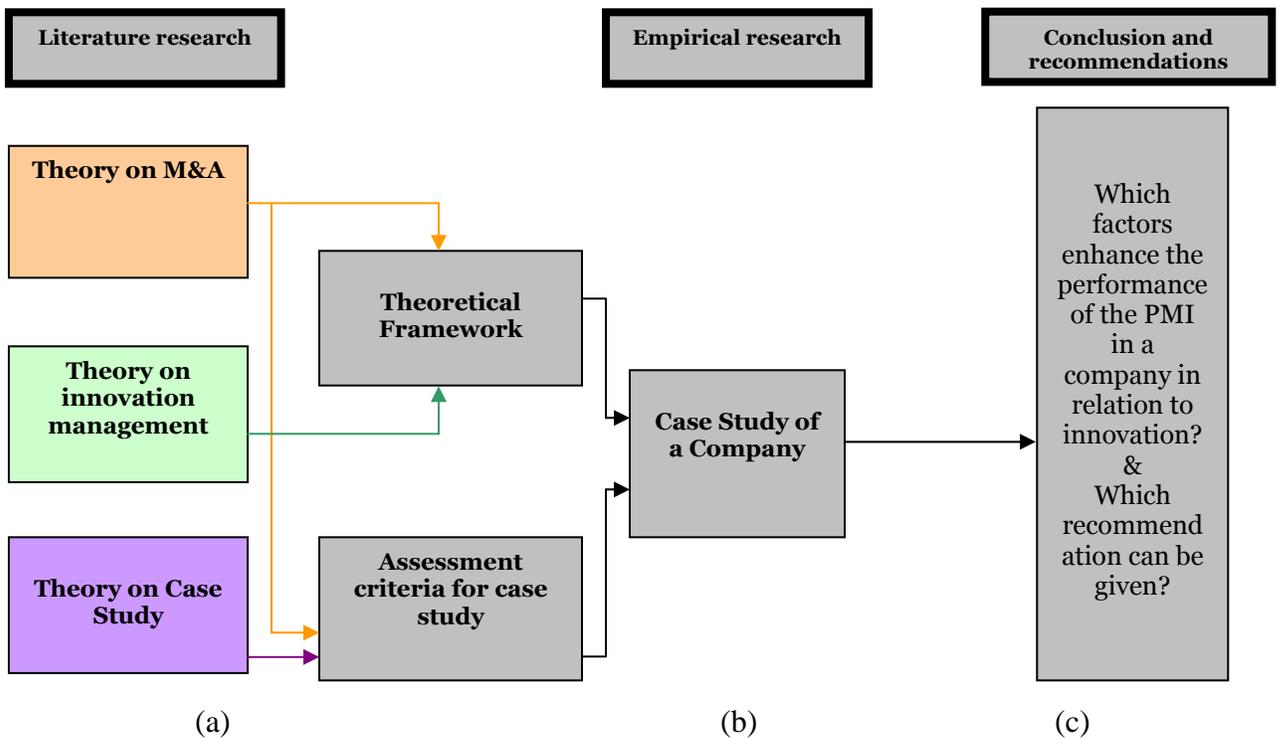


Figure 1: The research framework

The research framework of this research is shown in figure 1. Section (a) shows the topics which will constitute the literature research. The perspective of the desk-research for each of the subjects will be done in this phase. Theory on M&A and innovation management will be studied as foundation of the research, while theory on case study will be used to determine some criteria to choose a company for the case study. The theory on M&A will also contribute on choosing the company. Furthermore, the relation between M&A and innovation management will be elaborated in theoretical framework. Section (b) shows the information of the chosen company that will be assessed by means of empirical research. The necessary research information will be gathered from various case studies and journals. Section (c) is the conclusion and the recommendation for NWO that will be drawn from section (a) and (b).

1.2.3 Research Issue

The research issue will explain what the central question and the sub questions of this research are. They are formulated based on the research objective and research framework.

Central Question:

Which factors enhance the PMI process in relation to innovation performance?

Sub Questions:

1. Which PMI factors enhance the PMI process?
2. Which innovation management factors enhance the innovation performance?
3. How do M&A, PMI process and innovation management factors relate to each other and to innovation performance?
4. How would the case study be designed in order to execute the empirical research?
5. Which factors from the literature research can be found in the case study that enhance the PMI process and innovation performance?

1.2.4 Definition of Concepts

Merger:

The combination of the operations of two or more commercial interests or corporations to form a new company (Barrons Dictionary of International Business Terms)

Acquisition:

The taking over process of one company by another company (Barrons Dictionary of International Business Terms)

Integration:

An interactive and gradual process in which individuals from two organizations learn to work together and cooperate in the transfer of strategic capabilities (Haspeslagh, Jemison, 1991)

PMI (Post Merger Integration):

Integration process after merger is completed

PMI process:

The actual implementation of the designed effective organization in terms of innovation strategy and organizational structure (Haspeslagh, Jemison, 1991).

Innovation process:

Process by which an idea is translated into a product or service. Innovation involves deliberate application of information, imagination, and initiative in deriving greater or different value from resources, and encompasses all processes by which new ideas are generated and converted into useful products.

Innovation performance:

Innovation performance is an organization's ability to innovate and deliver value through such innovation. The innovation relates to the overall innovation process and its ability to contribute consistently to growth (Tidd et al., 2005)

1.3 Technical Research Design

This part states how the objectives previously set are going to be realized in the research project and which techniques are going to be recruited. It consists of research material, research strategy, and research planning.

1.3.1 Research Materials

The materials that will be used for this research will give answers to the sub-questions, and eventually the central question. These are:

Part	Sources	Accessing
Literature research	-Books in M&A and innovation management field -Scientific journals and articles about M&A and innovation management -Internet Sites : e.g. www.kpmg.nl ; www.forbes.com ; www.businessweek.com	Content analysis
Criteria for Case Study	-Books about case study: e.g. Yin, R.K., 2003 "Case Study Research: Design and Methods", Sage Publications -Scientific journals and articles -Result of the literature research	Content analysis
Implementation of Case Study	-Various case studies -Company's reports/ data (access through internet) -Business journals	Content analysis

1.3.2 Research Strategy

1. Literature research

Desk research strategy will be used in the first phase for theory expansion. First there will be an extended literature research in books, scientific journals and articles in the M&A and innovation management field to find the theories that relevant to the topic. At the end, the selected literature will give answers to the research question.

2. Criteria for a case study

Before selecting a company for a case study, it is important to know the criteria of a good case study. This will be done by reading books and articles about case study and also by using the literature research that has been done in the first step. After knowing the criteria, the suitable company can be found and used as a case study. A single case study will be used in this research due to the lack of time. However, by using a single case study there will be more chance for an in-depth analysis of the case.

3. Implementation of the case study

To validate the literature study, the case study will be carried out after the criteria are composed and the company is found. At last the literature research that already has been done in the first step will be used to compare with and support the results from the case study.

4. Conclusion and recommendation for NWO

The conclusion will be drawn by combining the literature research and the case study, which should give answers to the research question and fulfil the objective of this thesis. The recommendation will be given at the end for NWO which can be used for their project.

* The name of this approach will be used as representative for the others (in the same box), considering that this name is often used.

- Ad.1. Preservation: involves both companies continuing to operate autonomously so that their operations, culture, and other organizational characteristics remain intact and independent.
- Ad.2. Holding: involves a situation where the acquiring company acts, basically, as a holding company with no intention of integrating the two companies.
- Ad.3. Symbiotic: requires some degree of change to various aspects of the acquiring and target companies' organizational design and processes, as both companies' leading practices are gradually blended together.
- Ad.4. Absorption: describes a unilateral process where one company is assimilated into the practices, culture, etc. of the other company with the eventual goal of full consolidation.
- Ad.5. Transformation: necessitates significant changes in both original companies as the new entity seeks to totally reinvent itself thereby developing new routines, practices, culture, and other organizational attributes. This integration approach is placed at the top in the box of symbiotic because the need for organizational autonomy, tolerance for multiculturalism, need for strategic independence and degree of relatedness is higher than symbiotic approach.

These integration approaches will affect the PMI factors and innovation management factors. These will be discussed in respectively chapter 2 and 3. Holding approach will not be discussed in this research since this approach does not include intention for integration.

2.2 PMI factors

In this section, the factors that enhance PMI process will be discussed. First, a literature research has been done in M&A field. Three studies regarding PMI factors have been found during this literature research (De Noble et al. 1988; Nguyen and Kleiner, 2003; Epstein, 2004). These three authors found a series of PMI factors that have to be taken account to have a success PMI. De Noble et al. (1988) brought eight lessons in merger success to present a set of PMI planning guidelines. The lessons were drawn from a synthesis of relevant academic literature and an in-depth merger case study. Nguyen and Kleiner (2003) found eight keys to success of PMI. They based their founding on literature, case studies and empirical findings based by international research done by KPMG. The third research on PMI factors came from Epstein. He found five drivers of success in PMI and examined them at JPMorganChase, which its merger success was highly dependent on the execution of its PMI. These three studies were chosen and will be used in this research as a foundation in finding the appropriate PMI factors since they have found PMI factors and tested in the real situation. Other studies regarding PMI factors have been found as well. However, these studies have not found a series of PMI factors. Instead, they only focus on one PMI factor. Consequently, this kind of studies will only be used to support the factors founded by the three authors named above.

Furthermore, the three studies will be compared. By doing this, the quality of the result of the PMI factors will be enhanced. Hence, all of these authors have tested their findings in companies that have been engaged in M&A. It shows the validity of their studies. The outcomes of the three publications will be described respectively and after that, each factor will be analyzed. Furthermore, the factors that will be further used in this research will be highlighted at the end of each section.

2.2.1 The eight lessons from De Noble et al. (1988)

De Noble et al. found eight lessons for success of PMI. Those are:

1. Focus on Sources, Not Symptoms

According to De Noble et al, the source of the problem in PMI is that the partners in the deal did not have clear expectations about their roles and responsibilities in the new company. It is important to focus on this problem. In addition, PMI issues should be addressed early during merger negotiations to prevent ambiguity between organizations. Therefore, every effort should be made to ascertain the specifics of relevant PMI issues, and communicate these specifics as openly as possible.

Jemison and Sitkin (1986) found that there is constant pressure on management during the negotiation phase to consummate a deal quickly, thus resulting in significantly less attention being paid to PMI issues. Therefore, it becomes crucial for management to take a proactive view of the acquisition process during pre-merger negotiations. It is important for each company to have a clear and precise vision before the deal is done. Habeck et al. (2000) found that establishing a clear vision is a must to ensure a successful PMI. It often happens that the expectations are not implemented in the way that the company wants it. By having clear and precise vision before the deal is done, there will be less problems encountered in the PMI process and it is good for both companies that will undergo M&A process to know which direction they are going to go after the M&A is completed which avoids ambiguity.

→Having clear and precise vision before the deal is done

2. Get Line Management Involved

Line managers in a company have the responsibility of successfully implementing specific elements of the acquisition plan. Inclusion of line managers can bring perspectives which may increase the attention given to organizational compatibility and counteract the escalating momentum to complete the deal. Therefore, during the PMI process, consultation of line managers can prevent the imposition of inappropriate management systems onto the acquired company. One method of involving line managers in the acquisition process is to create a merger task force with several transition teams to deal with specific areas of integration. However, it is needed for both companies to give their cooperation.

The M&A process involve a wide variety of specialists in the analysis of many technical details. Commentators consistently recommend increased participation of operating managers and key staff people throughout the process (Drucker, 1981; Jemison and Sitkin, 1986). They argue that such involvement can facilitate better strategic choices by

bringing up a broader information base and greater commitment from those who will have to implement the decisions made during acquisition negotiations. However, there is no enough studies support this finding. It is not definitive yet whether the line management is the one that plays an important role in PMI. That is why this factor will be no more included in this research.

3. Cross-fertilize Management Teams

In PMI process, it is critical to replace the “us” vs. “them” mentality with a spirit of teamwork. It is needed that people in the management groups of both companies receive substantial promotions across the lines- from one company to the other. This will be applied in the first year of the merger. Otherwise there is a chance that managers will leave for better opportunities, and potentially ruin the chances for merger success. That is why it is important to take aggressive steps to ensure that key people are not discouraged by the acquisition.

According to Haspeslagh and Jemison (1991), how well the functional background of the top management teams in the two companies complements one another affects the acquisition-performance relationship. This means that it is necessary for the management team to receive promotions across the lines, from one company to the other in the first year of a merger. The goal is to convince managers in both companies that the merger offers them personal opportunities to grow and to learn from the other company. This principle applies not only to executives at or near the top, but also to the younger executives and professionals (Drucker, 1981).

→ *Cross-fertilize management teams*

4. People Count, Too

When a company engages in M&A, it means that it does not only purchase of another company’s assets and technology but it also include human element. Integrating employees between both companies is never been an easy process, and it will never be. De Noble et al think that the best chance for success is to engage in open communication with all employees about the need for improved competitiveness. If the labor force does not understand and support the new strategy, it is unlikely to succeed. It is crucial to support the employee, also the ones who must leave. This might include early warning about job eliminations, assistance in finding new employment, etc. These actions are also done to ensure the support of the people who will stay behind. If they see other managers or workers treated in a manner they perceive to be fair, the chance that they will have more motivation and support to the company is higher.

With open communication with all employees, the success in PMI can be achieved. In PMI process, communication is the key to make sure that everyone in the company knows what they are about to experience and do. It is also a way to retain and motivate key employees (Schuler et al. 2001). Like said above, if the workers treated in a fair manner, they will have more support for the company (De Noble et al. 1988; Schweiger and Denisi, 1991). Regardless of its cause, failure to do so will increase uncertainty and employees’ willingness to rely upon rumors, which can further increase anxiety. That

uncertainty and anxiety can lead to such dysfunctional outcomes as stress, job dissatisfaction, low trust in the organization and commitment to it, and increased intentions to leave the organization (Schweiger and DeNisi, 1991). Thus, it seems that the only way for management to deal with the anxiety that follows M&A announcement is to communicate with employees as soon as possible about all the anticipated effects of the change. Schweiger and De Nisi (2001) found in their research that realistic communications during a mergers process in the form of a realistic merger preview can help employees get through the process. Managing the communication process is also a valuable way to retain and motivate key employees. More about communication will be discussed further in page 21. Besides communication, it is also important to stay focus on what can be done to retain the key employee, for example by improving incentives and compensation schemes, and providing new opportunities for personal development, providing career opportunities (Shrivastava, 1986). By doing this, the employee will stay motivated.

→ *Continuous focus on employee*

5. Find the Hidden Costs

Many aspects of PMI will entail hidden costs. In looking at the cost of an acquisition, it is tempting to focus on the price paid for the acquired company, and then calculate return on investment based on this initial cost. However, the physical integration of facilities, the transfer of management systems, and other aspects of combining the two companies can add significantly to this initial expense. For example, the relocation of employees may also carry hidden costs. If the move is more than a short distance, some desired employees may choose to terminate their employment rather than move, reducing relocation costs but increasing hiring costs. Other employees may make the move, but quickly become dissatisfied and move back, increasing costs even more. Underestimating hidden costs can lead to disappointment in ultimate acquisition performance.

Unfortunately there is little known about the effect of the hidden cost on the performance of the PMI. There is no enough information to support this factor. Because of this, find the hidden cost will be no more included in the success factor.

6. Corporate Culture Will Change

Culture factor is often mentioned in M&A literature. Much of an M&A's success may depend on the management of the acculturation process. Many of the M&A process are failed because of the carelessness of the management of this factor. Due to the relationship between the M&A and acculturation processes, the management of acculturation must begin with the management of the PMI process. Otherwise the acculturation forms which develop within the company may diminish the potential for long-range M&A success.

Culture issue cannot be avoided by companies engages M&A (Frankema, 2001; Morosini et al., 1998; Norburn and Schoenberg, 1994; Olie, 1990; Quah and Young, 2005). The important task is not to combine two cultures into one, but how to walk with different

culture without impeding the integration process. As Frankema (2001) cited a metaphor: picture two icebergs in the ocean, where the tip of each represents the top management groups -primarily financial people-deciding the fate of the two companies and how the merger will work. As these top management groups set the merger in process, the two icebergs begin moving toward one another until the tips meet and mesh as one. Such a consolidation however, can never take place. As the icebergs approach one another, it is not the tops that meet, rather it is the much larger mass below the surface of the water, the respective culture that collide. Instead of synergy there is a culture clash. Even there is no direct clash, it is most likely in merging companies that the cultures of the two companies will differ. If these differences not managed properly, it can grow easily in aversive diversity, causing productivity problems like low level of trust and co-operation between groups of employees coming from different companies. Thus, there will be a high chance that the employees between merging companies have the “them and us” feelings. Management takes an important part in this culture problem. It is the management task to get groups with different cultural backgrounds to co-operate in a process of growing mutual understanding and synergy in solving daily problems in the work environment. After the culture is integrated, it is needed to manage the process thereafter, which is managing the cultural change.

→*Managing culture differences*

7. Strategy and structure should be linked

The merger of two companies creates the need to re-think the organization structure. The simplest way to absorb an acquisition into a company is to run it as a new operating division. This may be appropriate in some cases, but it runs the risk of losing the potential synergies of combined operations.

Operating efficiencies will only occur if operating changes are made. Thus, new lines of authority and reporting relationships must be established in order to create the context in which operating changes are feasible.

By combining two companies, it means that the organization structure of the as one formed company becomes different. This leads to changes in the strategy of the merged companies and also changes in organization structure since it must properly reflect the underlying strategy of the organization to be successful. Companies need to obtain synergies by matching their structures to their strategies. Furthermore, companies have to consider the integration approach that they choose in making changes in structure and strategy.

→*Strategy and structure should be linked*

8. Earlier is better than later

At last but not least, it is very important that managing PMI should be applied as early as possible in the M&A process. In many cases, waiting for problems to arise will make it too late to do anything about them.

There are number of advantages of speed in M&A process. From a financial perspective, time costs money. The faster post-acquisition integration is completed, the faster returns on investment are realized, as noted by Duncan Angwin in his research about speed in

M&A Integration (2004). Speed can also working against the uncertainty amongst employees. Faster integration may reduce the length of time for employees to experience uncertainty and in other hand, faster integration can improve the stakeholder enthusiasm. Early actions achieving quick post-deal wins helps delay the onset of entropy and therefore seems an attractive course of action.

Rapid integration may also serve to reduce exposure to the uncertainties of the external environment and it is also attractive in terms of competitive strategy. The deal itself and the speed of integration reduce the time available for competitors to respond to the new organization. This can give substantial immediate positional advantage as well as presenting competitors with a barrier to imitation.

That speed is important for the integration process is already known by researchers (Angwin, 2004; Ashkenas et al., 2000, Epstein, 2004, Max Habeck, 2000) but there is still another question. What does it mean by speed? In how many days the integration process must be completed? Duncan Angwin researched the speed in M&A integration in the first 100 days. 100 days is a timeframe amongst practitioners as a benchmark for progress and relates them to top executive perceptions of performance. From his research, it appeared that in terms of the importance of speed of action in the first 100 days, there is no evidence that provide strong support for the first 100 days, suggesting that this time frame is perhaps more one of convenience than substance. However, there does appear to be an association between the volume of changes made in the first 100 days and perceptions of acquisition success in the third and particularly the fourth year of life.

More studies in the effect of speed in different integration approaches are needed. It is not clear yet whether speed will affect preservation approach of integration considering that there is less integration between the companies.

→Speed in implementation

There are six factors that can be derived from the eight lessons from De Noble et al. (1988) and will be used further in this research. Those are:

- 1. Having clear and precise vision before the deal is done*
- 2. Cross fertilize management teams*
- 3. Continuous focus on employee*
- 4. Managing culture differences*
- 5. Strategy and structure should be linked*
- 6. Speed in implementation*

2.2.2 The eight keys to PMI according to Nguyen and Kleiner (2003)

In their research, Nguyen and Kleiner found eight keys to PMI:

1. Directors must get out of the boardroom

It is critical for executives to be actively involved in the integration. Chief executives must lead from the front, appear approachable to new staff and involve themselves actively in the merged company. Senior executives must make it clear to other managers that the combination process is a priority and requires their own time and focus.

Moreover, the new senior management team has to show support and learn quickly to operate the team.

According to Marks (1997) merger success is determined largely by top-level leadership. The key figure is the CEO or other senior executive (e.g. general manager) who is the steward of the combined organization. Leadership extends beyond the structural integration of companies to the joining of people. Thach and Nyman (2001) found that the role of the leaders in PMI is to make sure people have the tools and information they need to perform at the desired levels for the new organization. When the senior executives involve actively, a trust feeling can be built around the employee.

→ *Senior executives must be actively involved*

2. Set direction for the new business

According to Nguyen and Kleiner, by delivering clear goals, feeling of uncertainty about the change can be overcome. After the merger is completed, integration team has to be formed and managements of both companies have to communicate their expectations. Strategy and vision have to be discussed and after the team agrees on that, they should communicate it to the entire organization. They found that vision is perhaps one of the most important success tools available. Without it the future of the companies can turn into a series of activities that do not seem to lead to any particular goal or endpoint.

It is important to have the clarity of the vision for both companies before the deal is done, otherwise they could end up by having no vision until they merged together which can lead to disagreement between the companies. Thus, it is good to discuss the new strategy and vision after the two companies merged, but it is even better to do it before the deal is done.

This point is more or less in accordance with the first point from De Noble et al. (1988). See for more explanation page 13

→ *Having clear and precise vision before the deal is done*

3. Understand the cultural, emotional and political issues

It is important to show empathy for the pain of dealing with stress and uncertainty to the employee so that they know that the leaders care about what they have been and are going through. This, in turn, generates employee respect for an informed and insightful leadership. Another important factor that leaders have to take into account is being in touch with the concerns of employees. This will lead to knowing what they worry about, what excites them, what frustrates them. This empathy can come only from spending time with employees across levels and departments. Moreover, leaders should understand the importance of the culture permeating the entire combination process and counter culture clash by educating staff about each partner's culture and ways of doing business. Sensitivity to the cultural issue is an important factor for leaders in order to retain key people.

Showing empathy to the employee can be done by communication. Therefore a regular communication between top management and employees is crucial. It is also important

to consider the cultural issues. See more about communication on page 21 and culture on page 17. Factor communication will not be mentioned here since it will be widely described in point 5 (see below).

→ *Continuous focus on employee*

→ *Managing culture differences*

4. Maximize involvement

By maximizing employee involvement in the consultation process, leaders will get support for the change. Involving many operational staff as possible in the development of ideas will harness energy, harness momentum, and identify problems areas early. The more complex the integration, the more resources are required to manage it in terms of management time, skill, and working capital. The integration team should comprise staffs that have credibility and influence within the organization.

According to Thach and Nyman (2001) leaders can attempt to involve employees more in decision making around departmental and work issues. By doing this, the employees will feel important because they get the change to get involved in the consultation process. The maximize involvement of employee in the decision process has to be implemented in the integration team. Because of this reason, this factor will be considered as a factor of strong integration team, which will be discussed further on page 24.

