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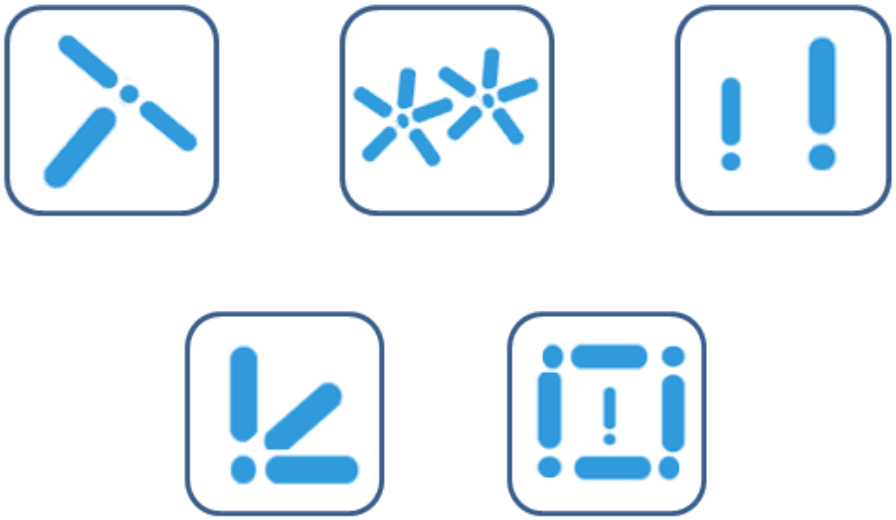

Creating a market plan for the company Power Consultant – regarding the service portfolio and the market situation

Master of Science Thesis

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ABSTRACT

Title: Creating a market plan for the company Power Consultant – regarding the service portfolio and the market situation

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Background: Power Consultant has initiated this master thesis to evaluate the opportunities to start working towards new customers and possibly new market segments. The reason for this is that they have opened a new office in Gothenburg and the office is primarily working towards one customer.

Purpose: The purpose of the master thesis was to create a market analysis for Power Consultants Gothenburg office, with a focus on the west coast of Sweden and possibly Norway. The result will be used as a decision material for the board of directors when deciding the further expansion of Power Consultant.

Method: The service portfolio was developed by investigating its current state and what types of actions that could be done to create more assignments. A development tool called morphological matrix was used.

There was a screening process for the market analysis to find out which markets that corresponds best with the current service portfolio. The chosen markets were then investigated with Porters five forces to see if there was any potential in them.

To analyse the surrounding world, a PESTLE analysis was done on the Swedish nuclear power market and other important nuclear power events was included in this section.

Results: Many of the services that were found could fit Power Consultants portfolio and would get them to target more customers' needs, along the life cycle of the product. This should not interfere with the existing portfolio.

The nuclear power industries have much potential and many countries are making huge investments to develop new technologies. The petroleum market has a competitive environment with many large consulting companies. The pharmaceutical market has many openings and opportunities to work with more human factors services.

Political laws and larger nuclear accidents are the biggest threat against the nuclear market. The decommissioning in Germany and the economical situation for Company A can affect the Swedish market.

Conclusions: It is important for Power Consultant to focus on the nuclear power market, where they have much knowledge. Attempting a new market will be time consuming and costly. Out of the two researched markets the pharmaceutical was the most promising one.

Investing in new services can lead to new assignments at the already existing market. More knowledge in the company on how to deal with assignments regarding new buildings and decommissions of power plants will lead to new assignments.

Key Words: Market analysis, Morphological matrix, Nuclear power, Porter's five forces, PESTLE, Service portfolio

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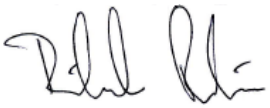
I would like to thank Power Consultant that has given me the opportunity to work with them through this master thesis. They have really made me a part of the company and I felt the importance of the paper. The topic has been exciting to work with and there have always been new interesting questions to deal with.

Thanks to all the people on Power Consultant, who took their time to participate in the survey. A special thanks to Angelika Kjär Boman, who have helped out and been a big part in the process of this master thesis. I could not think about a better supervisor and I wish her all the best in the future.

I would also like to thank my supervisor Lars Almefelt who has helped me with the structure and the content of the paper.

Gothenburg, 2012-02-10



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Rickard Berlin

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1 INTRODUCTION

This chapter will give an introduction to the topic, nuclear power, followed by the background for the master thesis, why did Power Consultant create this thesis? Then the reader will get information about the purpose, objectives, scope and delimitations. At the end of the chapter there is a reading guide that describes the structure of the report.

1.1 BACKGROUND

The world's energy consumption has increased approximately 35 percent during the last two decades. The augment is the same in all the sectors (transportation, industry, residential and service sector). This has led to a discussion in media about how to reduce the carbon dioxide emissions. Two of the largest users of energy today are China and the United States and almost 50 percent of the world's coal consumption is being used by China. (Ekonomifakta, 2010)

Nuclear power is one way to create energy without creating that much carbon dioxide. The problem with nuclear power is the nuclear waste and how to store it. (Energimyndigheten, 2010) China and Russia have lately been doing huge investments in the nuclear power plant industry. The accident in Fukushima, Japan at the 11th of March 2011 has led to a new safety discussion. To prevent similar events in the future constructions, calculations and analysis of the nuclear power plants must be improved.

Safety questions are not only applied to the nuclear power industry but for other business fields as well. There are specific cautions to assure that nothing will go wrong in the process. The same type of analysis and calculations could be used for the medical industry or chemical industry. The importance of designing the equipment and the control rooms is also one vital thing regarding the safety aspects.

Power Consultant is a consulting company with 46 employees and they work in the nuclear power safety industry. The company have five different services in their portfolio and these services can be read more about in Chapter 4. The background for the master thesis was that Power Consultant had begun looking for the opportunity to expand their business, this by starting to work towards new customers and maybe new market segments. One reason for this is that they have opened a new office in Gothenburg. The offices' opening day was October 2009. At the moment the office is mainly working towards one big customer, Company C. There is a risk to be that dependent on only one customer.

The services that Power Consultant provides can be sold in other industries as well, not only the nuclear power industry as it is today. The thought of expanding in to other business fields have been on the agenda before, but now with the newly opened office the question has been raised again. New customers in the nuclear power industry will remain prioritised.

1.2 PURPOSE

The purpose of the master thesis was to create a market analysis for Power Consultants Gothenburg office, with a focus on the west coast of Sweden and possibly Norway. The result will be used as a decision material for the board of directors when deciding the further expansion of Power Consultant.

1.3 OBJECTIVE

To be able to accomplish the purpose of the master thesis some objectives were stated. Should Power Consultant start working towards other businesses or should they try to grow stronger in the nuclear power industry. The focus was to find new customers for the office in Gothenburg, so that they are less dependent of Company C. The key questions for master thesis to answer were therefore the following two:

- KQ1: Should Power Consultant start working towards new industries or should they continue focusing on the nuclear power industry?
- KQ2: How much potential and how many customers are there in the nuclear safety market and other industries in the Gothenburg region?

To make a deeper analyse of the subject some sub-questions were stated. These questions were company, service and surrounding world oriented. These sub-questions that were answered are the following:

- SQ1: What do the employees of Power Consultant, at the Gothenburg office, believe is the right thing to do with the company?
- SQ2: Does something need to be changed or added in the product portfolio, to get more customers/assignments?
- SQ3: What are the topics today about the nuclear power industry in Sweden and worldwide?

1.4 SCOPE

The thesis had to contain certain parts to be able to analyse how Power Consultant should expand their organisation and still stay competitive and have a strong market position. The following list presents the keystones in this paper and below a description on each part.

