Master Thesis

- ***How can companies manage the risk of lost intellectual property, when sourcing in China?***
- *Single case study - GEA Process Engineering*

Cand.Merc. Supply Chain Management

Author: Amin Soltanizadeh

Supervisor: Lektor, Ph.D. Juliana Hsuan

The Department of Operations Management

Hand in date: 04-10-2011

Copenhagen Business School

STU incl. tables & figures: 169.649 & 79 pages

Copenhagen Business School
HANDELSHØJSKOLEN

Executive summary

This master thesis is the final assignment before obtaining a master degree within supply chain management, at Copenhagen Business School. The main subject of the thesis is how companies can manage the risk of lost intellectual property, when sourcing China.

The main purpose of this thesis was to investigate what problems there are in terms of risk of lost intellectual property when companies do global sourcing, with main focus on China, and how these risks could be reduced and could be approached. The thesis therefore starts by defining the background of global sourcing, and then turns its direction into sourcing in China, and the risks and issues involved with that. The main problem of sourcing in China is defined as the country's poor governmental and legal protection against IP infringement. The different types of risks regarding sourcing in China was found as being risk of reverse engineering, disloyal employees and R&D leakage. The thesis then describes different aspects of general and strategic risk management strategies, which is then used for analysis of the case company of the thesis.

The thesis is based on a single case study, at the engineering company GEA Process Engineering that have had a lot of experience within global sourcing, and especially sourcing in China, and issues with intellectual property counterfeiting. The different risks defined from the literature review, is then compared in the case organizations situation to find out what actions that they have done in different situations and how their organization do protection against IP infringement.

There were some similarities between the literature and the case organization in terms of the different risks, and some authors also agreed with the case organization on a future that look brighter, in terms of IP protection in China. This factor was therefore considered for the thesis risk management strategy towards reduction of lost IP, for companies sourcing in China. The strategic risk management framework was therefore split into different management scenarios, depending on how the Chinese environment will develop. The risk management strategy is further based on an overall strategy towards IP protection, with different types of measures and actions needed to manage and reduce the risk of lost IP.

Key words: Intellectual Property, Risk Management, global Sourcing, China, GEA Process Engineering, Infringement.

Contents

List of Figures:

List of Tables:

Abbreviations

MNC's: Multinational Companies

LCC's: Low-Cost-Countries

WIPO: World Intellectual Property Organization

IP: Intellectual property

IPR: Intellectual Property Right

IPR's: Intellectual Property Rights

FDI: Foreign Direct Investment

TRIP's: Trade-Related Aspects of intellectual properties

R&D: Research & Development

GEA: GEA Process Engineering

ETO: Engineer-To-Order

B2B: Business-To-Business

1.| Introduction

This paper is the final assignment also called "Master Thesis" of Cand.merc.SCM (Supply Chain Management) at Copenhagen Business School (CBS). The assignments overall subject is how can companies manage the risk of lost intellectual property (IP), when sourcing in China.

After a discussion with the leading Sourcing Manager of consulting company Accenture Denmark (Farzin Saber), on the topic of piracy and counterfeiting being a significant problem for companies sourcing in LCC, and here we especially discussed China. By that the risk of lost IP when sourcing in LCC came up as being an interesting, but also problematic area. I therefore found it interesting to go in depth with this area, and discovering what possible solutions there could be to minimize this risk. The problem is mostly in China because of the governmental situation, due to the less mature policies and regulations that there is, compared to the rest of the world *(Song et al., in Fredriksson & Jonsson 2009).*

Entry to foreign market has created opportunities for companies, by being able to generate new knowledge, and also being able to save money by lower labour costs, which is one of the most common reasons for companies sourcing in LCC like China *(Quintens et al. 2006)*. Companies deciding to sourcing and moving production abroad will always increase the different kinds of risks. These risks can be a broad of different kinds, and this will of course always be related to which type of country that the company decides to source from *(Cook 2007)*. Companies' most valuable asset is their rights to the type of products, that they are in control of and it is very important for companies, to be able to protect their Intellectual Property rights, which is more exposed when sourcing in unstable IP protection countries such as China *(Wang 2004)*. The consequence of lost IP when a company sources in China, could be very vital and could result in the loss of possible many years of investment in R&D, which will then affect the company in lost sales *(Cook 2007)*.

Managing risk is one of the primary objectives of firms operating internationally *(Ghoshal, in Miller 1992).* Companies and institutions are exposed to a variety of different kinds of risks that can be from, strategic exposures to natural catastrophes and other uncontrolled human behaviours, which can hit the companies and organizations in unexpected ways, and result in

huge problems and losses *(Andersen & Schrøder 2010).* It is up to the company and its management and managers to make sure that the company is secured in a descent way, so when the risk occur the company still would be able to survive, and won't be resulting in big setbacks in its operations.

So there are different kinds of risks and it is in different degrees how it will concern the specific organization. It depends on the work of the organization or company and they are therefore not necessarily affected by the same kinds of risks in the same degree. The different types of risks and uncertainties that companies should be prepared for are strategic risks, operational risks, economical risks, and hazardous risks *(Andersen & Schrøder 2010).*

1.1| Purpose

The purpose of this thesis will be to investigate the literature on sourcing and risk management strategies, to see how companies could protect their IP, when they decide to source in China. The focus of the thesis will further be based on an interview with GEA Process Engineering, which sources in both China and India and has been thinking about how they could reduce the risk of lost IP. The thesis will look at how GEA Process Engineering has seen the risk, and what they have been doing to manage the risk of infringement and piracy of their IPR.

When the risks of GEA Process Engineering have been analyzed the goal is to develop a strategic risk management framework that gives guidance for companies to manage the risk of lost IP, when sourcing in China.

1.2| Problem area

This section is to describe what problem area the assignment will be focusing on, and a description of why this particular problem area has been seen interesting to focus at, and spend time investigating and finding solutions to.

The protection of a company's IP is very crucial and important, especially when companies choose to source and invest in LCC's like China with less mature policies and regulation in terms of protection of companies Intellectual Property Rights (IPR's). Due to insufficient control of

information and product access, there is an increasing concern that protection of IP in all aspect could be pirated in such an environment with difficulties in taking any legal actions against. The consequence of lost IP could be very vital and could result in the loss of possible many years of investment in R&D, which will then affect the company in lost profit.

It is important for a company to be aware of the risk of lost, when sourcing in LCC's as mentioned, and there are a lot of factors involved in sourcing especially in China. The reason is that when a company is exposed to, it can be difficult for them to pursue the supplier depending on the country laws and rights when it comes to IP protection *(Wang 2004)*.

With managing risks being one of the primary objectives of firms operating internationally *(Ghoshal, in Miller 1992),* this thesis will be focusing on first of all the risks concerned with sourcing in China and then creating a risk management strategy for companies sourcing there.

1.2.1| Problem statement and research questions

The best way to be able to avoid such circumstances will be by reducing the potential risks of lost IP, so the main problem statement of the research will be as follow:

- ***How can companies manage the risk of lost intellectual property, when sourcing in China?***

The research will be based on the poor governmental protection of IPR, and different types of threats/risks that could be vital. As mentioned the main goal of the thesis will be to develop risk management strategy for companies to help minimizing the risk. It will further be based on a case study of GEA Process Engineering (GEA), which has many years of experience and knowledge on sourcing in China.

To be able to answer the problem statement it has been seen necessary to use a couple of research questions, in order to get around the problem area and being able to answer the problem statement, in the best possible way.

The following research questions have been seen necessary in order to answer my problem statement in the best way:

1. *What is global sourcing, and what are the motives behind?*
2. *What is the situation in China in relation to sourcing and IPR risks?*
3. *What is the purpose of risk management and how can it be performed?*
4. *What is GEA's strategic position on the Chinese market?*
5. *How does GEA Process Engineering deal with their current risks in China?*

To answer **research question 1**, a literature review will be done on global sourcing, with the different aspects that are related and different types of sourcing strategies there are. The different motives for pursue global sourcing will also be defined together with the different benefits and motives of global sourcing.

To answer **research question 2**, a literature review on the situation on IP protection in China will be given, including different sorts of potential risks that is involved with sourcing in China. There will also be looked at the governmental and legal situation in China, and the possibilities companies would have of pursuing possible infringers.

To answer **research question 3**, a definition of risk management and the purpose from different author's points of view will be given, and how strategic risk management can be performed, by looking at different methods.

To answer **research question 4** a review of my meeting with the GEA Vice President will be given, to find out how they view this issue and, where they have their concerns in relation to their operations in China and India. The gathered information will then be analyzed in order to find out the company's strategic position and how they deal with potential threats and risks.

Research question 5 will be answered by analyzing GEA's different experiences with risk exposures and analyzing their current measures on the problems, and what they have done in previous cases of piracy and counterfeiting of their IP.

The gathered information from the literature study and the case study will then be the base of the risk management strategy, which will be developed for IP protection for companies sourcing in China.

1.3| Delimitation

In this section I will present the delimitation of this thesis, where a description of the focus of the thesis, and also a description on the different decisions and approaches that have been taken will be given.

The thesis will be mainly focusing on the Chinese market because of the specific market situation, in terms of governmental and legal regulations that there are. Global sourcing and LCC's in general, will though also be mentioned as in many terms they have same similarities, but the main focus will be on the Chinese market. So the literature review will focus on background of global sourcing, and then being narrowed down to the specifics of sourcing in China and issues there.

The thesis is further delimitated to focusing on production organizations, which means that the scientific literature used, could either be generalized to production organizations, or is written relating to production organizations. The paper won't going into depth on, how the Chinese legal system is build and structured, as it would taking too much space, and also changing the focus of the paper, so therefore an overall description of the legal system will just be given.

The thesis further focuses on multinational companies (MNC's) global sourcing activities, and is not delimited to companies from specific countries. The case company and the information gathered from it will include experience and aspects of the company's business in India and China, as this will give a better overall picture of why China is much more difficult to perform business in legal wise.

When there in the thesis is referred to sourcing in China it is primarily based on the intra-firm type of sourcing, but information gathered from outsourcing is also used and be generalized to intra-firm sourcing activities.

1.4| Thesis Structure

Chapter 1 will be focusing on the introduction, motivation and purpose of the assignment, and then the problem statement. After being introduced with the problem statement and the

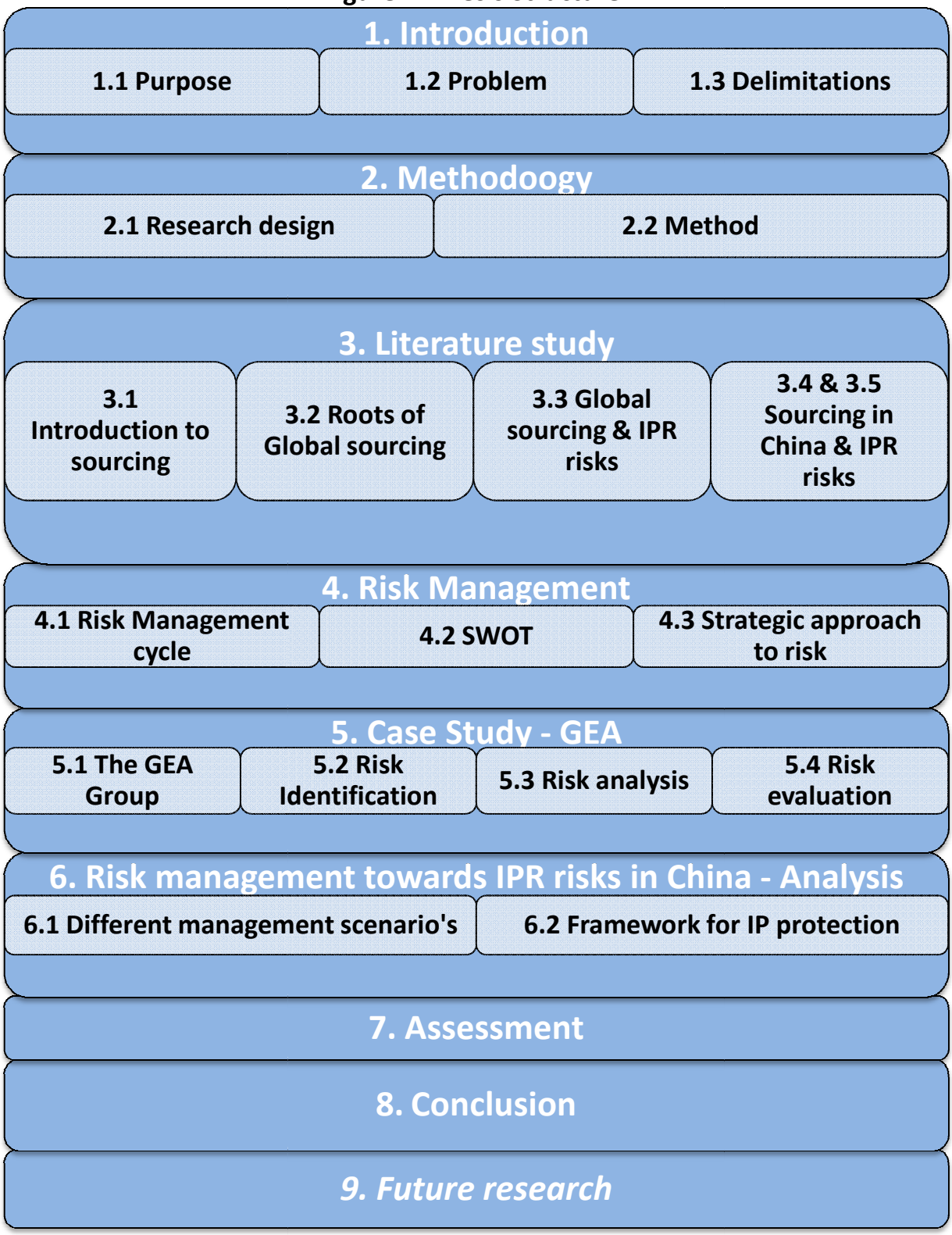
research questions developed from it. **Chapter 2** will be giving an overview of how the research design is build and the methodology used. The purpose of the methodology is to show how the data will be gathered and how it will be used in the paper, and also a description of the validity and reliability of the gathered data. In **chapter 3** a literature study on the main subjects of global sourcing will be given, sourcing in general and the different types of sourcing strategies. The chapter will then be focusing on sourcing in China and the different IP obstacles that are related with sourcing there, in relation to the governmental situation and legal regulations. Not all of the literature review will have the same importance of the papers further development, but in order to give a good overview and understanding and perspective on the subject, it has been needed to include anyway. The main purpose of the literature review is to make a foundation for the case study of the case company GEA Process Engineering.

Chapter 4 will be presenting different sorts of risk management strategies, from a very conventional form, to a more strategic based risk management framework. The risk management strategies will later be used for the analysis of the case company. **Chapter 5** will be the papers empirical study on the case company, starting with giving an overview of GEA Process Engineering and the company's history and structure, to give a basic understanding of the company. The paper will then go towards describing and analyzing the findings in the interview with GEA Process Engineering that is needed, for the rest of the papers risk management strategy.

Chapter 6 will be the development of the papers risk management strategy towards IPR protection, which will be based on gathered information from the previous chapters. The risk management strategy, which will be presented, will be primarily based on GEA Process Engineering's situation in the Chinese market, but is presented as a general framework for similar companies sourcing in China.

Chapter 7 will be an assessment and discussion of the risk management strategy developed in the analysis. **Chapter 8** will be the conclusion of the paper, where the research questions will be answered one by one, and at last an answer to the overall problem statement will be given. **Chapter 9** will focus on possible future research that could be interesting to look at, within the subject.

Figure 1: Thesis Structure



Source: *Own contribution*

2.| Methodology

The research approach chosen will not only influence the shape of the empirical study, but also the data collection, and how this will be analyzed. This will also affect the focus and role that the literature study of the assignment will have in the later research.

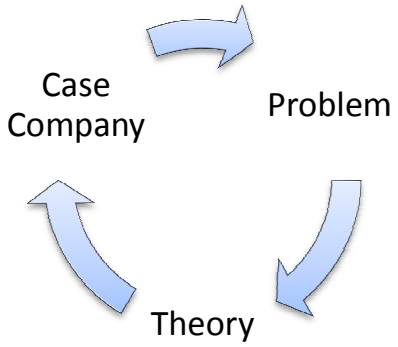
There are two common alternative ways of relating theory to reality, which are the deductive and inductive approach. The inductive approach can be described as an explorative way where the goal is to generate theory. This research approach seeks to understand, interpret and totalize, and goes from empiric study to theory (Saunders 2007 p. 117). The deductive approach on the other hand, focus on testing existing theories by developing propositions from current theories, and making them testable in the real world (Saunders 2007 p. 118). Although these are two different research approaches, it is also possible to combining them, which often is seen as an even better and advantages way, to draw conclusions on a research process *(Saunders 2007).*

This assignment will be focusing on a combination of the deductive and inductive approach, depending of the conclusion that is being focused on, in the given situation. I therefore see it as an advantage to using both of the methods, as the thesis first will be testing the theory, but then from the results building a new theory. The analysis of the case study will therefore be based on the deductive approach where *"testing theory"* will be done, and the inductive approach will be used when the risk management strategy is created also called the *"theory building"*.