→ *Strong integration team*

5. Focus on communication

Communication plays a critical role to the success of mergers. By having good communication, the coping abilities of employees will be increased, which in turn increases their productivity. This will impact the company's performance and create competitive advantage by achieving the projected strategic fit and synergies. Corporate culture can be changed with a proper communication plan in place, although it is extremely resistant to change. According to Nguyen and Kleiner (2003), communication plan must aim to share with employees:

- The shared vision for the new company
- The nature and progress of the integration project and the anticipated benefits
- Outcomes and rough timescales for future decisions

It is important to give early and honest announcements of all key decisions, which help reduce uncertainty and more likely induce respect.

Max Habeck et al (2000) believes that the achievement of merger integration goals depends on how well managers can persuade constituencies to believe in a vision and act to bring it about, which is actually communications task. Communication remains a leadership issue at all levels. Leaders essentially do three things: they set direction, they surround themselves with people who can steer their staff to follow that direction, and they commit resources effectively. The first two of these are intimately linked to communication (Habeck et al., 2000). What make mergers stand out as a particular communications challenge are the complex needs of the different constituencies. This complexity makes it that much harder for the newly-formed company to work put its

communication goals. Sometimes managers are unaware that “non-communication” – or under communication, or thoughtless communication – sends messages as well. The difference is that the sender is not in control of what the messages are. Clearly, communications need a framework and it needs a plan. Moreover, communication that is needed has to come not only from management level (top-down), but also from employees to management level (bottom-up) and between employees (bilateral). Bottom-up communication is needed, where employees can communicate to the senior management how they feel so that the senior management is aware of what is going on. Bilateral communication between employees during PMI is as much as important. The employees from two different companies that just merged have different background, different styles of working, different working environment before they merged. Now they have to work together. For sure, there must be a culture clash during the work. This problem has to be solved by communicating with each other. It is just for the same reason as why the management has to communicate to the employee adequately, so that the tension between employees can be reduced and ambiguity can be avoided. Thus top-down, bottom-up and bilateral communications are important. These three kinds of communication will be considered as one factor, which is named as multidirectional communications.

→ *Adequate multidirectional communications*

6. Provide clarity around roles and decision lines

In order to retain key staff, the new management has to work quickly to decide on the new structure, roles and identify any skill gaps. It is important to move fast to minimize the period of stress, otherwise it will damage the productivity of the employees. By the end of 100 days after the merger is announced, every employee should have clarity about the process, which will decide his or her future. By doing this, the CEO will gain respect by being seen to be fair when allocating positions. Furthermore, it is also important to have transparency around the process, clarity about the new roles, and prompt communication of decisions.

According to Schweiger and Denisi (1991) realistic job preview can reduce newcomers' uncertainty, bringing their expectations in line with reality, and helping them cope with the transition to their new jobs. Leaders should seek out and provide as much information as possible regarding what will happen to employees (Thach and Nyman, 2001). They need clear direction so that misunderstanding can be minimized (Appelbaum et al, 2000).

→ *Provide clarity around roles and decision lines*

7. Continue focus on customers

According to Nguyen and Kleiner, it is important to share future product roadmaps with customers as soon as possible so that they can feel secure about their purchasing decisions. This will retain customer confidence. In addition, the new company has to assure its customers that the service, support personnel, and salespeople will continue to serve customers without any interruption. The helpdesk is a very important area because

this is a front-line that can have an immediate impact on how customers view the company.

During PMI, companies become more introspective. Immediately after the deal is announced, the focus of both companies turns inward. The most vulnerable areas of the companies are sales and service (Huang and Kleiner, 2004). Unfortunately, shortly after the deal is done, many organizations experience lower sales, as well as increased complaints about customer service. When sales and service suffer, people in these groups tend to blame the M&A activity. Therefore, managers must ensure to maintain the standards of sales and service that their customers expect. Actions to boost sales and service must be overtly planned and quickly executed (Huang and Kleiner, 2004).

It is very important for companies to avoid ambiguity around the customers. It happens often that the customers feel confuse after the companies engaged in M&A. Sometimes the companies still do not know how they have to re-organize the companies, what will happen with the products, etc. If they do not handle this matter as soon possible, some potential customers can leave the companies and move to the competitors.

→ *Continuous focus on customers*

8. Be flexible

Nguyen and Kleiner found that it is important to be flexible in terms of integration process. Integration is all fine and good, but to become a market leader after the merger requires unity of strengths. For example, when the acquired company has a good performance in sales and marketing than the acquiring company, then it is better to let the sales and marketing department from the acquired company operate independently. This requires minimal integration with the acquiring company to maintain its unique characteristics.

To be flexible may be good for integration process. However, it is also dependent on which kind of integration that is chosen by the company. If the company chooses to have preservation integration, it means that the company can maintain their unique characteristics. It will be differently for company that have symbiotic or absorption or transformation integration. It is not easy to be flexible. When a company already decided to choose transformation as integration approach, it means that they already chose to completely transform the whole organization and structure, which means that there is a small chance to maintain the old characteristics of a company. This factor is high related on the level of integration that a company chooses which must be discussed in the beginning before the merger starts. There is still little evidence to be able to support this finding. Hence the relatedness and the importance to be flexible in integration process have to be researched thoroughly. Therefore it will be not included in this research.

The factors that can be derived from Nguyen and Kleiner (2003) are:

1. *Senior executive must be actively involved*
2. *Having clear and precise vision before the deal is done*
3. *Continuous focus on employee*
4. *Managing culture differences*

5. *Strong integration team*
6. *Adequate multidirectional communications*
7. *Provide clarity around roles and decision lines*
8. *Continuous focus on customers*

2.2.3 Five drivers of success in PMI according to Epstein (2004)

Another research on success of the PMI is done by Epstein (2004). According to him, there are five drivers of success in PMI. Failure on any one of the five can impede the achievement of merger goals. These five drivers of success are:

1. Coherent Integration Strategy

The first drive of success is a well articulated integration strategy how the merger will be integrated. The implementation of the integration strategy occurs when making decisions on the new organizational structure. All decisions should be made on the basis of a neutral, objective decision-making process that considers the solutions employed in the previous organization, as well as any other alternatives, along with the system conversion costs.

The integration strategy must include a commitment to address two key constituencies in every aspect of the PMI: Employees and Customers. These constituencies extend into all five drivers of success, since a successful PMI ascertains the impact on customers and employees for nearly every decision. Because of this reason, the employee and customer factors by Epstein will be used further in this research.

A well-conceived and well-articulated integration strategy will fail if employees aren't prepared to implement it, and customers aren't inclined to give their business to the new company. Furthermore, the integration strategy must be carefully developed to implement the strategy for the merger itself and execute on the strategic vision and strategic fit that led to the merger decision.

The integration strategy has to be well articulated. If not, it will result in ambiguity on both companies, which will impede the success of the PMI process. Defining the integration strategy is a part of having clear and precise vision for both companies, and this can better be done before the deal is done. This point can be included into factor having clear and precise vision before the deal is done from De Noble et al. (1988) and Nguyen and Kleiner (2003).

→ *Having clear and precise vision before the deal is done*

→ *Continuous focus on employee*

→ *Continuous focus on customers*

2. Strong integration team

The team must be a discrete, full-time function with ample resources and strong leadership. Most team members should be dedicated full-time to the PMI, and the team should be balanced with members of both companies. Not forgotten the PMI leader, who should be ambitious, confident, and a fully dedicated senior executive who disavows all biases stemming from the leader's former company. A very important factor of the integration team is to ensure that the integration process is seamless from the customer's

perspective. They must eliminate any culture clash in the new organization. It can be disastrous if the company culture is not well integrated.

It is the role of the integration team to make the day-to-day decisions that will drive the process forward, to provide guidance throughout the implementation phase, and to develop operating charters for task forces along with coordinating the data and recommendation that come in from these task forces. Therefore, it is needed to have a strong integration team. They are responsible for overseeing the integration of all administrative, physical, organizational, and cultural aspects of the consolidation (Tetenbaum, 1999). Members of the team should be assigned on a full-time, permanent basis. Most M&A are one-time events for their companies. Few go through the process often enough to develop a pattern. Individuals who have most successfully filled transition roles benefit from a mix of technical expertise, managerial proficiency, and interpersonal skills. They also require sensitivity to deal with the egos, anxieties, and needs of people above, below, and beside them in the organization. Beyond this, members of the integration team should believe in the prospects of the combination and be genuinely excited about the opportunity at hand (Marks and Mirvis, 2000). Furthermore, it is important to maximize employee involvement in the integration team as said before by Nguyen and Kleiner (2003).

A good team leader is a must in a strong integration team. The role of leader for the integration team leader is vital to the success of the implementation phase of the process. Given the complexity of the task, the inordinate amount of time it consumes, and the huge responsibility it bears, the leader of the integration team should be assigned to the role full-time. Leaders have to help their teams clarifying people's roles and setting ground rules.

→ *Strong integration team*

3. Communication

During the whole process of PMI, and particularly at the beginning of the process, communication from senior management is a very important factor. It must be significant, constant, and consistent. Each constituency must receive information that explains its role in the merger with a presentation that is tailored to them and consistent with the overall company message. Customers and employees need a very high level of communication throughout the process because of high levels of uncertainty about the impact of the merger on their individual wellbeing.

This point is in accordance with the point of Nguyen and Kleiner (2003). See further on page 21

→ *Adequate multidirectional communications*

4. Speed in implementation

Early completion of integration projects can both mitigate risk and permit an earlier realization of merger benefits. Immediate planning and design following the agreement is essential for a rapid PMI. Companies that move too slowly in the integration process face a number of threats, especially with regard to the two key constituencies. Employees may regard the slow pace as a sign of uncertainty and may pursue opportunities at rival

companies where the situation seems more stable. Customers may likewise fear instability and seek competitors' products if the visible aspects of the integration are not achieved rapidly. This point is in accordance with the last lesson from De Noble et al. (1988). See further page 17

→ *Speed in implementation*

5. Aligned measurements

A successful PMI requires the creation of measures that are well-aligned with the merger strategy and vision. To easily monitor progress throughout the organization, targets and milestones must be created in all areas and sophisticated tracking systems must be created. The integration team should tailor specific metrics that are consistent with organizational goals and relevant to employees throughout the organization. Both financial and non-financial measures should be included in the information provided to integration and business leaders to adequately monitor performance. This includes both process and results measures that report on past performance and are predictors of future performance.

According to Gates and Very (2003), measuring performance is needed to monitor the progress of the integration process. They found that if many acquirers are not rigorously tracking their integration progress, it is not surprising that they face difficulties in reaching their acquisition objectives. Integration can be very challenging when it implies major changes at both companies' organizations, and this argues for a careful supervision of its implementation. Any M&A possesses its own characteristics, therefore the integration process and its supervision must be designed according to the contingencies of the specific deal. According to researchers, adaptation in integration should increase chances of creating value (Gates and Very, 2003). Consequently, measuring performance should help guide and orient the integration.

→ *Aligned measurement*

The PMI factors that can be derived from the work of Epstein (2004) are:

1. *Having clear and precise vision before the deal is done*
2. *Continuous focus on employee*
3. *Continuous focus on customers*
4. *Strong integration team*
5. *Adequate multidirectional communications*
6. *Speed in implementation*
7. *Aligned measurement*

2.3 The factors that enhance the PMI process

The factors that are derived from De Noble (1988) et al., Nguyen and Kleiner (2003) and Epstein (2004) are summarized in the table below.

Factors	Factors derived from:		
	De Noble et al (1988).	Nguyen and Kleiner (2003)	Epstein (2004)
1. Having clear and precise vision before the deal is done	√ p. 15	√ p. 20	√ p. 24
2. Cross fertilize management teams	√ p. 16	-	-
3. Continuous focus on employee	√ p. 16	√ p. 20	√ p. 24
4. Managing Culture differences	√ p. 17	√ p. 20	-
5. Strategy and structure should be linked	√ p. 18	-	-
6. Speed in implementation	√ p. 18	-	√ p. 25
7. Senior executives must be actively involved	-	√ p. 19	-
8. Strong integration team	-	√ p. 21	√ p. 24
9. Adequate multidirectional communications	-	√ p. 21	√ p. 25
10. Provide clarity around role and decision lines	-	√ p. 22	-
11. Continuous focus on customers	-	√ p. 22	√ p. 24
12. Aligned Measurement	-	-	√ p. 26

Table 1: Factors that enhance the PMI process

This table shows the PMI factors that were derived from three studies. The factors that occur twice or more in table 1 will be regarded as important factors that enhance the PMI process. It means that the important PMI factors found in this research are: *having clear and precise vision before the deal is done, continuous focus on employee, managing culture differences, speed in implementation, strong integration team, adequate multidirectional communications, continue focus on customers.*

Furthermore, it is important to see whether there are differences of PMI factors in each integration approach. However, the results show no significant differences between each integration approach. Therefore, this work has been replaced to appendix 1.

Conclusion

In this paragraph, the PMI factors that enhance the PMI process were discussed. First of all, the integration approaches were described. Then three studies in M&A field were elaborated in order to find the PMI factors.

In conclusion, there are seven factors that are important to enhance the PMI process. These factors are:

1. *Having clear and precise vision before the deal is done*
2. *Continuous focus on employee*
3. *Managing culture differences*
4. *Speed in implementation*
5. *Strong integration team*
6. *Adequate multidirectional communications*
7. *Continuous focus on customers*

Furthermore, since the result of appendix 1 is based on individual opinions, more studies are needed to deepen the result of it. It can be done by looking for the relation between the PMI factors and the integration approaches to find how the factors affect the integration approaches.

3. Innovation management literature

This section describes the innovation management factors that can enhance the innovation performance. This section is presented as follows: first, the ten factors by Tidd et al. (2001) will be described. They based the factors on organization theory perspective. The factors that were found important will be selected and used further in this research. Some other studies also will be used to support these factors. Second, the funnel that represents the development process of innovation that was found by Wheelwright and Clark (1992) will be discussed.

3.1 Organizational innovation management factors

The importance of innovation for the competitiveness of companies and as an engine of growth is widely recognized (Hitt et al., 1993; Tidd et al., 2001; Tucker, 2002, as cited by Xu et al., 2007). Innovation is also seen as a tool for organizations to survive in today's turbulent environment. What does actually innovation mean? Many researchers come with their definition of innovation. In this paper, the definition of innovation is described simply as "the successful exploitation of new ideas", which is offered by the Innovation Unit of the U.K. Department of Trade and Industry as cited by Bessant (2003). In the innovation process, the importance of managing innovation is significant.

The challenge to managing the innovation process well is to ensure a broader and integrated view to underpin the structures and procedures which companies put in place to make it happen (Bessant, 2003). Organizations need to reflect and review the experience of success and failure- in order to learn about how manage the process better, and to capture relevant knowledge from the experience.

Innovation management is about learning to find the most appropriate solution to the problem of consistently managing this process, and doing so in the ways best suited to the particular circumstances in which the organization finds itself (Bessant, 2003). There is no one best way to do this. Nevertheless, there are certain innovation management factors that might enhance the performance of the innovation process and these factors were described below.

An important influence on success and failure on innovation is the organizational context in which the innovation is created and implemented. Tidd et al. (2001) found ten factors that enhance the innovation performance in this organization context. Those are:

1. Shared vision, leadership and the will to innovate

Articulation of a new vision is needed when a company wants to create an innovative climate. This vision has to be shared in the company and it arises from a good leadership. Talking about good leadership means that companies cannot ignore the importance of a presence of top management. Top management commitment is a common prescription associated with successful innovation; the challenge is to translate the concept into reality by finding mechanisms which demonstrate and reinforce the sense of management involvement, commitment, enthusiasm and support. According to

Tidd et al. (2001) the message for senior management is as much about leading through creating space and support within the organization as it is about direct involvement.

Research on innovation and leader effectiveness studies found that top management positive influence outcomes of innovation processes in organizations (Sastry, 1999; West et al. 2003; den Hartog and Verburg, 1997; Howell and Higgins, 1990). Leadership factors affect top management influence on innovation in several ways: through internalization/personal identification, encouraging diversity of opinions, providing protected environments, and compliance (Elenkov and Manev, 2005).

There are many advantages in delegating this important task to a management group, instead of a single manager according to Deschamps (2003):

1. Broader and more formal review of the idea's merits and risks
 2. More objective assessment through multiple perspectives
 3. More credible justification for decisions (positive or negative)
 4. A pool of resources for coaching initial projects
 5. More visibility and transparency in evaluating and selecting ideas
- Leadership by top management team

2. Appropriate organization structure

It is very important to focus on the structure of the organization where the innovation process takes place. The surrounding organizational context must be favorable.

Of course, the organizational context of one company is different than the other companies. Mintzberg drew much of the work on structure together and proposed a series of archetypes which provide templates for the basic structural configuration into which companies are likely to fall. Tidd et al. (2001) combined this work with their implications for innovation management, as summarized in appendix 2. The key challenge here for managing innovation remains one of fit, which is getting the most appropriate structural form for the particular circumstances. If there is a good fit, structure will enable and reinforce innovative behavior. That is why it is important to know which organization type does the company have, and from there the innovation process can be managed according to the organization type.

Increasingly we see the individual enterprise becoming linked with others in some form of collective (e.g. a supply chain, industrial cluster, a co-operative learning club, etc.). These networks can enhance innovative performance in some way. Networking represents a powerful solution to the resource problem. Sometimes it is no longer necessary to have every resource for innovation since they can be obtained from the networks. However, the risk is high that simply throwing together a group of enterprises will lead to suboptimal performance with the whole being considerably less than the sum of the parts due to friction, poor communications, persistent conflicts over resource or objectives, etc. Thus, it is very important to manage this very carefully and having shared commitment to deal with the others in a network.

→ Linking the organization structure and the managing process

→ Having complementary networks

3. Key individuals

There are several roles which key figures can play which have a bearing on the outcome of a project. For example, the inventor, this is known as the source of critical technical knowledge and responsible for an invention. Or the team leader, who have the organizational power to make sure things come more distant. Tidd et al. (2001) found those roles above are important to the success of the innovation. These key figures play roles which have a bearing on the outcome of a project. In addition, there is also one role that is found important in the innovation process. And that is gatekeepers (Tidd et al., 2001, Maidique, 1980). Innovation is about information and success is strongly associated with good information flow and communication. Study has shown that such networking is often enabled by key individuals within the organization's informal structure who act as gatekeepers (Tidd et al., 2001). According to Maidique (1980) gatekeeper's role involved acting as a clearing house for technical information for technologists. They acquired and translated external technological knowledge and then disseminated it to colleagues within the organization. Given the informal nature of much communication, gatekeepers used their extensive networks of personal communications both inside and outside the organization to keep their colleagues informed (Smith, 2007). This role is also becoming of increasing importance in the field of knowledge management and absorptive capacity (see page 35).

It is still uncertain whether the gatekeepers are the most important key individual in the innovation process, but it is sure that the role of gatekeepers cannot be missed in the innovation process. In any case, having of several key individuals in innovation process cannot be missed. Furthermore, in this research this factor will be named as having key employees. This is due to the fact that employees have a broader context and it is in relation with PMI factor.

→ Having key employees

4. Stretching Training and Development

To create a high-performance company, it is very important to get the organizations to commit to training and development. According to Tidd et al. (2001), studies at national, sector and individual company level stress the relationship between investment of this kind and innovation capability. The reason for this is that the ability of an organization to make the best use of new equipment or to produce products and services with novelty in design, quality or performance depends to a large extent on the knowledge and skills of those involved in producing such innovations (Tidd et al., 2001). Equipping a company only with new equipments, procedures or concepts are not enough. It needs training and development which can take a broader role. These processes also act as a motivator for the employee because they value the experience of acquiring new skills and abilities, and they also feel valued as part of the organization. It is also an empowerment exercise, where it enables people to take on more responsibility and demonstrate more initiative, which is very important in innovation process. Training and development can also be used to develop the habit of learning, which is a core element in continuous learning and sharing of new knowledge.

→ Provide training and continuous development for the employee

5. High involvement in innovation

Whereas innovation is often seen as the province of technical specialists in R&D, engineering or design, the underlying creative skills and problem-solving abilities are possessed by everyone. Although each individual may only be able to develop limited, incremental innovations, the sum of these efforts can have far-reaching impacts (Bessant, 1999). The organizational culture is the one that supports a continuous incremental innovation and encourage it over the long term. This point has been recognized in a number of different fields, all of which converge around the view that higher levels of participation in innovation represent a competitive advantage (Tidd et al. 2001). These higher levels of participation in innovation can be done through continuous improvement (CI). CI is defined as an organization-wide process of focused and sustained incremental innovation (Bessant and Francis, 1999). It results from a collection of attributes which are built up over time and represents an important element in dynamic capability, which is very important in a company, since it offers mechanisms whereby a high proportion of the organization can become involved in its innovation and learning processes (Bessant and Francis, 1999). Its strategic advantage is essentially as a cluster of behavioral routines, but this also explains why it offers considerable competitive potential, since these behavior patterns take time to learn and institutionalise, and are hard to copy or transfer.

Involvement of employees in CI may provide a powerful aid to effective management of change, since the turbulent nature of most organizational environments is such that increasing levels of change are becoming the norm. CI may also offer a way of smoothing the process in solving problems in successful innovation which are concerned with organizational adaptation.

→ Having continuous improvement capability

6. Effective team working

What companies tend to forget is that innovation is a corporate-wide task, involving production, marketing, administration, purchasing and many other functions. Experiments indicate that groups have more to offer than individuals in terms of both fluency of idea generation and in flexibility of solutions developed. A good project team for innovative tasks results from a combination of selection and investment in team-building, allied to clear guidance on their roles and tasks, and a concentration on managing group process as well as task aspects. According to studies involving different US companies, effective team building is a critical determinant of project success, as key driver to effective performance (Forrester and Drexler, 1999). Research has shown that the most effective teams are those with diversity in background, ability and behavioral style. Thus it is important to remind that when forming a group. By sharing values and norms governing the way team will work, the teams can move on to effective performance of their task. According to Tidd et al. (2001) there are other influential factors that affecting performance of the team. Those are team size, team structure, team process-the way in which meetings are organized and decisions taken, team leadership, team environment/organizational context.

Teams are increasingly being seen as a mechanism for bridging boundaries within the organization- and indeed, in dealing with inter organizational issues. Cross functional

teams can bring together the different knowledge sets needed for tasks like product development or process improvement. They also represent a forum where often deep-rooted differences in perspectives can be resolved (Jassawalla and Sashittal, 1999).

→ Forming cross functional teams

7. Creative Climate

In creating creative climate in a company, it is important to recognize that creativity is an attribute which everyone possesses, but their preferred style of expressing it varies widely. Some people are comfortable with big ideas and some people prefer smaller increments of change. This has major implications for how managers manage creativity within the organization. Creating some kind of climate in a company has to do with the culture that is embedded in a company. Culture basically equates to the pattern of shared values, beliefs and agreed norms which shape behavior. It is obvious that management cannot directly change culture, but they can change structures or process by providing modes and reinforcing preferred styles of behavior. Rather than just encouraging people or teaching tools, there are other ways to obtain a creative climate, which involves systematic development of organizational structures, communication policies and procedures, reward and recognition systems, training policy, accounting and measurement systems and deployment of strategy (Tidd et al., 2001). This factor is supported by the finding of Fischer and Farr (1985) and Kanter (1983), as cited by Mohamed and Rickards (1996). They identified organizational climate as an important antecedent of innovation.