- The company
- The service portfolio
- The market
- The surrounding world

A survey was conducted with the staff, to get a better grip on what they thought about Power Consultant and what they would like to change and improve. The survey was done to get interesting information about potential customers and industries.

The board of the directors and the CEO were contacted to determinate what types of thoughts they had on the expansion. It was important to know what they were expecting and what they thought the master thesis could generate.

There is a description of the current service portfolio and what the different services are able to do. This is followed by the development process of the portfolio.

The market analysis part states the industries that Power Consultants services are suitable for and there is an analysis of possible market segments in those industries. To investigate the topic more profoundly a list of potential customers and existing competitors in each market field were created.

Finally a surrounding world analysis was created to evaluate the situation of the nuclear power market. The analyses also contain events around the world that can affect the future for the industry.

1.5 DELIMITATIONS

The master thesis was executed during a time period of 20 weeks. The geographical limitations for the customers' and competitors' research where around the west coast of Sweden and some parts of Norway. Extra information about other customers was added because of the impact on the market. It was no focus on how services could be priced. Deeper going market segment analyses were done for some of the industries, not all of them, due to the time of the project.

1.6 STRUCTURE OF THE REPORT

The paper is divided in to ten different chapters including this introduction. Chapter two describes the methods on how the master thesis was accomplished in a structured way. After that is the theoretical framework explained in chapter three. Chapter four gives a shorter background of the company and their services portfolio. This is followed by a survey with the employees and the CEO. Then there is three different analysis segments, first of service portfolio (Chapter six), then of the markets (Chapter seven) and finally of the surrounding world (Chapter eight). In chapter nine there is a discussion on all the results from the master thesis. The final chapter gives the recommendations for the company and future possible research areas. All the chapters are listed below this paragraph.

Chapter 1. Introduction
Chapter 2. Method
Chapter 3. Theoretical framework
Chapter 4. Information about Power Consultant
Chapter 5. Interviewing the company
Chapter 6. Developing the service portfolio
Chapter 7. The market analysis
Chapter 8. Surrounding world analysis
Chapter 9. Discussion and conclusion
Chapter 10. Recommendations for the future

2 METHOD

This chapter gives the reader information about the methods for the master thesis. There are five sections, gather theory for the thesis, develop the service portfolio, search information for the analysis, analyse the situation and finally summarize the analysis. The method chapter shows that the master thesis was done scientifically.

2.1 GATHERING THEORY FOR THE THESIS

There is a start-up period at the beginning of the project to gather knowledge and litterateur about the subject in question. Well-known theories such as Porter's five forces, PESTLE and other business theories were collected. Different methods on how to develop a service portfolio and how to create a good questionnaire is describe further down in the chapter. Similar master theses were studied to get inspiration. This was combined with knowledge from earlier courses of Chalmers masters program in product development and the bachelor program in mechanical engineering.

All the gathered information from interviews, questionnaires, databases, external and internal research was compared with the theory framework. The theory from the research period was a foundation for the whole master thesis. Consultations with experts in different fields were held to set up which type of method that was most suitable for this master thesis.

2.2 THE PROCESS OF ANALYZING POWER CONSULTANT

Details about the company's services were gathered from the homepage of Power Consultant and from their quality computer system (ESKIL). There was an internal research to find out more about earlier researches at the company and what types of strategies they got today. A discussion was held with the supervisor at the company to make sure that the information was right. There was also a continuous dialogue with the staff to get a deeper understanding about the company.

A questionnaire was created to get the internal view on what the staffs thought about the company expanding. Interviews were also held with the CEO and boarder of directors on telephone to establish more information. Using a method created by Peterson formed the questionnaire and a figure of the development method can be found in Appendix A.

It is essential when creating a questionnaire to come up with a good structure of the questions. The more standardisation the answers are the better will the final result be for the survey. The problem is though that the more specific a question is the more has to be known about the current topic or issue. Unstructured questions are mainly used in an early developing phase. Here follows a short description on each step (Peterson, 2000):

1. Write down the requirements on what the questionnaire should answer to. This will be good when it is time to evaluating it. Have the survey fulfilled its purpose? (Peterson, 2000)
2. Create a list of research questions and will doing so try to make them specific so it is easier to evaluate the answers. Then rank them to see which questions those are most important for the study. (Peterson, 2000)
3. Consideration if the study participants are willing or able to answer the questions. Do they have enough knowledge and do they understand the language? Make sure to not make any question offending. (Peterson, 2000)
4. Open-end and closed-end question have both different advantages, and they are good when they are combined. Open-end question could be used to get some more information and enliven from the close-end once. Some questions have to be asked in

open-end, for example ZIP codes. Open questions are suitable in the beginning of a research when the researcher do not know what types of answers he/she could get. (Peterson, 2000)

5. Using the right word so that the study participant gets the correct message, and by this meaning not use any word that could influence his/her choice.
6. Creating a structure of the questionnaire that is logical for the study participants. (Peterson, 2000)
7. Evaluation the results with for the survey. Should any question be changed if the survey should be used for another test population? (Peterson, 2000)

2.3 DEVELOPING THE SERVICE PORTFOLIO

The method for developing the service portfolio was divided in to different phases. It started out with a study of the existing services portfolio, Chapter 4. The services were specified to be able to know what type of services Power Consultant provides to the customers. This was followed up by a research period with the board of directors to find out what they thought about the portfolio and what they thought was possible extents to the existing portfolio. This was considered the pre-study phase of the development.

Next phase was divided in to two different parts. The first part was to study the lifecycle of the product. The lifecycle of a product is all the different stages it goes through during the time it is used. For this the nuclear power plant was considered as the product and the task was to find possible new stages where the portfolio could be used. The second part included investigating the customers and the competitors on the market today. What are they targeting and what is there a need for? This research period gave new thoughts about other services that could be considered good investments for Power Consultant. The investigation was done for the companies that were active on the nuclear market.

A morphological matrix, a well known product development tool was used. The basic idea with this type of matrix is to combine different sub-functions to come up with a new solution. The matrix makes it possible to overview the whole system and to see how different things could work together. When all the sub-functions are specified the work with combining them could start. It is necessary that the creator of the matrix have good knowledge about how different sub-functions can be solved. By breaking down the whole system in to sub-functions, different parts could be solved individually. The final step is to come up with different solutions while mixing the sub-functions. (Silverstein, Samuel, & DeCarlo, 2008) Table 1 shows an example of a morphological matrix. The matrix had to be modified to suit services instead of products, more about this in Chapter 6.

	Different sub-solutions		
Functions	Sub-solution 1	Sub-solution 2	Sub-solution 3
Function X			
Function Y			
Function Z			

TABLE 1 AN EXAMPLE OF A MORPHOLOGICAL MATRIX

These steps lead to the final phase of the development where the solution is presented along with the discussion and conclusion on the results.

2.4 ANALYZING POSSIBLE MARKETS

The market analysis was done through a screening process to find industries that was suitable for Power Consultant service portfolio. Each potential market was divided in to segment to omit less attractive ones. These segments were analysed with Porters five forces and more information about this theory can be found in section 3.1.

Information for the deeper investigation for the customers and competitors were gathered directly from their homepages. This information made it possible to stat what type of services the customer needs and what type of services the competitive companies are providing. Swedish companies' registration office (Bolagsverket) has a register of every company, which was used when scanning for new customers. Certain key numbers, such as turnover, number of employees etcetera, came from the database 121.nu. Raw data like this was an important indicator in the analysis. A core thing for this master thesis was to gain knowledge about new markets and how they function.