2.1| Research Design

This section will give and introduction to how the design of the research will be, and discuss the methods relevant for this project, so the reader can understand how the thesis have been developed, throughout the literature and the qualitative data gathered.

Figure 2: Methodical approach



Source: *Own contribution*

Figure 2 shows the methodical approach of this thesis. The project takes its starting point with the problems and the general problem area in terms of IP protection when sourcing in China. A literature study and relevant theory regarding the subject will then be introduced, and used on the case company GEA Process Engineering. The gathered information from the literature study and the case study will then be the foundation of the strategic risk management framework, which will be developed for companies sourcing in China and wants to reduce risk of lost IP, and be prepared for different violations in the best possible way.

The assignments research design is combined with primary and secondary data, in terms of a case study and literature study. The primary source for the empirical study of the assignment will be a semi structured interview with the case company. The secondary data will be information found on the internet about the company and the company's annual report. The secondary data will also be scientific literature, which will form the scientific and theoretical approach of the assignment.

The semi-structured interview will be in cooperation with the case company GEA Process Engineering (GEA Niro) Denmark. The interview will be with the Director of Emission Control and Vice President Henrik Maimann who has been the lead of information and knowledge transfer to China and India. The relevance of the case company in relation to the thesis is GEA Process Engineering's operations in China and India, with the observation of risk of lost IP in those countries, which Henrik Maimann also has been involved in managing.

2.2| Quantitative versus Qualitative research

According to Andersen 2006, there are three types of research methods; quantitative or qualitative, or a combination of both of them. Andersen 2006 argues for, that the main difference between quantitative and qualitative research is the use of numbers. Quantitative research is mostly based on facts and study relations between sets of facts. Qualitative data on the other hand, is based on all other information than numbers, such as movies, photos, objects etc. *(Andersen 2006 p. 150).* The goal with the qualitative data is to get an insight instead of a statistical analysis. Common ways to do qualitative research is through interviews and observations where for quantitative is through surveys.

This study is performed by using a qualitative method and by conducting deeper investigations into a case study by testing previous research. The qualitative research that is performed in this thesis will be based on the interview with the case company, and the goal is to get a more in-depth study by using this method.

2.3| Data Collection

There are two categories of information which can be collected during the study, which are divided between primary and secondary data. Primary data can be gathered through interviews and observations, where the secondary data is however already existing data within areas, where research is being done (Andersen 2006 p. 47). The secondary data being already existing data can be gathered through internet, literature of scientific journals. This thesis will be based on both primary data and secondary data. The next part will give a description of how and which sources that have been used to gather the necessary information of the thesis.

2.3.1| Primary empiric data - Case study approach

The empirical study of this thesis is based on one case study of a company that has many years of experience with sourcing in China and has experienced infringement of their IPR's. The chosen research strategy is by Yin 2003 described as being as the strategy type of "the single case study". This means that the questions that is chosen for the structure of the case material is known as being open, what, who, how and why etc. questions. There is not any direct control

over situations as by using the open questions, the answers given will be based on current and past situations in relation to the company's strategy towards IP risks *(Yin 2003).* As there is being analyzed on "case study" it is important to define what this phenomenon means.

Yin 2003 defines this in the following two citations:

> *"A case study is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident. [...] The case study inquiry copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result benefits from the prior development of theoretical propositions to guide data collection and analysis"* (Yin 2003 p. 13).

In this assignment there will be used one case, so that is defined by *(Yin 2003)* as being the "*single-case study"* approach. Yin argues for that it is preferred to have more than one case to back up a research which is called *"multiple-case studies"* (Yin 2003 p. 53). But for the analysis of this assignment as a single case study can narrow down the analysis, to the specific case company that will be used, and the single-case study will have a much more in depth approach. The goal of the case-study is to understand, how the case-company has experienced IP problems in China, and what approaches and actions towards have been taken (Yin 2003 p. 41).

Gill (1995) argues for the difference between single case and multiple case studies with:

> *"…: (i) in-depth study of a single case versus the study of a number of cases; (ii) deep versus surface descriptions; and (iii) the telling of good stories versus the creation of good constructs" (Gill 1995 p. 2).*

The assignments case study is characterized by one case organization (i), where there will be performed an interview (ii), where the goal is to create understanding of the case organizations approach, and possible strategy towards the risk of Intellectual Property in China (iii). These differences should be included in the validity of the case study. It can be argued that one personal interview with the case organization might not be in-depth enough in relation to helping with the

answering the problem statement of the thesis. The possibility was though there to get more interviews, but I am convinced that more interviews would have given more valuable information, as the interview was performed after the literature study was performed, and therefore I had a basic goal of what I wanted to get answered *(Kvale et al. 2006).* I therefore argue and assess, that the semi-structured interview form is enough to cover the needed information to help with the answering of the problem statement.

The process of the structuring of the data material about the case organization will be seen as the "*flexible case design"* (Yin 2003 p. 62)*,* as the flexible case design will allow the interview questions to be adapted to the path of the interview. This will also allow potential unexpected and important information to be included, in the gathered data from the interview.

It has not been possible to follow the case organization on a long-term period, which means that the empiricism from the semi-structured interview is based on historical data, which forms the basis to achieve data of incidents, and events occurred before the start of the case study.

The empirical data gathered from the case study can't completely be seen usable to be compared to all global and MNC's sourcing in China as this would need more than one case on the same topic and same type of organization to conclude on *(Andersen 2006 p. 139-142).* The goal of the primary sources is to structure the case study and to find the relation between the literature studies, to be able to analyze on the data gathered and following a conclusion to the research questions and problem statement.

On the gathering of primary data in the interview with GEA Process Engineering there will be performed "systematic control*" (Andersen 2006 p. 143).* The systematic control on the semi structured interview will lead to "getting back on track" when the interview gets into a siding, by going back to the questions from the interview, which can be found in **appendix 1.** The sound file of the interview with Henrik Maimann is attached on the CD **appendix 2**.

2.3.2| Secondary empiric data

The secondary data is based on already existing data which can save time and resources if the necessary and useful information for the thesis is available. Secondary data include both quantitative and qualitative data and are used in principally in both descriptive and explanatory research (Saunders 2007. The secondary data can be based on journals, letters, TV programs, reports, and articles etc. *(Andersen 2006).*

The secondary data used for this thesis is mostly based on scientific papers and journals found through the school database, by searching for the specific topic. A couple of relevant journals have then been read, and been used if it has been seen relevant for the assignment. Information found on the internet, the case company's homepage especially has also been useful for secondary empiric data, about the structure and general information of the organization. The GEA Group Annual report 2010 has also been used for information about the company size, in terms of employees, revenue etc. which has been seen important to include in terms of giving a picture of the size of the company in the global market. Different reports on the topic, from big corporations such as PWC and IBM have also been used as they also give a different view compared to the scientific view. The supervisor's corrections, comments and suggestions have also been taken into account throughout the process of the assignment.

The analysis will connect the existing theories with my observations and interview and create what is unique for the management of risks associated with IP when sourcing in China. The focus will be on giving recommendations and create an overall strategic risk management framework that can be used by GEA Process Engineering and other similar companies, operating in the same environment.

2.4| Verification and generalization of empirical data

The quality of the empirical data throughout the thesis should be secured of a high validity and reliability. The empirical data are partly developed by an interview with GEA Vice President and Director of the division Emission Control Henrik Maimann. The other part of the empirical data are as mentioned gathered form information already available such as scientific papers and

the annual report of the organization. It is also important to state in which degree the results of the case study can be generalized for other companies and organizations.

2.4.1| Validity

The validity in this thesis refers to establishing the domain to which a study's findings can be generalized, when doing case study *(Yin 2003 p. 34).* The term covers the relationship between validity and relevance, where the validity is about the general accordance between the theoretical and empirical perception plan, with the relevance concerning the fact on, how relevant the empirical selection is for the problem statement *(Andersen 2006 p. 81).*

The terms also have a different meaning depending on whether the research is qualitative or quantitative. In a qualitative study validity means that there has to be conformity between the researcher's observations and the conclusion drawn. In quantitative research, validity means congruity between the statistic result and reality. Conducting a qualitative research will always have the risk of subjectivity and the empirical results will therefore be affected by my interpretation of the respondent's description of the reality *(Kvale 2006 p. 231).*

The research needs to be secured validity. This means that the research should be trustworthy, valid and that the questions suggested is to be answered in the project are relevant. I should be clear and confident on the findings to answer the research questions developed. Therefore the quality of the result depends on how similar it is to the phenomenon that I want to investigate *(Kvale 2006 p. 231).* When performing a semi-structured interview like in this assignment it is important to notice the possibilities that exist, where the interviewee could on purpose exclude answering some questions, if they maybe are company sensitive *(Kvale 2006 p. 231).* The interview was though seen with high validity because of the interviewee included a lot of their own experiences in relation to the topic and questions answered. The interviewee was also given the questions a couple of days before the interview to be able to prepare for the interview in the best possible way. The interview was of about approximately 1 hour, and the interview is also attached on the supplied CD as well as transcription into paper, of the interview.

For the secondary data there have been done a big effort in using a big amount of literature that concerns the assignments main subject of global sourcing and sourcing in China to secure a high validity of the secondary data. And with the data concerned are mostly scientific journals but also reports from companies with experience within the topic and the validity of these are seen as high.

2.4.2| Reliability

Reliability refers the demonstration of the operations of a study, like the data collection procedures can be repeated, with the same results *(Yin 2003 p. 34).* The reliability of a study is affected by the way the research is carried out and by the researcher's precision and attention during the processing of the gathered information *(Andersen 2006).*

In this thesis the reliability has been sought by having a case study based on a company with a lot of experience in the field. Naturally the reliability could have been even higher if it could have been supported by performing a multiple case study, by having another company with same type of operations interviewed and getting their experiences of sourcing in China added to the research. But as previously mentioned the single case study approach has been preferred for this thesis to narrow down and to give a more in-depth approach. A quantitative research by adding a survey where a larger amount of companies answering could further have been made, but haven't seen very useful, in terms of the thesis needing some more in depth answers, in terms of different experiences compared to a survey.

The author has gathered the information for the project by a personal interview with Director of Emission Control and Vice President, Henrik Maimann at GEA Process Engineering. The interview will be based on systematically planned questions and then going over to a general correspondence during the interviews progress between the author and the interviewee.

The reliability was sought by setting up an interview with a person that has had a lot of experience within sourcing in low-cost-countries and especially knowledge transfer to China and India, which Henrik Maimann has been in the lead of for the last many years working in GEA. It has not been possible to measure to what extent the interview answers would have been the same

if asked in a different way. The interview have been recorded and re-listened and then transcript into text which can be found attached on the CD. In case of any obscurities found later on, the interviewee has been contacted to verify and explain their answers.

2.4.3| Generalization of case study results

The generalization of the case study design has often been criticized and many authors have seen the case study design as unscientific. The method has although it's extend been very little involved in method literature *(Andersen 2006 p.115).* Andersen though thinks and assesses the case study as very crucial and important, when doing scientific studies. Yin thinks that it is possible to generalize from single case studies and multiple case studies, with the important thing being to describe the case study as good as possible, and then inductively end with general knowledge. According to Yin there are two categories of generalizing results from case study to theory; analytic generalization and statistical generalization. Analytical generalization relies on case studies (as with experiments) where previously developed theory is used as a template with which to compare empirical results of the case study. In analytical generalization the investigator is striving to generalize a particular set of results into some broader theory. The statistical generalization on the other hand relies on research based on surveys where a conclusion is made about a population on the basis of empirical data collected from a sample *(Yin 2003).*

In this research the results will be generalized through analytic generalization being the most common case study approach. Previous research and theories will be tested by examining the results from the case study. The results will then be the main point of the development of the strategic risk management framework that will answer the problems statement of the thesis.

Since the case study is based on an industrial company with focus on B-2-B (business-to-business) the results found might only be generalized for similar type of companies. There might be factors that are not caught, which would be more relevant for companies in other industries. Still, my believe is that the case study in this thesis, would allow generalization since the case company is multinational company (MNC) which often stand as an example for, and have major influence on other companies.

3.| Literature study

During this chapter previous research made on the subject of global sourcing and LCC sourcing will be described, with specific focus on sourcing in China. The start of the chapter will be presenting table 1, with the main major journals and authors that have been used during the literature review.

The literature review will be split into two sections with one presenting global sourcing, with the different benefits there are, and reasons for companies to move production to these countries. The next part will go in depth with the intellectual property risks that there are when sourcing in China, and why it especially is important to be aware of different problems and why risks of sourcing there is higher due to the governmental situation.

The main idea of this part of the thesis is to give the reader a view of the problem that the thesis have been build on, and to describe what the literature and different authors think about this issue, and how they view this problem.

Table 1: Important journals and authors for the literature review

Authors	Year	Research method	Key words	Focus Area
A. Fredriksson and P. Jonsson	2009	Case study	Sourcing in China	Developing a framework for low-cost sourcing assessment and to explore the consequences of low-cost sourcing in China for a European manufacturer.
L. Quintens, P. Pauwels & P. Matthyssens	2006	Review	Global purchasing	Findings on the central phenomenon, its antecedents and consequences as well on the globalization process of purchasing.
Wang, L	2004	Review	IP Protection in China	Describes the situation of IP protection in China with the problems etc.
M, Kotabe	1998	Review	Global sourcing strategies	Describes the different types of sourcing strategies, and makes a comparison of US and Japanese MNC's
A. Maltz, J. R. Carter, E. Maltz	2011	Quantitative	Sourcing decisions in LCC	Cost and reliability are key criteria used by sourcing managers, but other factors such as intellectual property protection also come into play.
Holweg, Reichhart &Hong	2011	Multiple Case study	Risks and costs in global sourcing	Define three basic cost elements in global sourcing: static, dynamic and hidden cost, and use a framework to assess the costs and risks inherent in global sourcing scenarios.
B. Smarzynska Javorcik	2004	Review	FDI & IPR	Indications on that a weak intellectual property regime encourages investors to undertake projects focusing on distribution rather than local production.
P. Samuelson	2002	Case study	Reverse engineering	Discussing a case of reverse engineering, whether it is a lawful way to acquire trade secrets
C. J. Clarke and S. Varma	1999	Review	Risk management	Integrated risk management approach allows companies to consistently deliver superior performance while proactively managing risks. The article outlines a structured methodology for risk management process evaluation and change.
G. Kennedy, D. Clark	2006	Review	Outsourcing to China risks/benefits	Ways in which companies sourcing in China can balance benefits and risk by addressing: IP and technology transfer rights, the business and legal environment in China, contractual arrangements, preemptive legal protections etc.
PWC	2005	Business Report	Risk management, and risks of China sourcing	This report by PWC, reviews the situation on the Chinese market in relation to IP and the problems related. It then comes up with proposals on how to manage the given risks and problems of doing business in China.

3.1| Introduction to global sourcing

The term of global sourcing has been defined with different kinds of words from the literature, being defined as *global purchasing, international purchasing, worldwide sourcing, import sourcing, offshore sourcing and international procurement* with all having the same meaning *(Quintens et al. 2006).*

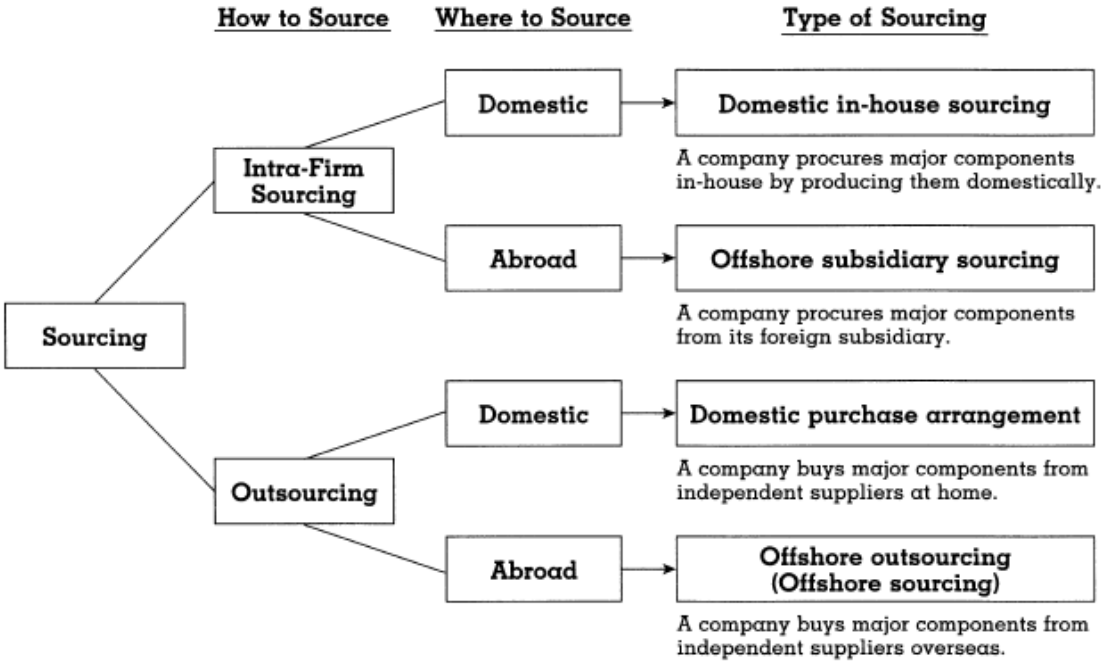
Quintens defines global sourcing is defined as:

"*the activity of searching and obtaining goods, services and other resources on a possible worldwide scale, to comply with the needs of the company and with a view to continuing and enhancing the current competitive position of the company"* (Quintens et al. 2006 p. 2).