→ Building a creative climate in the organization

8. External Focus

External environment is also important in innovation process, whether it is threats or opportunity. The company has to pick these external signals and communicate them through the organization. Developing a sense of external orientation-towards key customers or major technological developments-and ensuring that this pervades organizational thinking at all levels are of considerable importance in building an innovative organization. It is important for the success of innovation to understand user needs. By developing a widespread awareness of customers-both internal and external-quality and innovation can be significantly improved (Tidd et al.2001).

An important point in this factor is building relationships which enable clear and regular communication, providing inputs for problem-solving and shared innovation. Examples of mechanisms for enabling a broader awareness of internal and external customers are (Tidd et al.2001): voice of the customer techniques (such a quality function deployment), visits to customers and supplier by different groups of employees, internal customer training and involvement with customers.

The importance of focusing on customer in innovation management is not only found by Tidd et al. (2001) but also proved by other studies (Lukas and Ferrell, 2000; Christensen and Bower, 1996)

→ Continuous focus on customers

9. Extensive communication

Extensive communication in this sense means communication which is multidirectional (up, down and laterally) and which makes use of multiple channels and media. Many problems occur in innovation process due to the failure of adequately communication between different functional elements in the process. It happens a lot in a company where there is little integration between functions (R&D, marketing, sales, etc.) and where communication tends to be top-down and one way in character. In this way, smooth information flows and cross-functional co-operation would be very difficult to achieve. That is why it is so critical to develop a mechanism for resolving conflicts and improving clarity and frequency of communication across the different elements in the company (e.g. R&D, marketing, sales, etc.). Gatekeeper also plays a role in this communication process. According to Tidd et al. (2001), mechanisms for enhancing communication include (1) job rotation and secondment, (2) cross-functional teams and projects, (3) policy-deployment and review sessions, (4) team briefings, multiple media-video, notice boards, electronic mail, etc. Another reason for the importance of communication is that it can reduce uncertainty. It can break down barriers to innovation caused by fear or lack of knowledge. If employees have higher degree of interdependence to cooperate with others, then they are more likely to share information because of self-interest and reciprocity (Liano, 2006).

→ Building extensive multidirectional communication

10. The Learning Organization

In learning organizations, knowledge is seen as the basis for competition and managing knowledge becomes a primary task, especially in innovation process. Innovation can be represented as a learning cycle, involving a process of experiment, experience, reflection and consolidation (Tidd et al. 2005). This process has to be well managed where learning opportunities emerge and are exploited.

Organizational learning is not simply the sum of each employee's learning, although organizational learning occurs through individuals. Organizations do not possess a brain, but they have cognitive systems and memories. Learning enables organizations to build understanding and interpretation of their environment and to assess viable strategy (Fiol and Lyles, 1985). An organization committed to learning is likely to possess state-of-the-art technology, which leads to greater innovation capability in both products and processes (Calantone et al., 2002).

Based on the literature (Liano, 2006; Calantone et al., 2002; Hurley et al. 1998), the values of organizational learning capabilities revolve around its (1) commitment to learning, (2) open-mindedness, (3) shared vision and (4) intra-organizational knowledge sharing. The latter is included because learning cannot occur unless an organization has an effective and efficient system of information sharing which allows a reexamination of past decision strategies and implementation activities. In addition to these four dimensions, to encourage learning, organization must provide good communication channel and the feel of trust (Liano, 2006).

All of the innovation management factors above are also part of the learning organization. By applying those factors, a learning organization can be obtained automatically. Because of this reason, it is not necessary to put learning organization as a

factor. Other two important part of learning organization are absorption capacity and knowledge management. These two factors were mentioned several times in the innovation management literature as important factors in managing the innovation process. Therefore these two factors will be further included in this research and were described below.

11. Absorptive Capacity

According to Cohen and Levinthal (1990), absorptive capacity refers to a company's ability to identify, assimilate and exploit knowledge from external environment. The absorptive capacity of an organization depends on the absorptive capacities of its individual members. To this extent, the development of an organization's absorptive capacity will build on prior investment in the development of its constituent, individual absorptive capacities, and, like individuals' absorptive capacities, organizational absorptive capacities will tend to develop cumulatively. However, a company's absorptive capacity is not simply the sum of the absorptive capacities of its employees. Beyond diverse knowledge structures, the sort of knowledge that individuals should possess to enhance organizational absorptive capacity is also important. Accumulating absorptive capacity in one period will permit its more efficient accumulation in the next. By having already developed some absorptive capacity in a particular area, a company may more readily accumulate what additional knowledge it needs in the subsequent periods in order to exploit any critical external knowledge that may become available. To understand the sources of a company's absorptive capacity, it is also important to focus on the structure of communication between the external environment and the organization, as well as among the subunits of the organization, and also on the character and distribution of expertise within the organization (Cohen and Levinthal, 1990). As said before (see 3.1 point 3), gatekeeper's role may be very important in this factor because the company's absorptive capacity depends on the individuals who stand at the interface of either the company and the external environment or at the interface between subunits within the company.

→ Having absorptive capacity

12. Knowledge Management

According to Janszen (2000), to be able to permanently innovate, knowledge is paramount. Knowledge management is one of the key constituents of the innovation management process. Knowledge management is emerging as an important concept and is often cited as an antecedent of innovation (Carneiro, 2000; Dove, 1999). According to Darroch and McNaughton (2001), knowledge management is the management function that creates or locates knowledge, manages the flow of knowledge within the organization and ensures that the knowledge is used effectively and efficiently for the long-term benefit of the organization. When knowledge is used, learning takes place, which in turn improves the stock of knowledge that is available to the company. Therefore, a company that effectively manages knowledge is also likely to be a learning organization (Sinkula et al., 1997) (see page 34). According to Dove (1999), knowledge management is responsible for having the right knowledge in the right place at the right time. This means that the knowledge must be available sufficiently in advance, the

knowledge must be in the right specific person and the knowledge must anticipate emerging needs, satisfy current needs, and weed out the obsolete needs-everywhere in the organization. The role of gatekeepers in this factor is significant since they are needed to enabling effective sharing and communication of valuable knowledge resources.

→ Manage the knowledge within the organization

This section described the factors that are brought by Tidd et al (2001) and also two other factors that were found in the innovation management literature in organizational theory. All of these factors were found important because of their influence on the innovation performance. Those factors are:

1. *Leadership by top management team*
2. *Linking the organization structure and the managing process*
3. *Having complementary networks*
4. *Having key individuals*
5. *Provide training and continuous development for the employee*
6. *Having continuous improvement capability*
7. *Forming cross functional teams*
8. *Building a creative climate in the organization*
9. *Continuous focus on customers*
10. *Building extensive multidirectional communication*
11. *Having absorptive capacity*
12. *Manage the knowledge within the organization*

The innovation management factors named above are the factors that can enhance the performance of innovation. The list provides all the needed factors that have to be taken into account in managing the innovation. However, these factors valid for innovation management in general, not for the M&A context. In 4.2 these factors will be altered according to the changes caused by M&A. Thus, the factors named above will act as a foundation for further research in the next section, where the relation between M&A and innovation factors will be established.

3.2 Development funnel

In this section, the innovation management process by using the development funnel will be discussed. It is important to include this development funnel because then we can see how the development process from ideas to reality (called as innovation practices) is realized. Hence, this development funnel focuses more on the process rather than the organization, as Tidd et al. (2001) did.

Wheelwright and Clark (1992) described in their book the famous innovation funnel which is defined by the way the organization identifies, screens, reviews, and converges on the content of a development project as it moves from idea to reality (see figure 3).

Managing the development funnel involves three very different tasks or challenges. Those tasks, which are related to the stages of innovation, are (see figure 3):

1. Widen the funnel's mouth

In this stage, the organization must expand its knowledge base and access to information in order to increase the number of new product and new process ideas. This can be achieved by for example having relationships with university and research labs for more technical ideas to soliciting creative inputs from manufacturing, marketing, customers, and suppliers.

2. Narrow the funnel's neck

After generating a variety of alternative concepts and ideas, management must screen variety of alternative concepts and ideas and focus resources on the most attractive opportunities. The hard part is to narrow the neck of the funnel while ensuring that a constant stream of good projects flows down it. This narrowing process must be based on as set of screening criteria that fit the company's technological opportunities while making effective use of its development resources in meeting strategic and financial needs.

3. Ensure that the selected projects deliver on the objectives anticipated when the project was approved.

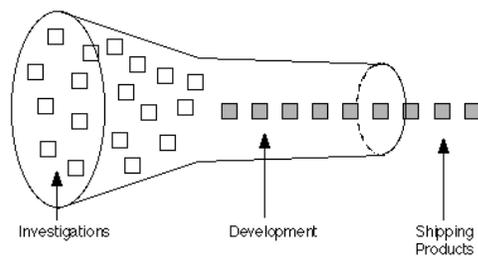


Figure 3: The Development Funnel (Wheelwright and Clark, 1992)

According to Wheelwright and Clark (1992) innovation funnels vary strongly in practice. Even in situations where managers have created a screening and review process, the actual funnel is different than in the theory. Because of this reason, Wheelwright and Clark made three alternatives models based on three sets of dimensions that define the choices companies make about the development funnel. The model that is used in this research will be model III. The explanations of model I and II can be found in appendix 3.

Model III

The third model offered by Wheelwright and Clark (1992) is much more appropriate ideal for a development funnel that combines and integrates the best features of the first and second models (see figure 4). It operationalizes an approach that is very close to the simple concept shape (see figure 3). This third model is called innovative and focused. According to Wheelwright and Clark (1992), the real power of the Model III development funnel is derived from three sources: avoiding the problems inherent in Models I and II, folding a creative set of innovative ideas into a logical set of development projects, and ensuring those project tie directly to the business strategies.

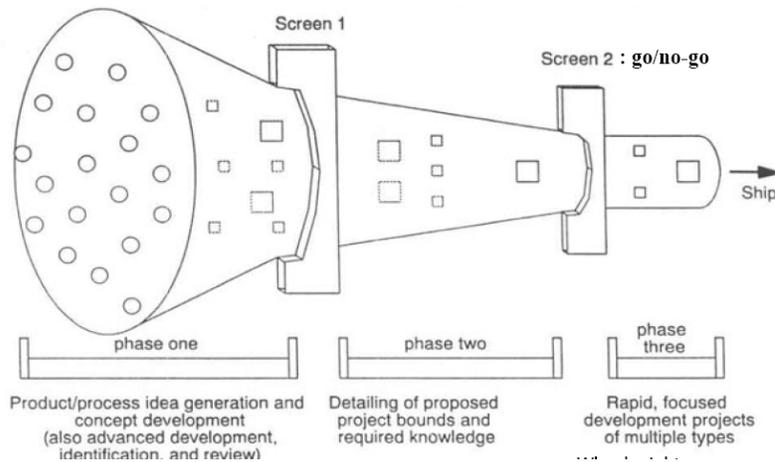


Figure 4: Model III (Wheelwright and Clark, 1992)

- Phase 1

The initial part of the third model development funnel represents the concept development and idea generation for potential product/process efforts. The intent in this stage is to dramatically expand the mouth of the funnel. This can be done in a number of ways, gathering ideas from a variety of sources rather than just R&D. One means for enlarging the mouth of the funnel is to institute procedures and incentives that encourage innovation and input from all parts of the organization as well as from customers, competitors, and suppliers. Each sub function and groups in the company needs to view itself as having significant responsibility for generating new ideas and concepts, and identifying ways in which they might be incorporated into products, services, and manufacturing processes. To encourage such behavior, recognizing individual and group contribution through competitions and awards can be done (Wheelwright and Clark; 1992).

- Screen 1

As shown in figure 5, a narrowing of the funnel occurs at Screen 1, which comes at the end of the product/process concept development stage. It is a review by a mid-level group of managers (peers) drawn from the individual functional units to determine what additional information is needed before a go/no-go decision (screen 2) can be made. Screen 1 can be thought of as a “completeness” or “readiness review rather than as a decision review. It is important that a time line be associated with individual ideas critical to carrying out the aggregate project plan, while not all ideas need to be reviewed every time. The intent in screen 1 is to periodically (quarterly or monthly) review the status of those ideas in the concept development stage of the funnel, which can also be conducted by a cross-functional team. While not all ideas need to be reviewed every time, it is important that a time line be associated with individual ideas critical to carrying out the aggregate project plan. As part of screen 1, ideas should be checked for their fit with technology and product market strategies, their potential role in executing the aggregate plan, and their appropriateness as an application of the company’s development resources. In addition, key areas of knowledge critical to the success of potential projects

need to be identified and the way in which they will be accessed needs to be established (Wheelwright and Clark; 1992).

In screen 1, ideas should be checked for their fit with technology and product market strategies, their potential role in executing the aggregate plan, and their appropriateness as an application of the company's development resources. Furthermore, key areas of knowledge critical to the success of potential projects need to be identified and the way in which they will be accessed needs to be established. If the idea is found to be complete, it can be moved into the mid-phase where project bounds are detailed and required knowledge is specified. If the idea is still incomplete and not ready to move on, then the specific tasks needed to complete it so it meets the requirements of Screen 1 can be agreed upon: assignments made for completing them, and the time at which it will next be reviewed at a Screen 1 meeting established. In this way the product/process concept development stage can be completed effectively and efficiently, and the standards for moving to the next stage applied consistently.

Besides reviewing ideas for completeness, Screen 1 carries out a second, important function. It begins to identify competing concepts, ideas that might be integrated into platform development projects, and those that might be most effectively embedded in enhancement or derivative projects.

- Phase 2

This sets the stage for the activity that is to take place between Screens 1 and 2, defining and creating the appropriate sequence and set of platform and derivative development projects. This mid-funnel phase links the development projects under consideration directly to the stated strategies and objectives of the business.

- Screen 2

At screen 2, senior management reviews product and process development options and selects those that will become development projects. Thus Screen 2 is a go/no-go decision point, and any projects passing it will be funded and staffed with expectation that it will be carried through to market introduction. That is, while subsequent project reviews and updates will be held with management once the project is underway in the narrow neck of the funnel, at Screen 2, management commits itself to fund the entire development effort or stops the potential project from going into formal development. The second phase has a very specific purpose which is to take the data and information developed during Phase 1 (concept development) and put it in a form that will enable senior management to evaluate proposed projects against (1) competing and complementary projects under consideration, (2) the functional strategy maps, (3) the aggregate project plan, and (4) the available development resources. If approved, this statement of a project's bounds and the knowledge required for its completion become the starting point for Phase 3 project execution by the development team.

- Phase 3

In this phase, the project that passed screen 2 will be executed. This execution needs the required knowledge for the completion and also all the resources that are needed. When

the execution of the project is done, then the new product or process can be introduced to the market or to the company itself, if it is a new process.

Conclusion

In this section, the innovation management factors by Tidd et al (2001) and the development funnel by Wheelwright and Clark (1992) have been discussed. There are two important factors came up during the literature research of the organizational factors that have not been included before by Tidd et al (2001), those are: the middle management and the fit of the project with the organization strategy. Therefore, these factors were added to the list of organizational innovation management factors. Furthermore, the development funnel of Wheelwright and Clark has been discussed as well. There are three models of development funnel, but the one that is more ideal is Model III. The phases in this development funnel that have to be done to screen the ideas into product concepts were described as well in this chapter.

The combination of Tidd et al. (2001) and Wheelwright and Clark (1992) can be used in enhancing the success of the innovation performance. It is necessary to give an attention not only to how to perform the development process (called innovation practices), but also which organization characteristics that an organization has to have to enhance the innovation process (called innovation structure). The organizational factors that were offered in this chapter can be applied into the organization and the development funnel can be applied into the innovation practices.

4. Theoretical Framework

In this chapter, the relation between PMI, innovation management factors and PMI process in relation to innovation performance will be established. The first part of this chapter will explain the relation between PMI and innovation performance. Consequently, this relation will affect the innovation management factors, which will be discussed in the next section.

4.1 Relation between M&A, PMI and innovation performance

M&A has become an important and quick means to gain access to technology and technical know-how. Hence, M&A can be seen as an alternative to in-house technology development through research and development departments (Chakrabarti et al, 1994). Furthermore, M&A may stimulate innovation for a number of reasons (Man, Duyster; 2005):

1. M&A may solve problems related to the transmission of tacit knowledge, which is difficult to be transmitted from one firm to another.
2. M&A may raise the overall R&D budgets of companies involved which allows them to reap economies of scale and enables them to tackle larger R&D projects than each individual firm could have done.
3. M&A allows firms to have complementary knowledge that can be combined which can result in strengths and develop new technologies or products that each partner on its own would not have been able to create.

Despite the reasons named above, a study done by Man and Duyster (2005) has shown that M&A has a negative and/or neutral effect on innovation. This is caused by some reasons. First, M&A is time consuming which means that the management focuses more on the M&A process and neglect the innovation of the company. Second, there is a chance that the acquiring company is not able to absorb the knowledge from the acquired company which leads to less innovation. The last reason is, the newly merged or acquired firm may be poorly integrated into the other firm or ineffectively managed after the M&A (Hitt et al., 1991). All of these have negative influence on the innovation performance. Hence, poor PMI can destroy the very innovative potential of the target that it sought to acquire (James, et al. 1998). Thus, it is necessary to have a well planned and executed PMI to avoid these problems. It is assumed that when the PMI process is executed properly, it will reduce the problems associated with difficulties in integrating, which results in a good innovation performance. The literature review of the study done by Man and Duyster (2005) showed that when the process of PMI runs smoothly, the innovative performance is higher as well. A well-developed PMI process therefore enhances innovation. For example, the turnover of key managerial and technical employee following M&A can negatively affect the performance of the acquired business. To prevent this, it is important to be able to retain the key employees, which starts from the PMI process. Other relation between PMI process and innovation performance can be seen from the needs of integration team. As said above, one of the reasons of failed

M&A is that the management team tends to focus more on the PMI than the innovation. If top management become less committed to innovation, they will offer fewer rewards and/or incentives to those desiring to create and champion internally based product innovations. In turn, lower level managers become less interested in expending efforts required for the development of product or process ideas that lead to patents. As a result, the transfer of new product ideas to marketable products is less likely to occur. This phenomenon has to be avoided by organizations engaging in M&A. By having a good integration team, the management team will give more attention on the innovation process since the integration team already focuses on the PMI. To summarize, a properly executed PMI process may result in a good innovation performance. The next question will be: how do we measure a good innovation performance. The innovation performance can be regarded as good when the expected synergy from M&A is realized. This can be lower costs of innovation, new product development, more patents produced, new products earlier on the market (Schoch, 2007). Hence, indicators are therefore needed to measure the performance. These indicators will be discussed in the case study design. See chapter 5.

4.2 Effect of M&A on innovation management factors

As discussed above, M&A relates to innovation. Consequently M&A affects the innovation management factors. Innovation management factors consist of several important factors that may enhance the performance of the innovation. Hence, the M&A process will bring changes in the innovation management factors of the merging companies, since companies that have engaged in M&A are more volatile, fragile, etc. The impact of M&A on the innovation management factors are described in table 2. Since M&A affects the innovation management factors, the integration approaches will affect the innovation management factors as well. These relations can be found below the table.

Normal situation	Impact due to M&A
1. Leadership by top management team	Top management team can consists of employees from the acquiring and the acquired companies. This will lead to trust, more communication, and more cooperation between the employees. This top management team has to focus more on the innovation process, rather than the PMI.
2. Linking the organization structure and the managing process	The organization structure will be changed following M&A. This means that there is a possibility that the managing process will be changed, which will fit into the new organization structure.
3. Having complementary networks	Wider networks will be available since the acquired company will bring more networks. This situation has a positive influence on the companies. There is also a chance that there also will be overlapped networks.
4. Having key employees	There will be some key employees coming from the acquired companies. In this context, the managing of these key individuals will

	be more difficult.
5. Provide training and continuous development for the employee	This factor is important for both the existed employees, and the employees coming from the acquired company. By providing training and development, especially the employees coming from the acquired companies will feel that they are treated well and that they have the chance to grow in the new company. This will reduce the anxiety of the new employees.
6. Having continuous improvement capability	Changes in the organisation like M&A are likely to induce changes in the culture, and thus also in the organisation's ability to adopt and explore knowledge.
7. Forming cross functional teams	The cross functional teams in this context will consist of employees coming from acquiring and acquired companies. By doing this, there will be more communication and cooperation between the employees. This process will reduce the anxiety of the employees. By combining them in the team, they will be forced to cooperate together.
8. Building a creative climate in the organization	This will be more difficult since the employee from the acquiring company might be losing their innovative spirit since there is a chance that they will feel lost, angry, etc. after the M&A.
9. Focus on customers	The customers in this context are not only customers from one company, but also from the acquired company. Thus it will be more complicated to focus on customers, since now they serve more customers.
10. Building extensive multidirectional communication	This communication will be more extensive, since there are new employees coming from the acquired company. This communication will be very important since it is needed, not only for the PMI, but also for the innovation performance.
11. Having absorptive capacity	Absorptive capacity is highly needed in this context since there will be external knowledge coming from the acquired company.
12. Manage the knowledge within the organization	It is evident that M&A adds additional layers of complexity and difficulty in knowledge sharing and transfer in organizations.

Table 2: Impact of M&A on innovation management factors

Ad.1.

In preservation, both firms continuous to operate autonomously and the need for strategic interdependence is low. This can lead to a separate R&D department. This means that there will be two management teams, coming from acquiring and acquired companies.

On the contrary, symbiotic and transformation have a high need for strategic interdependence. The companies are stimulated to be integrated as a whole. That means

that the management team might consist of employees coming from both companies, especially transformation approach, where both companies look for new entity. Furthermore, absorption approach needs high strategic interdependence, but has a low need for organizational autonomy. There are two possibilities, whether the management team will consist of employees coming from both companies, or may be consist of only employees coming from the acquiring company.

Ad.2.

Regardless of the kind of integration approach, as soon as the company engages in M&A, the organization structure will change. However, the intensity of the changes will be different between each integration approach. For example, there will be more changes in transformation than in preservation. Changes might be applied for preservation, but it is also possible that the organization structure will not change, since both firms continue to operate autonomously.

Ad.3.

All kind of integration approaches will add new networks to companies engage in M&A. This will enrich not only the acquiring company's networks, but also the acquired company. It might happen that there will be overlapped networks, when the acquiring and acquired companies come from the same sector.

Ad.4.

Key employees are important for the success of innovation performance. Their role will be more significant when the company where they work engage in M&A. After M&A, new key employees will be coming from the other company. Their presence is very important since they can help the companies engage M&A to realize the expected synergy. These key employees coming from M&A activity posses technological knowhow which can be used to contribute to the innovation performance. However, research shows that key employees, including scientists and champions of innovation may leave the company after M&A (Ernst and Vitt, 2000). Therefore, as discussed before in 4.1, key employees have to be treated well from the time when PMI begins. In case of symbiotic, absorption, and transformation approaches, the key employees coming from acquired company will help the upcoming projects. In preservation approach, usually their operations, the R&D operation in this case, will remain independent. This means that the key individuals from acquired company or acquiring company will stay on their position just like before the M&A activity.