The purpose of the surrounding world analysis was to find threats that could indicate that a change of market was something that was not optional but necessary for Power Consultant. Information concerning this issue was gathered in news media and by using search engines like DI.se and Google.com. For the surrounding world was the PESTLE-analysis used, more information about this in section 3.3.

2.5 CREATING THE RECOMMENDATIONS

To come up with the recommendations for the board of directors the results from all the analysis were discussed. The main question and the sub-questions were answered and what the pros and cons could be with different decisions.

3 MARKET ANALYSING TOOLS AND MODELS

This chapter gives the reader a better understanding of the tool's/model's that were used while investigate the markets and developing the service portfolio. There is also information regarding the expansion of a company.

3.1 PORTER'S FIVE FORCES

Michael Porter was the creator of the well-known theory called Porter's five forces. He was a Harvard economist and some would describe him as a guru of business strategies. His model was created to evaluate how good a certain market investment would be. It is possible to apply the model to any market or submarket in any industry. The five different fields describe the possibilities of the market and if there will be a good return of the investments. These are the fields that Porter's five forces include, existing competitors, potential competitors, substitute products, customer power and supplier power. Following model describes each field: (A.Aaker & McLoughlin, 2007):

FIGURE 1 PORTER'S FIVE FORCES AND DIFFERENT ASPECTS THAT COULD BE DICUSSED IN EACH FIELD (MAXI-PEDIA)

3.1.1 BUYERS

How much power do the customers have over the market? If they have more power than the seller's this will lead to pushed prices and higher demands on the services. The larger portion that the customer has of the seller business the more he is able to control it. How many customers are there on the market? What are the significant differences between the buyers on the market? (A.Aaker & McLoughlin, 2007)

3.1.2 COMPETITIVE RIVALRY

The first question that has to be asked is how many competitors are there on the market? What is the size of the existing ones? Are there any powerful companies that control the whole market or any small vulnerable ones? What type of strategies do the competitors use, how do they

differentiate themselves from the rest of the market? There is a risk that if many companies are offering similar services, the margins might be more or less non-existing (A.Aaker & McLoughlin, 2007)

3.1.3 BARRIERS TO ENTRY

Who can enter the market and what type of barriers do this company has to pass. The barriers could be capital investments, distributions channels, economies of scale or product differentiation. What would the affect be if a competitor entered the market? Do other companies have the knowledge to enter the market? (A.Aaker & McLoughlin, 2007)

3.1.4 SUBSTITUTES

Is it possible that the customers could get the same service in another way from someone that is not considered as a competitor on the market? For example could this be seen in the cell phone market where customers could use the landline instead of the cell phone. This is of interested when comparing what the customer could get if changing to a substitute service, the trade-off between price verses performance. (A.Aaker & McLoughlin, 2007)

3.1.5 SUPPLIERS

How many suppliers are there for the company and how unique are their services or products? The more customers a supplier got the more power they will have. This power could be used to raise the prices. The size of the supplier is also significant when it comes to how much power they got. (A.Aaker & McLoughlin, 2007)

3.2 EXISTING SERVICE ON A NEW MARKET

The Ansoff matrix was created by Igor Ansoff and published in Harvard business review. The matrix focuses on two things, products and markets. He came up with how companies should work depending on which part of the matrix they were focusing on. (Lester, 2009) The matrix can be seen in the figure below.

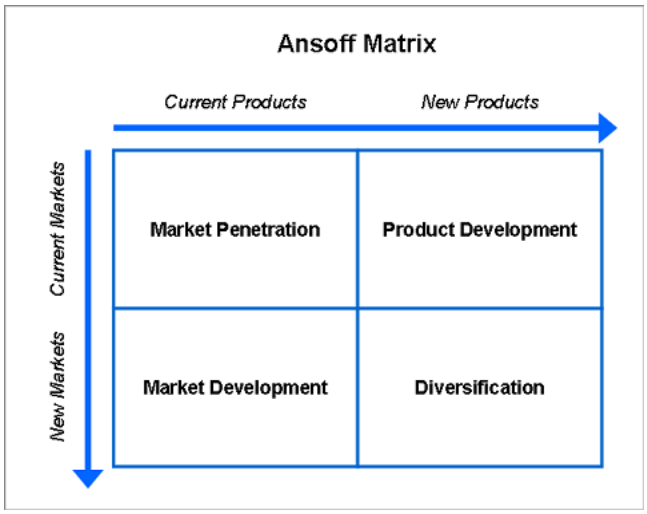


FIGURE 2 THE FOUR DIFFERENT FIELDS OF ANSOFF MATRIX

When Ansoff came up with the theory in 1957 was the focus products not on services but the theories could be used in the same way. The part of the matrix that Power Consultant is interested in is the current product and new markets. The key information from this division was the importance of locating new customers and finding out in which segment group they were in. I.e. finding new possible openings where the services are attractive. It is also important to

leverage the brand and the company reputation on to the new market. (Lester, 2009) This was adapted for both the service portfolio and the market analysis

3.3 PESTLE MODEL

PESTLE, PESTEL or PEST as it was called from the beginning, is a model that can be used to investigate the market environment. The model can be executed for an existing market or a new market. It contains six different areas: political, economical, social, technological, legal and environmental. The PESTLE analysis is possible for either a macro perspective or a micro perspective. (JISC Advance, 2009) Here follows a list with important questions for each research field:

- Political, is there anything a party or parties could do to change the market? Are there any directives from the EU Government that could influent the future of the market? (JISC Advance, 2009)
- What type of economical parameters can affect the market/industry? Does the market grow or does it shrink? (JISC Advance, 2009)
- Social, are there any aspects from the main society or any cultural things that could affect the market? Could anything be changed because of education aspects? (JISC Advance, 2009)
- Is there any another technology that could make it difficult to succeed? Does the market have a technological progress? (JISC Advance, 2009)
- Can any laws from the Government change the current situation for the legal aspects of the services? (JISC Advance, 2009)
- What type of environmental things can influence the market, such things as outcome from political and social areas? (JISC Advance, 2009)

4 INFORMATION ABOUT POWER CONSULTANT

This section will describe the background of the company and how they work with their service portfolio today. It was important to do this research before the market analysis to be able to know which types of industries that could fit Power Consultant. The current energy market situation is discussed in chapter six.

4.1 POWER CONSULTANT

Power Consultant has at the moment 46 employees in the company and 30 persons are stationed at the headquarter in Solna, Stockholm and the 16 others are at office in Gothenburg. The average age of the employees are 39.3 year and they have together almost 600 years of experience of the nuclear safety business. (Power Consultant, 2010)

Power Consultant is a consultant company with five business areas, but the main two is safety analysis and safety reports. The other fields are human factors, education and project management. These services could be sold individually or as a package solution. None of these services are locked to nuclear power industry. It is therefore possible to adapt them to other industrial fields, for example is project management something that exists in almost every industry today. (Power Consultant, 2010)

The company has a bright vision on the future and they will strive to continue expanding. Power Consultant has a goal to develop their services so that they can satisfy the customers even in the future. They do also have a co-operation with the consultant company COMPANY R, to become more competitive. (Power Consultant, 2010)

4.2 SERVICE PORTFOLIO

This section describes each of Power Consultants five service fields, safety analysis, safety reports, human factors, education and project management. Quality is important in each field and the services are ISO 9001 qualified. It is possible to get a custom-made solution with different fields involved. (Power Consultant, 2010) At the end of each chapter there is a list of project successfully completed by Power Consultant. The figure below shows the different service fields.