So the definition of global sourcing is much more than the physical sourcing and buying products, it is because of the sourcing process of a company doesn't only includes the operational tasks, but also much more strategic responsibilities, such as supplier development to generate global sourcing synergies. Global sourcing can also be the result of a reactive, opportunistic decision to the purchasing cost of one item, but on another hand also is a strategic coordinated effort to enhance the competitive position of the company, on the market. This is for example if there is a big demand of the company's products in one country and by that the company chooses to source directly in that country *(Quintens et al. 2006).*

Although global sourcing mostly would refer to sourcing internationally, it could in other terms also be relating to sourcing in the company's own country. This term is when the company have scanned and searched the market for better options, but then anyway decided and figured out, that it is most suitable and profitable for them to source domestically, instead of going abroad *(Quintens et al. 2006).* This term can also be seen in figure 3 where different sourcing strategies are described, which is based on either domestic intra firm sourcing or domestic outsourcing *(Kotabe 1998).*

Figure 3: The Different Sourcing Types



Source: Kotabe, M. (1998) p. 6

Figure 3 by Kotabe 1998, describes how sourcing is in general divided and what the main differences is between different types of sourcing strategies, and if it is domestic or abroad intra-firm sourcing and if it is abroad or domestic outsourcing.

The two phenomenons's, which are related to global sourcing, are as mentioned sourcing and outsourcing. And in the next section the two sourcing types will be going into depth and described further, in terms of their differences and the factors that there is on the decision making between the two.

3.1.1| Sourcing vs. Outsourcing

Before deciding to perform sourcing from a foreign country it is important to define whether to outsource or intra-firm source. So the difference in intra firm-sourcing and outsourcing will be explained in this section. Cook 2007 describes the intra-firm sourcing as just sourcing, where it was previous described as being the overall definition of sourcing. But there is being referred to the intra-firms sourcing as presented in Kotabe's sourcing strategy model in figure 3.

Cook describes Sourcing and Outsourcing in the following ways (Cook 2007 p. 2):

> ***Sourcing*** *is transferring the site of your manufacturing to a foreign location but maintaining some or all of the control over ownership of the manufacturing process.*
>
> ***Outsourcing*** *is transferring the site of manufacturing to a foreign location and transferring most or all of the control of the manufacturing process to a foreign entity.*

So sourcing is basically when a company chooses to transfer the company's production or R&D etc. to another foreign location and from there procure and buy the products. The company will though still maintain most or all of the control of the process by themselves, and therefore reduce the risk of the movement to another country in some points. Risks in terms of proprietary rights are more protected when sourcing, as the company still is in control of most of the company *(Cook 2007).*

Outsourcing is though different in the way that the company transfers the whole entity and most of the control, to another company in a foreign country. The difference is therefore that the company has more control over the process when they source compared to outsourcing. In outsourcing the risk of proprietary rights are bigger, because of the production is given to another company's control *(Cook 2007).*

Cook 2007 argues that there is risk when sourcing or outsourcing on different kinds of product rights, but that there is much more risk associated with transferring and outsourcing products to a third party, compared to source and still maintaining ownership of the manufacturing. The issue on the risk of outsourcing and sourcing in foreign countries are also always depended on which kind of country, and the insecurity with the government, which can cause that the company will be exposed to some sort of copied products or knowledge. And then the government can't help the company if the company is exposed to therefore it is important for companies to be aware of these risks. This will though be described a lot more in depth, later in this chapter.

3.1.2| Decision making on sourcing or outsourcing

The decision making process when companies want to know whether to outsource or source in a foreign country depends on different factors, and are important to be aware of before a company decides to implement one of the two concepts in their organization, the different factors to be aware of will be described in this section.

Different factors can be seen as the environment of the country, which of course also depends on which products the company tries to outsource. Other than this one of the more important things is the country's legal system which is important to investigate, because it is very important that the legal system of the foreign company provide protection for intellectual property rights, and what the country's law say's if such things are violated. So will the company violated be compensated, and can they get any sort of replacement *(Cook 2007).*

Another thing there is for the company in the decision process is the product easy to copy or duplicate, and how will they allow access to their specific manufacturing process or technology. Control over the products is also important to state, in terms of it should be the company itself, or is it fine that the other company have access to the different various products. It has to be said that it is not only a matter of copying physical products, it might as well be the method or a strategy on how a machine works, that could be copied, which will be gone into depth later.

Other than that there are always decision criteria related to the country's political relations to western countries, and infrastructure of the country. If a company wants to source it is also always important to think about the living standards to the employees that they are planning to move abroad in the implementation process and the transfer to the given new site.

The decision making process of outsourcing and sourcing, is also affected by the cost associated. Companies need to be aware of that sourcing strategies are much more costly, as it requires plant allocation, and or construction of new sights, also the asset, knowledge with the personnel transfer needs to be taken into consideration. Outsourcing will also show short term resolution and faster turnarounds for the company, compared to sourcing that mostly will show a turnaround, in a later term of the implementation, considered all the much more work required in

the implementation. Outsourcing compared to sourcing strategies, is also easier to modify in terms of finding another supplier if the first suppliers performance turns out to be none acceptable a new supplier could be sought instead. Outsourcing on the other hand will also be able to add quick value to the company if the supplier is in hold of valuable knowledge and experience which can add value to the products and future products they will be supplying the company *(Cook 2007)*.

All in all it is very important for companies to make a checklist on the different factors and pro's and cons' on whether it more suitable for them to source or outsource, and what countries that will be most suitable for them and helping them in the decision process on moving their production to foreign countries. A lot of factors should be taken into consideration and the company needs to think about how much they are willing to invest in the new sourcing strategy, and also very important if they plan it to be a short or longer term solution, together with if they expect to obtain value fast and in a short term basis, which will be mostly suited for outsourcing. Sourcing on the other hand requires more investments, and is more time consuming to implement, considering the plant allocation, personnel and knowledge transfer to the new sight.

3.2| Roots of global sourcing

According to Matthyssens et al. 2006 global sourcing is a very young research topic, although it has been used for some years now. Global sourcing is divided into three main fields, international business, marketing management and purchasing and supply management, which will be described in this section.

3.2.1| International Business

Global sourcing emerged significantly in the early seventies when companies discovered the potential advantages of sourcing from abroad from an international business point of view. Leontiades, in Matthyssens et al. 2006, discussed the use of "satellite plants" which are foreign subsidiaries of multinational firms founded in foreign countries because of low-cost production. This was seen as a form of global purchasing. Leff, in Matthyssens et al. 2006, point out that the shift towards production in less developed countries was due to the ability of these countries to

export goods, at competitive prices. Hefler, in Matthyssens et al., 2006 talks about the early eighties, and put forward three types of global purchasing based on the ownership of the supplying plant; from arm's length relationship, over to joint venture, to fully owned plants. Global purchasing is also seen as a special case within the international business literature where it is used as a tool, to achieve a better position against competitors so relating to the competitive advantage there is of global sourcing. Kotabe and Murray, in Matthyssen et al. 2006 describe the different view to global sourcing, as global sourcing often on, only being seen at a multinational view. Although as previously mentioned it also can relate to domestic sourcing if the company finds out it being more profitable than going abroad.

3.2.2| Marketing management

Matthyssens et al. 2006 also argues for how the purchasing function has also been approached from a marketing point of view. This should be understood as companies could have the benefit in terms of sales increase if they have a thorough understanding of the purchasing practices of their industrial customers. There is a tendency to focus on buyer-supplier relationships in an international context *(Haugland, in Matthyssen et al. 2006).* Others focus more on the inward-outward connection of international knowledge transfers within a company. The idea is that global purchasing and global marketing within a company should be linked *(Karlsen et al., in Matthyssen et al. 2006).*

3.2.3| Purchasing

The third and last field of global sourcing according to Matthyssen et al. 2006 is the purchasing view, with global purchasing being considered as a special case in purchasing management.

According to Narasimhan, in Matthyssens et al. 2006 a thorough search for goods and services is believed to enhance the competitive position of the company, and to improve its performance. In one of the first articles on worldwide purchasing Davis et al. 1974 identified different factors that should be taken into consideration when the decision between a local and a global supplier is taken. The comparison on the choice of having a centralized purchasing organization versus a decentralized purchasing is given. The seven factors that have been identified to affect the choice of a local versus a global supplier by Davis et al. 1974 were;

product categories, distance between buyer and supplier, governmental policies and regulations, nationalism, market versus product pressure and characteristic of the buyer.

Overall, this third stream of literature brings two major messages; the first being the role, which global purchasing plays in creating competitive advantage. The second being the message that the actions of global purchasing should be considered in a broad perspective of total cost of ownership, since global purchasing is part of a large international supply chain, *(Matthyssens et al. 2006).*

To summarize the three above mentioned fields of global sourcing, and what they have contributed with in relation to the creation of the global sourcing literature. The three fields studies and gives answers to why and how companies purchase globally, even though that it is seen to be very complex and also risky business.

3.2.4| Benefits of global sourcing

It is important and relevant to look at why firms have increased their pursuit of purchasing from suppliers beyond their national borders.

The need to source components, subassemblies and finished goods from all over the world has been identified as an important influence on purchasing strategy and corporate strategy in general at least since the 1980's. Lower cost of labour is one of the main factors that are attractive to manufactures deciding to go abroad and source in other countries that North America and Western Europe *(Dicken, in Maltz et al. 2011).* As mentioned there is no doubt that the search for lower costs has been the greatest driver of global sourcing. Other factors include a search for higher quality, greater material availability, and access to product and process technology *(Monczka, Trent, & Petersen, in Kotabe, 1998).*

There is a wide agreement between most of the authors from the literature that one of the main reasons is the cost reduction aspect that drives companies to seek global sourcing and low cost country sourcing. However the reduction in cost is not the only factor and driver for companies seeking global sourcing, as there is also the aspect of the access to new technologies

or higher quality products and also creating better relations in new countries and markets (*Holweg et al. 2011)*. It could be grouped into three categories, from *(Holweg et al. 2011)*:

1. Gaining access to cheaper resources and better international competitive position
2. Establishing a presence in new markets
3. Obtaining access to distinctive resources

(Monzka et al., in Holweg et al. 2011) argues for that the individual aspects of the above categories has changed very little over the past years, and has made relevant table that sums up all the main benefits and drivers for companies that wants to seek global sourcing.

Table 2 shows the factors and benefits that there is for companies to seek global sourcing, and gives a good broad picture of the main driving forces. The table is with a summary of three papers, from three different time periods, with their opinion of the rationale behind global sourcing. The interesting thing to see is that they all agree with most of the benefits, although there are many years of difference between the first research and the last on this subject.

Table 2: Rationale for global sourcing (in order of importance)

Monczka and Giunipero (1984)	Monczka and Trent 1991	Nassimbeni (2006)
• Lower prices	• Cost reduction	• Purchase materials and components at lower costs
• Firm had worldwide operations and attitude	• Quality improvements	• Achieve resources not available in the home country
• Availability of foreign products	• Increased exposure to worldwide technology	• Possibility of acquiring less expensive manpower
• Improved quality of foreign products	• Delivery and reliability improvements	• Global competition
• Technology available from foreign sources	• Introduction of competition to the local supply base	• Global attitudes of the company
• To fulfil countertrade/offset/local content requirements	• Establishing a presence in a foreign market	• Possibility of acquiring advanced technologies
• Due to developing worldwide competition	• Satisfying offset requirements	• Reduction of commercial barriers
• Improved delivery of foreign product	• Reacting to the offshore sourcing practices of competitors	• Possibility of developing a presence on foreign markets
		• Presence of plants in foreign countries
		• Possibility of selling products on supplying markets
		• More favourable taxation

Source: *(Holweg et al. 2011 p. 2)*

Although there is a broad agreement between the different motivational factors behind global sourcing there is still difficult to differentiate between benefits from outsourcing to external suppliers, and the benefits of sourcing as described before *(Holweg et. al. 2011)*.

3.3| Global sourcing & IPR Risks

The use of the term "risk" is to referring to uncertain environmental variables that reduce performance and predictability, as well as the lack of predictability in firm outcomes itself, can be confusing *(Miller 1992)*.

Risks of sourcing is important to state and go through, because there is a lot of things that companies should be aware of when they decide to source in countries like China. While as

mentioned previously global sourcing offers benefits, it also presents some potential issues and difficulties to achieve the available benefits. The cultural and political differences are the obvious, but also important factors that should be considered. Potential suppliers that are capable of delivering the needed products or solutions, and whether they are capable of providing the consistent quality that the company needs, and the customers would expect is also a important factor and risk to be considered. Companies that decide to source in a LCC like China for the first time can also be experiencing that the procedure of gaining value out of it would take much longer than anticipated. Companies new to sourcing in LCC's should also be concerned about other issues, including staff quality and technical capabilities in the region, government interference, intellectual property protection and potential for fraud *(IBM report)*.

Some of the main risks of sourcing that companies should be aware of identified by IBM include:

- Inflexible customs practices
- **Intellectual property protection threats**
- Foreign exchange controls
- Business licensing limitations
- Political or joint-venture partner interference
- Project management challenges associated with migrating manufacturing operations effectively

The risk of Intellectual property has been highlighted as being the main risk that the thesis will be focusing on, with the different risk exposures related to intellectual property loss.

3.3.1| Intellectual Property

With intellectual property being one of the main focuses of the thesis, it is important to give a description of what it is and why intellectual property rights and protection is significant and important for companies.

The Intellectual Property is defined by the World Intellectual Property Organization (WIPO) as being creations of human minds including: *inventions, literary and artistic works, and*

symbols, names, images and designs used in commerce (WIPO.int). It is different from any other forms of property that can be assigned, montage and licensed. IP is a kind of intangible asset owned by the creators, but is also a property in a legal sense that can be owned and dealt with. There are different terms used in describing IPR, with some sounding familiar for example, copyright, trademark and patent where others will be less familiar, for example, the industrial property, geographic indication and trade secrets/undisclosed information. The intellectual property is divided into two categories: industrial property, which includes inventions (patents), trademarks, industrial designs, and geographic indications of source; and copyright, which includes literary and artistic works, musical works, and artistic works. Rights related to copyright include those of performing artists in their performances, producers of phonograms in their recordings, and those of broadcasters in their radio and television programs *(WIPO.int)*. In recent years, with the irresistible development trend of hi-tech and bio-tech, there are also copyright issues in these two fields which have drawn more attention than other fields *(Wang 2004)*.

3.3.2| Intellectual property rights in global economies

The legal protection of intellectual property is playing a more important role in the society and is receiving more attention worldwide, because of the huge international cooperation in science and technology, and development of economy and trade. Companies are trying to develop strategies towards protection of IPR's, as it is a critical factor in order to obtain height in science and technology, industry and economy. The development of the knowledge also requires consistency with the given countries legal system *(Wang 2004)*. Wang also argues for that protecting IP is essential for fair competition, research and innovation. The costs of creative inventions also increase when it is products that are easy to copy. This for example includes products that are expensive to produce, but are easy to duplicate in mass such as pharmaceutical products, software etc *(Maskus, in Wang 2004)*. Wang also argues for that it is important that successful IPR protection also needs to show a return on investment, for it to be profitable to spend time and resources on establishing. This could for example be increased market share and sales attributable to IPR protection. Companies can also only maintain competitive advantage on the market by actively protecting the results of investment, knowledge and creativity by protecting their IPR's *(Wang 2004)*.