Ad.5.

Training and development for employees can take a broader role in M&A context. These processes also act as motivator. Not only for the new employees coming from acquired company but also the employees from the acquiring company. This will create the feeling that the company where they work give them the opportunity to grow. This is very important since there will be lots of ambiguity during PMI. Training and development can also be used to develop the habit of learning, which is a core element in continuous learning and sharing of new knowledge. This continuous learning and sharing of new

knowledge have very significant roles in innovation activities after M&A. Since there will be new knowledge and technological know-how coming from the other company, training and development will act as a way to remain up to date with the new knowledge. Regardless of the kind of integration approach, it is important to provide training and development for employees. However, the intensity or the kind of training and development in the preservation approach may be different from the transformation approach. There will be more training for employees in transformation approach, given that there will be new routines, practices, etc in this approach.

Ad.6.

As discussed before in chapter 3, involvement of employees in continuous improvement (CI) may provide a powerful aid to effective management of change. CI may also offer a way of smoothing the process in solving problems in successful innovation which are concerned with organizational adaptation. This means that CI becomes an important tool after M&A, where there will be many changes occur inside the organization. Just as factor training and development for employees, it is important to have CI ability regardless of the kind of integration approach.

Ad.7.

Cross functional teams in this context will not only consist of employees from different background, but it will consist of employees coming from acquiring and acquired companies. There will be more different background and different culture combined in one team. However, it also depends on the fact whether the R&D department will operate independently or integrated after M&A. When the R&D chooses for preservation approach, then it might be that there will be no employees coming from the acquired company to form the teams. On the contrary, symbiotic and absorption approaches will lead to a team forming consist of various employees since these approaches have a high need for strategic interdependence. Because of this, the employees coming from the acquired company have a chance to work in the same team with the acquiring company. However, there is a chance that the management of this team will be more difficult, since there are more different backgrounds, different culture, and different style of working in one team. On the contrary, a cross functional team in a transformation approach might be easier to manage, since there will be completely new routines, practices, and culture for both companies.

Ad.8.

Sometimes the creative climate in the company will be reduced after acquired by a bigger company that usually has less creativeness. Consequently, it is important to stimulate them to be innovative by encouraging them through some ways, for example reward and recognition systems, training policy. By doing this, the employees will feel more appreciated and will be more motivated.

Ad.9.

In accordance to factor having complementary networks, there will be more customers for companies after M&A. Furthermore, it is important to stay focus on the customers

and this will be more difficult since there are more customers to be served. Moreover, customers will leave when they perceive uncertainty or ambiguity about the future; or when they are concerned about whether existing contracts and agreements will be honored after a deal is closed, or when they have to deal with new procedure and policies.

Ad.10. Building extensive multidirectional communication

Undoubtedly communication is very important in managing innovation. This factor will have a more important role in M&A context than in normal situation. It is important to communicate between employees since communication can resolve conflicts and improve clarity, where employees during M&A usually feel anxiety, stress, afraid, etc. Communication can reduce uncertainty as well. If employees have higher degree of interdependence to cooperate with others, the role of communication will be more significant. In preservation approach, there might be less intensity of communication between the employees coming from acquired company and acquiring company. This is due to the fact that each company will operate autonomously. In this situation, the kind of communication that will be needed is more top down approach, where the management (team) can clarify all the problems and goals after M&A. This can clarify any issues among the employees. In symbiotic, absorption and transformation approaches, the kind of communication is not only top down, but also laterally between employees. Since the employees from both companies will work together, they will need to communicate to each other.

Ad.11. Having absorptive capacity

According to Prabhu et al. (2005), companies that have greater absorptive capacity because of their existing internal knowledge are better at choosing and integrating external knowledge and using it to create still newer knowledge. This means that absorptive capacity in the innovation management is very important, especially in the M&A context.

Since there will be external knowledge coming from M&A, absorptive capacity is needed to be able. By having that capacity, the external knowledge can be identified, assimilated and implemented in the innovation process. Absorption, symbiotic, and transformation approaches might inquire for more absorptive capacity than preservation approach.

Ad.12. Manage the knowledge within the organization

Breman et al. (1999) suggest that it may be difficult to maintain innovativeness in the immediate PMI period because knowledge transfer becomes a one-way process from the acquirer to the acquired, which can make employees in the acquired organisation feel stressed, angry, disoriented, frustrated, and confused. Further information and knowledge are increasingly seen as key resources in the so-called knowledge-intensive companies. To motivate the employees, knowledge sharing is needed, which presumes a motivation. A knowledge-sharing culture involves the exchange of experiences, together with the ability to identify and cooperate with persons in the organisation with complementary competencies, etc. Thus, companies need to develop a knowledge-sharing culture and a common identity, since this helps to identify what the organisation

must know and what capabilities should be developed. Since symbiotic, absorption and transformation approaches need a high degree of interdependence, more knowledge transfer might take place. On the contrary, there will be less knowledge transfer in the preservation approach.

As a matter of fact, all of the factors named above reinforce each other. For instance, when the key individuals are treated well, they will feel appreciated which lead to a better performance. Furthermore, when they have the chance to develop, by training, it will enhance their performance as well. In addition, when they are allowed to work with other employees coming from the other company, they will have the chance to learn from each other and the chance of knowledge transfer will be bigger.

Besides the organizational innovation management factors, the development funnel that has been discussed above (3.2.2) is affected by M&A as well. When companies engaged in M&A and decided to integrate the R&D, there will be two possibilities. First, using one new development funnel combined from the acquiring and acquired companies. Second, using the most suitable development funnel for the R&D, which come from the acquiring or the acquired company. In case of absorption, when two R&Ds work autonomously, each R&D might keep and use its own development funnel. On the contrary, symbiotic approach may combine the development funnels of two merged companies and absorption approach may use the development funnel that fits the best, since it is about assimilation of one firm into the other firm. Transformation approach, on the other hand, might use a completely new kind of development funnel where the two firms will develop new routines and practices.

4.3 M&A, PMI factors, and innovation management factors in relation to innovation performance

After companies engaged in M&A, the next step in the process is to determine the integration approaches they will use. The integration approaches chosen will later determine their focus direction on integration. After drawing up the integration approaches, the PMI process can be executed. The managing process of PMI will be enhanced by taking the PMI factors into account. When this PMI process is executed properly, it may result in a good innovation performance. Furthermore, innovation management factors are needed to be applied as well because they have a significant role in enhancing the innovation performance. Additionally, these innovation management factors are affected by the changes condition, which is M&A. When these steps are taken, the expected synergy can be realized. To summarize this, a framework has been made below.

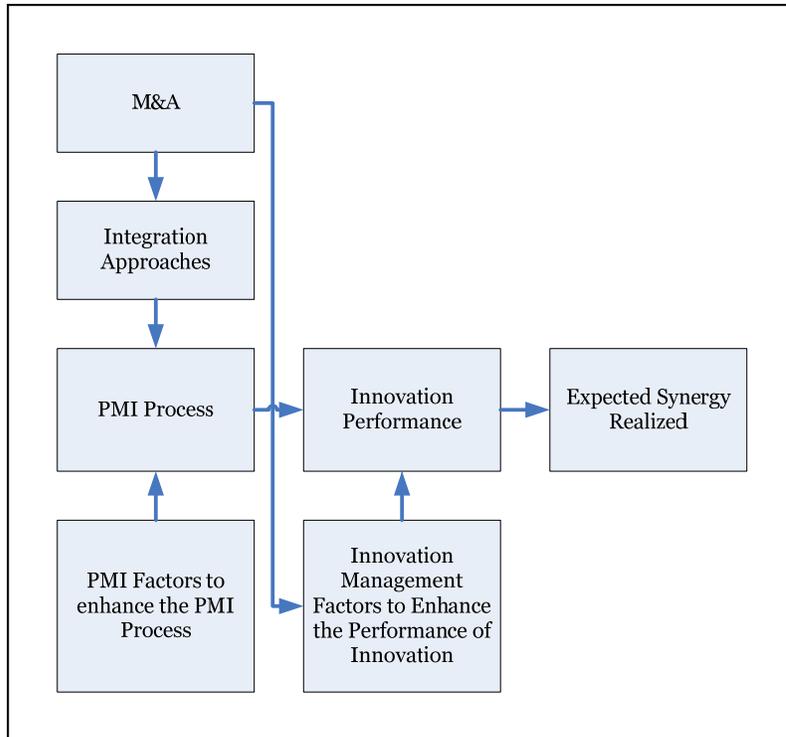


Figure 5: Relation between PMI factors, Innovation management factors and PMI success

Conclusion

Sometimes organizations (especially a mature one) cannot handle a new entrepreneurial subsidiary and its innovativeness and creative ways of working. The merged or acquired company will slowly adapt to the inquisitor or mature organisation's existing, and often stifling management systems. This in turn will lead to increasing inertia and with it frustration, decreasing both employees' motivation and their liking for recklessness. This is the reason why it is essential to apply the PMI factors to get a smooth PMI, and to focus on the innovation process by applying the innovation management factors. As Hitt et al. (1991) said, M&A may enhance or complement a firm's innovation processes when properly planned and targeted. When the PMI factors are applied, the PMI process will be enhanced. When the PMI is executed properly, it may result in a good innovation performance. Furthermore, innovation management factors are also needed to manage the innovation process, which will enhance the innovation performance. When the innovation process is not managed well, it will result in poor innovation performance. Again, M&A has to be used to enhance the innovation performance of an organization, not as substitution for innovation. In conclusion, when the PMI factors and innovation management factors are applied, positive outcomes are expected on PMI process, which may result in a good innovation performance.

5. Case Study Design

In this part, the design of the case study will be discussed. The main purpose of this design is to avoid the situation in which the evidence does not address the initial research questions. This design also shows how the case study in chapter 6 will be done.

5.1 Criteria of the case study

In this research, a case study will be used for the empirical research. The case study approach refers to methods, which emphasize qualitative analysis. The major strengths of a case study are that the researcher can study the bounded case in depth and in its natural setting and has the ability to understand the complexity of the case and its context. Because of these reasons, a case study has been chosen for this research. It will be not easy to get information from inside the company since M&A is quite a sensitive topic. Thus by using a case study, an intense and thorough analysis of the available information can be done so that this research can provide a complete analysis of the case. However, there are some weaknesses of a case study, such as: the lack of controllability, restricted availability of the information and generalizability.

An important aspect in empirical research is the selection of the case study. This selection process can be done by screening the companies available with some criteria. The criteria that a company has to fulfil are:

- The M&A has to be at least three years ago (Ahuja et al., 2001, Angwin, 2004) because then the effect of the M&A can be seen.
- The motivation for the company in engaging M&A comes from technological reason
- The company has some innovation activities, since the innovation process in the case will be studied.
- There is enough information available that is easily accessible

The chosen company for the case study in this research is Cisco Systems (hereafter: Cisco). A thoroughly description of the case study can be found in chapter 6.

5.2 Data collection

According to Yin (1994), there are some sources of evidence for a case study. Those are: documentation, archival records, interviews, direct observations, participant observation, physical artefacts. The source of evidence that will be used in this research is documentation. The strengths of documentation are: stable because of repeated review, unobtrusive exist prior to case study, exact and broad coverage. However, there are also some weaknesses included. Those are: difficult retrievability, biased selectivity, and reporting bias (Yin, 1994). The access to the information is quite difficult since the inside company's information is not published for the outsider. Thus it is important to use other sources of information outside the company as many as possible to be able to provide information about the company and to analyse it based on the facts from the information. Hence, there is a tendency of biased selectivity. Because of this, there is a chance that more positive information will be chosen since it will influence the result of the research. This can be prevented by using other sources of information, not only

information coming from the company itself. Therefore, documentations that will be used in this case study were also obtained from other sources such as business magazines, e.g. Business Week, Financieel Dagblad, Harvard Business Review.

5.3 Data Analysis

In analyzing the case study, it is important to define the questions of the case study. There is one question that will be answered after conducting the case study. The question is: Which factors from the literature research can be found in the case study that enhance the PMI process and innovation performance?

5.3.1 Analysis of Cisco's acquisition process

It is widely known that Cisco has a quite tremendous achievement in acquiring companies. Therefore, an extended analysis about its acquisition strategy and process will be done. The PMI factors and innovation management factors that Cisco has will be discussed as well. The aim is to find whether Cisco also use the PMI factors and innovation management factors that have been found in the literature research (chapter 2 and 3).

5.3.2 Analysis of Cisco's performance by using internal and external indicators

It is necessary to measure the performance of innovation. Indicators are therefore needed, both external and internal. Veldhuizen (2006) made a list for indicators that can be used measuring the performance. The complete list of the indicators can be found in appendix 4. However, not all of these indicators will be used since not every indicator is easily accessible and can be applied to this research. The internal indicator that will be used in this research is the management and the post-M&A process, since this research investigate about PMI. The indicators can be seen in table 3. However, it is not easy to obtain the data's since this is a case study based on documentation. Thus not all of the indicators will be used. Furthermore, the external indicators that will be used in this research are the market and consumer factors. This can be seen below.

Internal/External	Indicators
Internal	
Management and the PMI process	Funds internally available to finance R&D projects
	Scale of the typical R&D project
	Top management of the R&D function replaced
	Companies innovation/R&D strategy
	Companies strategy
	Re-organization of R&D teams
	Less motivated R&D personnel
	Decreased danger of being imitated
	Improved management of the R&D process
	More productive R&D personnel
	Integration team

	Individual treatment of employees
	Attention on cultural aspects
	Line managers involvement
External	
Market	R&D expenditure
	Number of employees
	Number of new products (announcements)
	Number of suppliers
	Market growth
	Market share
	Market concentration
	Extent of entry barriers
	Availability of substitutes and complementary products
	Dominance of suppliers-markets
	Dominance of clients-markets
Consumer	Improved/lower customer satisfaction (product's quality, price, improvements, innovations)
	Product prices
	Diversification

Table 3: Performance indicators

6. Case Study CISCO Systems

This chapter will discuss the chosen company for the case study in this research, which is Cisco Systems (hereafter Cisco), a company in the global internet industry that has been successfully acquired many small companies. The outline of this chapter will be as follow; first the history of Cisco and its acquisitions will be given. Second, the data classification that will be needed to analyze the case study will be elaborated. Third, the analysis of the case study will be done based on the indicators that have been described in chapter 5. At the end, the discussion and conclusion of the case study will be given.

The data for the case study were derived primarily from six case studies collection. Other sources were taken from business journals, such as Business Week, Forbes, Fortune, etc.

6.1 History of Cisco

6.1.1 The beginning, '80s

Cisco is one of the most successful companies in the global internet industry. It started at Stanford University in 1984, where Leonard Basack and Sandy Lerner, a husband and wife team of computer scientist who worked in two different departments, frustrated by the fact that their computers situated in different department ran on different operating systems and, as a result, they could not send email messages to each other (Killick et al., 2001; Prashanth, 2004; Tempest et al., 1999; Yemen et al., 2003;). As a solution, this couple built an IP router (Internet Protocol Router), which enabled the connection of normally incompatible networks.

Basack and Lerner left Stanford and formed their own company, Cisco, at their home until in 1986 they moved its operation to Silicon Valley. Encouraged by the initial success, Cisco started seeking venture capital funding. They received funding of \$2,5 million from a venture capital company, Sequoia Capital in return for a 29,1% equity stake (Yemen et al., 2003).

In November 1988 Cisco's board appointed John Morgridge as its CEO. He expanded Cisco's business in Europe and Japan. He emphasized team building at Cisco and offered stock options to most of the employees, changing the policy of awarding stock options to only executive-level employees. He also made efforts to increase the diversity of Cisco's workforce. By 1988, Cisco's revenues reached \$5,45 million. The company had 35 employees, where 12 out of them are engineers. By late 1989, Cisco's 174-strong workforce comprised of 35 software engineers with the rest from diverse fields including manufacturing, sales and marketing, customer service, finance and administration.

6.1.2 The expansion, '90s

In the early 1990s, the company experienced spectacular growth because of the increased popularity of routers and certain top management changes, including the recruitment of John Chambers, as the Senior Vice-President (Worldwide Sales and Operations).

One of the first things Chambers did after his appointment as CEO was to establish a compensation system tied to team successes and to instil a policy of open communication. One of the reasons why Chambers insists on teamwork was so that he could enact his key plan for decentralisation. According to him, decentralisation was the

only way in which he could sustain a path of high growth for the business and allow the business to be flexible enough to adapt to a fast-moving technological environment. Decentralisation also allowed Chambers to eliminate the layers of management between himself and the customer, thus enabling him to get closer to the customer. Under Chambers's leadership, Cisco grew into a highly decentralized business with presence in five major areas (Asia Pacific, Japan, North America, South America, and Europe), more than 43,000 employees, and operations in 75 countries (Yemen et al., 2003).

Another significant change that Chambers made was a shift in focus from being technologically driven to customer driven. He continuously listens to what his customers are telling him and believes that his customer's needs and wants help guide and shape the future strategy and direction of Cisco. Therefore the engineers were asked to make product modifications that fulfil the customer's requirements. The sales team aggressively promoted the product and added several major corporate customers.

After sometimes, Chambers felt that Cisco was relying too heavily on routers. He felt that Cisco should offer the widest possible range of networking products to its customers. At the same time, Chambers realized that Cisco could not fully depend on its R&D team to come up with new products that catered to the market demands on a regular basis considering that in the mid-1990 the IT industry was very competitive with rapidly shrinking product life cycles. This belief was the one that drives Cisco's acquisition strategy.

6.2 The acquisitions

6.2.1 The reasons

Cisco decided that they wanted to dominate the networking industry. They are striving to be either the number one or number two player in each market segment in which they chose to compete. However, they realised that Cisco's 80% market share of routers would be of little value if the market decided to move to new technologies, thus product diversification was essential given the rapid market developments. An acquisition strategy would enable Cisco to own, develop and market an array of network products and standards as the market demanded them. It is a way to gain access to new technologies (Tempest et al., 1999), just as Chambers said: "We realized that we had to have same way to have the advantages of a big company while acting like a small company from a product development point of view, while retaining big company influence by leveraging our strengths in manufacturing, distribution, and finance across the entire company". He viewed partnerships and acquisitions as the most efficient means of offering customers an end-to-end networking solution and developing next-generation products.

In line with the philosophy of always listening to their customers, Cisco had as one of its objectives a plan to provide a complete solution for businesses. This company provided a variety of end-to-end data networking products tied together by the Cisco brand (Yemen et al., 2003). Cisco focused on acquiring start-up companies that were working on emergent technologies with a promising future in the networking business.

6.2.2 The three step process

Cisco employed a three step process as a standard procedure for acquisitions and to ensure uniformity in execution all across the company (Prashanth, 2004). The three step process is:

1. Evaluating the target company

In the first step, Cisco team made an evaluation of the target company to be acquired and convincing its management regarding the benefits of merging together.

When considering candidates, Cisco looked at five factors (www.forbes.com): *the target company's vision; its short-term success with customers; its long-term strategy; the chemistry of the people with Cisco; its geographic proximity.*

Cisco will examine whether the target company shared a similar business vision. In most cases, the target company had to be on the verge of developing a new product (within the next couple of months), which had the potential to be commercially exploited and generate quick profits. Target companies were categorized by stages of maturity, whether geographically local or distant, or hardware versus software. Four stages of maturity were identified:

Classification		Characteristics	Examples of companies
by Prashanth;2004	by Tempest, Kasper;1999		
Design	Software companies	-primarily engineering companies -no product in production yet in R&D -have no manufacturing -requires the least amount of involvement from the Cisco manufacturing organization during the integration process	American Internet Corporation CLASS data Systems Precept Software Inc. WheelGroup Corporation, LightSpeed International, Inc. Global Internet Software GroupNetsys Technologies TGV Software, Inc. Internet Junction, Inc.
Spin-In	Pre-production hardware companies	-have the technology but they were not yet shipping any product -have already developed a prototype but the product was not yet designed for manufacturability -this type of acquisition was relatively straightforward from a manufacturing integration standpoints, since there was no existing infrastructure with which to contend and no existing customer order backlog to	Clarity Wireless Corporation Dagaz Ardent Communications Corp. Skystone Systems Corp. Telescend Granite Systems, Inc. Nashoba Networks, Inc. Telebit Corp's MICA Technologies

		satisfy	
1 st generation	Small hardware companies shipping product	<ul style="list-style-type: none"> -shipping products to a limited installed base of customer -Cisco acquire these companies for their engineering team and the potential they offered for developing next generation products -do not have the manufacturing quality standards of a mature company in general -integration process had to proceed without impacting the continuity of supply to existing customers 	<ul style="list-style-type: none"> Summa Four, Inc. NetSpeed, Inc. Network Translation, Inc. Grand Junction, Inc. Combinet, Inc. Kalpana, Inc. LightStream Corp. Newport Systems Solutions, Inc. Crescendo Communications
Mature	Mature hardware companies	<ul style="list-style-type: none"> -mature company -large customer base -has manufacturing processes in place -typically took far longer to integrate due to the complexity of the decisions that had to be made -both companies would typically have significant resources to dedicate to the integration process, thereby facilitating the effort 	StrataCom, Inc.

Table 4: The four stages of maturity

Another important factor taken into consideration was whether the values and culture of the company fitted with those of Cisco. In doing this, Cisco’s managers examined several aspects of the company. They reviewed the previous decisions made by the target company and the lessons they had learned from their past mistakes. Cisco checked if the company’s actions were similar to those that Cisco would have taken in such a situation. This was an indicator of synergy in style of functioning. All these things were done to make the integration process easier if Cisco decided to buy. This process is named as due diligence process. The definition of due diligence process in this research is: *the process of investigation, performed by the acquiring company, into the details of a potential target.* This due diligence process is done not only in terms of finance, but also in other factors, such as product portfolio, manufacturing process, organizational structure,

culture of the company, etc. See appendix 6 for an example of due diligence process done by Cisco.

2. Determining the compatibility

In this step, the company to be acquired was examined in terms of how various divisions of the company and its employees fitted with Cisco. An acquisition team, comprising key members from all the departments of Cisco was instituted. The team's task was to assess the extent to which both the top management and the lower level management employees of the potential company could be accommodated in Cisco. Cisco's engineers studied the technological aspects of the company, while the finance personnel looked into the company's financial records. The culture of the target company was also studied closely by Cisco's acquisition team.

Once the acquisitions team was satisfied, the decision regarding the acquisition was left to the top three executives of Cisco's board.

3. Integrating the acquired company

The last step is integrating the acquired company, which is estimated that on an average Cisco took 100 days to complete the acquisition. For this purpose, Cisco put in place an integration team, comprising 15-25 persons, consists of experienced members of both organizations. Cisco appoints one of the senior managers within the acquired company as the integration team leader. The overall team was then divided into sub teams that were responsible for leading key business process conversion tasks. One day after the deal is announced, the Cisco's team hit the company with tailor made orientation programs.

Cisco's HR and business development team visited the acquired company and interacted with the employees to clarify any doubts relating to the deal. The team distributed pamphlets describing Cisco's organizational structure, employee benefits, and the strategic significance of the acquired company for Cisco. Cisco's integration team conducted negotiations with the top management and mapped employees to determine where they would fit. These decisions were based on the experience of employees. Usually the product engineering and marketing departments retained their identity and enjoyed functional autonomy, while the sales and manufacturing departments were merged into Cisco's department.