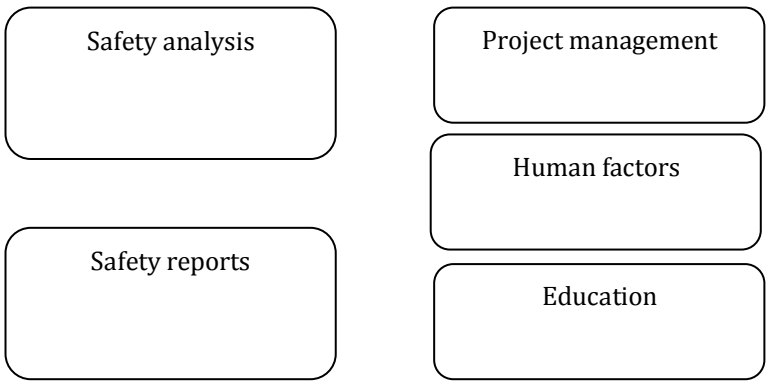


FIGURE 3 THE FIVE SERVICE FIELDS THAT POWER CONSULTANT GOT TODAY

4.2.1 SAFETY ANALYSIS

Power Consultant has a long experience of risk and safety analysis, especially when it comes to businesses with high safety requirements. The company has knowledge about and can provide both deterministic and probabilistic methods. These methods are used to calculate the risk of a specific event; the risk that something could go wrong. These calculations are also known as

common cause failure (CCF) and helps out with the decision whether a component should be changed. (Power Consultant, 2010)

In the nuclear power business is mainly probabilistic analysis used. The calculations can be done for a power plant to investigate the consequences of earthquakes, fires, flooding and pipeline failures. Power Consultant has done many of these calculations for nuclear power plants both in Sweden and Europe. With the results from probabilistic safety analysis, specific actions can be done to prevent the evaluated risks from happening. The thought is that everything that could go wrong is calculated and what that could bring as a sequel. These calculations are important things when it comes to technical complex organisations. (Power Consultant, 2010)

These methods are universal and could be used for example chemical process safety and transportation industry. Power Consultant has had many succeeded projects in both Ukraine and Russia but also in Sweden at Company D, Ringhals 2 and Ringhals 4. (Power Consultant, 2010)

4.2.2 SAFETY REPORTS

Safety reports show administrative authorities and the general public that the nuclear power plant follows those laws that exist for reactor safety. When it comes to safety reports that Power Consultants have been involved in; production updating and inspections of all the parts in the power plants can be mention. (Power Consultant, 2010)

Safety reports for a nuclear power plant contains many parts, the two most important parts are the general part and the system part. The general part describes how the facility withstands those demands and laws that there is, and also how the facility would react on a certain event. The safety part, also known as safety technical specification (STF), describes which types of systems the power plant contains to assure the safety of the plant. There is a declaration in the STF on all the safety components that has to be ready and all the parameters that they should contain to assure the safety. (Power Consultant, 2010)

When a power plant is updated to increase the efficiency or to be modernised all the safety analysis has to be revised. To make sure that the safety analysis is up-to-date for the new facility. This means that the safety reports must be updated as well for new facility, to make sure that it is described in the right way. Therefore, working with safety reports means administered existing safety analyses and safety reports. The work is primarily focusing on evaluating the requirements and rules that exist for reactor safety. Power Consultant has been involved in updating and modernising the facilities at Company C 1, Company C 3, Company C 4 and Oskarshamn 3. (Power Consultant, 2010)

4.2.3 HUMAN FACTORS

How the human factor affects technical systems is a central element when it comes to safety. Power Consultant has divided human factors in to three different areas, experience feedback, working methodology and control room layout. All the areas are stated in detail further down in this section. (Power Consultant, 2010)

Using experience from earlier events is a keystone, thus if that were not the case the same problem can occur again. Power Consultants has experience about nuclear events, changed requirements, ageing problems and modernization of nuclear power plants. This type of experience is hard to gain through education and can be used while developing new parts. (Power Consultant, 2010)

Working methodologies are a way of describing how the labours should work. There could be huge consequences if something was done in the wrong way at the nuclear plant. The structure on how things should be done is therefore elementary to prevent any accidents. Knowledge from

earlier projects and events are present when developing working routines. (Power Consultant, 2010)

The last part of the human factors is the layout of a control room. Power Consultant is today developing new interfaces for the operators at the nuclear plant. This type of assignment involves work task analysis, developing a new interface, verification and validation. These things are based from a long time of working with different control rooms, both from process industries and simulations educations. (Power Consultant, 2010)

Power Consultant has been involved with evaluation and development of a new operator interface at Company D, the verification and validation of control rooms at Company C 2 and Company D 3. (Power Consultant, 2010)

4.2.4 EDUCATION

The nuclear power industry has high demands on safety, which sets the need for an education with high standard. The people that work in this industry must be well aware of the foundations to a safe work environment. The requirements for education in the nuclear power industry are high, so that organisations could understand and co-operate with each other. (Power Consultant, 2010)

Power Consultant provides education in any area of their business fields. The education is created with well-known models combined with the knowledge that they got from the nuclear power industry. This is done to create an education that is complete and where things are in its right context. Power Consultant also provides the service of identifying what type of competence and education a company could need to become more successful. (Power Consultant, 2010)

Power Consultant has education in human factors for engineering for well-known university such as Chalmers, to spread their knowledge. They do also have courses in international nuclear management for managers that will work in authorities in Finland, Russia and Sweden. There are also some courses in project management, working analysis, reactor and turbine education at Company D. (Power Consultant, 2010)

4.2.5 PROJECT MANAGEMENT

Power Consultant offers to lead multinational projects with their own staff and with other co-partners, engineers and specialist in different fields. They will also do smaller projects with just their own co-workers. The work procedures for project managers are to establish clear goals and the strategy on how to get there. The manager is also responsible for the time plan and which members that should be in the project team. (Power Consultant, 2010)

Today the project manager's main goal is to see that the project succeeds in time and reaches its goals, but also solving the problems that can occur during the way. There are not many projects that do not have any problems at all. The manager is commonly working towards many customers and organisations both in Sweden and other countries, therefore is communication skills fundamental to succeed. Project management is something that could be used in other fields than nuclear power, because the working procedures are similar regardless which industry it is. (Power Consultant, 2010)

Power Consultant has worked with project assignments when it comes to radioactivity pollutant at all the reactors at Company C and projects when it comes to updating the safety reports on Oskarshamn 2 and Oskarshamn 3. (Power Consultant, 2010)

5 INTERVIEWING THE COMPANY STAFF

There are two parts in this section, first the survey where the reader gets information on how it was executed and what the result was. The result was analysed to help out with the market analysis.

5.1 COMPANY SURVEY

Two different questions were stated at the beginning of this survey. The first one was how interested the staff members are of an expansion? This question was divided in to more questions so that it was not to straight forward. There was also a question to find out which persons that sees a future in the Power Consultant or for the company.

Research question number two was, in which way Power Consultant should expand. In other words should they keep their focus on the nuclear industry or try to expand in to other market segments. The question was also asked in sub-questions to not make it to straight ahead. Is there even an interested in the company to start working towards new industries?

There is a part of the survey where the employees had a chance to express themselves and give some more information about other businesses or companies. This part was as open-minded as possible to make it creative.

5.1.1 PREPARATION

The survey was carried out to all the employee's at the Gothenburg office and it was created with the guide in the method part, see Appendix A. Both open-end and closed-end questions were used to gain as much knowledge as possible. The complete survey can be found in Appendix B.

The survey was distributed to the e-mails of the employees, and they could fill it out online. Google documents were used to create it. Totally 14 people were asked answer to the questionnaire.