As this thesis is mainly focusing on the Chinese market, there will later on be described the legal situation towards IPR protection in China, as mentioned that the development of knowledge requires high consistency with the countries legal system.

3.4| Intellectual Property protection in China

China is often criticized for their low level of ability in relation to protect companies operating and sourcing there, this part will therefore give a comprehensive understanding of the IP environment in China and the country's legal enforcements towards IP infringers.

In the recent years, the demands for protection of innovative products, and products in general have sharply increased. The Chinese government has established and implemented a couple of IP laws to encourage more inventions of creative works and to ensure a better investment environment for both domestic and foreign investors. China has realized the huge importance of IP in economic growth in order to catch up with other developing and LCC countries *(Wang 2004)*. Piracy and counterfeiting issues are as mentioned still very presence *(Asia Law & Practice, in Wang 2004).* Numerous cases in China of violation of IPR's such as counterfeit of different sort of products and solutions, with also food and healthcare piracy which has resulted into poisoning and illness. The developing high-tech industry with a lot of investment in innovation is also bringing out much more counterfeiting, but the Chinese government are still trying to stop counterfeiting as much as possible by various methods and cooperation with different authorities, but IPR protection are still hard to control *(Wang 2004)*.

China's current progress in IP protection has improved in the recent years, with different sorts of investments and integration of series of IP laws *(Maskus, in Wang 2004).* This is for example by an agreement of the Trade-Related-Aspects-of-Intellectual property rights (TRIPS) *(WIPO.int).* With China establishing their IP system, they have also entered the international framework on protection of IPR. China has also become a member of the World Intellectual Property Organization in 1980. China has in the recent year been entering other IP conventions, in order to better fulfil the obligations under the international treaties and conventions *(Wang 2004)*.

China has also seen the need for urgent establishment of legal mechanisms towards IPR infringement, in terms of different types of legal options available for victims. They first required the Ministry of Justice to administer legal reform, including organising training of legal workers by funding allocation to the courts, and organising exchange of legal research with foreign countries. Different types of laws were established relating to foreign direct investment (FDI) and international technology transfer. So China has significantly lived up to international treaties and conventions, which have become the model of their laws and standards towards the issue *(Yang & Clarke 2005)*. Table 3 gives a view on how possible disputes could be solved in the Chinese legal system.

Table 3: Comparison and contrast methods of resolving disputes

Legal obligation on execution	Consultation	Mediation	Arbitration	Litigation
	No	No	Yes, compulsory	Yes, compulsory
Further action if no execution	Mediation, arbitration or litigation	Consultation, arbitration or litigation	Final	Final on second instance with two-tier hearing
Party consent	Bilateral	Bilateral	Bilateral	Unilateral
Solver	Internal communication	Coordination by a third party	Arbitration panel	Court panel
Confidentiality	Yes and the best	Yes, no publicity but mediator is an outsider	Yes, no publications unless agreed by the parties, and no spectators, but arbitrators are outsiders	No, cases are open to spectators and publications
Time	Most efficient	Efficient	Relatively efficient	Lengthy
Cost	Least costly	Not costly	Low cost	Costly
Human power	No outside resources	Yes, but limited	Yes, but some	Yes, much
Experience in China	Yes, traditional	Yes, traditional	Moderate	Limited
Corporate confidence	Very high	High	Moderate	Low

Source: *Yang & Clarke 2005 p. 3*

Although all the efforts the China has been doing in order to minimize the counterfeiting and piracy, is that proper protection in China is still in the early stages, and as also mentioned previously not yet mature or conventional enough, to warrant proper consideration and development by the Chinese government and the public. First of all China started much later compared to other developing nations with IP protection, but is though catching up quickly. But as Wang 2004 mentions a lot is still needed like higher financial penalties, and other types of harsher punishments for IP offenders in China. With the punishments being sufficient with small fines and formal apologies to the victims, the counterfeiters and pirates still seem to sail safely on regardless of improvements to the legal framework *(Wang 2004)*.

3.4.1| IP protection issues in China

As mentioned in above the primary reason for the bigger risk of IPR lost when sourcing in China is a lot related to their legal system, with less mature policies and regulations compared to the western *(Song et al., in Fredriksson & Jonsson 2009).* Comparing the Chinese legal system with much more mature Asian countries such as Japan, Taiwan and South Korea with very good opportunity to protect IPR's, China is still way behind and in some cases it can be even impossible to obtain protection *(Cook 2007).* The cultural differences in the interpretation of contracts and how they should be used in possible legal and society proceedings are also an issue when sourcing in China. This is due to countries with rapid social changes are with bigger risk of involved parties cancelling or changing contracts *(Zuckweiler et al., in Fredriksson & Jonsson 2009).* In relation to the culture in China, the contract is usually only a starting point for a relationship, as it can be changed and modified as circumstances will change. This also means that it is almost impossible to hold a Chinese company to the exact points of a given contract, but it is still an opportunity according to (Cook 2007) to develop a good working relationship that will make the arrangement more successful.

Javorcik argues for that weak IPR regimes scares away foreign investment in high technology sectors where IPR's plays an important role of the company's business activities. This is also because that it shifts the focus of FDI from manufacturing to distribution. The relationship between IPR and FDI is according is also very complex. This is because that a weak IPR regime will increase the probability of infringement and piracy of the products, which will make the host, company a less attractive location for foreign investors. Although a strong protection will on the other hand shifts the preference of MNC's from FDI towards licensing. The importance of the IPR legislation and protection in a country is of course also very depended on the different industries *(Jarvorcik 2004).* For example for the company that wants to source in China the concern about unsecure IPR will be depended on the purpose of the type of sourcing and investment in the country. If it is Research & Development (R&D) facilities that the company wishes to move to another country with an unsecure IPR regime the IPR's are very important compared to companies that only will focus on sale and distribution of products *(Mansfield, in Jarvorcik 2004).* This also means that a proper risk management strategy towards the issue is very important and needed in order to be able to perform R&D in the country.

Although as previously also mentioned, China has enacted IP laws which should provide protectio, as if the company was doing its business in any other Western country, the problem is that it is very hard to take legal action against a counterfeiting company or employee. This is due to the civil procedure law in China make it very difficult to protect against high technology and other trade secrets *(Kennedy & Clark 2006)*. According to Kennedy & Clark the civil procedure law puts a strong burden to proof a case in a court. There are also no rules shifting the burden of proof to the opposite part. This can therefore make it very difficult for the company to prove that a high technology patent has been infringed or a trade secret has been misappropriated. There is also no discovery in civil proceedings, as the parties are only required to submit evidence that assist their case and there difficult to proof a case. Oral evidence is also very rarely accepted in civil proceedings, and oral evidence of employee leakage will be very hard to use as evidence. It is also stated that all companies in China operate in an environment where preventive measures to protect IPR's are essential. When a case gets to court, it is very difficult to rely on inferences and oral evidence, as the company will need to have real documentary evidence in order to win *(Kennedy & Clark 2006)*.

So all in all the legislation and policies issue towards the protection of IPR has a huge impact on how secure companies can feel when they source and invest in production facilities in China. China are especially important here as they are very attractive to do business in, but as mentioned because of the less mature law towards IPR it can be difficult and sometimes even impossible to do anything about product piracy. But as also mentioned the risk depends very much on which type of sourcing that is performed in the given country, with R&D being a very high risk type to move which will be described later.

3.5| Types of IPR risks when sourcing in China

Different types of risks and issues for companies choosing to source in LCC's like China will be looked at in this part, with the main issue still being the governmental and legal situation in China. It will be based on different parts of the business with high risk that are exposed to counterfeiting and other problems in general, related to source products from another country in this case China.

3.5.1| Intellectual Property and employees in China

Disloyal employees stealing and leaking valuable IP are always a possibility, and this is not only when sourcing in China, but a general risk companies are facing *(Ellis et al. 2011).*

Chinese employees working for foreign firms may also have entrepreneurial mindsets, which see them be interested in starting their own businesses and get rich quickly, even if this would mean that they would be stealing their employers IPR. Therefore both the business and production process that would give the employee valuable knowledge could result in potentially disloyal employees *(Kambil et al., in Keupp et al. 2009).*

This is also the same case in the next part where the risks of R&D performed in China, will be reviewed from different point of views.

3.5.2| Intellectual Property and R&D risks in China

R&D in China have been seen for MNC's as a market driver, to gain foreign technology to locally made products. The company would benefit by local engineering talents, and also gaining the ability to create new technology onshore. This has though caused different kind of IP challenges for the companies. Although the companies would gain innovation and new knowledge by facilitating the R&D onshore, it has with time resulted in domestic competitors rising quickly, and creating a significantly low profit margin in the Chinese market. So in the long term, the issues of IP management and protection are problematic and costly due to the leakage of valuable R&D information. With domestic companies working with the MNC's on R&D, could result in later competing with them on the same type of products *(PWC redefining IP value 2005).*

Companies that choose outsourcing of their R&D will always be concerned with processes and implications of sourcing innovation from outside the firm's boundaries. Although there is a lot of factors and expected benefits for companies outsourcing their R&D, or just seeking the R&D abroad from their own company sights, it is also concerned with risks and problems associated when it is in a country, with less mature policies and regulations concerning IPR's.

Outsourcing of R&D is also a important part of the company and from a top management's point of view, with huge fear and risk in the decision process, on whether to go through with it or not. This is although most concerned with products of high innovation and low technology because those types of products will be much easier to copy *(Veollabs)*. With an evolving world developing into a global marketplace, many companies have though come to the conclusion that it is profitable to have R&D in a LCC such as India or China, compared to Western countries. A majority of companies are still not approaching the move to developing countries in relation to R&D activities, because of the concern in relation to risk of IP and the protection system that the company will be facing to avoid infringement. The concern is highly related to the companies fear that if they outsource R&D to for example China, the products would be copied easily, and without the company's knowledge. And when they do find out they will be almost facing nothing to do and there new highly potential idea will be lost leaving them nothing to do about it.

Riezmann et al. 2008 argues for and confirms the above study, which one of the biggest reasons for companies choosing to do in-house R&D instead of outsourcing, due to the information leakage problems related. This is even though that the company is aware of the benefits and the cost saving, that they will be able to by proceeding their research outside of the firm or just abroad with skilful people for a lower cost.

So it can be said that there is a huge concern with doing R&D abroad and outsourcing of R&D due to the risk of lost IP when it is performed in countries with bad IP protection like China. Although there is a lot of a benefit to get by outsourcing or having onshore R&D facilities in the sourcing country, but companies tend to prefer to keeping R&D on-sight as they are too concerned with the risks of losing their valuable gained IP by R&D.

3.5.3| Risk of reverse engineering in China

Reverse engineering is another way of copying a company's products, and this part will be focusing on this issue. Reverse engineering, as the name implies is an engineering process going in reverse. The process has in recent times emerged from the shadows of engineering science to become common in many organizations today *(Computerworld.com)*.

The issue is not only based for sourcing in China, but since China is known for copying company products, this part will talk about the risk of reverse engineering which of course also is a violation of a company's IP. Reverse engineering is defined as when a company or individual taking apart an object to see how it works in order to duplicate or enhance the object. The reason for the reverse engineering is that people can learn about the product and by creating a copy saving all the effort that has been put into creating the object in terms of R&D *(Stinnet 2005).* The issue here is that when companies sell a product, the risk of reverse engineering will always be there as the company will no more be in control of the given product.

Samuelson 2002 argues in her case study about whether "reverse engineering is a lawful way of acquiring trade secrets". Purchases in an open market gives the opportunity for companies to take a product and take the product apart and measure it test it etc. in order to find out how it has been developed with what components. This is an authorized way of acquiring trade secrets according to jurisdictions in some countries mentioned in the given article.

This therefore makes it very difficult for companies to be able to protect their IP rights and this is not only for companies operating and sourcing in China, but just in general. This type of risk are in relation to IPR a very common way of companies copying products and by that making a similar product or might even create a better one with some adjustments to the product.

With small entrepreneurial companies being one of the only sources for China's genuine innovation piracy and reverse engineering tactics, are widespread in the Chinese private sector companies. China is one of the high risk countries in relation to reverse engineering this is because of the fact that state-sponsored Chinese companies efficiently reverse engineer technology products, with many individual design elements. This is because that they will be able to bring high-demand products to market and get hold of market share *(PWC redefining IP value 2005).*

The reason for the companies reverse engineering tactics rather than spending time on their own R&D and coming up with innovation is that they are undercapitalized and therefore it is much easier for them just to copy others products.

3.5.4| Summary of IPR risks in China

In this part the IP situation in the Chinese market was given, and the different issues that there is related with sourcing in this country from the legal issues to other significant risks identified that companies should be aware of, when they choose to source there. Although China has implemented different IPR laws, and joined all major international IPR related conventions and becoming a member of WIPO with TRIPS regulations. Managers and academics still see China with a weak IPR regime including an almost none existing legal system, resulting in patents not being safe and particularly enforceable.

The major issues and risks concerning IPR leakage has been identified as being disloyal employees, R&D risks and reverse engineering also called reengineering and will be the factors looked at on the case company in Chapter 5.

4.| Risk Management strategies for Analysis

Risk Management has become a critical issue as a result of globalization and the continued pursuit for greater returns, and is basically about identifying and managing risks in the best possible way *(Clarke & Varma 1999)*. This part will therefore give an introduction to the concept of risk management, to give a view into what it is and how it could be performed according to strategic risk management practices. First a conventional risk management approach will be presented and then a more integrated through the organization approach. A SWOT analytical framework for risk management purposes will also be presented, to show how necessary information for risk management can be applied through a SWOT analysis. The risk management approaches will help on the analyzing part of the case company, and by that gathered information is able to create a strategic risk management framework towards IP protection.

The Risk management challenge has been approached in many different ways depending on the assumed professional perspective *(Andersen & Schrøder 2010).* When looking at risk management it very much depends on the type of risk that is being analyzed and what it is that the risk management want to do about it.

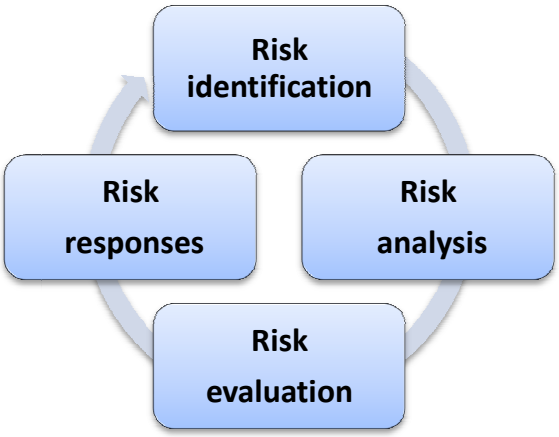
Risk management is a strategic business process, and the management of a given company needs to assess whether the company's business activities are consistent with its stated strategic objectives. There should also be a link between the risk management and the investments and the growth decisions of the company. So the overall company strategy needs to determine what risk-based returns the company would be expecting of the business activities that are performed. This means that the board and top management of the company needs an overall "birds-eye" view of the risk exposures, so they can avoid and minimize any surprises and show good control *(Clarke & Varma 1999)*.

4.1| Risk management approach

Risk management can be approached in many different ways, depending on the type of professional perspective of it. Different risk management strategies are different in terms of how much they involve the overall company strategy. In figure 4, the conventional risk management process is presented, which shows that first the most important risks that could expose the cooperation must be identified, and when this is done different techniques should be adopted to analyze potential risk situations, and possible outcomes of the identified exposures. The management of the company will then decide in which degree the exposures are acceptable in view of the general organizational responses. At last the exposures will be modified through the risk mitigation efforts, and adoption of different risk-transfer activities. By this the company will retain a risk level that is acceptable within its overall risk policy *(Andersen & Schrøder 2010)*.

So in short terms the below conventional risk management cycle shows an ongoing process relating to four following activities that continue over time. The process starts with identifying, analyzing, evaluating the risk and then response to the risk with the information gathered in the previous steps *(Andersen & Schrøder 2010)*.