The IT integration team integrated the acquired company's systems, including its e-mail id, ERP systems, customer care systems and its website with Cisco's systems. In most cases, Cisco was able to achieve the IT integration task well before its deadline, which is 60 days from the date of acquisition.

The employees of the acquired company went through a 30-day tailor made orientation program. The new managers were trained about Cisco's hiring practices, the sales personnel received training on Cisco's products, and the engineers were educated about the development project being undertaken by Cisco. Cisco has done more for the employees from the acquired company to make sure that they felt comfortable. This part will be further explained below.

6.2.3 The people

Because retaining acquired personnel was a directive from the top, Cisco managers told potential employees upfront what to expect. Kate Dcamp, senior vice president of HR at Cisco was a key player in the integration process. After the deal has done, DCamp informed acquired employees of their roles and titles as soon as possible. Each person was given employee stock options. Acquired employees were quickly provided with office space, and instant Cisco training. Compensation, vacation days, tuition reimbursements, and career opportunities were laid out. Beside that, a customized packet of information was also distributed that included descriptions of Cisco's structures, benefits, and the reason for buying the new company. DCamp stressed it was essential that Cisco did "what we said we were going to do" because it built trust, which was essential to communicating effectively and building loyalty. This process took approximately two or three months to complete for companies with 1200 or fewer employees (Yemen et al., 2003). If the take-over company was tiny this could be finished within 10 days.

To make the employee of the acquired company feel at home, Cisco also had developed an approach called the "buddy system". The buddy system involved appointing an experienced Cisco employee to be the "manager of the intangibles" within both the acquired company's engineering and manufacturing organizations, and swapping a handful of Cisco employees with employees from the acquired company. Both the "managers of intangibles" and the on-site Cisco staff would assist employees from the acquired company with questions regarding how to access information and get things done within the Cisco organization. While the "manager of intangibles" position had no official reporting structure beneath it, the role was considered a critical part of the integration process and was reserved for strong performers within the Cisco organization. This buddy system de-stresses a lot of anxiety about how to do things and how to be productive within the Cisco organization. Furthermore, the employees of the acquired companies also benefited from Cisco's history of explosive growth and need for skilled workers. Every redundant person had the opportunity to apply for any Cisco job opening worldwide.

6.2.4 Number of acquisitions

Cisco began with its first acquisition in 1993. Just after that year, Cisco began acquiring many companies, with a minimum of three companies a year till 24 companies in 2000. However, the number of acquisitions made by Cisco drastically reduced from 24 in 2000 to two in 2001 and five in 2002 indicating the cautious approach adopted by the management. After initiating only two new acquisitions, John Chambers decided to focus on the components of business that they could control during the market correction.

Before 2001, entrepreneurs and quick technology development drove the M&A. Post 2001, senior leadership spent more time and energy on inspiring and cultivating internal talent or getting more from the already acquired companies. Acquisitions had laid the foundation for 50 percent of Cisco's business. With the changed economic climate, Chambers and his team decided that market conditions meant Cisco could wait until a target company had a proven product in hand before acquiring it. Till now, Cisco has acquired more than 100 companies. See for full list of Cisco's acquisitions in appendix 5.

6.2.5 Three examples of acquisitions

To get more insight into the acquiring process, three examples of acquisitions done by Cisco will be described below. Three companies were chosen: Stratacom, Summa Four and Cerent. There are reasons for using these examples. First of all, it is expected that more insights into the acquisition process of Cisco can be obtained by describing the process in these three companies. Second, these three companies were chosen to show how Cisco had handled these three different companies. The acquisition of Stratacom was invaluable to Cisco as it helped them refine and develop their acquisition process. It was Cisco's largest acquisition at that time (1996). Handling an acquisition the size of Stratacom enabled Cisco to learn important lessons about the integration process since there were problems during the process. Cerent is also quite a big company that Cisco has acquired. On the contrary, Summa Four is a small company with only 210 employees. It is expected that each acquisition process shows differences.

- **StrataCom (1996)**

StrataCom was acquired by Cisco in 1996. This acquisition has cost Cisco \$ 4 billion. StrataCom was a leading supplier of Asynchronous Transfer Mode (ATM) and Frame Relay high-speed wide area network (WAN) switching equipment that integrates and transports a wide variety of information, including voice, data and video. The acquisition helped Cisco to provide end-to-end solutions across public, private or hybrid networks.

The integration of StrataCom into Cisco took longer than the 90 days which Cisco had publicly stated. The divergent products of the two companies created confusion and Cisco found the leveraging of StrataCom's products through its existing sales channels a difficult task. There are some problems found on this integration. First, an internal challenge for Cisco was to get the company as a whole to embrace the ATM technology. Second, Cisco faced difficulty to convince its 1800 sales forces to push the sale of StrataCom switches as the commissions received from the sale of the StrataCom equipment was much lower than that which they received from the sale of Cisco's routers. Because of these problems, many of the StrataCom sales force were dissatisfied with the Cisco sales approach and resigned from Cisco. Furthermore, Cisco also discontinued one of its previous acquisition products after acquiring StrataCom. Customers who had recently installed that product were angered because of this action. Therefore, Cisco placated its customers by agreeing to compensate them.

The acquisition of StrataCom was one of the only ones of a mature-stage company, which means it made the integration more complicated. This explains why problems occurred during the integration process with Cisco. Another reason for the problem is that the sales force of StrataCom were dissatisfied with the Cisco sales approach which made them resigned from Cisco.

- **Summa Four (1998)**

Summa Four was acquired in 1998 by Cisco for \$ 116 million. It is a leading provider of programmable switches, sold primarily to telecommunications service providers worldwide. This acquisition will enable Cisco to offer value-added telephony applications

to new and existing service providers as well as extending these services to a voice-over-IP (Internet Protocol) infrastructure.

At the time of the acquisition announcement, Summa Four had 210 employees, including 65 development engineers and 23 employees in the manufacturing organization. While there was a good deal of excitement about the prospect of working for Cisco, a number of employees were worried. One manager said, "This is an exciting time, but I worry that a number of changes are going to be forced down our throats." The idea of being acquired by Cisco was still very new to Summa Four's employees.

One of the areas that attracted the most concern was the cultural implications of being acquired by a much larger company. Summa Four's management knew that they were just one of many in a long line of Cisco acquisitions. They had built their business in a simple functional organization, where personal connections and informal processes allowed for quick action. In a larger organization, effective problem solving would likely require a host of specialists and multiple organizational units, resulting in a far more complex process. Some employees worried that the feel of working in the high-energy world of a small business would be lost.

There was also concern about the level of influence that Summa Four employees would be able to exert within Cisco. It was unclear which roles their current products would play among the Cisco offerings, and their ability to guide the integration process might be severely limited. With over 10,000 people working for Cisco, Summa Four employees worried that Cisco would not be very receptive to their input.

- **Cerent (1999)**

In August 1999, Cisco acquired Cerent Corporation for \$6.9 billion. Cerent was a two-year old company that had only introduced its first product to market eight months prior to being acquired by Cisco. This company was a leading developer of next-generation optical transport products. With this acquisition Cisco was entering a new business, the optical transport market.

On the 25th August 1999, Carl Russo (at that time Cerent CEO), informed his staff that Cerent would be acquired by Cisco. Directly after the acquisition announcement, Cerent employee received a folder containing basic information about Cisco, including phone numbers and e-mail addresses of several Cisco executives and an eight page chart comparing the vacation, medical and retirement benefits at Cerent and at Cisco. The next two days Cisco hosted a question and answer session to allay any fears which the Cerent employees might have had. Cisco's reasoning behind the information sessions was aimed at reducing staff uncertainty over the transition period in order not to affect productivity. Chambers also told the Cerent staff that there would be no layoffs resulting from the acquisition.

On the 26th August 1999, Cisco's integration team began plotting Cerent's transformation and started mapping each of the 266 Cerent employees into a Cisco job. On 31st August, Cisco's IT team arrived at Cerent to plan the conversion of Cerent's computer systems. By the 25th September, when Cisco's 23 member integration team met with Cerent executives most of the big decisions concerning Cerent had been made. It was decided that Cerent would continue to manufacture its products at the factory that it was currently using. Cisco learned from their earlier mistakes when it had acquired

StrataCom where approximately one-third of StrataCom’s sales force resigned within a few months as they lost accounts to existing Cisco sales staff and as a consequence of changes to their commission plan. In order to avoid resignations from Cerent staff, Cisco decided that the sales staff were to remain independent and that they would keep their own accounts.

Towards the end of September, Cisco’s transition team had completed the employee mapping exercise. In line with their policy, most employees kept their jobs and bosses. There were approximately 30 were assigned from the 266 employees in order to avoid job duplication with existing Cisco’s employees. After the acquisition, work continued as normal for the former Cerent employees. Mr Russo, the former CEO, commented that the atmosphere was more sober and said: “it feels more like a business and less like a start-up”.

6.3 Managing Innovation in Cisco

To introduce the new product to the market, Cisco has a plan that is called *NPI* process (*New Product Introduction*). This NPI process involved three phases: *Strategy and Planning; Execution; and Deployment*. It is only the early-stage development products that would usually use the NPI process (see software companies in table 4).

Between the strategy and planning and deployment, there are a series of checkpoints to help the various disciplines into the NPI process step by step. The multiple checkpoints were used to ensure that there are shared vision for the new products and a commitment to allocate sufficient resources to it. The three phases and the multiple checkpoints can be found in table 5.

Phase	Checkpoint	Purpose
1. Strategy and Planning	1. Concept checkpoint: ensured that a cross functional team had approved both the product requirement document (PRD) and the business plan attached to it, and was willing to commit resources sufficient to get to the product design point	Designers would have developed a definitive design specification for the product.
2. Execution of the PRD (Product Requirement Document)	2. Execution checkpoint: ensured that the cross functional team agreed on both the design specifications and the revised PRD, and was committed to dedicating the resources required to ship the product on a particular date 3. Orderability checkpoint: About a month before the first product was shipped (close to the end of the execution phase), the product had to pass	The engineering group worked with manufacturing to develop and test prototypes in this phase. Manufacturing groups would conduct a thorough design for manufacturability (DFM) review early in the prototype development process and would help the engineering group develop a product that was easily testable on the Autotest (product testing system).

	<p>this checkpoint. This was a manufacturing driven checkpoint that ensured that the product had passed a rigorous set of criterion before being posted on Cisco's Web Site. The manufacturing group used the checkpoint to ensure they could hit the ship date and meet the expected ramp-up in demand.</p>	
<p>3. Deployment before entering the market</p>	<p>4. Time to quality and volume (TTQV) checkpoint: This checkpoint included analyses on yields and cost, and was designed to ensure that the manufacturing group could make the product cost-effectively at high volumes. This checkpoint was conducted two to three months after production had begun so that sufficient run-rate data could be collected and used for analysis. Once the product had passed this checkpoint, it was produced according to its own roll-out plan and lifecycle.</p>	<p>Once the product passed the orderability check point, it was added to Cisco's price list, and it entered into the deployment phase where it was either slated for "unlimited release"¹ or "controlled release"².</p>

Table 5: NPI process of Cisco (Tempest, N., Kasper, C.G. "Cisco Systems, Inc: Acquisition Integration for Manufacturing (A)", Harvard Business School, Harvard, 1999).

¹Products slated for unlimited release were typically those that were in high demand, had completed all the development milestones, and for which Cisco had significant capacity to build, test, ship, and service.

²Products slated for controlled release were typically those that still faced some degree of design risk.

More than simply adding to its list of offerings, Cisco saw product development as a high leverage item. It is Cisco's goal to quickly convert the new acquired products to its own NPI process to reap significant sales volume improvements. This means that Cisco needs to quickly assess where each of the company's products were in the development process. With this information, Cisco could make an informed decision about which products to convert to the NPI process, and which products were too far along in their development to benefit from the change. Cisco tried to convert as many new products as possible. This NPI process would be implemented within 90 days after the deal is closed (Tempest, Kasper, 1999).

Chapter 6.1-6.3 describes the acquisition process of Cisco. As mentioned above, Cisco has done many acquisitions and it still continues till now. The reason for that is that Cisco wants to provide a one stop solution of creation of information networks. John Chambers, the CEO, think that the only way to stay innovative and to keep up the fast pace of high technology industry is buy doing acquisition. Examples of acquisitions that Cisco has done were described above, which involve the acquisitions of Stratacom, Summa Four, and Cerent. These companies have undergone the same processes in

general. However, there are different outcomes from these acquisitions, due to the fact that each company is unique and their reaction to the acquisition of Cisco is different as well. Another point that can be learned from this case study is that the information from second sources such as journals and magazines are insufficient given that they do not provide inside information. Thus it is more difficult to judge the real situation of the integration process.

6.4 Data analysis

This section elaborates the analysis of the Cisco's case study. First, the analysis of PMI factors that Cisco has will be done in 6.4.1. In 6.4.2 the innovation management factors that enhance the performance of Cisco's innovation will be discussed. At last, the analysis of Cisco's innovation performance will be discussed. This analysis will use the indicators that have been listed before in chapter 5.

6.4.1 PMI factors

There are some PMI factors identified in Cisco acquisitions. The selection of these factors was based on data that were obtained from the case studies documentation and journals. The PMI factors that will be discussed in this section are: *continuous focus on employee, due diligence process, speed in implementation, strong integration team, adequate multidirectional communications, and continuous focus on customer*. To be able to analyze the PMI process, some indicators are used in this section. These indicators have been discussed in chapter 5. The indicators that will be used are the internal indicators of management and post M&A process, which are: integration team, individual treatment of employees and attention on cultural aspects. These indicators are similar to some of the PMI factors. Therefore they will not be discussed separately. Other internal indicators will be not used since there is no enough information to analyze it.

- **Continuous focus on employee**

Since the employees of acquired companies were critical to the success of the acquisition, Cisco went to great efforts to retain them. Integration success was due in large part to the very organized, methodical approach that Cisco took toward managing the experience of acquired employees (Tempest, Kasper; 1999). Their objective during the acquisition and transition is to make the employees whole. That is, their efforts were focused on ensuring that employees maintained comparable-of not better-financial consideration and benefits as they transitioned to Cisco's policies, such as employee stock options that employees from the acquired companies received. It is a fact that Cisco was able to retain a significant number of employees of the companies it acquired. According to a study conducted in 1999 (Prashanth, K., 2004; Fortune Nov 8, 1999), the employee turnover among the employees entering Cisco through acquisitions was just 2.1%, as against the industry average of over 20%. This was lower than even Cisco's overall employee turnover. However, it is still important to acknowledge that there are also employees of the acquired companies that left Cisco after some years. The percentage of Cisco employees who leave voluntarily has crept up from 4.7% in 1999 to 5.6% in 2000 and the departure have included some high-profile executives (Bus. Week, Nov 2000).

That many employees left Cisco can be seen especially in 2000. That year was a difficult year for a high tech industry, where Cisco suffered lapses in key technologies, employees resigned, and its stock fell 38% since March 2000 (Bus. Week, Nov 2000). There is no enough information to determine the reason that made them left Cisco. Was it because of Cisco as a company that is not able to combine the different culture of working or because of the tough year for the industry? However, some says that part of the reason for leaving Cisco is a growing concern that Cisco may be getting too big to move fast. A former software developer for Cisco says some employees feel “boxed-in” by an increasing amount of drudgery which makes it was getting tough to be productive (Business Week, Nov 2000). Furthermore, Cisco had a restructuring program that was announced in 2001, which includes a worldwide workforce reduction. This is due to the fact that the economy was in crisis at that time. However, other evidences show that more than 90 percent of the workers acquired by Cisco have stayed with the company after 2002 (Forbes, June 2006). Cisco claims that 75-80% of its acquisitions have met or exceeded expectations and that the attrition rate of employees for acquired companies is only 6%, which is less than that for the company as a whole (Kraemer, et al. 1999). If it was true that before 2002 some employees have left Cisco because of lacking of good management of the employee, it can be assumed that Cisco has learned from the past to retain more employees after 2002. This factor of employee retention is similar to the PMI factor that has been described in the literature research, which is continuing focus on employee.

- **Due diligence process**

For Cisco, problems related to the culture in the integration process can be avoided by looking the culture of the target company in the due diligence process. Once acquisition contenders were identified, engineers examined the technology and financiers went over the company’s books. Cisco’s team also evaluated the depth of the company’s talent, the quality of its management, and its venture funding-all things aimed at making the integration process easier if Cisco decided to buy. Because they acquired a company as often for its talent as for its technology, management focused closely on cultural matters. Due diligence process has not been mentioned in the literature research of this research. Obviously, this process is very important for Cisco in acquiring companies and it might contribute to the success of Cisco in acquiring so many companies. As mentioned before in the literature research, it is needed to have clear and precise vision before the deal is done. This is also in line with the fact that Cisco screens the target company by looking to the target’s vision, strategy, etc (see the three step processes in 6.2.2). This is a part of due diligence process. This process is important since it can avoid ambiguity between the two companies. Hence, due diligence process has a broader extent which makes this factor is better defined than the having clear and precise vision factor.

- **Speed in implementation**

Fast integration was done by Cisco by integrating all the needed factors into Cisco, rightly after the acquisition deal is closed. It means assimilating the acquired company into Cisco quickly and respectfully to avoid ambiguity. Usually Cisco needs 100 days for the integration process and it also depends on how big the company that Cisco acquire.

The overall team was then divided into sub teams that were responsible for leading key business process conversion tasks.

In terms of employee integration, Cisco would customize a plan to meet the needs of the acquired company's labour force. Cisco would offer employees flexibility around the transition process (e.g. timing of geographic moves), in addition to the traditional economic incentives. For example, they might be given the option to continue working at the acquired company's plant for as long as the facility was maintained; move to one of Cisco's production facilities in California; or move into another part of the Cisco organization (e.g. quality control, field service).

- **Strong integration team**

Promptly after the deal is closed, Cisco sent the integration team to the acquired company comprising of 15-25 persons which consists of experienced members of both organizations. Cisco usually appoints one of the senior managers within the acquired company as the integration team leader. By doing this, the acquired company can get the sense of knowing since there is someone from their company before it will be acquired. The effect of one of the senior managers within the acquired company as the integration team leader was experienced by Tony Crabb, previously the vice president of manufacturing for StrataCom. Crabb found that from the perspective of employees within the acquired company, it is quite important to see someone they know and trust leading the integration effort. If it were a Cisco person leading the process, they would feel as if it was being imposed upon them, and therefore resent the process. On the other hand, if it is someone they know, it is easier for them to ask questions and feel a part of the process.

Furthermore, the integration team came to the company with a clear strategy, knew what they all had to do to integrate the acquired company to Cisco. Hence, their task to integrate the acquired company into Cisco is a hard task. With the help of clear strategy, a fit between these companies can be achieved.

- **Adequate multidirectional communications**

It can be concluded from the case study that open communication was used by Cisco in communicating with the acquired companies. Even before the integration process was conducted, Cisco already had an extensive communication with the target companies, why are they interested in the target companies, why it will be a mutual adjustment relation, etc. This early communication process can smooth the integration process.

- **Continuous focus on customer**

Cisco keeps focusing on customer since they are the core of the business. John Chambers is known to be relentless competitor who is fanatical about putting the customer first. This is continuously done by the employee, also during the acquisition. It can be seen that Cisco were always opened about their acquisition process to the customer. They regularly inform the customer about the progress of the acquisition process that they are dealing with. Furthermore, during the acquisition process customers were still able to place orders for the acquired company's products within a day of acquisition. However, there were also some problems occurred with the customer during the integration

process. For example when Cisco discontinued one of its previous acquisition products from StrataCom, customers who had recently installed that product were angered because of this action. However, Cisco placated its customers by agreeing to compensate them. This kind of problem is the one that has to be avoided during the integration process since it will give a bad image to the customers.

The only PMI factor from the literature research that has not mentioned in the case study is the managing culture differences. In collecting and reading the sources about Cisco, there was no information about managing the culture differences. What has been found was more about managing the acquired companies' employee. The fact that the culture factor was not mentioned may be caused that Cisco always performs due diligence process, where the culture of the target company is asked and analysed. When there is no fit in the culture, then the deal will not go further. This process is done to ensure that there will less culture clash between Cisco and the acquired company. This will not say that there is no problem surrounding the people and culture between Cisco and the acquired employees. However, Cisco did some things to ensure that the acquired employees will feel that they are part of Cisco (see 6.2.3 for more details).

6.4.2 Innovation Management Factors

The innovation management factors that were found in Cisco will be discussed in this section. These factors were found based on analysis of the case studies and other sources as business journals and scientific journals. The innovation management factors were obtained by screening the information in the case studies and they will be further elaborated below. The factors that will be discussed in this section are: *cross functional teams, extensive multidirectional communications, continuous focus on customers, creative climate, having complementary networks, and provide training and continuous development for the employee*. Then, the differences between the development funnel as described in chapter 3 and the NPI process of Cisco (see 6.2.2) will be explained.

- **Cross functional teams**

To ensure that the NPI will be successful, it required both technical expertise and management talent in order to understand the market, to translate market needs into a product, and to deliver that product to market quickly. Cisco's NPI process requires that input from marketing, engineering and manufacturing, which were incorporated into the product design to ensure that products were designed for functionality, manufacturability, testability, and cost-effectiveness. This means that Cisco used cross functional teams from different background to complete the NPI process. These teams are involved in all NPI's phases. More evidence for this factor is that Cisco asked to the target company in the due diligence process whether they utilize cross-functional teams in the development process (see appendix 6).

- **Extensive multidirectional communications**

One of the many ways to enhance communication is by having cross functional teams.

It stimulates the employee to communicate with each other multidirectional. This factor has been found in Cisco. This can be a sign that there is extensive communication between employees, especially in managing the innovation process. They have to maintain this communications in order to clarify problems. As we know, Cisco has a de-centralised R&D. To make sure that the R&D and the manufacturing, marketing department will have the same production goal, they must have extensive communications between them during the innovation process, considering that the other departments are still under Cisco while some of the R&D of the acquired companies operates autonomously. However, it is possible that there are some problems occur in the communication process especially because Cisco exists from different acquired companies which mean that they have different culture.

- **Continuous focus on customers**

This factor obviously exists in Cisco. The company put the customer in the first place. They look first at the needs of the customers and then they try to fulfil the demands of the customers. Focus on customer has always been a culture in this company, as John Chambers always exerts this to the employee.

- **Creative climate**

Cisco's structure became more de-centralised, granting considerable autonomy and stability to the creative groups within the company in the hope of preserving and enhancing their entrepreneurial talents. This shows that a creative climate is created in the company to enhance innovation. Cisco has several ways to maintain the creative climate among the employee. They reward innovators within the company, for example by Cisco's Distinguished Engineer, Cisco Fellow, and Pioneer Technology Award programs. The Distinguished Engineer and Cisco Fellow programs were developed as a way of recognizing the contributions of key technical employees and allowing them to set and influence the company's technical direction, while encouraging them to communicate those developments to the industry at large. Furthermore, Cisco also gives stock option to all the employees, including the ones from the acquired companies. This will create creative climate where the employees are triggered to be innovative as they can to receive the reward.