5.1.2 THE RESULTS FROM THE SURVEY

The total amount of people that answered to the survey was 9 employees approximately 65 percent, so it was hard to draw any complete conclusions. The following result was based on the people that answered. The first part was with the closed questions where it was possible to answer from one to five, the results could be found in Table 2. For the first question was a one not good and a five very good. When answering the questions about the size of the company, was a one too few and a five too many. The last question regarding the future was a one, working less than a year at the company and a five, working more than ten years at the company.

First part of the survey showed that there was a genuine interest for the company from the staff, an average of four was how well the people liked working at the company. The staff did also see a future in the company, which is a sign that they liked it. The result for the size of the company showed that there was an interest to expanding and especially at the Gothenburg office. The employees were behind the decision from the boarder of directors to expand the company.

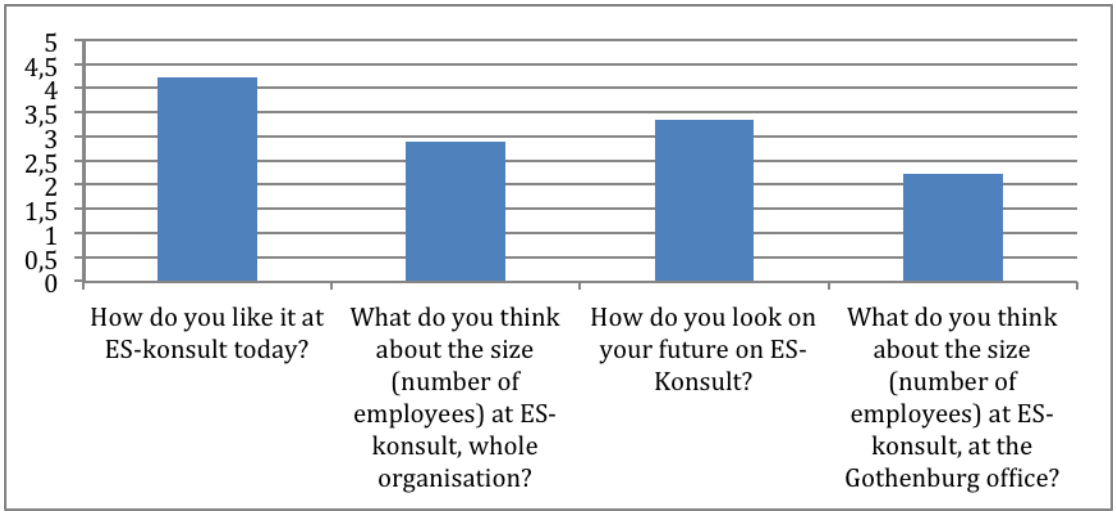


TABLE 2 THE ANSWERS FROM THE CLOSED-ENDED QUESTIONS

The results from ranking each business field from one to five, where one is the thing they would like to work most with and five the one that they would like to work least with, gave following ranking:

1. Safety analysis (2.4)
2. Project management (2.6)
3. Safety reports (2.8)
4. Human factors (3.1)
5. Education (3.4)

The result from ranking the services showed that there was a wide difference in what people thought was most important to work more with. For the market analysis it is therefore not any focus on an industry that could eliminate any service areas. One interesting thing that the survey showed was that there is a high interest for working with project management. Power Consultant does not today have this as a main service field, which might be something to investigate if it should be.

All the people that answered to the survey were positive to work to another industry than the nuclear power. Therefore will there not be a problem from the employees when it comes to changing market segments.

The result from the open-ended questions showed that almost everyone thought that the company should continue working in the energy industry, for example the oil market or wind power market. Other interesting thoughts that came out from the survey were process industries such as chemical, paper, medical and car industry.

5.2 Opinions from the CEO and board of directors

The purpose with the interview was to get more information about what the higher part of the organisation was expecting out of this master thesis. One board member and the CEO were interviewed at separate times. The interview was based on questions that were prepared before the meeting, with three different aspects, the market situation, the services portfolio and the future of the nuclear business. The interview formulary can be found in Appendix B.

Both parts were on the same page on where the expansion was going. The main focus is nuclear power and if there would be a change of this, it would be for the whole organisation and not only

the Gothenburg office. They thought that if Power Consultant should change market that should be an investment for a long time and not something that was just for the moment.

There is not today any specific stated fact that Power Consultant should not work towards specific industry because of any ethical values, such as the tobacco industry or industries which produces large amount of carbon dioxide.

The services that they would like to work more with and could fit other industries were human factors and risk analysis. Power Consultant has started a group that works with calculations for nuclear plants. This could in the future turn into a new service in the portfolio. Power Consultant has as a goal to just working with high quality assignments and not easier services such as drawing cables or working with construction.

The future for the nuclear power industry is something that both the boarder member and CEO looks positive on even though the accident in Japan. This accident has not been expressed that much in media as expected. The Harrisburg accident was not even close to the one in Japan, but still do people have more knowledge about that one.

6 DEVELOPING THE SERVICES PORTFOLIO

This chapter describes the development process of the service portfolio. First there was an analysis of the lifecycle of the product. This was followed by an investigation of the distribution of the resources at the company. Next a visualisation of the different lifecycle phases of the product and after that possible new services to the service portfolio. Finally a morphological matrix on how the services could be combined. At the end of the chapter the result of the service development presented.

6.1 ANALYZING THE NUCLEAR POWER PLANT AS A PRODUCT

There has been stated, that the customers would like to co-operate with companies that have resources to do more for them. (Hall, 2011) That was why it was important to investigate what types of services that could improve the competitiveness of Power Consultant. The plan with this was to improve Power Consultants core business. Hence there was not interesting to look at services that were not focusing on high quality.

The nuclear power market has similarities with the car industry where there is one company that sells the car and another who provide the maintenance work. When the nuclear power plant is in place there is a need for certain services. Figure 4 shows that the physical product is only a smaller part of the market and that is possible to add many more services to an existing product.

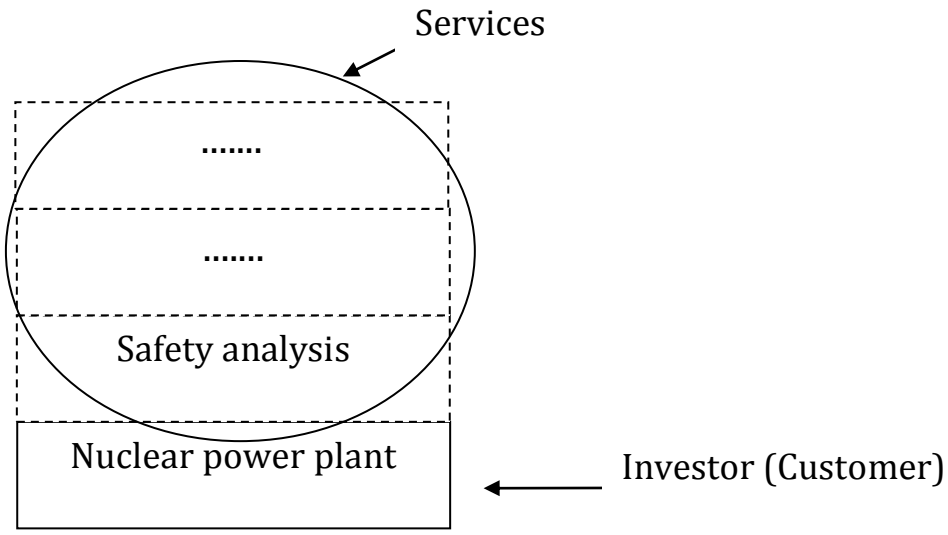


FIGURE 4 THE MAIN PRODUCT IS JUST A SMALL PART OF THE WHOLE MARKET (WISE & BAUMGARTNER, 1999)

Wise and Baumgartner are talking about the importance of following the customer downstream. What they mean with downstream is that there is much value during the entire life cycle of the product. By trying to carry out more activities, services, during the life cycle more value can be earned. It is a key thing to investigate, which states, the customer goes through during the lifecycle of the product. (Wise & Baumgartner, 1999)

What phases does the nuclear power plant go through? The lifetime of a power plant could be divided in to five phases, which is showed in Figure 5. Today is the product portfolio focusing on two areas, maintenance and upgrade, these states occurs longest in the lifecycle. Though, if the industry should live on, is there a need for new constructions and decommissioning assignments. By start to focus on the whole cycle of the power plant it will lead to more assignments in the future. Each phase is explained further down.