Figure 4: Conventional risk management cycle



Source: *Andersen & Schrøder 2010 p13*

The exposures are modified through risk mitigation efforts, and adoption of different risk-transfer activities so that the corporation will retain a risk level that is acceptable within the overall corporate risk policy. With risk factors and the associated economic exposures may change dynamically over time, the described elements of the formal risk management process should be repeated within regular time intervals *(Andersen & Schrøder 2010).*

The risks are divided into the following types of risks *(Andersen & Schrøder 2010 p. 78)*:

- Strategic risks: *New regulations, political events, social changes etc.*
- Operational risks: *Malfunction, process disruptions, legal exposures etc.*
- Economic risks: *General demand, price relations, foreign exchange etc.*
- Hazards: *Natural catastrophes, man-made disasters, casualties etc.*

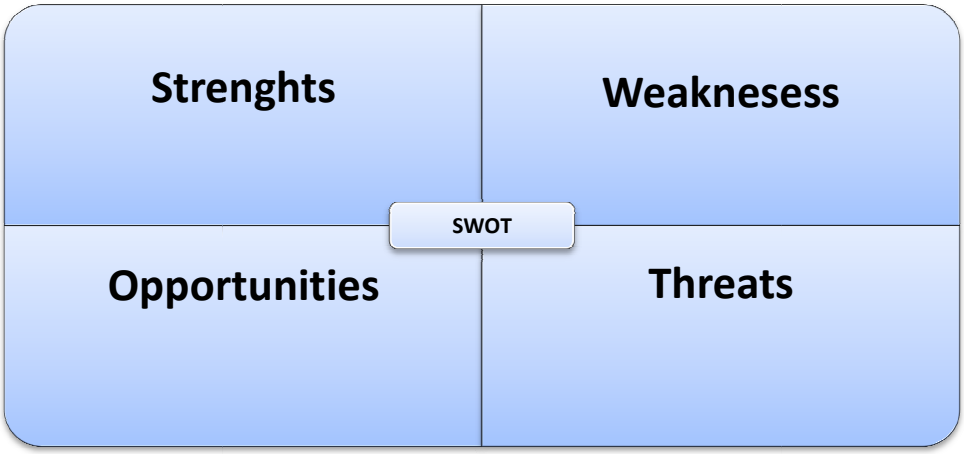
The threat of government policy uncertainties can be many different kinds, which relates to the strategic risks, this could be regulations, and barriers. Even when countries policies do not change, the managers may be uncertain to the government's commitment of enforcing new statutes that can concern the company's business in good or bad ways, and the company should always be aware of this risk especially when being international *(Miller 1992)*.

In this thesis the focus is as previously mentioned on risk of Intellectual Property infringement and counterfeiting. This is based on the operational and strategic risk level as it includes the risk of Intellectual Property and legal exposures with the legal systems in China being less mature than in other countries. The other risk categories mentioned are also important for companies as well as for GEA, but as it is not the main focus of the thesis they are only mentioned to illustrate the different kinds of risks and uncertainties companies and organizations face.

4.2| Strategic analysis SWOT

When performing risk management it is important to gather necessary information about the external and internal environment of the giving company. For this analysis it can typically be summarized in a SWOT analytical framework, where the strengths and weaknesses are identified in the internal corporate environment and opportunities and threats identified in the external market environment, being compared against each other and prioritized *(Andersen & Schrøder 2010)*.

Figure 5: SWOT Analysis



Source: *Andersen & Schrøder 2010 p. 155*

A summary of a strategic analysis within the SWOT framework can help to identify important strategic risk factors. The SWOT analysis would though not being explicitly state the relative importance of the various risk factors. Results from a SWOT analysis can also essentially feed into the initial assessment phase of the risk management process. It is though

important to state that a SWOT framework normally focuses on the strategic and economic risk factors, and therefore could be complemented with assessments of operational risk factors and hazards *(Andersen & Schrøder 2010)*. When different risk factors have been identified the associated exposures should be evaluated with the purpose of determining the risk that is representing most material, and economic effect. These risks can further be assessed from two different perspectives, with the possibility of the risk event will occur and the economic impact the specific risk event would impose on the giving company *(Andersen & Schrøder 2010)*.

4.3| Strategic approach to risk management

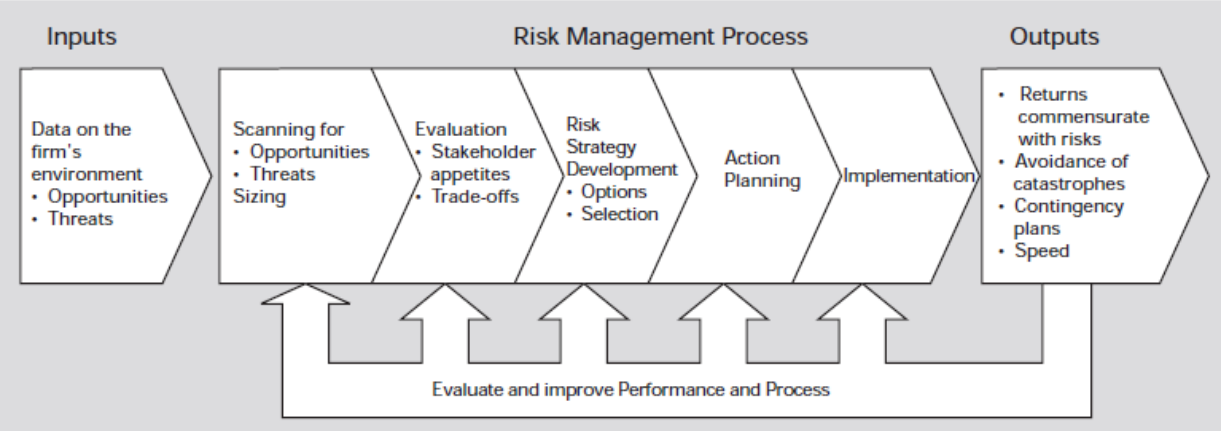
In the previous part the conventional risk management framework and different types of risk exposures were presented, and next how to gather necessary information about the company for a possible risk management strategy was introduced in terms of the SWOT analysis. In this part the two methods will be combined in a more strategic way, and present how a strategic risk management approach could be performed.

The traditional risk management responsibilities and responses are typically split into their differing origins. So this means that different departments are dealing with different risks by using different approaches, which are often at a very low level like in the conventional risk management approach *(Clarke & Varma 1999)*. Many companies rely on forecasting from the past to determine the approach to the different risks. Clarke & Varma 1999 though argues for that there is a need for a holistic approach to understand the enterprise-wide risk, instead of splitting the risks. It is further argued for that the management can become confused, and therefore fails to be able to manage the risks in the overall company's advantage. A more strategic overall approach is therefore needed to be able to manage the risks in the best possible way. This can be used by the top management to guide the development of the risk management process, the organizational structure and the culture towards the best approach by involving all aspects of risk.

Clarke & Varma 1999 describes that risks is based on two main elements, being stake and uncertainty with each element usually has a gain and a loss potential. The stake could be a financial gain or loss, an improvement or deterioration in strategic position and improvement in

or damage to reputation, a threat to a company's existence, and increase or decrease in its sense of security. This means that the higher the stakes, the greater the potential gains or losses. For example forecasting from historic data only works in periods of stability, this means that uncertainty in turn would vary in relation to the time and the situation *(Clarke & Varma 1999)*. Risk management is by Clarke & Varma 1999 defined as a strategic business process where information is continually gathered on the company's environment and position. The process of the risk management starts with inputs of the company's external environment, which can be seen in figure 6. The analysis of the company and its external environment is typically summarized in a SWOT analytical framework, where strengths and weaknesses identified in the international corporate environment and opportunities and threats identified in the external market environment are compared against each other and prioritized, as presented in previous part. By using the input of the SWOT the management can evaluate, analyze and prioritize the dynamic risks that is being faced *(Clarke & Varma 1999)*. Second step is to scan for opportunities based on the external environment analysis where the SWOT would be performed. The business strategies must be re-aligned based on the revisions in the environment. Monitoring, measuring and managing process of the risks must be modified based on the environmental scan.

Figure 6: Risk management as a strategic business process



Source: *Clarke & Varma 2010 p. 3*

When the opportunities and threats are evaluated, the management should then decide what the risk tolerance level would be and different goals for risks and returns. So a risk

management vision and strategy based on the risk environment should be created based up on the overall organizational strategy and responsibilities *(Clarke & Varma 1999)*.

4.4| Summary of risk management

In this chapter an introduction was given to the term of risk management, different risk factors that there is and how companies can try to manage their risk and gather information through different frameworks.

The first part introduced a conventional approach to risk management, where the specific risk is identified and then, analyzed, evaluated and then responding to it. The conventional risk management strategy is though as mentioned very simple and has weaknesses as it doesn't consider and take overall company strategy environmental and opportunistic factors into account. A SWOT analysis was then presented to show how it can help performing a strategic analysis of internal and external factors of a company in terms of risk factors, but also opportunities which also should be taken into consideration, when performing strategic risk management. Then a strategic approach to risk management was introduced being much more integrated in the entire organization, with the overall company strategy and the top management being involved in the decision making. And for the input for the risk management strategy the SWOT analysis is a good framework to identifying, opportunities and threats, to get as mentioned the internal and external factors of the environment involved in the strategy making.

The risk management tools presented will be used for the analyzing part of the case company, and from that being able to proceed with the framework from Clarke & Varma 1999 to create an integrated strategic risk management approach towards IPR's when sourcing in China.

5.| Case study - GEA Process Engineering

The empirical study will start by a presentation of the case organization of the thesis with some history and how the company is structured as it is a matrix structure with many tiers it is important to give a detailed description. The presentation of the case company, GEA Process Engineering will then be summarized into a SWOT analytical framework. With the main purpose

of identifying the opportunities and threats that they are experiencing which will be analyzed and evaluated. The gathered information on the Chinese market will also be for the input for the risk management strategy development in chapter 6.

5.1| GEA Group

The GEA Group is a German engineering organization, which is structured into five different kinds of segments, and leaded by a listed strategic management holding company called GEA Group Aktiengesellschaft, performing all general functions for the entire Group. This involves general functions such as human resources, legal, tax, mergers & acquisitions, supply management, financial management, group accounting, group communications, investor relations and internal audit. GEA is an international technology company that operates within a lot of different business activities. GEA focus on the development and production of process technology and components for sophisticated and efficient production methods en different kinds of end markets. GEA Group is a market leader in 90 percent of its businesses, being one of the largest companies within the food and energy sector, with both being long-term growth markets, and also generating 70 percent of the company's total revenue *(GEA Annual Report 2010 p. 10).*

The GEA Group operates as mentioned within a lot of different business segments, such as GEA Farm Technologies Segment, GEA Heat Exchange Segment, GEA Mechanical Equipment Segment, GEA Process Engineering Segment, GEA Refrigeration and Technologies Segment. This assignment will though only be working and focusing on the business activities within GEA Groups segment named GEA Process Engineering.

GEA Process Engineering specializes in design and development of process solutions for the dairy, brewing, food, pharmaceutical, and chemical industries. This segment is also considered being a market leader in the business areas within; liquid processing, concentration, industrial drying, powder processing and handling and emission control *(GEA Annual Report 2010 p. 10).*

5.1.1 | GEA Process Engineering history - GEA Niro A/S

The history of the Danish part of the company of GEA Process Engineering started with A/S Niro Atomizer and was founded in 1933 by Johan Ernst Nyrop, and became quickly a world leader in industrial drying, with spray drying, freeze drying, and fluid bed processing as core

technologies. In the 1990's Niro dropped "Atomizer" from the company name and in 1993, the Niro Group was acquired by the German GEA Group and began to co-operate closely with other GEA companies specializing in process technology and engineering. In July 2008 Niro A/S changed the name to GEA Niro which is also the name that we know today *(niro.com)*.

Due to the importance of controlling feed quality prior to drying brought GEA Niro into the concentration business and falling film evaporators became part of the scope of supply, primarily within the dairy industry. It's involvement in pre-treatment has since grown the business to include extraction and membrane filtration. The start of this period saw the two-stage drying concept introduced to the dairy industry. Spray drying technology was also applied to air pollution control in 1978 *(niro.com)*.

In 1989 the need to further develop particulate processing techniques led to GEA Niro upgrading its fluid bed technology and introducing new equipment for blending, coating, pelletizing, and de-dusting (to produce powdered, agglomerated or granular products of specific properties). During the 1990's GEA Niro formed the GEA Niro Pharma Systems business unit in order to strengthen the presence of the Powder Technology Division in the pharmaceutical market *(niro.com)*.

GEA Niro is located in Soeborg, Copenhagen and has globally installed more than 10,000 plants, one of the main characteristics that GEA Niro is known for, is delivering solutions that meet customers' exact requirements being Engineer-To-Order (ETO). Many of the world's leading manufacturers have chosen GEA Niro's drying technology for their production of dairy and food, chemicals and pharmaceuticals powders. Some of these products are manufactured in a single plant, others in a fully engineered process line designed and installed by GEA Niro in collaboration with leading suppliers of auxiliary equipment *(GEA.com)*.

GEA Niro is the headquarters of GEA Process Engineering being a part of GEA Group AG in Bochum, Germany. This segment of the GEA Group has subsidiaries and representatives in more than 50 countries with more than 4800 employees. In Soeborg, about 500 employees are engaged in the design, engineering, and sales of processing plants *(GEA.com)*.

Figure 7: GEA Process Engineering's worldwide business

Source: *GEA.com*

Figure 7 shows the size of GEA Process Engineering's operations around the world, and gives an idea of the size of the company's global businesses. The GEA Process Engineering segment of GEA Group had in 2010 a turnover of more than 1 billion EUR which is close to 25 percent of the whole Groups total turnover *(GEA Annual Report 2010)*.

5.1.2| Background of sourcing in China and India

First of all it is important to distinguish what type of sourcing strategy that GEA are using in the LCC's that they are operating in and what motives there is behind their strategy. Henrik Maimann clearly said that one of their biggest motives for going to these countries and especially China is due to the interesting markets available there. Henrik Maimann admitted that one of the other major motives for expansion to China and India is due to the significant lower labour costs that there is available there which they can take advantage from.

Henrik Maimann was also very clear about that they have a strict policy for LCC sourcing, where it is important that they will open their own production facilities and plants. So they are using the term of intra-firm sourcing strategy that in GEA's situation can be described after M. Kotabe's 1998 in figure 3, chapter 3.1 being the abroad offshore subsidiary sourcing strategy. The main reason according to Henrik Maimann for this is that they are not interested in any sort of joint venture agreements with any companies in those countries, or having other external suppliers working for them in those areas. Although Henrik Maimann mentioned that GEA in most of the western countries are having a lot of external companies supplying them, but that they aren't interested in this when they source in LCC's like India and China mainly due to risk of IPR's. Henrik Maimann also mentioned that when they use external suppliers, they never have the same supplier taking care of a whole order, and usually split the order into 2-3 different suppliers, so that the supplier won't have hands on a whole product, but only parts of it making it even more difficult for them to attempt to copy it *(Appendix 2)*.

5.2| Strategic analysis of GEA - SWOT

In this part of the thesis, there will be analyzed on the information gathered from the interview with GEA Process Engineering, where the information on China will be summarized through a SWOT analysis. The main purpose is to identify the related opportunities that a MNC like GEA have by sourcing in LCC's like China, but also very important to identify the main threats, in terms of risks they are experiencing there. The weaknesses and strengths will also be presented, but mostly for giving an overall picture of the company. China is the main environment being analyzed on, but the reason that India is being mentioned will be to show the difference there is from sourcing in China compared to India, legal wise.

The main purpose is of course the identification of the main threats/risks that the company is experiencing and then analyze on those risks, by also looking at how GEA are responding to their potential risks and how they have responded to previous infringement. This part is mainly based on the semi structured interview (described in the methodology), with GEA Director of Emission Control and Vice President Henrik Maimann, being the main responsible for the business development and information processing to China and India. He is also responsible for making the correct measures, in order to minimize the risk of lost IP possible. Information from the GEA Annual report will also be used for this part.

5.2.1| Strengths

As mentioned in the introduction of the company GEA are the market leader in many of their business areas within liquid processing, *(GEA Annual Report 2010)*. They further have a lot of experience with sourcing in China, as they have been there for more than the past 10 years *(Appendix 2)*. Overall high tech skills and knowledge in their field, with lots of highly experienced employees like Henrik Maimann who has lots of experience of previous sourcing operations to LCC's.

5.2.2| Weaknesses

GEA are currently not performing any of their R&D for businesses in China & India onshore, and are performing all R&D for those countries from the office in Soeborg Denmark, and therefore losing out on benefits of local R&D *(Interview)*. Employees leaving to start their own business as also mentioned in the literature study. Henrik Maimann here explained that their employees are some of their main assets, and therefore them not being very loyal, and leaving with high knowledge of the business is a big weakness. The main and most important weakness is of course the legal systems in China being the main risk factor, making it more difficult for the company to be able to prosecute any offenders of the company's IPR's, through patents, trademarks etc. This is the main reason that the other risks occur compared to other countries due to the less mature government and legal actions, that can be done to possible infringers of the company's IPR's. Henrik Maimann explained that the legal situation in India is much more mature than the Chinese, and that the only problem with the Indian is that a lawsuit, usually can take up to 8 years to get to an end *(Appendix 2)*.