- **Having complementary networks**

In the interview with Saikat Chaudhuri (Associate Professor of Management of Wharton School of Business, University of Pennsylvania), Daniel Scheinman (Senior Vice President and General Manager of Cisco Media Solutions Group) said that technology alliances, suppliers, and customers help Cisco by giving input on what is going on a on the market and what they need (www.cisco.com). This relation between Cisco and the networks helps Cisco too to find and produce something innovative that can be put in the market, and the information that were obtained from the relation can also help Cisco to result in perfection in their products. It is almost impossible to manage the innovation without having supplement from the outside.

- **Provide training and continuous development for the employee**

Cisco provides their employees with training and development programs. They also use job rotation for the developing of the employees. They want to make sure that by rotation, employee's skill sets will be broadened. They allow employees to participate in rotational assignments, which offer local positions and overseas opportunities so that the employee can choose the one that best matches their interests.

They also have so called Cisco Leadership Series and Cisco University. The leadership series enhance the collective leadership capacity of the employees and allow for cross-functional collaboration while Cisco University provide employees with development opportunities and an online portal where they can manage their individual careers and all activities related to career development.

By giving opportunities to the employee to grow in the company, it can gain trust and more motivation for the employee to work there, as they feel that they are treated well, and that they get chance to develop their interest, knowledge, and skill.

- **NPI process vs. development funnel**

The foundation of the NPI process has some differences comparing to the development funnel that has been discussed before in chapter 3. The NPI consists of several steps toward bringing a new product into the market. It begins immediately with the definitive design specification for the product, while the development funnel begins with the process of idea generation and concept development. A possible explanation for the fact that NPI begins immediately with the definitive design specification is that because Cisco acquires companies that already has a concept of their product in the time Cisco acquired it. This means that the acquired company has already a product in mind and Cisco is ready to launch that specific product. As said above, Cisco needs to quickly assess where each of the company's products were in the development process. With this information, Cisco could make an informed decision about which products to convert to the NPI process, and which products were too far along in their development to benefit from the change. This NPI process would be implemented within 90 days after the deal is closed. That is why the NPI begins immediately with the definitive design, not with the product/process idea generation as the development funnel in the literature research does. Hence, the NPI process focuses more on the execution of the production process while the development funnel focuses more on the screening many ideas into a definitive product.

There are five innovation management factors that have not been found in the case study of Cisco. These factors are: linking the organization structure and the managing process, having key employees, having continuous improvement capability, having absorptive capacity, manage the knowledge within the organization. The reasons for this might be that information about the factors named above are quite difficult to get since factor as having continuous improvement capability, having absorptive capacity, and manage the knowledge within the organization cannot be seen and judged from secondary sources. There were also no information about factor linking the organization structure and the managing process and factor having key employees. More information about the organization structure of Cisco is needed before able to analyze the factor linking the

organization structure and the managing process. In addition, it can be assumed that Cisco has some key individuals from Cisco itself and coming from the acquired companies since Cisco is a high tech company, where key employees are needed to achieve a good innovation performance. However, the case study has not mentioned whether there is some kind of gatekeeper or other kind of key employees. Therefore, more information inside Cisco is needed to be able to come up with more conclusions.

6.4.3 Cisco's innovation performance

In this section, the Cisco's innovation performance will be discussed. It can be seen whether Cisco has succeeded in its innovation or not by analyzing the data's. The summary of the data's gained from Cisco's annual report and electronic journals can be found below in table 6. This analysis will use the indicators that have been discussed before in chapter 5. However, not all of the indicators can be used since there is limited information available. These indicators were obtained from business journals, magazines, and Cisco's annual report. The external indicators that will be used in this research are: *Net sales, R&D expenditure, number of employees, market share, and new product announcement*. In fact, there are other external indicators that come from the consumer side, such as customer satisfaction. However, it is not easy to obtain this data. Hence, the customer satisfaction data is based on opinion, which is biased. Therefore it will not be used in this research.

Fiscal year ¹	Number of acquisitions		Patents filed	Patents issued	Net sales	R&D expenditure	Percentage of R&D's contribution in net sales	Number of employees
	Fiscal Year	Year						
2007	13	12	968	647	\$34.922	\$ 4.499	12,9 %	49.926
2006	7	9	1127	688	\$28.484	\$ 4.067	14,3 %	38.413
2005	16	12	1218	469	\$ 24.801	\$ 3.322	13,4 %	34.000
2004	6	12	825	447	\$22.045	\$ 3.192	14,5 %	34.093
2003	5	4	747	327	\$18.878	\$ 3.135	16,6 %	34.466
2002	3	5	695	240	\$18.915	\$ 3.448	18,2 %	-
2001	10	2	688	185	\$22.293	\$ 3.922	17,6 %	30.000
2000	28	24	751	150	\$18.928	\$ 2.704	14,3 %	34.617
1999	10	18	530	88	\$12.154	\$ 1.594	13,1 %	20.657
1998	7	9	260	60	\$8.459	\$ 1.020	12,1%	14.623
1997	8	6	105	34	\$6.440	\$ 698	10,8%	10.728
1996	7	7	43	67	\$4.096	\$ 399	9,7 %	8.259

Table 6: Several performance indicators of Cisco

Sources: www.cisco.com

1: Fiscal year ends in July of each year

- **Number of acquisitions**

The number of acquisitions of Cisco increased each year from 1996-2000. In fiscal year 2001, Cisco decided to acquire fewer companies, which is narrowed to 2 companies. In 2004 Cisco began acquiring more companies. These acquisitions were done to pursue more innovation in time, since put products on time in the market is important in high tech industry. Seeing the amount of acquisitions that Cisco has done and the reasons for Cisco for doing that, it can be concluded that Cisco is an innovative company. They keep acquiring companies to be able to provide all solution to the customers and to be innovative in high tech industry. Hence, these acquisitions help Cisco to refine their product offers.

- **Patents**

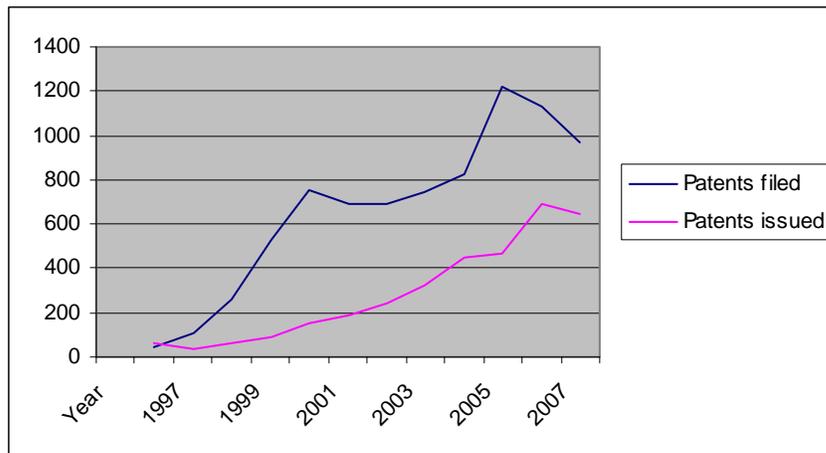


Figure 6: Patents and R&D expenditure

This table shows the comparison between the patents that were filed and the patents that were issued for Cisco. The amount of patents issued from 1996 is increasing toward 2007. Hence, there is a peak amount of patents issued in 2006. Interestingly is that in the year of 2000-2001 and 2007, the differences between the patents filed and patents issued are huge. It might be that the innovation that Cisco has was already patented by other companies. Furthermore, it is expected that the more companies Cisco acquires, the more amount of patents are filed. This can be seen also in figure 5, that the amount of patents increase by each year, just like the amount of acquisitions. However, Cisco acquired only two companies in 2001 and five in 2002 but the amount of patents was still increasing at that time. Nevertheless, the more patents are issued, the more innovation that a company has invented. And this figure shows that the patents issued increases. This shows globally that Cisco is keep innovating throughout the years.

- **Net sales and R&D expenditure in relation to number of acquisition**

It can be seen from table 1 that the net sales from 1996 until 2001 were increasing, but at the year of 2002 and 2003 the net sales were decreasing. The decrease could be related to the slowdown in the US economy around that time. However, after 2003 the net sales towards 2007 were increasing. It happens as well for R&D expenditure. They went down in 2002 and 2003. The possible reasons for that are: the impact of the restructuring

program that Cisco announced in 2001. This program included a worldwide workforce reduction, consolidation of excess facilities, and restructuring of certain business functions. One of their priorities is to reduce expenses, which lead to reduced R&D expenditure. Another possibility is that there were fewer acquisitions have been made at that time, which contributes as well to less R&D expenditure. However, it is interesting to see that no information states that Cisco eliminates their R&D during the economic crisis, while it happens occasionally in other companies that have engaged M&A. As a matter of fact, Cisco maintains the existence of its R&D department. This might related to the fact that R&D is the core of Cisco's business which makes it impossible to eliminate the R&D.

Furthermore, it is interesting to see that while the net sales and R&D expenditure in 2002 and 2003 decreased, the percentage of R&D contributing to net sales since 2001-2003 were increasing to quite such high amount, about 18%, in comparison to other years. This can be due to the fact that the net sales during 2002-2003 declined, which lead to a higher percentage of R&D expenditure's contribution to net sales.

Hence, it is surprising to see that the number of acquired companies by Cisco at 2001-2003 were very low. In fiscal 2001, there were ten acquired companies, but the R&D expenditure rose high while in 2000 Cisco acquired 28 companies with less R&D expenditure than 2001. It could be that the R&D expenditure in 2001 was so high because of the prices of acquisition, which could be doubled in that year since the economy slowed down, which made the value of the acquisition's price higher.

It is also important to investigate the relation between net sales and number of acquisition. The assumed relation is that the more of acquisitions have been made, the higher the net sales will be, since innovation is expected after acquisitions. Back to table 1, the net sales increases every year (except 2002-2003) while the number of acquisitions does not always increase. It varies every year. It might be that some acquisitions results in more innovation than other acquisitions. In addition, there are some factors that have to be taken into account in analyzing the relation between net sales and number of acquisition. Those are: the fluctuation factors in the world of economy; the size, the price of each acquisition; and the amount of employees from the acquired companies. To summarize, the relation between net sales, R&D expenditure and number of acquisitions in this case study have not been found. This needs further research.

- **Employees**

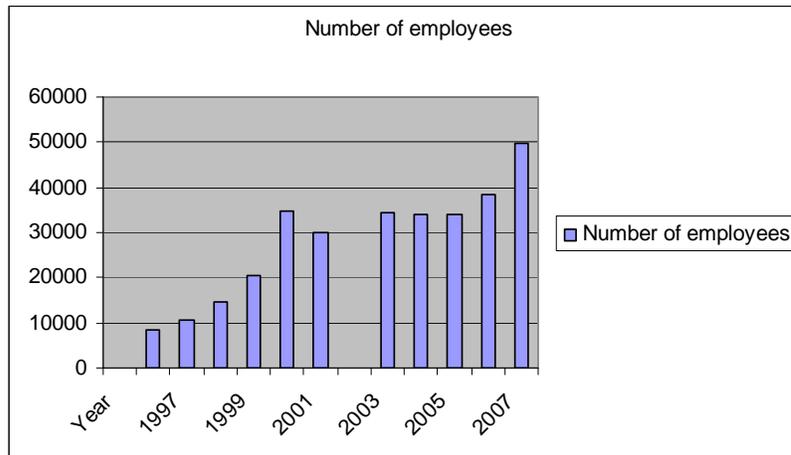


Figure 7: Number of Cisco's employees
Sources: www.fortune.com; Paulson, 2001

The number of employees in Cisco from year 1996 till 2007 increases constantly, except in year 2001. It decreased by 4600 employees. This may be due to the fact that Cisco has reduced their workforce by around 4000-6000 people during its rough times, a move that directly conflicts with Cisco's previously expressed "no layoff" philosophy. Unfortunately, there is insufficient information in number of employees for 2002. However, it can be seen that, even there were some layoffs in Cisco, the number of employees from 1996 until 2007 keeps increasing. This increased amount is due to the fact that Cisco keeps acquiring companies which lead to more employees coming from the acquired companies. The increased amount shows a positive result in terms of amount of employee. However, more research is needed to know how many employees from acquired companies coming and how many have left Cisco after acquisition. More explanation about factor employee see 6.4.1.

- **Market share**

	2007	2006	2005	2004	2003	2002	2001	2000	1999
Router	92%	94,07%	51,52%	74,3%	79,9%	-	-	68%	-
Switching	-	-	-	-	-	-	-	-	-
Advanced Technologies	-	-	-	-	-	-	-	-	-

Table 7: Cisco's market share
Sources: www.xchangemag.com, www.networkworld.com, www.crn.com, www.telephonyonline.com

There is no sufficient information for the market share of Cisco. Furthermore, Cisco has many products in the market, which makes it more difficult to find the market share that Cisco has for each products. However, there are three core products of Cisco, which are router, switching, and advanced technologies.

As said before, Cisco strives to be the first one or the second player in the market they compete. It can be seen in table above that almost in every year, in this case 2003-2007, Cisco has more than 50% share for router market. 50% is a very high amount, which

means the half of the entire market. This means that Cisco is able to fulfil their goal to be the first or second player.

An example showing that Cisco gains profit from the acquiring is described below. Cisco acquired StratumOne Communications (78 employees) in June 1999 for \$435 million. It also acquired Cerent Corporation (130 employees) and Monterey Networks (132 employees) in August 1999 for a combined \$.4 billion. All of these companies provided products that helped Cisco to enter the OC-48 SONET equipment and higher speed space quickly. According to research company RHK (www.findarticles.com), Cisco had 29% of the 2,2 billion North American market for OC-48 SONET equipment in 2000. A year earlier, Cisco had just 1% of the market for OC-48 products.

29% of 2,2 billion is 638 million, which is far below the amount paid by Cisco for these three companies alone. Cerent's sales to date at the time of the acquisition were \$10 million. Assuming that the sales of StratumOne and Monterey were less than Cerent's, since Cerent has the highest purchase prices and all the companies were about the same age at the time of purchase, still there is an amazing increase in sales experienced from this set of acquisitions, assuming that the combined sales at the time for all three was \$20 million. This means that Cisco was succeeded to higher those sales from \$20 million to \$638 million in a little over a year, which makes it an almost 32-fold increase in sales. This means that there is still a way to go to recover the total. This means that Cisco did a good investment, where Cisco has made its way to a higher market share by combining the three companies. If Cisco has shown that it was succeeded in increasing sales and increasing its market share, Cisco sure can achieve back the purchase price within a few years.

Conclusion

This chapter described the acquisition process of Cisco. It started with how Cisco has performed the acquisition process, and ended with the analysis of Cisco's innovation performance. The goal of the case study is to find whether the PMI and innovation management factors that have been discussed in the literature research also appear in Cisco and how do the factors influence Cisco's performance.

In the first section of data analysis, the PMI factors and innovation management factors that enhance the performance of Cisco have been discussed. That section describes which factors that can be found in Cisco and these factors were compared with the factors from the literature research. There are similarities between the literature research and the factors from Cisco. Hence, there is one factor that is very important to enhance the performance of PMI process that Cisco has and that factor has been added to this research. This factor is called as due diligence factor. Furthermore, the innovation management factors from the literature research have been found in Cisco as well, although there are some factors that are not present in Cisco according to the case study. In addition, Cisco also uses NPI, a kind of development funnel, in managing their innovation process.

In the second section of data analysis, the innovation performance of Cisco as a company is analyzed. It was not easy to analyze the results due to the lack of sufficient information. There were several indicators that have been used to indicate the innovation performance, e.g. net sales, R&D expenditure, number of acquisitions,

number of employees and market share. The results showed that Cisco has an outstanding net sales performance, which always increases by years. However, the net sales during the year 2002-2003 went down. This might be due to the fact of the slowdown economy at that time. Furthermore, the R&D expenditure was increasing each year as well, except the year 2002-2003. Relations between the R&D expenditure and number of acquisitions, and net sales and number of acquisitions have not been indicated in this research although it is expected that the number of acquisitions has influence in the net sales and R&D expenditure. More thoroughly further research is needed to investigate the relation. In addition, there are factors that have to be considered in looking at the relation between net sales and number of acquisitions; and R&D expenditure and number of acquisition. Those factors are price, size of acquisition, and number of employees that are coming from acquired company. Furthermore, the amount of the patents issued for Cisco increases every year. This indicated that Cisco stays innovative, and the acquisitions have helped Cisco to do that. There is no sufficient information about Cisco's market share. However, by using the available data, it can be seen that Cisco is able to realize their goal to be the first or second of every market they compete in. This goal never can be achieved without the acquisitions, which helps Cisco to place new product innovation in the market at the right time. Question will be raised, whether Cisco still innovate by its own. As said before, Cisco still develop 70% internally while the rest coming from acquisition. In addition, Cisco combine its core product with the products from acquired company to provide one solution for the customer.

Cisco continued to purchase technology in order to bring a broad range of products to the market in a timely fashion. If they believe that they are unable to enter a particular market in a timely manner with internally developed products, they may license technology from other businesses or acquire businesses as an alternative to internal R&D. As a matter of fact, usually Cisco develop it product 70% internally and 30% from acquisition. In integrating the acquired company, it is the *different types of products at different points in their lifecycles* that matter for Cisco. For Cisco, the complexity of the integration process and the level of resources dedicated to the effort varied depending on the type of acquisition. From a manufacturing standpoint, software companies and pre-production companies were the least complex to integrate into Cisco, since these types of companies typically did not have a manufacturing organization in place, nor an existing customer backlog to satisfy. Thus Cisco has more influence and able to add more value on the manufacturing side. Cisco can integrate the company into their operations and set them up on our systems right from the start. In addition, small hardware companies shipping product and mature hardware companies were the most complex to integrate. How complex it is to integrate, Cisco always try to integrate the acquired company. The easier the acquired company to integrate, the faster the integration process is done. The way how Cisco integrates the acquired companies are more or less comparable with the integration approaches from the literature research. The difference is that Cisco uses the stages of maturity in manufacturing, while integration approaches in the literature research defines the approaches based on the need for interdependence, need for autonomy, degree of relatedness and tolerance for multiculturalism. See table 7 for the comparison between Cisco and the literature research approach.

Need for interdependence and degree of relatedness	Integration approaches according to the literature research	Cisco
↑	Absorption	Software companies
	Symbiotic	Pre production hardware companies
	Preservation	Small hardware companies shipping product
	Holding	Mature hardware companies

Table 7: Integration approaches in literature research vs. Cisco

Thus, choosing of the target company will impact the success of innovation management eventually. Once the company find the target company, they have to find which kind of integration approaches that they want to have and they have to be able finding the suitable strategy for it. This will lead eventually to a better PMI and innovation management process. For example, when a company likes Cisco want to acquire mature hardware companies with a goal of absorption, it is going to be very difficult since the target company is already matured. It would be easier if this company acquire the mature companies with preservation as the integration goal. Otherwise, they have to reorganize almost all of the aspects of the company for absorption. However, in the case of Cisco, the acquired companies usually are integrated into Cisco. Hence, there are time differences in accomplishing the integration due to the fact that there are different types of maturity in manufacturing. Furthermore, the product engineering and marketing departments of the acquired companies usually retained their identity and enjoyed functional autonomy, while the sales and manufacturing departments were merged into Cisco's department.

By applying the PMI factors, Cisco enhances the PMI process positively. For example Cisco is quite successful in retaining employees coming from acquired companies, which lead to a well executed PMI process. This may result in a good innovation performance. Cisco would not be able to have a good innovation performance when the integration process of people and products of the acquired companies have not been managed well. Of course there were still problems during the PMI which made some of the employees leave Cisco but Cisco has learned from its mistakes. Furthermore, due diligence process ensures that there is a fit between Cisco and the acquired company. By doing this, the innovation performance can be enhance, since Cisco knows from the very beginning that the acquired company is compatible with Cisco. To summarize, the PMI factors that can be found in Cisco affect the PMI process positively which influence Cisco's innovation positively. Furthermore, it is difficult to examine how the innovation management factors of Cisco were affected by M&A since it is impossible to compare with Cisco's situation before it started with acquiring companies. There is no information available how Cisco managed its innovation before its first acquisition.

7. Conclusion, Discussion and Recommendation

In this final chapter conclusions are drawn in 7.1. Discussion will be elaborated in 7.2 and recommendation for further research will be given in 7.3.

7.1 Conclusion

This section deals with the conclusion of this research. The conclusion is based on the answers of the research questions that finally give the answer to the central research question. The central research question was:

Which factors enhance the PMI process in relation to innovation performance?

To be able to answer this question, first the five sub questions that have been formulated in chapter 1 will be answered in the following paragraph.

1. Which PMI factors enhance the PMI process?

In order to find PMI factors that enhance the PMI process, several studies on PMI factors have been used. Three studies have been discussed further in this research. These three studies were chosen because of the fact that the authors have found a series of PMI factors which have been tested in companies. Based on these series of PMI factors, a comparison and further selection of the factors have been done. The literature research on PMI factors has resulted in seven important PMI factors that companies can focus on for the PMI process regardless of the integration approaches. Those are: *due diligence process, continuous focus on employee, managing culture differences, speed in implementation, strong integration team, adequate multidirectional communications, and continuous focus on customers*. An important remark is that due diligence process has to be performed before the M&A deal is done. Furthermore, this research shows that there are no significant differences for the PMI factors between the integration approaches. However, more studies are still needed to extend the result of the relation between integration approaches and PMI factors. It can be done by investigate the relation between PMI factors and the integration approaches. It is expected that the higher the need to integrate/for strategic interdependence is, the more PMI factors are needed.

2. Which innovation management factors enhance the innovation performance?

The next question in this research deals with the innovation management factors. There are two kinds of innovation management factors that have been discussed in chapter 3. The first one is the organizational innovation management factors and the second one is the development funnel, which can be used in managing the innovation process from ideas to reality.

The organizational innovation management factors that are needed to enhance the performance of innovation are: *leadership by top management team, linking the organization structure and the managing process, having complementary networks, having key employees, provide training and continuous development for the employee, having continuous improvement capability, forming cross functional teams, building a*

creative climate in the organization, focus on customers, building extensive multidirectional communication , having absorptive capacity, manage the knowledge within the organization. These innovation management factors were also affected by M&A, since the situation will change after the company engages M&A. Additionally, the integration approaches will affect the innovation management factors as well. These impacts on innovation management factors can be found in 4.2.

The development funnel in order to manage the innovation process has been described as well in chapter 3. This development funnel starts with product/process idea generation, followed by the detailing of the project and ended by the execution of the project. There were three kinds of development funnel. Only one funnel has been chosen in this research, which is the third model. The third model is much more appropriate for a development funnel that combines and integrates the best features of the first and second models.

3. How do M&A, PMI process and innovation management factors relate to each other and to innovation performance?

It is essential to investigate whether there is some relation between PMI process and innovation performance. The fact is that a well executed PMI process may result in a good innovation performance. When the PMI is well done, it can affect the innovation positively. Hence, innovation management factors are also needed to enhance the innovation performance.