The new constructions phase contains the stage from where the idea of building a new plant until that the new power plant is in place. This phase is a long procedure and if a company can be a part of this there is promising for the company in the future because they have the knowledge about how the plant was created.

The next phase is when the power plant is up and running and the action that has to be done to keep the plant running in a safe manner. This is one of the phases that the plant is longest in and where a lot of the actions have to be done.

To get more energy out of the plants and make them even better during time is the upgrading phase. This could be done anytime during the maintenance phase. New technology has to be implied to get the most out of the plant and make it effective.

The decommissioning phase is when the decision from closing down the nuclear power plant until the day the surroundings are restored. This could take a long time, one example is the plant in Sweden, Barsebäck that has been closed down for many years but still not all of the parts demolished.

The nuclear waste phase contains every part from the power plant and has to been taken care of. This runs from the day that the plant start producing energy, until every single part is removed and the environment is restored to its starting phase. Thus there is not only the fuel that has to been taken care of, all the parts that has been in contact with radiation has to be stored in some safe way. The amount of time and how the parts, waste, should be stored depends on how radioactive it is.

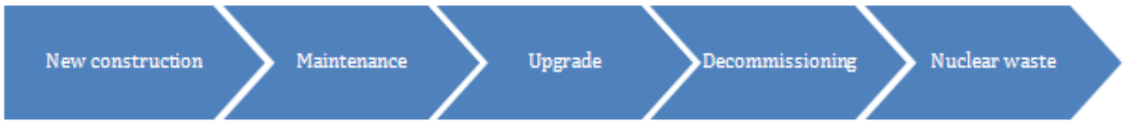


FIGURE 5 LIFETIME OF A NUCLEAR POWER PLANT

It is vital that the service solves the problem for the customer and that the money spent for the service gives a high value. Value could be quality, flexibility or solving something that the customer could not have done himself.

6.2 Analyzing the distribution of resources at Power Consultant

During a section at the company each person got the opportunity to describe what they were doing today and which phase that was in the nuclear lifecycle. The distribution of the recourses was displayed in a matrix, Table 3. This matrix will show where people are poisoned today and what types of assignments they are doing at the moment. The matrix is divided into all the current services fields and the lifecycle from the nuclear power plant. This was done to get more knowledge about the situation and what type of fields that should be attempted more to cover the whole lifecycle. The matrix is based on the employees from the Gothenburg office and not the whole organisation.

	New building	Maintenance	Upgrade	Decommissioning	Nuclear waste
Safety reports	0	6	9	0	0
Safety analysis	0	3	4	0	0

Human factors	0	1	2	0	0
Project management	0	1	3	0	0
Education	1	1	1	0	0

TABLE 3 THE CURRENT SITUATION AT POWER CONSULTANT

The matrix shows that not any existing resources are working towards decommissioning or nuclear waste and few are working with education in each field. The wish would be to have resources working towards more than just one specific field and by doing so create more assignments. The matrix below, Table 4, shows which field that is most important to improve. To create assignments for every field may not be possible but the aim is to get a better balance to the unequal situation that there is today. The red colour in the matrix symbolise where Power Consultant should put more focus, the yellow where the situation is stable and the green symbolise where the status for the assignments are satisfying.

	New building	**Maintenance**	**Upgrade**	**Decommissioning**	**Nuclear waste**
Safety reports	0	6	9	0	0
Safety analysis	0	3	4	0	0
Human factors	0	1	2	0	0
Project management	0	1	3	0	0
Education	1	1	1	0	0

TABLE 4 THE PREFERED DISTRIBUTION OF THE ASSIGNMENTS

The next section will give descriptions on how Power Consultant could work to come up with assignments for the red fields.

6.2.1 IDEAS ON HOW MORE ASSIGNMENTS COULD BE CREATED

This section is divided in to all the services fields that Power Consultant is working with. The recommendations are mainly for the red fields in the matrix, but some other thoughts could be discussed too.

6.2.1.1 SAFETY REPORTS

Assignments concerning safety reports and new buildings could be to co-operate with companies that are in the building construction business but does not contain the knowledge about how to write safety reports. There could also be by working with companies that are developing new parts for the power plant.

The same type of companies that are a part of the building of the companies could be used as a partner when it comes to the decommissioning phase. Something else could be companies that are specialist in tearing down buildings. There is also a need to transport the parts from the plant to a location and a logistical partner could be valuable.

The waste from the nuclear power plant needs to be transported by boat, train or truck. To find companies that work with transportations of dangerous cargo but do not have the knowledge

about how to write safety reports could be one way. There is also necessary to have a safety report for the waste when it is in its storage position.

6.2.1.2 SAFETY ANALYSIS

There are similar thoughts about safety analysis, construction and demolition companies could be interested in the services that Power Consultant offers. Cooperation with these types of companies could benefits Power Consultant in matters of getting assignments in the rest of the world. The possibilities of working in other countries could be read more about in Chapter 8.

The most of the assignments for the safety analysis will be in the new building phase where the customer has a high need for these types of services.

6.2.1.3 HUMAN FACTORS

The role of human factors is something that has to be implemented at the beginning of the process to be able to affect the outcome of the plant. This is not always considered and something that companies tries to do at the end of the process when it could be to late. So pushing harder on the companies that are thing about building a nuclear power plant could be a good idea. The human factors are central in control room development to be able to create a functional working environment.

To work with companies that are building new plants or developing new control rooms, creates more assignment s. The upgrading phases could be human factors inspirited. There are not that many human factor services that regard the nuclear waste.

6.2.1.4 PROJECT MANAGEMENT

The project management is a service that could easily be a part of each stage of the lifecycle. It is though important to be a part of a project that has to do with the new building and the decommissioning, this to gain knowledge about these states Power Consultant does not have project management as core business so this is not something that they need to start working with. Project management in each stage is something that will come natural when other services are connected to it.

6.2.1.5 EDUCATION

To be able to have education in each state there is a need to get more staff active in each field. The teaching will be better executed if Power Consultant gets more knowledge about each specific field.

To co-operate and teach companies that are already working in each field is a good idea. Hence, this could be education for Power Consultant. There are construction companies that do not have the knowledge about the nuclear safety and could therefore use Power Consultant when doing their assignments in a nuclear power plant.

Power Consultant does already today have the knowledge about how to teach and therefore should the focus be on getting more knowledge about each states.

6.3 VISUALIZATION OF THE DIFFERENT PHASES WITH FIGURES

Today Power Consultant has a way of describing their services in a good way with figures, see Figure 6. Here follows a description of each icon from left to right. The first is safety analysis with three exclamation marks to show how important this is. The next figure is human factors and by turning the exclamation mark upside down the icon becomes three persons or humans. The next is safety reports and it has a symbol that reminds about a list. The one after that is education where an exclamation mark has been placed in the middle symbolizing a person to shows how

important the teacher is. The last one is project management and the icon visualizes different processes that go on at the same time, similar to a Gant schedule. What Power Consultant does not have is a way of describing the different lifecycle phases with their graphic profile. It is easier for the customer to understand the services with these types of icons and therefore should it be some for the different life phases as well.