5.2.3| Opportunities

As mentioned GEA are not performing their R&D for their business in China and India and are therefore missing out on benefits of local R&D. This could be in terms of local engineering talents and also gaining the ability to create new technology onshore instead of having to transfer that knowledge to the sourcing country *(PWC redefining IP value 2005)*. So here they are missing out on new technology development by expanding their R&D to local places, instead of only performing this from the head office. Expansion of their business in China is also an important opportunity, as Henrik Maimann mentioned the interesting market that there is, and that they are also planning on expanding *(Appendix 2)*.

5.2.4| Threats/risks

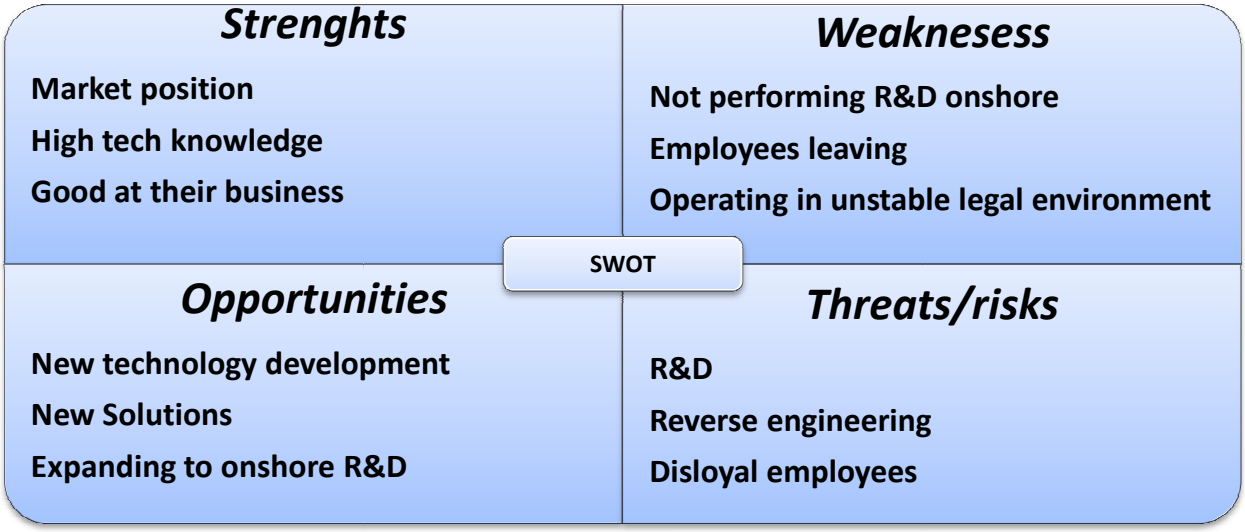
The threats that will be presented will only be focusing on threats/risks that relates to IP loss, and not other threats involved. The main purpose with the interview with Henrik Maimann was as also previously mentioned, with the purpose of finding out what they see as their main risks in relation to IPR.

The main risk that was identified at the interview was first of all the risk of reverse engineering, which they have been exposed to a couple of times before. This was explained as being, when their customers try to reengineer or redevelop a product that GEA had supplied them with in an earlier stage. This risk is a huge IP exposure and will in the next part be analyzed further *(Appendix 2)*. The other main risk was the risk or threat of employee leakage of valuable information. Henrik Maimann explained that they have previously experienced former or current employees leaking information to other companies and competitors. In some situations he explained they have experienced former employees with high level of knowhow and business knowledge, going together and establishing their own company and trying to steal GEA customers *(Appendix 2)*.

The third main risk in relation to the IP of the company that Henrik Maimann explained was the risk of R&D and innovation getting out. Henrik Maimann explained, that they are currently dividing the R&D performed in example India are only for projects outside of the country, and R&D for projects in China and India are performed from Denmark only. The R&D projects going

on in India are though still in a risky situation as the knowledge the employees are in possession of are extremely important for the company and for China they don't have plans of R&D facilities in the near future *(Appendix 2)*.

Figure 8: Summary of SWOT analysis on GEA



Source: *Own contribution*

5.3| Threats/risks analysis

This part is to analyze the information gathered in the interview with GEA, and to find which elements of the company's risk management strategy that could be improved.

From the interview with GEA it was clear that they are doing different types of measures in relation to their IPR, and have some different types of policies about, how to run their business in China & India. These things are such as owning the companies contra joint venture, or getting a supplier to take care of some of their business. GEA don't have any special overall strategy towards risk management of IPR *(Appendix 2)*, although they have overall risk management strategies on other risks of their business, which are all described in their annual report, where they describe how and what they are doing, for example in relation to financial exchange risks *(GEA Annual report 2010)*.

In the interview with GEA, we discussed the different risks GEA are currently dealing with, in relation to their business in China and India. Henrik Maimann explained what type of measures they do in order to minimize the risk in the best possible way, and what type of IP risks

could create the biggest damage, which they are most concerned about. Also the importance of the legal and governmental situation in these countries are as mentioned before very difficult compared to western countries to win a lawsuit, when they try to take legal action against a company that have violated their IPR's in somehow. Henrik Maimann explained in the interview that they focus a lot on patenting and trade marking their new products and solutions in the correct way, so that they will show other companies that the specific solution is owned by GEA Process Engineering. Although they are efficient in their patenting of their solutions, they still experience piracy and counterfeiting in different forms, which will be discussed further in the following section of the thesis.

5.3.1| GEA Process Engineering on regulation and policies

As mentioned in the literature review it is much more difficult for companies to secure their IP in China, and can in some ways be, impossible to get win a lawsuit, when going through a case that involves violation of IPR. So the main focus for analyzing on GEA's risks of IPR's in China are because of the less mature government, in relation to take legal action against possible infringers.

Henrik Maimann told that it is very difficult for the company to be able to get the court on their side when they are involved in an IP infringement by another company. In China Henrik Maimann said that it is very difficult to proof that the other company has done a violation, and actually defined it as almost impossible to win a law suit over a Chinese company. In India on the other hand, he said that it is possible but that an Indian trial can take up to 8 years, making it impossible for them to get anything out of a trial as it can take so long for a decision.

Henrik Maimann explained that they usually go to the violator by scaring and threatening them by legal action, and have usually had good experience with getting the companies to agree on paying some sort of loyalty agreement, or agreeing on some deliveries from GEA on the specific project. Henrik Maimann also made it clear that they usually won't go on compromise when they experience IPR piracy and infringement and would either go to the counterfeiting company or try a lawsuit, to give a signal to other possible infringers. Henrik Maimann also explained that they see a clear prosperity in terms of the Chinese government protection of IPR, in the recent years. He also mentioned that it is going in the right direction, and he could imagine

that in some years they will become as good as other more mature countries in the same area such as Japan, South Korea and Taiwan in terms of IP protection *(Appendix 2)*.

5.3.2| On Risks of reverse engineering

The main concerns for GEA in relation to the risk of IPR are first of all, the risk of reengineering by their customers. This is a big risk for them and difficult for them to really prevent although they might have patented the product or solution, it is never 100 percent secured if the customer decides to develop the product themselves. This concern is a contractual aspect that GEA communicates with their customers, and by that makes it clear to them that this is not okay, and the prosecutions that they could do against them if this is the case. The way that GEA usually has handled this sort of risk by their customers reengineering their product, is that they threaten them with legal action, to get them to agree on some sort of loyalty agreement, which will get them to pay a fee a licence to use the GEA solution.

Another way that GEA try to prevent their customers to reengineer their solutions is by going to their customers first. By warning the customer and telling them that if they buy any sort of product from the company, they will make legal action against them and by that try to scare them off so that they won't buy the product.

The other concern for GEA here is that even though they maybe can get some sort of loyalty agreement with their former customer, the lost IP will be out, and several other companies can be in position of it and therefore it is difficult for GEA to get anything out of it. Therefore their best way of trying to secure it is by "threatening" and scaring of potential buyers of the products, which they feel is one of their only options and the best way they can secure it.

5.3.3| Risk of employee leakage

One of GEA's biggest concerns in relation to IP risks are the employee risks that there are, from peoples know how, and knowledge if this should be leaked to other companies. To prevent this GEA have different procedures that should prevent this. For example they only give specific parts of drawings to the personnel concerned, and no employee will ever be given the drawing of a complete solution, and by this they try to minimize the knowledge of the employee by preventing them to having knowledge of the whole system. This is a good part for limiting the

knowledge of the employee, but will also on the other hand limit the employee's development in terms of gaining new knowledge of the system that could be valuable for the firm. This is also the part where the employees can feel that they are being treated badly in relation to the company's lack of trust in them. This could therefore also be one of the reasons that this could develop into the employees leaving the company, to either start working in another one, or even as Henrik Maimann mentioned, that they in have experienced former employees starting their own company, and then trying to steal GEA's customers, by offering the same solutions. Henrik Maimann said that this issue concerns them very much, as it is the employees knowledge that is equal to the company's IP, and if the company should lose this, it will be a big loss for the company. This issue was also stated in the literature review by *Keupp et al. 2009* backing this by mentioning that some Chinese employees just want to get rich quick and therefore uses gained knowledge on starting their own company.

Henrik Maimann mentioned in the interview, that the main concern that they have regarding risk of IP loss would be if some of their valuable employees decides to leave the company. This is a huge concern for them as the employee will be leaving with a lot of valuable information and know-how on different procedures. This is a major concern for them as the employees can go over and start working for another company or competitor and sharing GEA's IP on how things are done with the new company. Henrik Maimann even mentioned that they have had periods where employees have quit and then started their own company by then trying to steal GEA's customers, and making offers on same projects as GEA. This is though a contractual issue which needs to be in place in terms of confidentiality of the company's IP knowledge *(PWC redefining IP value 2005)*.

5.3.4| Risk of R&D

When discussing about R&D and innovation facilities placed in their operations in China or India, Henrik Maimann told that they currently use only R&D practices from the Danish main office, and don't use China and India to develop new solutions. But in India they have organized an R&D Center, which is used for projects in external countries, and by this they want to minimize the risk of valuable IP being lost in the country. IP can though still be lost in this situation, as the innovation and the research that is being developed, still can be leaked and get into the hands of other companies. GEA is just keeping them to this type, by having R&D in

different countries of the ones that they are working in to be able to minimize the risk of lost IP in the best possible way. Henrik Maimann also mentioned that having R&D in India is very significant for them because of the cheap labour but most important because of the qualified and high educated skills that they can get there.

Henrik Maimann further mentioned that they currently are not having any R&D in China, and this is due to language, and cultural differences between western countries and India compared to China is a lot closer. But mostly because of the high risk there is of leakage, as it would be beneficial to have onshore R&D, and they are therefore not planning to perform R&D in China in the near future.

5.3.5| Summary of risk analysis

Henrik Maimann talked about how they try and be fast and efficient in patenting their new products and solutions, so they can be secured. But he also explained that, although they are quick with the patenting of new solutions and products, the patenting is not that helpful if the selected solution should be violated. This is due to the governmental situation in China that makes it very difficult to get anything out of a lawsuit. He explained that it is possible to go through with a lawsuit, but that it is difficult to get enough evidence that can get anything out of the infringer. This is also argued for in PWC redefining IP value 2005, stating that companies should not focus too much on patenting, and thinking that products are secure just because of the products are patented.

Risks of reverse engineering are one of the main problems that Henrik Maimann thinks they are facing. Henrik Maimann mentioned some different situations, where they have experienced customer reengineer a solution that they had bought from GEA in a previous stage. In the mentioned situations GEA had contacted the companies and let them know of their violation and threatened them by lawsuit, and by that figured out a mutual solution with some loyalty offered to GEA and by that buying a license to some parts of the solution.

On R&D Henrik Maimann mentioned that the potential risks they are involved with, and that they avoid any sorts of R&D in China due to risk of IPR. In India though they have a R&D Center, which they use for projects in the western market and by this they minimize the risk of any valuable information to the Indian market gets out. But this means that they are missing out

on potential resources that can be used by having onshore R&D facilities in China, which could help with local operations. As also mentioned, the company would benefit by local engineering talents, and also gaining the ability to create new technology onshore.

Employee leakage is also one of the major risks that Henrik Maimann mentioned being one of their main risks. He mentioned that this is a major concern for them, if employees with valuable knowledge and knowhow trained at GEA, would go to a competitor and share all the company's trade secrets. Henrik Maimann mentioned that they had experienced former employees going together and starting their own company and fighting for the same projects available on the market.

5.4| Evaluation of risks on the Chinese market

The next step of the risk management approach followed by Clarke & Varma 1999 (chapter 4) is the risk evaluation process. In this step I will come up with an evaluation of GEA Process Engineering threats and risks, which they are facing in China.

In the interview with GEA, Henrik Maimann explained that they always are quick to patenting their new solutions through WIPO, so that they make an effort in securing their IP. This is though as I understood from the interview not something that is very useful for them, as they still would have a lot of difficulties winning a possible lawsuit, and therefore the IP patent might seem a lot more "symbolic" instead of really having any influence on the protection of the IP *(Appendix 2)*.

As also mentioned in the literature review the Chinese courts are accused of favouring Chinese companies, over international companies. With indications of weak enforcement of IP rights in China, there are indications of the country's own companies have learnt on how to use the legal system, to their own benefit. There have been different cases that proof that this is the case, and the Chinese courts would prefer to protect the Chinese companies *(PWC redefining IP value 2005)*.

Dependence on conventional IP protection mechanisms should therefore be adjusted to how the Chinese market would develop, as in many situations, simple risk management won't be

beneficial, this will also be explained further in next chapter. GEA should still, patenting their solutions, but the reliance on it should be less, because of the mentioned reasons that it won't help them very much if their patent would be violated. One of the main reasons that it is important for companies to patent their new invention or solution is that if GEA won't do it, some other company could take the patent of GEA solution, and then they would be the ones with the problem. But GEA should not think that they are secured by patenting their solutions, and therefore other risk management approaches and strategies should be taken against this complex issue that there is by operating in a country like China, with less mature legal policies and regulations. Next part will therefore be focusing on different actions and approaches that can be taken, also based on how the Chinese market would develop legal wise.

6.| Risk management strategy development

In the last chapter the "input" for the strategic risk management strategy was gathered through the information from interview, the annual report and the homepage and put into a SWOT analysis. The main risks was then analyzed and in this section the proposal for a risk management strategy towards reducing risk of lost IP will be presented. The risk management strategy will focusing on risks in China in general and although India was also involved in the interview with GEA it as also mentioned before from the interview with Henrik Maimann it is much more difficult to maintain IPR's in China. The reason is as also before mentioned the fact that it is possible to protect and take legal actions through a court in India like other mature economies, the only problem in India though, was that a court procedure on a case, could take up to 8 years and therefore it is very unprofitable to go the court way there as a lot of things can happen in those 8 years. In China though as also previously mentioned the governments often want to protect Chinese companies, and it is therefore very difficult to get anything out of a lawsuit there.

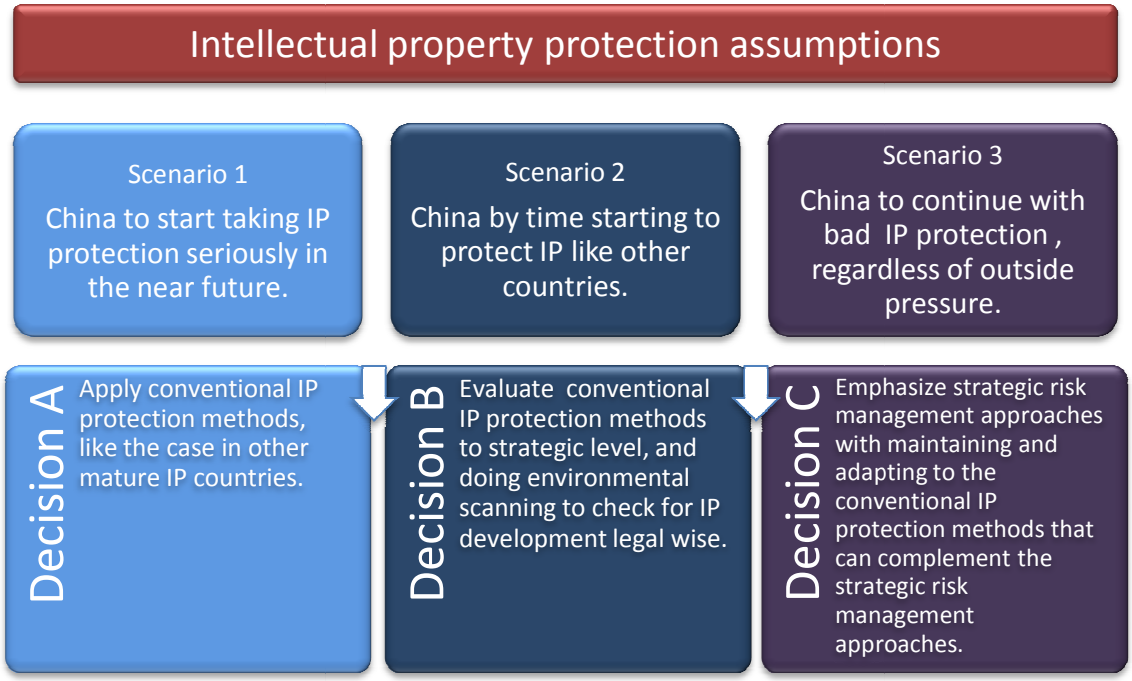
6.1| Risk management scenarios in China

As mentioned in the literature and the interview with GEA some think that China in the near future could become a better IPR environment, and as presented in PWC redefining IP value 2005 report, it is stated that they don't see China become a better IP environment in the coming years. Companies like GEA should therefore have an adjustable risk management strategy which

will be based on different future assumptions, on how the IP environment would develop in China. This is of course something that is difficult and maybe impossible to predict, and therefore the model will be based on three different scenarios based on the Chinese IP protection. GEA should by following the different scenarios happening in the market be able to control their risk management strategy towards IPR's in a much better way.