When the employees are not treated properly during the PMI, it can affect their performance negatively. Moreover when the innovation process is not properly managed, it will result in poor innovation performance. For instance, when the process of knowledge transfer is neglected, there is a chance that the needed external knowledge for the innovation could not be obtained. In addition, the creative climate has to be maintained among the employee so that they can continue in innovating. Thus, it can be concluded that both, PMI and innovation are evenly important and reinforce each other. The combination of PMI factors and innovation management factors ensure that a good innovation performance can be achieved which will lead to the expected synergy from the M&A. And not forgotten is that M&A has to be use to enhance the innovation performance of an organization, not as substitution for innovation. To summarize this, a framework has been made. This can be seen in chapter 4.

4. How would the case study be designed in order to execute the empirical research?

First of all, this research has used case study as the empirical research for the following reasons: it emphasize qualitative analysis, the researcher can study the bounded case in depth and in its natural setting and it has the ability to understand the complexity of the case and its context. Thus by using a case study, an intense and thorough analysis of the available information can be done so that this research can provide a complete analysis of the case. However, there are some weaknesses of a case study, such as: the lack of controllability, restricted availability of the information and generalizability. The chosen company for the case study in this research is Cisco Systems. A thoroughly description of the case study can be found in chapter 6.

Furthermore, assessment criteria for the case study are needed before beginning in selection of the suitable case study. The criteria that a company has to fulfil in this research are: the M&A has to be at least three years ago because then the effect of the M&A can be seen, the motivation for the company in engaging M&A comes from technological reason, the company has some innovation activities, since the innovation process in the case will be studied and there is enough information available that is easily accessible. In addition, this research used documentation as the source of evidence of the Cisco case study. Furthermore, some indicators were used in the case study to analyze the innovation performance of Cisco.

5. Which factors from the literature research can be found in the case study that enhance the PMI process and innovation performance?

To examine the literature research, a case study of Cisco has been done in this research. Some factors that have been discussed before in the literature research have been found in Cisco case. Hence, there is one factor that was not mentioned before in the literature research, which is due diligence factor. In due diligence process, the target company will be examined by the mother company to see the match between these two companies. This factor is believed as the most important factor that brought Cisco's success in acquiring companies. By performing due diligence process, the chance to have a success PMI is bigger. Due diligence factor is similar with the one factor that has been found in the literature research, which is having clear and precise vision. However, the definition of due diligence is broader. Therefore, due diligence factor replaced the having clear and precise vision factor.

Furthermore, the only PMI factor from the literature research that has not mentioned in the case study is the managing culture differences factor. The fact that the culture factor was not mentioned may be caused that Cisco always performs due diligence process, where the culture of the target company is asked and analysed. When there is no fit in the culture, the deal will not go through. This process is done to ensure that there will less culture clash between Cisco and the acquired company.

In addition, this case study has shown that it is the *different types of products at different points in their lifecycles* that matter for Cisco. For Cisco, the complexity of the integration process and the level of resources dedicated to the effort varied depending on the type of acquisition. Cisco uses the stages of maturity, while the integration approaches in this research uses other approach. Thus it can be concluded that it is also possible to have other kind of integration approach that is different than the one discussed in this research.

In relation to the innovation management, there were five innovation management factors that have not been found in the case study of Cisco. These factors are: linking the organization structure and the managing process, having key employees, having continuous improvement capability, having absorptive capacity, manage the knowledge within the organization. The reasons for this might be that information about the factors named above are quite difficult to obtain since factor as having continuous improvement capability, having absorptive capacity, and manage the knowledge within the organization cannot be seen and judged from secondary sources. There were also no information about linking the organization structure factor and the managing process

and having key employees factor. More information about the organization structure of Cisco is needed before able to analyze the factor linking the organization structure and the managing process. In addition, it can be assumed that Cisco has some key individuals from Cisco itself and coming from the acquired companies since Cisco is a high tech company, where key employees are needed to achieve a good innovation performance. However, the case study has not mentioned whether there is some kind of gatekeeper or other kind of key employees. Therefore, more information inside Cisco is needed to be able to come up with more conclusions. Furthermore, it is difficult to examine how the innovation management factors of Cisco were affected by M&A. This is due to the fact that there is no information available how Cisco managed its innovation before its first acquisition.

It can be concluded that the case study done in this research has confirmed that it is essential to use the PMI factors to enhance the PMI process. Furthermore, the innovation management factors need to be applied in order to enhance the innovation performance. This case study has also shown that when the PMI is properly executed, it will enhance the innovation positively.

7.2 Discussion

In this section, the evaluation of the research's result and the research's process will be discussed.

PMI and innovation management factors

This research focused more on the organizational factors. Furthermore, factors discussed in the literature research have been detected as well in the case study. However, this research has used only one case. This means that there should be more research done in order to validate the result of this research and make changes, when needed, on the factors that are really significant in the context of having a successful PMI process in relation to good innovation performance. It is also essential to investigate further the effect of integration approaches on PMI factors and innovation management factors. It might be that not all of the factors are important for each integration approach.

The PMI factors that were found were based on three studies primarily. In addition, other studies have also been used to support each factor. The three studies have been chosen because they have found a series of PMI factors that might enhance the PMI process. However, these factors have not been tested in high tech companies while the case study in this research was a high tech company. Therefore it is important to acknowledge that changes may apply for different context.

The innovation management factors that have been discussed in the literature research is based primarily on the work of Tidd et al. (2001). After that, those factors were elaborated and analyzed by using other literature studies, which resulted in a long list of factors. The impact of each factor on enhancing the innovation performance should be tested further. It is hoped that more studies can be done in order to select the factors that really significant in enhancing the innovation performance.

Relation between M&A, PMI factors, and innovation performance

This research showed that a well executed PMI process may result in a good innovation performance. This relation is in line with the result of study done by Hitt et al. (1991). In addition, this research makes a contribution to the existing literature that it is possible to have good innovation performance after M&A, while many studies have shown that M&A affect innovation negatively. However, more studies are certainly needed to test the validation of this conclusion since this study only used one case to test the conclusion.

In addition, indicators to measure a good innovation performance are needed. However, this issue came up at later stage, which was difficult to explore the indicators thoroughly. Therefore, indicators as listed in the study of Schoch (2007) has been used.

Furthermore, it has been explained in chapter 4 that M&A will affect the innovation management factors that have been derived in chapter 3. The impact on the innovation management factors have been elaborated in this research by analyzing the integration approach and the innovation management factors. However, this impact has not been tested in the case study since the case study did not provide the normal situation of the company (before engaging in M&A). Therefore more research is needed to find how the innovation management factor is affected by the M&A situation, and whether all of the innovation management factors are still needed in M&A context. The next question is whether changes in factors will apply for companies in different sectors. I assume that the extent of some factor in a high tech company will be different than in a banking company. This issue has to be studied further.

Case study of Cisco

A case study approach has been chosen in this research with documentation as sources. First of all, it is difficult to use qualitative indicators on basis of secondary sources since management information is less often used in general information and companies are hesitate to give inside information. This information may only be answered by the company's profile. Furthermore, due to the fact that the data was obtained from second sources, the indicators are not tested in real life circumstances.

It is also important to acknowledge that the case study that has been used here, Cisco, is active in high tech industry. Some differences may be applied in other industry. Despite all the weaknesses of the case study in this research, the case study of Cisco has also helped in understanding how to perform the PMI process better which may result in a good innovation performance. In addition, this research was based on a single case in the high tech industry and the results have, therefore, to be treated with caution. Furthermore, Cisco has acquired more than 100 companies. This means that it was difficult to examine the acquisitions process of Cisco one by one. Consequently, the result of the case study was gained from screening Cisco's acquisition process in general. Furthermore, it is important to notice that Cisco has consciously made acquiring an integral part of its development strategy and has invested the time, money, people, facilities, processes, and management support begin making it work. Again, Cisco has been done many acquisitions which makes it easier since Cisco has the experience. Furthermore, the success of Cisco is also caused by the fact that Cisco has people who do this integration process full time. It is a core function of the company. This is what

makes it difficult for other companies since they do not have the resources and the experience to do this. An important remark about Cisco is that Cisco does not believe in merger of equals, where two companies with equally strong cultures, personnel, and resources merge. According to Cisco, a merger of equals adds the additional complexity of merging, which can further complicate the difficult integration period. This believe is in line with the study that Ahuja and Katila(2001) found, where larger company should focus their M&A activity on small targets of they would like to increase their innovative performance. The role of size in M&A is still unclear. Therefore more studies can focus on this issue.

Reflection

This section discusses my performance on this research. I realized that I have found many obstacles during the research which made more difficult to accomplish. There were factors inhibited the progress of this research. First of all, I should have taken more time to make a better planning and to focus more on the research. Hence, there are also some personal circumstances during the time of research which made me focus on the research less than expected. I also have found this research difficult since I did not have enough background to support writing the research. It took longer for me to understand what this research was actually about.

I have learned from this research that it is really important to plan the research design thoroughly since it is used as a foundation prior to conduct the research, which will impact on the research process later on. When I just began with this research, understanding the topic was my main problem. It took me a while before I realized that this topic is complicated but yet interesting. I also have learned that I have to be aware of the importance of giving a definition for every point that I would use in my research. It was always difficult to me to write down all the necessary things. But now I become understand the necessity defining information related so that ambiguity can be avoided. In addition, I have found analyzing the case study is more interesting than the literature research because the case study is more practical, while literature research is more into theoretical. This may explain that the case study of this research is performed better than the literature research. Despite all the problems that I have experienced with, I believe that I have contributed to the existing M&A literature. My research can be seen as a step stone for further research in PMI factors and innovation management factors in relation to innovation performance. In addition, I also have learned so much during this research, not only for my knowledge, but in terms of personal development as well.

7.3 Recommendation

The recommendation in this section will be only directed to companies and researchers for further research. No recommendation will be given to NWO since the research of NWO is already ended.

Recommendation for companies

First of all, it is important to be aware of the importance of due diligence process. This process leads eventually to a better PMI process. Due diligence process has to be carried out before acquiring companies. Thus it is not only the PMI process that counts, but the

pre M&A, which is due diligence process, as well. Second, it is important to decide which integration approach that the buyer and the acquired company will choose. This has consequences for the integration process. Third, PMI and innovation management factors have to be taken into account in order to have a smooth PMI process which will affect innovation positively. These factors will lead to a better management of the PMI process and innovation management process. At last but not least, it is essential to use M&A to enhance or complement the innovation, not as substitution for innovation.

Recommendation for further research

Given the importance of the pre- and post-integration phases, both qualitative and quantitative cross-company studies could shed more light on which PMI and innovation management factors are important and how the presence or absence of these factors influence the success of M&A. Furthermore, more studies are needed to investigate the degree of the importance of each PMI factors and innovation management factors in integration approaches. The PMI and innovation management factors have to be tested empirically, specifically using better measures of PMI process and innovation performance. Together, a better understanding of these factors and PMI process and innovation performance may provide theories to guide the management team in realizing synergy from M&A and more consistent advice for management practice.

It is also needed to investigate companies competing in the same business areas, which is high tech company in this research. The focus here should be both on the actual experiences in the acquired companies, the specific conditions related to the acquisitions, and on the management of the post- and pre-integration phase.

A recommendation for a case study approach is to gather secondary information before trying to get inside information or the information from the company. The combination of primary information and secondary data should raise the validity of the cases study and will give the researcher the opportunity to operate more efficiently when entering the company. While research attention has primarily been on the negative effects on M&A, more researchers should study the possibility to achieve the expected synergy from M&A. It is hoped that this research represents a step in that direction, prompting further research which will provide a better understanding of the factors that may enhance the PMI process in relation to innovation performance.

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Glossary

Merger:

The combination of the operations of two or more commercial interests or corporations to form a new company (Barrons Dictionary of International Business Terms)

Acquisition:

The taking over process of one company by another company (Barrons Dictionary of International Business Terms)

Integration:

An interactive and gradual process in which individuals from two organizations learn to work together and cooperate in the transfer of strategic capabilities (Haspeslagh, Jemison, 1991)

PMI (Post Merger Integration):

Integration process after merger is completed

PMI process:

The actual implementation of the designed effective organization in terms of innovation strategy and organizational structure (Haspeslagh et al., 1991).

Innovation process:

Process by which an idea is translated into a product or service. Innovation involves deliberate application of information, imagination, and initiative in deriving greater or different value from resources, and encompasses all processes by which new ideas are generated and converted into useful products.

Innovation performance:

Innovation performance is an organization's ability to innovate and deliver value through such innovation. The innovation relates to the overall innovation process and its ability to contribute consistently to growth (Tidd et al., 2005)

Due diligence process:

The process of investigation, performed by the acquiring company, into the details of a potential target. This due diligence process is done not only in terms of finance, but also in other factors, such as product portfolio, manufacturing process, organizational structure, culture of the company, etc.

Appendix 1: PMI factors according to integration approaches

A classification can be made based on the relation between the factors and the integration approaches. This classification has been made based on four individual opinions. These four individuals are: me as the conductor of this study; Emiel Wubben, Maarten Batterink as the supervisors of this study; and Lianne Simonse as a temporary supervisor. At the end, these four different opinions were compared and the ones that are occurred twice or more will be used as the final answer, which can be seen in table 2. The explanation of the table is also provided below.

PMI factors	Preservation	Symbiotic	Absorption	Transformation
1. Having clear and precise vision before the deal is done	√	√	√	√
2. Cross fertilize management teams	-	√	√	√
3. Continuous focus on employee	√	√	√	√
4. Managing culture differences	√	√	√	√
5. Strategy and structure should be linked	√	√	√	√
6. Speed in Implementation	√	±	√	±
7. Senior executives must be actively involved	- / √	√	√	√
8. Strong integration team	√	√	√	√
9. Adequate multidirectional communications	√	√	√	√
10. Continuous focus on customers	√	√	√	√
11. Provide clarity around role and decision lines	±	√	√	√
12. Aligned measurements	√	√	√	√

PMI factors vs. Integration approaches

√=important in this approach

±=more or less important, but the intensity is less than the other approaches

- =not relevant

The table shows which PMI factors are needed for each integration approach. The relation between the factors and the integration approaches in this research is based only on indication/individual arguments that were, as far as possible, derived from the explanation of the PMI factors and the integration approaches.

Since almost of all factors present in the integration approaches, it is not possible to identify which factors are typical or important for each integration approach. More research is therefore needed. However, there are some comments can be made based on table above. It can be seen that the only factor that does not present in symbiotic approach is the speed in implementation. The speed of the implementation in this approach is not necessarily needed since the intention of this approach is to blend gradually between the two companies. Also notable is that all of the PMI factors in absorption approach are needed to enhance the performance of PMI. This is due to the fact that the eventual goal in absorption approach is the assimilation of one company into the other company which leads to full consolidation.

Some of these factors are similar with the three factors that are considered important based on the literature research, which are having clear and precise vision before the deal is done, continuous focus on employee and adequate multidirectional communications. This similarity confirms the importance of the six factors (having clear and precise vision, focus on employee, strategy and structure should be linked, adequate multidirectional communications and continuous to focus on customers) regardless of the kind of integration approach that merged companies choose.

Ad.1. Having clear and precise vision

This factor will affect all kind of integration approaches. Every company that has undergone M&A needs to have vision to know what they will do after the M&A, no matter what the level of the integration is.

Ad. 2. Cross-fertilize Management Teams

This factor is more important in symbiotic and absorption approaches where the level of integration between companies is higher than in preservation. The higher the integration, the more connection exists between the companies. This means that learning process between companies is higher, which makes that it is important that the manager from one company moves to the other to learn from each other.

Ad. 3. Continuous focus on employee

This factor is more important in the other approaches of integration than in preservation approach because in other integration approaches (symbiotic, absorption, transformation) there are some significant changes that will affect the employee's future, e.g. change of structure, change of policy. It means that it is very important to focus on the employee. However, this factor is still important even there is little integration between the companies after M&A (preservation approach).

Ad. 4. Managing culture differences

It is obvious that culture affect almost all kind of integration approaches, but it affect less in holding approach, there is no integration in this approach.

Ad. 5. Strategy and Structure should be linked

This factor is important in all integration approaches. It does not matter whether the level of integration low or high, but once the company took the decision to engage in M&A, automatically the structure, and finally the strategy of the company will change. In preservation approach it will affect each company's structure and strategy while in symbiotic approach it will affect the merged companies as one. This factor in transformation approach will be very important, since there all be new practices, new organizational attributes. This might lead to a completely new strategy and new structure for both companies.

Ad. 6. Speed in implementation

It is most likely that speed in implementation will affect the preservation and absorption approaches the most, seeing that there will be totally new routines, practices, culture, and other organizational attributes that have to be integrated quickly to avoid ambiguity. This factor might be affect the transformation approach as well, since there will be new organizational attributes. Speed can reduce the ambiguity among the employees and customers as well. On the contrary, the need of speed in implementation in symbiotic might be less since the integration grows gradually in this integration approach.

Ad. 7. Senior executives must be actively involved

This factor is important in symbiotic, absorption and transformation where the intention for integration higher is than in preservation and holding. Unfortunately no final answer for the preservation approach can be drawn since the results of the four opinions are even for this approach.

Ad. 8. Strong integration team

The role of integration team is crucial in symbiotic and transformation approaches, where there will be significant changes in the companies. Still, this integration team is important in absorption integration. The need of integration team in preservation might be less needed.

Ad. 9. Adequate multidirectional communications

Communication is highly important in symbiotic, absorption and transformation approaches. However, it is also needed to have communication in preservation, although the intensity and the kind of communication are different.

Ad. 10. Continuous focus on customers

Focusing on customers is important for all kind of integration approaches, even there is no integration at all between the companies. After all, the customers need to be informed how the M&A will impact them.

Ad. 11. Provide clarity around role and decision lines

The clarity around roles and decision lines is more important in symbiotic, absorption and transformation approaches because the ambiguity among the employees is bigger and the level of integration is higher than in preservation.

Ad. 12. Aligned measurement

Measurement is mostly needed in symbiotic, absorption and transformation approaches where the intensity of integration is high. However, measurement is also needed in preservation approach because then the progress of the companies after the announcement of M&A can be tracked and measured.

Appendix 2: Mintzberg's structural archetypes

Organization Archetype	Key Features	Innovation Implications
Simple structure	<ul style="list-style-type: none"> -Centralized organic* type -Centrally controlled but can respond quickly to changes in the environment -Usually small, directly controlled by one person -Strengths: speed of response and clarity of purpose -Weaknesses: vulnerable to individual misjudgments, limited resource to growth 	<ul style="list-style-type: none"> - Small start-ups in high technology - Strengths: high in energy, enthusiasm & entrepreneurial flair - Weaknesses: weak in long term stability & growth, over-dependence on key people who may not always move in the right business direction
Machine bureaucracy	<ul style="list-style-type: none"> -Centralized mechanistic* organization -Controlled centrally by systems -Their success comes from developing effective systems which simplify tasks and routinize behavior -Strengths: ability to handle complex integrated processes like vehicle assembly -Weaknesses: potential for alienation of individuals and the build-up or rigidities in inflexible systems 	<ul style="list-style-type: none"> -Depend on specialists for innovation and impacting at the system level (e.g. fast food, mass production, large-scale retailing). -Strengths: stable, focus of technical skills on designing the systems for complex task -Weaknesses: rigid and inflexible in the face of rapid change, limited innovation arising from non-specialists
Divisionalized form	<ul style="list-style-type: none"> -Decentralized organic form designed to adapt to local environmental challenges -Usually larger organizations -Involves specialization into semi-independent units (e.g. strategic business units, operating 	<ul style="list-style-type: none"> -Innovation often follows a "core and periphery" model in which R&D of interest to the whole organization, or of a generic nature is carried out in central facilities whilst more applied and specific work is

	<p>divisions)</p> <ul style="list-style-type: none"> -Strengths: able to attack particular niches, whilst drawing on central support -Weaknesses: internal frictions between divisions and the center 	<p>carried out within the divisions</p> <ul style="list-style-type: none"> -Strengths: able to concentrate on developing competency in specific niches and mobilize and share knowledge gained across the rest of the organization -Weaknesses: centrifugal pull away from central R&D towards applied local efforts& the friction and competition divisions which inhibits sharing of knowledge
Professional bureaucracy	<ul style="list-style-type: none"> -Decentralized mechanistic form -Power located with individuals but co-ordination via standards -Characterized by relatively high levels of professional skills, typified by specialist teams in consultancies, hospitals or legal companies -Control is achieved through consensus on standards and individuals possess a high degree of autonomy -Strengths: high levels of professional skills, able to bring teams together 	<ul style="list-style-type: none"> -Typified with design and innovation consulting activity within and outside organizations (e.g. formal R&D, IT or engineering groups, where technical and specialists excellence is valued -Strengths: technical ability and professional standards -Weaknesses: difficult to manage individuals with high autonomy and knowledge power
Adhocracy	<ul style="list-style-type: none"> -Organization designed to deal with instability and complexity -Not always long lived, but offer a high degree of flexibility -Team-based with high levels of individual skill but also able to work together -Internal rules and structure are minimal and subordinate to getting the job done -Strengths: able to cope with high levels of uncertainty, creative -Weaknesses: unable to work together effectively due to unresolved 	<ul style="list-style-type: none"> -Most commonly associated with innovative project teams (e.g. in new product development or major process change) -Strengths: high levels of creativity and flexibility -Weaknesses: lack of control and commitment to the project at the expense of the wider organization

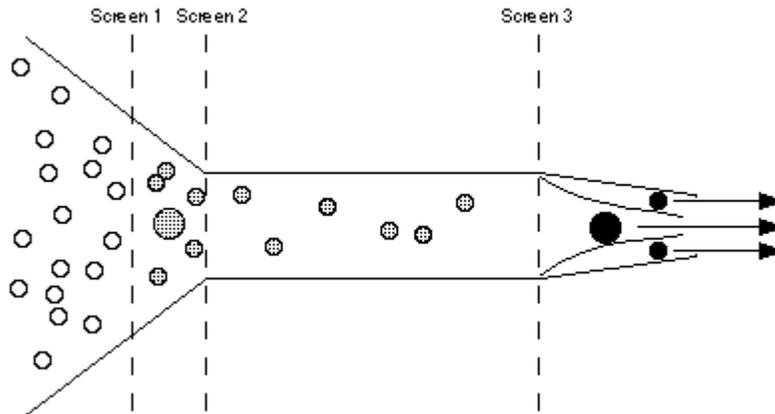
	conflicts, lack of control due to lack of formal structures or standards	
Mission-oriented	<ul style="list-style-type: none"> -Emergent model associated with shared common values -The organization is held together by member sharing a common and often altruistic purpose (e.g. voluntary and charity organizations) -Strengths: high commitment, ability of individuals to take initiatives without reference to others because of shared view about the overall goal -Weaknesses: lack of control and formal sanctions 	<ul style="list-style-type: none"> -Can be highly successful, but requires energy and a clearly articulated sense of purpose -Continuous improvement driven from within rather than in response to external stimulus -Strengths: having clear sense of common purpose and the empowerment of individuals to take initiative in that direction. -Weaknesses: overdependence on key visionaries to provide clear purpose, lack of “buy-in” to the corporate mission

*Organic type: essentially environments suited to condition of rapid change

Mechanistic type: suited to stable conditions (Burns and Stalker, 1961, cited by Tidd et al., 2001)

Appendix 3: Development funnels from Wheelwright and Clark (1992)

The first model of the funnel is common in larger, technology-intensive companies. Companies adhering to this model rely primarily on their R&D group to generate ideas for technologies and for new products and processes.