FIGURE 6 THE DIFFERENT WAYS THE SERVICES ARE DESCRIBED BY FIGURES

To create symbol for each life state Power Consultants logo the exclamation mark has been used. The sketches are rough symbols on how the presentation of the life phases could be done. The first is the new building of a nuclear power plant, the symbol shows a hammer, symbolising the construction of a plant. The stage is more the just physical construction work, but at the end of this stage is this the important thing.

FIGURE 7 THE CONSTRUCTION ICON

The next one is two cog wheels that are working together to keep the nuclear power plant up and running, which symbolises the maintenance part.

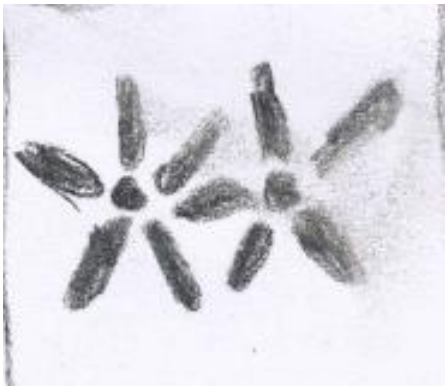


FIGURE 8 TWO COGWHEELS SYMBOLISING THE MAINTAINACE PHASE

Figure 9 shows two exclamation marks, first a smaller one and then a bigger one next to it. This should symbolise that the plant goes through a change and comes out from it as a better plant, an upgrade.

FIGURE 9 THE UPGRADE SYMBOL

The decommissioning phase is symbolised by an exclamation mark that falls down and that will be the destruction of the plant.

FIGURE 10 THE DECOMISSIONING FIGURE

For the last phase which is nuclear waste, four signs are safely enclose the exclamation mark, which in this case symbolise the waste that has to be stored in a safe way to not hurt the environment.

FIGURE 11 THE SYMBOL SHOWING THE SAFETY OF NUCLEAR WASTE

6.4 POSSIBLE EXTENTS OF THE SERVICE PORTFOLIO

Existing customers were investigated to find out what types of services they would be interested in. Competitors were also investigated to find out what types of services they were offering today. The information on the potential services was gathered from the homepages and annual reports from the companies. This section will only touch upon the topic and show where there are possible options to fit Power Consultant. To assure that the service should be adapted into the services portfolio an analysis on the market is needed to establish what types of threats and possible openings there is.

6.4.1 FE-ANALYSIS

This type of analysis is used in product development phases and on existing products. It is possible to calculate material stresses in a computer model with this type of analysis. The calculations can be evaluated and changes could be done to the part if necessary. There are two types of FE-analysis that is used in the industry, 2-D modelling and 3-D modelling. It is possible to calculate more things than just stresses, for example how vibrations will impact the part or an instant shock. How fatigue will affect the material through different cyclic loads and how cracks will develop in the material. Another thing is how heat transfer through the part, this could be for conductive materials and for thermal fluid dynamics. (Widas, 1997)

This type of analysis could be used to investigate how a nuclear power plant would be affected of an instant shock, for example an earthquake or how the fluid moves in different pipes. This could also be used for other industries where pipes are present.

6.4.2 RISK MANAGEMENT

Risk management is a conception that involves many different methods. The basic thought with risk management is that everything should be solved risk free and with a high satisfaction. The methods could be used in any type of market. Concepts that are well known in the risk management are for example, hazard and operability study (HAZOP), process hazard analysis (PHA) and failure modes and effects analysis (FMEA).

6.4.3 TECHNICAL CALCULATIONS

Calculations could be done without 2D and 3D models by just using programs for example Matlab. It is harder to get good results for more advance components and systems with these types of calculations. The calculations could be done for mechanical system, aerodynamics, sound and vibration etcetera.

6.4.4 DECOMMISSIONING SERVICES

A nuclear power plant has a certain lifetime and after that, is there a need do deal with the existing components. It is sometimes expressed as decommissioned and dismantling services (D&D). How to store and take care of nuclear parts are depending on where in the process the part has been.

The amount of competitors that were targeting this certain field was low and Power Consultant could gain market shares by focusing on this field.

6.5 HOW TO COMBINE THE SERVICES

The combination that Power Consultants can create with their services should lead to that the customers feel satisfied with the service they are paying for. By combining them in different ways and sell the services as a package solution this can be made possible. It can be a good idea to start out with a basic solution and after that sell other services as extra services e.g. education. This

will give the education service a higher value when considered as extra services and not something ordinary.

The complexity of setting up perfect combination of services is hard without any contact with the customer and therefore should the customer be a part when creating the final solution. Table 5 shows the different combinations that can be created out of Power Consultants service portfolio. Other services from the research period are present as well. The first step in the matrix is the product, which is either the nuclear power plant or a component.

To create sub-functions to the total solution is tougher when it comes to services than dealing with physical products. A way of doing this was by dividing them in to different groups regarding the features of the services. This type of arrangement can make it easier for the customer to understand in which fields he could choose from. The structure will also make it simpler to see how the services could be combined to improve the complete solution. It is possible to make more segments out of the cells, for example are there three different sub-functions of human factors.

	Different sub-solutions			
Functions	Sub-solution 1	Sub-solution 2	Sub-solution 3	
Involved product	Nuclear power plant	Component		
Safety service	No safety service	Safety analysis	Safety reports	
	No safety service	Safety analysis	Safety reports	
Calculation services	No calculations	Technical calculations	2D-models	3D-models
Human factors	No human factors	Human factors		
Education services	No education	Education		
Management	No management	Management	Risk management	

TABLE 5 MORPHOLOGICAL MATRIX ON HOW DIFFERENT SERVICES CAN BE COMBINED

To come up with different stages of each features is something that is commonly seen when working with products. Where the product starts out with a basic solution for the customer and then the features get more advanced. It is though important to remember that the services should add more value to the customer.

6.6 THE RESULTS OF SERVICE PORTFOLIO DEVELOPMENT

The first thing to remember is that the product is just a small part of the market. The services that could be added to the product are more important which is described by Wise & Baumgartner as following the product downstream.

It was clear after the analysis of the resources that the distribution of the employees was uneven regarding the different phases of the lifecycle. Power Consultants current services can fit in other stages of the lifecycle than they are in today. Adapting the services and trying to take assignments in other phases is a way of strengthening the market position. To make this a part of the company's marketing plan would be the first step. An action like this will make the whole company a part of the lifecycle phase mentality. It is also important to state to the employees what each state of the lifecycle contains.

The basic idea is that Power Consultant should try to create more assignments in more life stages. Different ideas on how this could be done have been suggested and many of them are with a help from another company, where Power Consultant could use their special knowledge and help the company to be able to complete a certain assignment.

Power Consultant got a great way to describing their services portfolio but not the different phases of the lifecycle. To come up with a way to visualize the different stages for the customer is important. By doing so the customer could easily see where in the life cycle they need help and what kinds of services that Power Consultant could do for them. The final symbols for each state can be found in Figure 12 and Figure 13. The symbols could also be colored in other ways to make the stage clearer.

To evolve the staff in this process is important to assure that everybody knows what each symbol means. The symbols are not only a way to make it easier for the customers but also the employees. By having figures or some other visualization tools to describe certain actions, makes things less transcendental.

FIGURE 12 THE FINAL CONSTRUCTION ICON, THE MAINTAINACE ICON AND THE UPGRADE ICON

FIGURE 13 THE FINAL DECOMMISSINING ICON AND NUCLEAR WASTE ICON

The results from the market analysis showed that there are new services that can fit well in with the service portfolio. To continue working with the already started up calculation group could be a first step to create a new service. Technical calculations can be used for the whole lifecycle of the product and could therefore improve Power Consultants market position.