Bellow figure 9 is therefore showing the different IP protection assumptions that are concerning sourcing in China, with basic decisions that would come from each assumption. The structure is as mentioned based on three different possible scenarios on how the IP protection would develop in China legal wise.

Figure 9: Different management scenarios on IP in China



Source: *Own contribution, inspiration from (PWC redefining IP value 2005 p. 39)*

Henrik Maimann explained in the interview about the way they see's Chinas development and how they think that it would be developing in relation to protecting intellectual property like other countries in the same area have done like Japan, Singapore, South Korea and Taiwan. Like figure 9 shows the different scenarios that GEA could experience the Chinese government would develop into, in the following years. The intellectual property protection assumptions for GEA is

based on the possibilities of a time based aspect, on when China will become a country securing IP rights like the case of most other countries with mature policies and regulations towards this issue.

So for GEA to get their IP risks under control, GEA should think about the fact that China might be differing from the other Asian markets mentioned, in relation to maturing up in a possible near future. Based on a report made on IPR protection in China by PWC, China would not even be having satisfactory IP protection in place in 10-15 years. If it though should be changed with being the opposite and reports suggesting China will become a mature economy and securing IPR's it will be easy for GEA to stick to scenario 1 from the model with a more conventional risk management strategy and just patenting their solutions as they would be doing in all other countries and keep it with that.

6.2 | Risk Management strategy towards IP protection in China

As mentioned by (Ghoshal, in Miller 1992) managing risk is one of the primary objectives of firms operating internationally, a risk management strategy will therefore be presented here. This step is based on Clarke & Varma 1999 risk strategy and action planning development, which will be based on the outcome of the figure 9 in relation to how the Chinese market will develop in terms of IPR's protection.

The risk management strategy towards IPR risk is presented in figure 9, which is split into different colouring splitting the possible outcomes of the Chinese market. So the risk management framework will be based on the degree of risk management that will be needed according to how the market will develop in China in the coming years. As the future is very unpredictable for companies operating and sourcing in China, it is therefore necessary to have a risk management strategy that can be modified according to how the market would develop. With authors from the literature study and Henrik Maimann from GEA, mentioning that the Chinese market is going in the right direction in terms of IPR protection, and other authors predicting that the Chinese market won't be better in the coming years this is a way for the company to be able to react, in different legal environments.

The risk management strategy should therefore be easy to adapt to the market and adaptable to future market trends. The framework will therefore be based on an overall approach, with different approaches relating to how the Chinese market would develop, in terms of different actions that would be necessary for them. The framework will be more general, and not only focusing on GEA, but companies sourcing in China in general.

The risk management framework is important to be a part of the overall global company strategy. This is due to the fact that the risk management approach in the given environment should be able to be equal to the overall company strategy, to avoid miscommunications *(Andersen & Schrøder 2010)*.

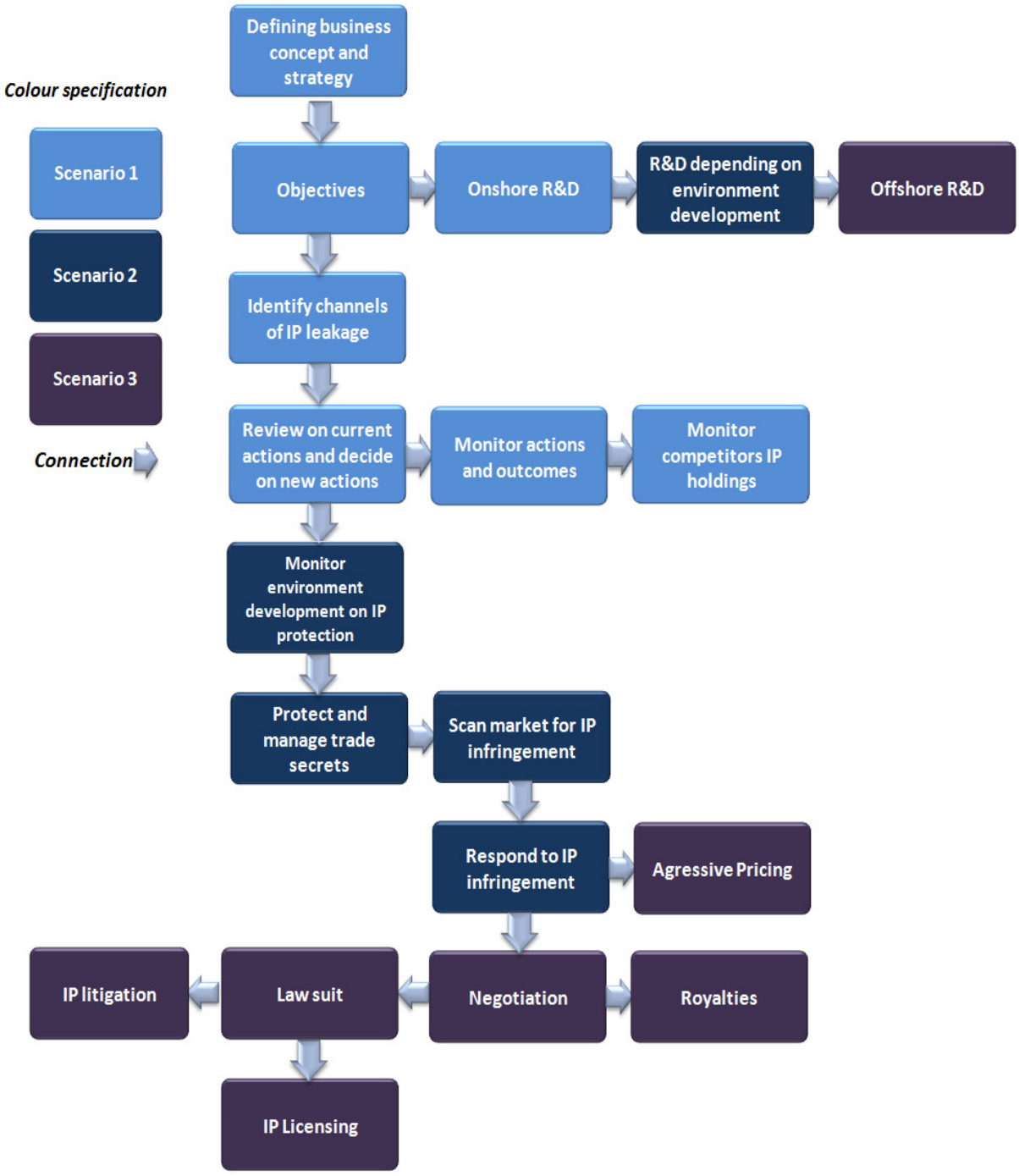
6.2.1 | The IPR risk management framework for sourcing in China

The structure of the risk management framework will be based on inspiration from *(PWC redefining IP value 2005).*

The risk management strategy that will be presented is as mentioned split into different "colouring" depending on how the market would be developing in China, concerning IP protection as we saw in figure 9. The strategy is build up on the entire business concept and strategy for the company, and then the different actions will be described. The model will be starting in scenario 1 from figure 9, and then depending on the market development from environmental scanning and different outcomes, go over to scenario 2 and 3. Scenario 3 is where the company will need to do aggressive risk management towards possible infringers, to protect their IP rights. It has to be mentioned that circumstances in all of the risk management scenarios can be experienced so there will be overlapping, although that the Chinese IP protection would be at a different management scenario than coloured.

This is because of there can occur situations where litigation and negotiation with potential infringers would be needed, or it would be most beneficial for the company to get some royalties on a possibly pirated product or solution.

Figure 10: Strategic IP risk management framework for sourcing in China



Source: *Own contribution*

6.2.1.1 | Strategy, identifying and analyzing IP risks

MNC's sourcing in China must define the business strategy that they want to use and take that into consideration in their risk management strategy. Like with the strategic risk management strategy, where the overall company strategy are in correspondence with what risks the company want to take, and what risks are the risks that it prefers to avoid *(Andersen & Schrøder 2010)*. Companies further need to examine the potential risks of IP loss by identifying potential IP leakage channels and from that develop a strategy that will minimize the leakage that occurs in the different aspects of the business. Find out what the risks are and look at the possibilities of potential minimization of the risks, and what measures that can be done in the given risk situations.

In this thesis the main risks of IP in relation to sourcing in China has been identified as being R&D, disloyal employees, and reverse engineering. As also mentioned the overall strategy of the company will also involve some of the business activities that the company should or shouldn't be involved in, based on the perceived risks that can affect the company's business opportunities in the given market *(Clarke & Varma 1999)*. This can be identified as whether the company should perform its R&D onshore, or offshore considering the higher risk of valuable IP loss. As mentioned in the literature review, there are significant benefits of onshore R&D, but the company should only perform this if the environmental situation turns into a more mature, IP protection wise. This will therefore be based on how the governmental situation would develop, and should only be performed in the sourcing country if China starts developing into scenario 1 where China starts taking IP seriously.

In relation to disloyal employees and reverse engineering it is more a matter of the contractual perceptions, where it from the beginning is important that the company are having the right clauses in the employment contracts *(PWC redefining IP value 2005)*.

6.2.1.2 | Review on the different measures on the IP risks

It is important for the company to after having identified the given risks that they are facing, to look at and reviewing what has so far been done in relation to the risks and what can they possibly do to minimize the risk. Depending on what type of risk that the company is facing the

company should like the conventional risk management, analyze and then also evaluate on the risks that is being faced *(Andersen & Schrøder 2010)*. The company will then get a much better insight on the risks identified, and by that be able to correspond better to and there better able to measure and react to the specific risk, in a later step of the framework.

6.2.1.3 | IP Monitoring in the environment and competitors

When the company knows what type of their solutions and products that they want to patent, it is important to be monitoring the market for other types of solutions that are perhaps close to their own. Another important thing for companies operating in China is to be monitoring the competitors patents, with this being an ongoing thing, so that the company can assure the competitors somehow hasn't got their hands on information that is not owned by them and they maybe have stolen or some sort of leakage has appeared, maybe through a former employee.

Companies operating in China with underdeveloped legal system should also consider the defensibility that they have in the market. With the less mature legal situation in country, it is often difficult to get anything out of a possible lawsuit, as it is very difficult to prove the case in a court *(Kennedy& Clark 2006)*. The environment development is therefore an important aspect to consider for the company, in relation to if the country that there is being operated in is going to develop and become more mature in relation to IPR protection *(PWC redefining IP value 2005)*.

Companies should therefore be looking at whether the market and environment development in the country is starting to take IP rights seriously like it is seen in the western countries in the near future, which can be seen as the first scenario. The second scenario shows that the environment development in the country can be predicted as by time the country will start taking IPR seriously. The third scenario presented is that the country doesn't seem to be changing in the near future, and this therefore requires much more management on a strategic level for the company and a lot of monitoring and aggressive strategy towards possible infringers.

6.2.1.4 | IP Patenting & Trademarks

Patenting new products and solutions is as mentioned not something that will prevent IP violation and companies should therefore think about which products and solutions they think

should be patented *(PWC redefining IP value 2005)*. Companies have high end products which are very fragile for the business if there is IP leakage, and also low end products which are much less fragile for the rest of the business. The company should therefore use more efforts in patenting their new high-end solutions, and not the less low-end solutions that would be easy for other companies to copy. This is also due to the fact that IP patenting won't mean that the products are secured in a court in for example China, and therefore the company should plan on what products they should be using effort in patenting. The company should therefore focus on their high-end products, as those are the ones that they want to secure in the best possible way. As mentioned in most cases it would be impossible for the company to be able to get the right proof and get in favour by a court, and therefore low-end products which would be less complex are waste of time and resources patenting *(PWC redefining IP value 2005)*..

6.2.1.5 | Protecting IP and trade secrets

Next step is to protect the company's IP and trade secrets in the best possible way. The main idea is to find and respond to violations and infringements as soon as possible to minimize and preventing damage. So the company should scan the market and track down potential infringers of their products. This can though be very time consuming and costly process for products that can be easily copied, and remanufactured in China. Therefore as mentioned the focus should be scanning for infringers for the company's high-end products, which would affect them, the most in terms of losses.

For the low-end product the company should accept the infringements as long as the governmental situation is weak towards IPR's. They should instead try to have an aggressive pricing strategy on the market, so that they can position themselves as a leader on the given products, and by that they can be able to keep infringers out. If the infringer can't match or only be able to sell the copied product at a slightly cheaper price it won't be attractive for them to copy the product *(PWC redefining IP value 2005)*.

On the high-end products, the company should track down the infringers this will of course take time depending on the kind of business that the company is involved in. The infringers should be threatened with legal action, and negotiate with them on possible royalty agreement,

and instead getting a payment for the IP rights that they are currently illegally in possession of. If the infringer won't accept to pay for the royalty, the company must take aggressive actions towards, and take legal action through a lawsuit. Depending on how the lawsuit goes, if the company can come up with an agreement with the infringer through court, they can now arrange and accept a fee in terms of royalties by IP licensing which will allow the other company to use the IPR's by paying for it.

If no settlement in court is done the company must not give up and take aggressive actions towards the infringer. This can be done through IP litigation Yang & Clarke 2005 process where experts in the field come in and win the case for the company. This can be time consuming, but it is important for the company to show that they take infringement very seriously and that they don't accept it, and is ready to go very long in the given case to show that other companies shouldn't try, to copy the company's products in the future.

7.| Assessment

This part is to interpret the findings during the analyses, and giving my view on the different scenarios and possible approaches and solutions, that was presented in the risk management strategy.

In the first part of the analysis the issues that GEA Process Engineering is dealing with was presented together with their position on the market which was summed up in a SWOT analysis. The different measures, that GEA is doing towards their different risks and the risks was then analyzed to get a better insight in it from their point of view.

GEA Process Engineering is very aware of the different risks that they are associated with in their business in China, and have experienced IP violations a couple of times. With the risks of R&D, reverse engineering and disloyal employees being pointed out as being the significant IP risks that there are in relation to IP. GEA has in terms of pursuing any sort of infringers or counterfeiters, always seen it more beneficial to go directly after the company or person first. This is due to the fact that it is very difficult for them to get the court on their side when it is

related to another Chinese company, as the court would in most cases favour the Chinese company over the foreign. GEA have therefore chosen to use the legal action in terms of a lawsuit as a threat and go directly to the infringer and trying to come up with a settlement instead. This could be in terms of a royalty agreement and the other company buying license for being allowed to producing or working with a specific product or solution.

This is something that GEA have had great success with, but although they can come up with agreements with potential counterfeiters, it is still not in their interest that other companies or people steal their IP.

From the inputs of the analysis of GEA and the literature a strategic risk management framework was developed. This risk management framework was developed with inspirations from the *(PWC redefining IP value 2005 report).* The frameworks purpose is to be able to be used for GEA, but is presented in a way that it seems applicable for other companies as well, and a more overall perspective is taken into consideration. The risk management framework is split into different case scenarios, of three possible governmental scenarios that China could develop into. The risk and the uncertainty from possible governmental regulations will always be there, and is especially more uncertain when the company is working internationally and working in unstable governmental countries like China. The three scenarios are based on the different future scenarios that the Chinese market could develop into in terms of IP protection. This is based on some of the literature and from Henrik Maimann's interview, where some suggesting that China is going in the right direction in terms of IP protection and others stating that it is not going to happen in any near future. Therefore three different scenarios were created so the risk management framework can adjust in terms of the different possible outcomes of Chinese IP protection governmental and legal wise.