Model I (Wheelwright and Clark, 1992)

*the circles represent new products; shading indicates the extent of development, and size the scale of the project

The screening processes are as follow:

- Screen 1: focusing on technical feasibility and proof of concept
- Screen 2: emphasize manufacturing feasibility and fundamental economics
- Screen 3: considering customer preferences, distribution channel, and financial return expectation

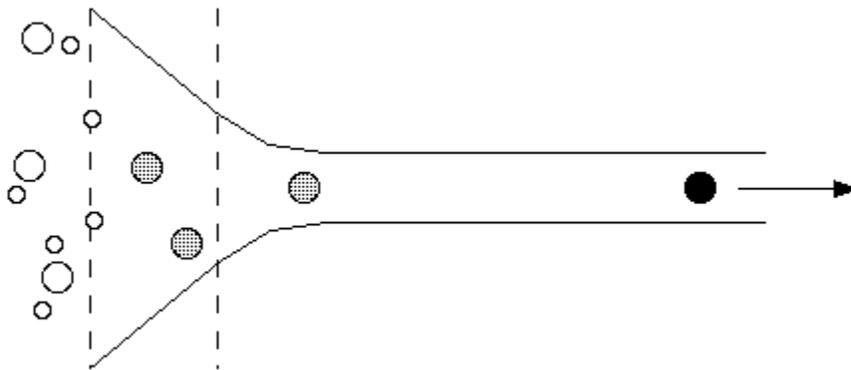
As a development project passes through a Model I funnel, it competes with other projects for resources. When successful, it often picks up ideas from competing projects that have lost momentum or been screened out. Many times, even a project that passes through the funnel successfully and is introduced to the marketplace finds itself competing with other products offered by the company. Thus, to be successful over long term, the resulting product must continue to compete successfully for sales, service, and customer attention, not just against products from competitors, but against products from within the company.

In funnel Model I, only relatively few ideas become successful products from hundred ideas, this is due first to the fact that carrying an ideal all the way from research through to market introduction is an extremely expensive proposition, and second, to the notion that research can generate many more ideas than could ever be supported by the company and absorbed by the marketplace. The active ideas are reviewed systematically based on current knowledge and understanding. Model I has strength in certain kinds of markets, however there are some factors that raise questions about the appropriateness of this model in a variety of industries. First, for many companies, a broad-ranging, exploratory research group is a luxury that few can afford. Second, successful advanced development groups often become committed to turning their pet projects into

marketable products, making it difficult or impractical to “kill” them. Thus, with a Model I funnel, increasing numbers of advanced development projects may find their way into commercial development. But such companies often lack the discipline and mechanisms to significantly reduce the numbers of development projects in process, and yet have insufficient resources to carry out all of them in a timely and successful manner. Third, the complexity of development of Model I. As projects become increasingly complex, difficult, and expensive, it is impractical to screen out “competing projects”. Many markets simply do not grow fast enough to provide adequate rates of return by following this procedure, and too many products in the marketplace can confuse the distribution channel and final customers, and add complexity and cost in manufacturing.

Model II

The second model of the funnel is more common in small companies. Since this paper focuses more on large companies, model II will not be discussed. See for more information table 3.



Model II (Wheelwright and Clark, 1992)

*the circles represent new products; shading indicates the extent of development, and size the scale of the project.

Dimensions of Choice that Determine Funnel Characteristics	Model I (R&D Push/Survival of the Fittest)	Model II (Single Project/Big Bet)
<u>Creating Development Projects</u>		
<i>Sources of Ideas</i>		
Entry Points	Primary single function-R&D	Multiple functions
Direction	Bottom up/grass roots	Top down/senior management
Breadth	Wide within R&D/narrow for entire organization	Broad overall
<i>Selection Process</i>		
Purpose	Review/ready for next step	Go/no-go
Criteria	Internal/technical	External customer requirements/finance
Structure	Formal authorization	Informal/gut feel

People	Peer review	Senior management decision
<u>Convergence to Concept/Detailed Design</u>		
<i>Process/Screens</i>		
Timing	Technical milestones	Frequent/calendar
Purpose	Identify promising concepts	Go for one adjustments
Criteria	Technical interest/ performance	Customer requirements/finance
Formality	Signatures required	Informal
People	Peers/senior management approval	Senior management
Decision making	Consensus	Top management decision
<i>Pattern of Convergence</i>		
Number of options	Multiple/competing options	Single option
Width/length of neck of funnel	Wide/long	Narrow/short
<u>Commitment to Market</u>		
Criteria for introduction	Meets tests for performance	Meets financial targets
Decision making	Peers/top management	Top management

The dimensions of choice of Model I and II (Wheelwright and Clark, 1992)

Appendix 4: The Performance Indicators

Internal Indicators

Internal	Indicators	Unit	Compare pre / post-merger	References
<i>Performance</i>	R&D expenditure	€	y	
	Number of employees	numeric	y	
	Number of new products (announcements)	numeric	y	griffin <i>et al.</i> (1996)
	Patent citations	numeric	y	flor <i>et al.</i> (2004)
	Patents	numeric	y	kemp <i>et al.</i> (2003) flor <i>et al.</i> (2004)
	Number of new products ideas	numeric	y	Chiesa <i>et al.</i> (1996)
	Profits from new products	%	y	griffin <i>et al.</i> (1996)
	Product quality	y/n	y	Chiesa <i>et al.</i> (1996)
	Sales from new products	%	y	griffin <i>et al.</i> (1996)
	Sales per employee	€	y	kemp <i>et al.</i> (2003)
	Market share	%	y	Lijn <i>et al.</i> (2002)
	Marketing expenditures for new products	€	y	Rogers (1998)
	Growth rate of sales	%	y	kemp <i>et al.</i> (2003)
	Profit ratio turnover	%	y	kemp <i>et al.</i> (2003)
	ROI (return on investment)	%	y	kemp <i>et al.</i> (2003)
Production costs per unit	€	y	Chiesa <i>et al.</i> (1996)	
<i>Explaining the efficiencies rationalization</i>	Termination of non-concurrent R&D programs	y/n numeric	n	cassiman <i>et al.</i> (2005)
	Termination of concurrent R&D programs	y/n numeric	n	cassiman <i>et al.</i> (2005)
	Re-organization of R&D teams	y/n	n	cassiman <i>et al.</i> (2005)
<i>Short run economies of scale</i>	Cut of R&D personnel	y/n numeric	n	cassiman <i>et al.</i> (2005)
	Closure of R&D laboratories	y/n numeric	n	cassiman <i>et al.</i> (2005)
<i>Long-run economies of scale</i>	New R&D programs in technological fields already covered by the company	y/n numeric	n	
	Specialization	y/n	y	Röller <i>et al.</i> (2006)
<i>Economies of scope</i>	Production time	time	y	Röller <i>et al.</i> (2006)
	Combined production process	y/n numeric	n	Röller <i>et al.</i> (2006)
	Combined production sources	y/n numeric	n	Röller <i>et al.</i> (2006)
	Transfer of R&D technical personnel from the other company	y/n numeric	n	cassiman <i>et al.</i> (2005)
<i>Technical progress</i>	Transfer of R&D physical equipment from the other company	y/n numeric	n	cassiman <i>et al.</i> (2005)
	Getting knowledge (patents, methods, other blueprints) from the other company	y/n	n	cassiman <i>et al.</i> (2005)
<i>Purchasing economies</i>	Creation of joint teams	y/n	n	cassiman <i>et al.</i> (2005)
	Cheaper R&D sources	y/n €	y	Röller <i>et al.</i> (2006)
<i>Process/speed</i>	R&D cooperation	y/n	y	Röller <i>et al.</i> (2006)
	Time-to-market for new products	time	y	Cohan P.S.
	Developing time of technological knowledge	time	y	cassiman <i>et al.</i> (2005)
	Time of introducing new production processes	time	y	cassiman <i>et al.</i> (2005)
<i>Management and the post-M&A process</i>	Introducing new products	time	y	cassiman <i>et al.</i> (2005)
	Funds internally available to finance R&D projects	€	y	cassiman <i>et al.</i> (2005)
	Scale of the typical R&D project	€ / numeric	y	cassiman <i>et al.</i> (2005)
	Top management of the R&D function replaced	y/n	n	cassiman <i>et al.</i> (2005)
	Companies innovation/ R&D strategy	y/n	y	Lijn <i>et al.</i> (2002)
	Companies strategy (competition strategy) *	y/n	y	Lijn <i>et al.</i> (2002)
	Re-organization of R&D teams	y/n	n	cassiman <i>et al.</i> (2005)
	Less motivated R&D personnel	y/n	y	cassiman <i>et al.</i> (2005)
	Decreased danger of being imitated	y/n	y	cassiman <i>et al.</i> (2005)
	Improved management of the R&D process	y/n	y	cassiman <i>et al.</i> (2005)
	More productive R&D personnel	y/n %	y	cassiman <i>et al.</i> (2005)
	Integration team	y/n	n	bannert, Seo de noble
	Individual treatment of employees	y/n	n	Seo, De Noble <i>et al.</i> (1988)
	Attention on cultural aspects	y/n	n	Seo, De Noble <i>et al.</i> (1988)
	Line managers involvement	y/n	n	De Noble <i>et al.</i> (1988)

* Innovation differentiation, marketing differentiation, quality differentiation, service differentiation, low cost leadership

** Technical innovation audit, benchmarking, portfolio management, or other tools

External indicators

External	Indicators	Unit	Compare pre/post-merger	References
Market	R&D expenditure	€	y	griffin <i>et al.</i> (1996) Lijn <i>et al.</i> (2002) Lijn <i>et al.</i> (2002) Lijn <i>et al.</i> (2002) Scherer <i>et al.</i> (1989) Lijn <i>et al.</i> (2002) Lijn <i>et al.</i> (2002), Rölller <i>et al.</i> (2006) Lijn <i>et al.</i> (2002), Rölller <i>et al.</i> (2006) Lijn <i>et al.</i> (2002), Rölller <i>et al.</i> (2006)
	Number of employees	numeric	y	
	Number of new products (announcements)	numeric	y	
	Number of suppliers	numeric	y	
	Market growth	€	y	
	Market share	%	y	
	Market concentration (C-4)	%	y	
	Extent of entry barriers	y/n	y	
	Availability of substitutes en complementary products	y/n	y	
	Dominance of suppliers-markets	y/n	y	
	Dominance of clients-markets	y/n	y	
Consumer	Improved/lower customer satisfaction*	y/n	y	Chiesa <i>et al.</i> (1996)
	Product prices	€	y	Lijn <i>et al.</i> (2002)
	Diversification	y/n	y	

*product -quality, price, improvements, innovations

Appendix 5: List of Cisco's acquisitions

Acquisitions date	Company	Business	Country	Value
Sept 24, 1993	Crescendo Communications	CDDI/FDDI, LAN switching, and ATM	USA	-
Jul 12, 1994	Newport Systems Solutions	Routers	USA	-
Oct 24, 1994	Kalpana	LAN switching	USA	204.000.000?
Dec 8, 1994	LightStream	ATM switching	USA	\$ 120.000.000
Aug 10, 1995	Combinet	ISDN remote-access networking	USA	\$114.200.000
Sept 6, 1995	Internet Junction	Internet gateway software	USA	\$5.500.000
Sept 27, 1995	Grand Junction	Fast Ethernet and Ethernet desktop switching products	USA	\$348.000.000
Oct 27, 1995	Network Translation	Network address translation (NAT) and Internet firewall equipment	USA	-
Jan 23, 1996	TGV Software	Web applications	USA	\$115.000.000
Apr 22, 1996	Stratacom	ATM switching and WAN	USA	\$4.000.000.000
Jul 22, 1996	Telebit	Modems	USA	\$200.000.000
Aug 6, 1996	Nashoba Networks	LAN switching	USA	\$100.000.000
Sept 13, 1996	Granite Systems	Gigabit Ethernet switching	USA	\$220.000.000
Oct 14, 1996	Netsys Technologies	Network simulation	USA	\$79.000.000
Dec, 1996	Metaplex	SNA solutions	USA	-
Mar 26, 1997	Telesend	WAN access	USA	-
Jun 9, 1997	SkyStone Systems	Synchronous Optical Networking/Synchronous Digital Hierarchy (SONET/SDH)	USA	\$66.500.000
Jun 24, 1997	Global Internet Software Group	Firewall	USA	\$40.250.000
Jun 24, 1997	Ardent Communications	Broadband Internet access	USA	\$156.000.000
Sept 2, 1997	Integrated Network	Digital subscriber line	USA	-
Dec 22, 1997	Light Speed International	VOIP	USA	\$160.000.000
Feb 18, 1998	Wheel Group	Computer security	USA	\$124.000.000
Mar 10, 1998	NetSpeed	Broadband internet access	USA	\$236.000.000
Mar 11, 1998	Precept Software	Internet television	USA	\$84.000.000
May 4, 1998	CLASS Data System	Computer networking	USA	\$50.000.000
July 28, 1998	Summa Four	LAN switching	USA	\$116.000.000
Aug 21, 1998	American Internet	Computer networking	USA	\$56.000.000
Sept 15, 1998	Clarity Wireless	Wireless networking	USA	\$157.000.000
Oct 14, 1998	Selsius Systems	VOIP	USA	\$145.000.000
Dec 2, 1998	Pipelinks	Synchronous optical networking	USA	\$126.000.000
Apr 8, 1999	Fibex Systems	Digital loop carrier	USA	\$250.000.000

Apr 8, 1999	Sentient Networks	VOIP	USA	\$195.000.000
Apr 13, 1999	GeoTel Communications	VOIP	USA	\$2.000.000.000
Apr 28, 1999	Amteva Technologies	VOIP	USA	\$170.000.000
Jun 17, 1999	TransMedia Communications	Gateways	USA	\$407.000.000
Jun 29, 1999	StratumOne Communications	Synchronous optical networking	USA	\$435.000.000
Aug 16, 1999	Calista Private	Branch exchange	USA	\$55.000.000
Aug 18, 1999	MaxComm Technologies	VOIP	USA	\$143.000.000
Aug 26, 1999	Monterey Networks	Synchronous optical networking	USA	\$3.700.000.000
Aug 26, 1999	Cerent	Synchronous optical networking	USA	\$3.700.000.000
Sept 15, 1999	Cocom	Cable modems	USA	\$65.600.000
Sept 22, 1999	Weblines Communications	Contact management	USA	\$325.000.000
Oct 26, 1999	Tasmania Networks Systems	Web cache	USA	\$25.000.000
Nov 9, 1999	Aironet Wireless Communications	Wireless LAN	USA	\$799.000.000
Nov 11, 1999	V-Bits	Digital video	USA	\$128.000.000
Dec 16, 1999	Worldwide Data Systems	Information technology consulting	USA	\$25.500.000
Dec 17, 1999	Internet Engineering Group	Synchronous optical networking	USA	\$25.000.000
Dec 20, 1999	Pirelli Optical Systems	Fiber-optic communication	USA	\$2.150.000.000
Jan 19, 2000	Compatible Systems	Virtual private networking	USA	\$317.000.000
Jan 19, 2000	Altiga Networks	Virtual private networking	USA	\$250.000.000
Feb 16, 2000	Growth Networks	Chipsets	USA	\$355.000.000
Mar 1, 2000	Alantech Technologies	Network management	Schotland	\$180.000.000
Mar 16, 2000	Jet Cell	Mobile telephones	USA	\$200.000.000
Mar 16, 2000	InfoGear Technology	Information management	USA	\$301.000.000
Mar 29, 2000	SightPath	Content delivery	USA	\$800.000.000
Apr 11, 2000	PentaCom	LAN switching	USA	\$118.000.000
April 12, 2000	Seagull Semiconductor	Computer networking	USA	\$19.000.000
May 5, 2000	Arrowpoint Communications	LAN switching	USA	\$5.700.000.000
May 12, 2000	Qeyton Systems	Wavelength-division multiplexing	Sweden	\$800.000.000
June 5, 2000	HyNEX	Internet access	USA	\$127.000.000
July 7, 2000	Netiverse	LAN switching	USA	\$210.000.000
Jul 25, 2000	Komodo Technology	VOIP	USA	\$175.000.000
July 27, 2000	NuSpeed	Internet Systems iSCSI	USA	\$450.000.000
Aug 1, 2000	IPmobile	Mobile software	USA	\$425.000.000

Aug 31, 2000	PixStream	Media player (application software)	USA	\$369.000.000
Sept 28, 2000	IPCell Technologies	VOIP	USA	\$200.000.000
Sept 28, 2000	Vovida Networks	VOIP	USA	\$169.000.000
Oct 20, 2000	CAIS Software	Integrated development environment	USA	\$170.000.000
Nov 10, 2000	Active Voice	Communication software	USA	\$266.000.000
Nov 13, 2000	Radiata	Wireless networking	USA	\$295.000.000
Dec 14, 2000	ExiO Communications	Wireless networking	USA	\$155.000.000
July 11, 2000	AuroraNetics	Computer networking	USA	\$150.000.000
Jul 27, 2001	Allegro Systems	Virtual private networks	USA	\$181.000.000
May 1, 2002	Hammerhead Networking	Computer networking	USA	\$100.000.000
May 1, 2002	Navarro Networks	Computer networking	USA	\$73.000.000
July 25, 2002	AYR Networks	Computer networking	USA	\$113.000.000
Aug 20, 2002	Andiamo Systems	Data storage	USA	\$2.500.000.000
Oct 22, 2002	Psionic Software	Intrusion detection	USA	\$12.000.000
Jan 24, 2003	Okena	Intrusion detection	USA	\$154.000.000
Mar 19, 2003	SignalWorks	Echo cancellation	USA	\$13.500.000
Mar 20, 2003	Linksys	Computer networking	USA	\$500.000.000
Nov 12, 2003	Latitude Communications	Web conferencing	USA	\$80.000.000
Mar 12, 2004	Twingo Systems	Computer security	USA	\$5.000.000
Mar 22, 2004	Riverhead Networks	Computer security	USA	\$39.000.000
Jun 17, 2004	Procket Networks	Routers	USA	\$89.000.000
June 29, 2004	Actona Technologies	Data storage	USA	\$82.000.000
Jul 8, 2004	Parc Technologies	Routers	USA	\$9.000.000
Aug 23, 2004	P-Cube	Service Delivery Platform	USA	\$200.000.000
Sept 9, 2004	NetSolve	Information technology	USA	-
Sept13, 2004	dynamicsoft	Communication software	USA	\$55.000.000
Oct 21, 2004	Perfigo	Computer networking	USA	\$74.000.000
Nov 17, 2004	Jahi Networks	Network management	USA	\$16.000.000
Dec 9, 2004	BCN Systems	Routers	USA	\$34.000.000
Dec 20, 2004	Protego Networks	Network security	USA	\$65.000.000
Jan 12, 2005	Airespace	Wireless LAN	USA	\$450.000.000
Apr 14, 2005	Topspin Communications	LAN switching	USA	\$250.000.000
Apr 26, 2005	Sipura Technology	VOIP	USA	\$68.000.000
May 23, 2005	Vihana	Semiconductors	USA	\$30.000.000
May 26, 2005	FineGround Networks	Network security	USA	\$70.000.000
Jun 14, 2005	M.I. Secure Corporation	Virtual private networks	USA	\$13.000.000

Jun 27, 2005	Netsift	Computer networking	USA	\$30.000.000
Jul 22, 2005	KISS Technology	Entertainment technology	USA	\$61.000.000
Jul 26, 2005	Sheer Networks	Service management	USA	\$97.000.000
Sept 30, 2005	Nemo Systems	Computer networking	USA	\$12.500.000
Nov 18, 2005	Scientific-Atlanta	Digital cable	USA	\$6,900,000,000
Nov 29, 2005	Cybertrust	Information gathering	USA	\$14.000.000
March 7, 2006	SyPixx Networks	Surveillance	USA	\$51.000.000
Jun 8, 2006	Metreos	VOIP	USA	\$28.000.000
Jun 8, 2006	Audium	VOIP	USA	\$19.800.000
Jul 6, 2006	Meetinghouse	Computer security	USA	\$43.700.000
Aug 21, 2006	Arroyo Video Solutions	Video on demand	USA	\$92.000.000
Oct 10, 2006	Ashley Laurent	Gateways	USA	-
Oct 25, 2006	Orative	Mobile software	USA	\$31.000.000
Nov 13, 2006	Greenfield Networks	Semiconductors	USA	-
Dec 15, 2006	Tivella	Digital signage / IPTV	USA	-
Jan 4, 2007	Ironport	Computer security	USA	\$830.000.000
Feb 9, 2007	Five Across	Social networking service	USA	-
Feb 21, 2007	Reactivity	Web services	USA	\$135.000.000
March 5, 2007	Utah Street Networks	Social networking service	USA	-
Mar 13, 2007	NeoPath	Data storage	USA	-
Mar 15, 2007	WebEx	Web conferencing	USA	\$3.200.000.000
Mar 28, 2007	SpansLogic	Computer networking	USA	-
May 21, 2007	BroadWare Technologies	Surveillance	USA	-
Sept 18, 2007	Cognio	Mobile software	USA	-
Sept 27, 2007	Latigent	Business performance management	USA	-
Oct 23, 2007	Navini Networks	Wireless LAN	USA	\$330.000.000
Nov 1, 2007	Securent	Digital rights management	USA	\$100.000.000
April 8, 2008	Nuova Systems, Inc.	Computer networking	USA	\$678.000.000
June 10, 2008	DiviTech A/S	Digital service management	Denmark	-
July 23, 2008	Pure Networks, Inc.	Computer software	USA	\$120.000.000
Aug 27, 2008	PostPath	Email	USA	\$215.000.000
Sept 19, 2008	Jabber	Presence	USA	-

Appendix 6: Sample List of Manufacturing Due Diligence Issues

Issues	Sample Questions
Target market dynamics	<ul style="list-style-type: none"> - What was the demand forecast? - What were the gross margin targets?
Product portfolio	<ul style="list-style-type: none"> - What was the product set? - What was the development status on new products?
Manufacturing technology	<ul style="list-style-type: none"> - What was their process for designing products for manufacturability, testability, cost, cycle time and volume?
Verification process	<ul style="list-style-type: none"> - How did they conduct internal and external design verification?
Supply base and order fulfillment	<ul style="list-style-type: none"> - Who was on their approved vendor and subcontractor list? - How did they manage their material pipeline and inventory?
Development, release, and manufacturing process	<ul style="list-style-type: none"> - What was their philosophy on design? - How much were they influenced by sales versus engineering? - Did they utilize crossofuntional teams in the development process?
Manufacturing process competencies	<ul style="list-style-type: none"> - Did they have any specific manufacturing core competencies that should be taken into consideration?
Organizational structure	<ul style="list-style-type: none"> - How were they organized? - How many people were in each area?
Leadership/management competencies	<ul style="list-style-type: none"> - What was the skill level of the work force as a whole? - What were the leadership capabilities of the management team?