The risk management strategy has then been developed, which starts from an overall company business strategy, which should be involved in the decision making of the risk management. This is as also previously mentioned important, so that the whole company are working in the same direction, and for the same goals. One of the objectives here is the great opportunity there is of having onshore R&D facilities, instead of having them outside due to

minimizing risk of lost IPR. In GEA's case they are currently running all R&D for China from their R&D facility in Denmark, and this is strictly because of the huge risk there is, and they don't want to risk their innovation in that sort of unstable governmental country. The proposed risk management strategies therefore have R&D based on the outcome of the different scenarios in China. If China starts to take IP seriously in near future, companies should think about moving their R&D onshore, as they will benefit a lot from it, in terms of lower labour costs, skilful people, but also the saving on the transaction costs by transferring the new innovation IP to China. On the other hand if the situation won't change in the near future, it is preferable to keep all sorts of R&D outside as it is very vital for the company to lose any sort of newly gained and innovation and IP. The model from there on goes into the standard approach of identifying possible risks, and from that monitoring and protecting the risks in the best possible way. Overall it is important for the company to do environmental scanning, to first of all check for any IP development in the country, which should be ongoing. The company should also be scanning the market for any IP violations ongoing, by checking competitors and customers IP patents, and check if there are any violations.

The model should be seen as an overall strategy, with different action planning on different situations and environment developments. The next step would obviously be the implementation process of Clarke & Varma 1999 model, but has not been something that has been possible to try. An implementation of such a strategy would further take long time, and is nothing that can be done from one day to another. The goal of the model is therefore to show how a risk management strategy could look like and how companies could approach risks of IP. The outputs of the model should though minimize or avoid any sort of IP violations, and letting the company feel safer about the environment that is being operated in, in this case China.

8.| Conclusion

The goal of the conclusion is to summarize the main points of the assignment, and answering the problem statement, which will be done by first giving answers to the research questions.

8.1| Conclusion – Answer to research questions

Based on the analysis I will answer the problem statement by answering the research questions and then the main problem statement. First the research questions will be answered, then the main problem is answered, by the thesis overall analysis and assessment.

8.1.1|What is global sourcing and what are the motives behind?

Global sourcing is the activity of searching and obtaining goods, services and other resources on a possible global scale, with the goal of complying with the company needs and with the focus of continuing and enhancing, the current competitive position of the company. Global sourcing doesn't always mean in foreign activities, as if the company scans the market and finds it more suitable to perform domestic sourcing it still relates to global sourcing.

Global sourcing has been performed in many decades with mainly the same factors and motives behind. These motives could be, the lower labour costs as being one of the main purposes, but also foreign interesting markets to sell in, competitive position in a worldwide business etc.

8.1.2|How is the situation in China in relation to sourcing and IPR risks?

IP is a kind of intangible asset like inventions, symbols, names etc. being owned by its creators, and also a property in a legal sense that can be owned and dealt with.

China has implemented different IPR laws, and joined all major international IPR related conventions, by for example becoming a member of WIPO with the TRIPS regulations. But Managers and academics still see China with a weak IPR regime including an almost none existing legal system in relation to IPR's. This means that patents are not being safe and

particularly enforceable if a company's IP would be pirated or counterfeited. It is also often the case that a court would favour Chinese companies over foreign to protect their industry.

The major threats and risks concerning IPR leakage in China has been identified as being first of al, disloyal employees where former employees taking the knowledge of the company and starting their own company. Second is reverse engineering where previous customers or competitors reengineer a product and by that save on R&D. The third is R&D risks, which means that a lot of companies prefer not having R&D activities in China.

8.1.3|What is the purpose of risk management and how can it be performed?

Risk Management has become a critical issue as a result of globalization and the continued pursuit for greater returns, and is basically about identifying and managing risks in the best possible way. Risk management can be performed by following a conventional risk management framework, with four different steps including; identifying, analyzing, evaluating and responding to the given risks. Strategic risk management is a more integrated way of risk management and can be performed by, summarizing the company's strategic position on the market through a SWOT analytical framework, which includes the internal and external factors of the environment of the company. The company then has information on how to approach different opportunities and threats and by that perform their risk management strategy. This is also presented in a risk management strategy by Clarke & Varma 1999.

8.1.4|What is GEA's strategic position on the Chinese market?

GEA Process Engineering is a business segment of the GEA Group and specializes in design and development of process solutions for the dairy, brewing, food, pharmaceutical, and chemical industries. The company's strategic position on the Chinese market was summarized in a SWOT analytical framework out their strategic position in terms of external and internal factors. GEA are a market leader in their business and have a lot of high-tech knowledge. On the opportunities they could perform onshore R&D, instead of offshore as it is now. Threats identified was the risk of disloyal employees, leaving the company with a lot of the company's knowledge and starting their own business. The risk of reverse engineering was also seen as a major risk, which GEA has experienced a couple of times, where for example customers trying to reengineer some or all of a solution.

8.1.5|How does GEA Process Engineering deal with their current risks in China?

GEA doesn't have any specific risk management strategy towards the threats/risks that they are having with their business in the Chinese environment. They do think about, and take necessary action against potential risk factors. In terms of IP infringement in previous cases, GEA has turned their attention towards the infringer and threatened them with legal actions through lawsuit. This has worked for them and in the previous cases they have come up with a sort of loyalty agreement, where the infringer would pay for a given solution or a part of that solutions license. In case of employee leakage, they try to keep the employees from knowing how a complete solution looks like and only giving access to what is related to their work. On R&D they are currently not performing any onshore, and perform all innovation for China, from the office in Soeborg, Denmark.

8.2|How can companies manage the risk of lost intellectual property, when sourcing in China?

Based on the gatherings from the literature study and the case study a strategic risk management framework towards reducing risk of lost IP was created. Some of the literature and the interviewee in the case study predict a brighter future in China IP wise, and some of the literature suggesting that it isn't something that will happen in any near future. The risk management strategy was therefore developed on different management scenarios, depending on how the Chinese legal system will develop. The risk management strategy was stated being important to have a connection through the whole organizations business strategy, which should be defined for companies sourcing in China. The strategy then describes different actions and approaches that should be taken, depending on how the environment in China would develop on IP protection. Environmental scanning has been seen as an important factor, so that companies can follow the development of IP in the country. Companies should also be effective in patenting their high-end products and save time and resources on less high-end products, and could instead do aggressive pricing to keep any possible counterfeiters away.

All in all it is important for companies to have an overall strategy towards risk of lost IP, and be prepared with actions and approaches to different situations and scenarios, to be able to reduce the risk of lost intellectual property when sourcing in China.

9.| Future research

This part is to describe how the topic of the thesis could be researched further, and new possible factors could influence the topic.

As mentioned in the assessment (chapter 7) the implementation process of the risk management strategy would be interesting to look at, as it would be the obvious next step of the risk management strategy by Clarke & Varma 1999. But also completely different factors would be interesting, which will be described in the following part.

China and is an attractive country for sourcing activities and foreign investment due to the lower labour costs and highly skilled people. Though the lack of mature policies and regulations in terms of IPR that there are can prevent companies in sourcing there, and if they do source they will have to use high risk management on the IPR. This assignment presents the issues there is by sourcing from China due to the lack of IPR protection that there is in many developing countries especially China. The thesis gives a case example from GEA Process Engineering that is and previously has experienced infringement of their IPR in different types of situations. They though predict, and some authors' predict that China with time, will be taking IP more seriously and develop into a country with more mature governmental and legal situation, like it is seen in most of the western world. The western are also putting pressure on the Chinese government in order to living up to the IPR protection standards.

Western governments and large corporations claim that strong IPR's are needed to maintain investment and innovation. This position is though contrasted by new political and social movements, which argues for that strong IPR's enforcements would hinder economic growth and welfare in developing countries *(Archibugi & Filippetti 2010)*. Imitation is needed as it will be impossible for the emerging countries to learn and innovate if they don't have the chance to work on previously made products. This is due to the development of emerging countries is associated with creative imitation and absorption *(Archibugi & Filippetti 2010)*.

So for the economies to be able to maintain economic equilibrium in the China areas have is argued for having an increasingly effect on development, and by placing pressure on them on IP

piracy & counterfeiting such as reverse engineering, could hold back their future development. This would therefore be interesting aspect to focus more on in a future research aspect. By looking at how the economies would be affected by strong IPR enforcements.

So future research purposes would be investigating how companies in China sees the trend on more strict IPR enforcements in terms of they are able to innovate with the resources that they have or if this would cause a setback to them.

This could be viewed in the term of, if the economies would with time be able to do their own investments in R&D and innovation and therefore wouldn't depend too much on IP thefts and for example reverse engineering. So by looking at the trend and analyzing when the countries would be in position of working under the same IP law as the most of the world, would be relevant from a whole different point of view of this thesis purpose.

So final words will be that this assignment is as mentioned focusing on how companies should manage and respond to the risk of lost IPR's by good risk management. Future research would first of all be going to the next step in terms of implementation process of the risk management framework, but also by looking at how the economy and companies development in China would be affected by strong IPR enforcements.

10.| References

Books:

- Andersen, I. (2006). *Den skinbarlige virkelighed: om vidensproduktion inden for samfundsvidenskaberne* (3. udg. ed.). Frederiksberg: Samfundslitteratur.

- Andersen, T.J. and Schrøder, P. W. *Strategic risk management practice: how to deal effectively with major corporate exposures*. (2010). New York: Cambridge University Press.

- Cook, T. A. (2007). *Global sourcing logistics: how to manage risk and gain competitive advantage in a worldwide marketplace*. New York: American Management Association.

- Ellis, C., Scott, A., & Woollard, S. (2011). *Intellectual property rights in China* (2nd ed.). New York: Springer.

- Kvale, Steinar & Brinkmann, Svend (2006):"InterView". 1. udgave. 7. oplag. Hans Reitzels Forlag

- Saunders, M., Lewis, P., & Thornhill, A. (2007). *Research methods for business students* (4. ed.). Saddle River: Financial Times Prentice Hall.

- Stinnett, B. (2005). *Think like your customer: a winning strategy to maximize sales by understanding how and why your customers buy*. New York: McGraw-Hill.

- Yin, R. K. (2003). *Case study research: design and methods* (3. ed.). London: Sage.

Journals:

- Archibugi, D., & Filippetti, A. (2010). The globalisation of intellectual property rights: four learned lessons and four Theses. *Italian National Research Council*, *1*(2), 13p

- A. Maltz a, J. R. Carter a, E. Maltz b,1 (2011) How managers make sourcing decisions about low cost regions: Insights from perceptual mapping, *Industrial Marketing Management xxx*

- Clarke, C. J., & Varma, S. (1999). Strategic Risk Management: The New Competitive Edge. *Published by Elsevier Science Ltd*, *32*(4), 11p

- Davis H. L., Eppen G. D. and Mattsson L. (1974). Critical Factors in Worldwide Purchasing. *Harvard Business Review*, 52(6), 11p

- Fredriksson, Anna and Patrik Jonsson . Assessing consequences of low-cost sourcing in China. *International Journal of Physical* 39.3 (2009): 23. Print.

- Ghoshal, Sumantra. 1987. Global strategy: An organizing framework. Strategic Management Journal, 8, (1), 15p

- Gill, John (1995): "Building Theory From Case Studies". Small Business and Enterprise Development, Sheffield Business School, Sheffield, UK 2, 4p

- Holweg, M., Reichhart, A., & Hong, E. (2011). On risk and cost in global sourcing. Int. J.Production Economics 131, 1(1), 9p

- Javorcik, B. S. (2004). The composition of foreign direct investment and protection of intellectual property rights: Evidence from transition economies. *European Economic Review*, *48*(1), 24p

- Kennedy, G., & Clark, D. (2006). Outsourcing to China – Risks and benefits. *computer law & security report*, *22*, 4p

- Keupp, M. M., Beckenbauer, A., & Gassmann, O. (2009). How managers protect intellectual property rights in China using de facto strategies. *R&D Management*, *2*(39), 14p

- Kotabe, M. (1998). Efficiency vs. effectiveness orientation of global sourcing strategy: A comparison of U.S. and Japanese multinational companies. . *The Academy of Management Executive (1993-2005),*, *12*(4), 14p

- Lai, E. L., Riezman, R., & Wang, P. (2006). Outsourcing of innovation. *Springer-Verlag*, *38*(.), 31p

- Matthyssens P., Quintens, L. & Pauwels, P. (2006), The global purchasing challenge: A look back and a look ahead, *Journal of Purchasing and Supply Management*, 12 (4), 3p

- Miller, K. D., 1992. A Framework for Integrated Risk Management in International Business, Journal of International Business, 23 (2) 20p

- Quintens, L., Pauwels, P., & Matthyssens, P. (2006). Global purchasing: State of the art and research directions. *Journal of Purchasing & Supply Management.* (12), 12.

- Samuelson, P. (2002). Reverse Engineering Under Siege. *Communications of the ACM*, *45*(10), 6.

- Wang, L. (2004) Intellectual property protection in China, The International Information & Library Review 36, 8p

- Yang, D.; Clarke, P. “Globalisation and intellectual property in China”, Tech Novemberation, Year: 2005 Volume: 25 Issue: 5 11p

Company reports:

- GEA Group Annual Report 2010 - http://www.geagroup.com/imperia/pb/1%20GEA%20Group/Investor%20Relations/Finanzberichte/2011/Geschaeftsbericht/GB/GEA-GB-2010-E.PDF

- IBM. (2006). IBM Low-cost country sourcing can benefit a company's bottom line. *IBM Global Services Route 100 Somers*, *1*(1), 1-16 http://www.gregbrennan.com/pdfs/IBM%20Low%20Cost%20Country%20Sourcing.pdf

- *Veol Labs* Outsourcing R&D Intellectual Property Concerns. (n.d.). *Medical Device Development Company India, Medical Devices Design & Manufacturing –*. Retrieved July 30, 2011, from http://www.veollabs.com/IPRIND.-1.pdf

- Price Water House Coopers, (2005). Redefining Intellectual Property Value - The Case of China. *A Technology Center Publication*, *1*(1), 1-76 - http://www.pwc.com/en_US/us/technology-innovation-center/assets/ipr-web_x.pdf

Interviews:

25-07-2011 Henrik Maimann, Director of Emission Control and Vice President - GEA Process Engineering – henrik.maimann@geagroup.com

01-03-2011 Farzin Saber, Lead of Sourcing & Procurement Senior Manager – Accenture A/S – Farzin.saber@accenture.com

Internet sources:

- Convention Establishing the World Intellectual Property Organization. (n.d.). *WIPO - World Intellectual Property Organization*. Retrieved September 10, 2011, from http://www.wipo.int/treaties/en/convention

- GEA Niro specializes in spray drying technology. (n.d.). *GEA Niro specializes in spray drying technology*. Retrieved September 10, 2011, from http://www.niro.com/

- GEA Process Engineering. (n.d.). *GEA Process Engineering*. Retrieved September 10, 2011, from http://www.GEA.com

- Schwartz, M. (n.d.). Reverse-Engineering - Computerworld. *Computerworld - IT news, features, blogs, tech reviews, career advice*. Retrieved September 10, 2011, from http://www.computerworld.com

- WIPO - World Intellectual Property Organization. (n.d.). *WIPO - World Intellectual Property Organization*. Retrieved September 10, 2011, from http://www.wipo.int/portal/index

Appendices 8

Appendix 1: Interview structure

Interview with GEA Process Engineering 25/07-2011
Interviewees:

Director of emission control and Vice President Henrik Maimann

The purpose of the interview and the questions is to develop a foundation for a discussion, and elements that you find interesting also will be included to clarify your organisations specific global sourcing aspects and the risk of intellectual property when operating in China/India. The questions will be structured so that they are based on the assignments theoretical framework, and would help with answering the research questions of the assignment.

What were the motives for opening/moving production activities to China/India?

- Low cost labour
- Market entry
- Competitive advantages
- Other

What types of global sourcing strategies do you operate with, in China/India?

- Intra-firm sourcing
- Outsourcing

How does the Information processing/know how to the sights function in relation to valuable and high risk information?

What is the concern for risks associated with loss of intellectual property with legal systems in low-cost-countries being less mature than in Western countries?

What types of risks in your organization are you most worried about in relation to IPR?

- Leakage of valuable information on different solution/products
- Reverse engineering
- Employee Leakage
- Other

How do you prevent intellectual property violation on the sights in China and India?

- Risk management strategies related to protect IPR

How do you monitor the market for other companies copying your products?

- Have your IPR been violated so far?

How do the company deal with R&D and innovation in IPR risks?

- Is new product/solution development kept outside of China/India?
- Is this kept in-house or is there also parts outsourced?
- If performed on the sights is there any specific measures done by the company, to avoid leakage of valuable information?

How well do you feel your products are secured when patented through WIPO in relation to your business in China/India?

Appendix 2: CD

Attached is a CD with sound files and transcription of the interview with GEA Process Engineering.