To be sure that a certain service is a positive thing to start working with, there is a need to do more researches. A SWOT analysis or something similar could tell if the service is worth continuing working with. There are many companies at market that are trying to specialize themselves in a certain field. Hence, this is why it is a need to be investigated it more.

Management was something that the employees found interesting to work with. Developing this track can be something Power Consultant should consider and risk management is something that suits them, since they can put their experience to good use.

The advantages on covering more activities in the products lifecycle is considered as important and this theory should be in mind when choosing new services. Choosing services that are not directly connected to the nuclear power industry could be valuable if there would be a change of market.

To combine the services without the customer is not a great idea but trying to divide them in to different sub-groups depending on the features is good. The sub-functions could have been divided in the different stages of the nuclear power plant, but this was not done because it would limit the structure to the nuclear power industry. And the portfolio should still be opened for other markets at this stage.

The most important thing from this chapter, for the company, is to start working with the lifecycle of the product. To implement it as soon as possible in their way of looking upon the nuclear power industry will make a huge difference.

7 THE MARKET ANALYSIS

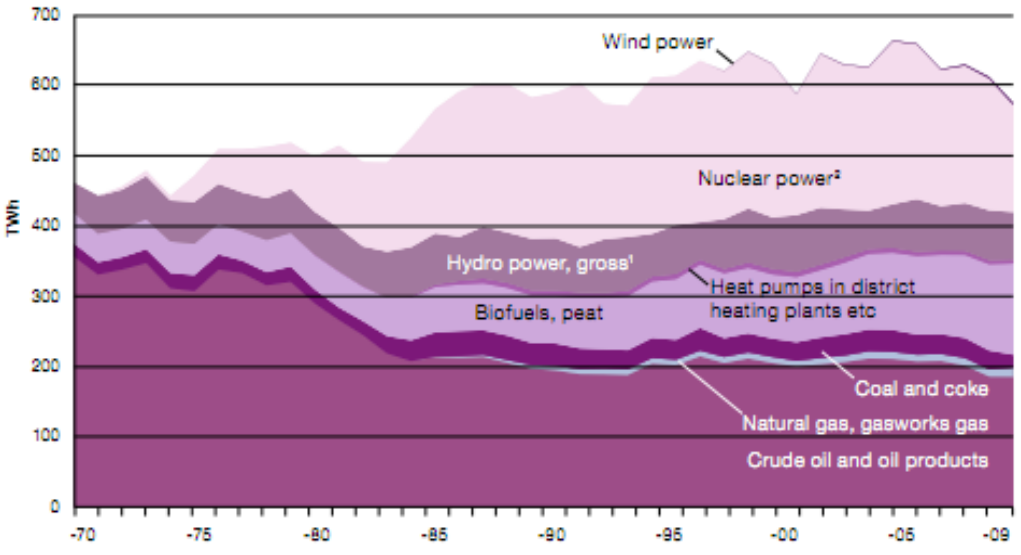
This chapter will explain the working procedure for the market analysis. It is first an investigation on which types of industries that can fit the service portfolio. After this, specific industries and market segments were investigated to find out how much potential they had and if it was an idea to start working towards them. The nuclear power industry was investigated to see if there are any potential customers or threats that Power Consultant did not know about. The market analysis did also dig deeper in to who the potential customers are and which competitors that have targeted the market segments. This section will answer to KQ1 and KQ2.

7.1 ANALYSIS OF POTENTIAL INDUSTRIES

The definition of an industry is a group of different organisations that are producing the same type of products or services. When doing a market analysis, it is important to get a grip of the whole industry before start looking on a specific market segment. Question likes, is it a large or small industry or does the industry have a dominating firm? These types of question will give a better understanding if the market is worthy approaching. (Barringer, 2009)

Svensk näringsgrensindelning (SNI) is how companies in Sweden are registered today. The system describes which type of industry that they are in and what is done in that industry. Every company has to be registered in this system and it is based on NACE an EU:s standard. A company could be registered to more than just one SNI number. (StatisktiskaCentralbyrån) This certain system was used when specifying the industries.

Power Consultant are today focusing on companies that are in or working towards customers in the creating electricity industry (SNI D 35110) and the nuclear power segment. For other segments that are in the same industry see Figure 14. To start looking at different segments in the industry that Power Consultant are targeting today was the first step.



Source: Statistics Sweden and the Swedish Energy Agency.
Note: 1. Includes wind power until and including 1996. 2. Nuclear power is shown as gross power, i.e. as the nuclear fuel energy input, in accordance with the UN/ECE guidelines.

FIGURE 14 A PLOT OF THE TOTALENERERGY SUPPLY IN SWEDEN BETWEEN 1970-2009, EXCLUDING NET ELECTRICY EXPORTS (ENERGIMYNDIGHETEN, 2010)

It is important to mention that the project management and education services are suitable for more or less every industry. For that reason, the focus was on Power Consultants core business

safety reports and safety analysis. The human factor service was also included because it was suitable for new potential industries for Power Consultant.

Manufacturing industries and other process industries were suitable for Power Consultants service portfolio. There was important to aim at industries that were in the higher quality spectra because that is where Power Consultant has its competence. It means that process industries such as paper production were not interesting to investigate further. These are the industries that came out as most promising after the research period:

- Services for extractions of minerals (SNI B09)
- Refined petroleum and coal products (SNI C19)
- Creating chemicals and chemical products (SNI C20)
- Manufacturing of pharmaceutical products and medication (SNI C21)
- Manufacturing of other transportation vehicles (trams, airplanes, train) (SNI C30)
- Distribution of electricity, gas, heat and water (SNI D35)

It was not possible to investigate all these industries due to time of the project. Therefore, the ones with the highest potential were chosen from the list above. The western part of Sweden has a broad and large industry when it comes to refined petroleum so that was one of the industries. Services for extractions of mineral have a broader market in the Norwegian parts where there are many offshore activities.

The research showed that when it comes to safety analysis was nuclear power one of the largest attractive markets. There are other industries where safety analysis was present, such as the pharmaceutical and chemical industry. These two industries are similar, but there is more involvement of human factors in the pharmaceutical industry. Hence, there are a lot different types of mechanical devices, which have to interoperate with the human. Therefore the pharmaceutical industry was considered more interesting.

Safety analysis exists in some cases in the tobacco industry and the transportation with airplanes, boats and trains. This does also mean for the Gothenburg area, that there is an opportunity to work with tram transportation. These industries did not seem to cover the other services fields that well and therefore not chosen.

The distribution of electricity could be an interesting field for Power Consultant. There were many related services to the nuclear power market. Though, a big part of the work assignments had to do with different type of calculations and electrical measurements. These are services that Power Consultant is not providing today. This industry was therefore left out from market analysis.

The segmentation was on the electricity industry, the refined petroleum and coal products industry and finally pharmaceutical industry. The procedure is described in the next section.

7.2 SEGMENTATION OF CHOSEN INDUSTRIES

There was a need to segment the different industries in to distinct segments to be able to create a market analysis. Different approach is needed to different segments of the markets and there are bigger opportunities in some segments than others. (A.Aaker & McLoughlin, 2007)

Segmentation could be done in many different ways the most commonly is that customers are divided in type of organization, geographic location or occupation. The word segment means in the field of business customers that have the same needs. (A.Aaker & McLoughlin, 2007)

For this master thesis the segmentation was primarily done to make it easier to find out, which type of segments were Power Consultants services most suitable for. It is possible to make these segments even smaller but at this early stage that was not necessary.

7.2.1 ENERGY INDUSTRY SEGMENTATION

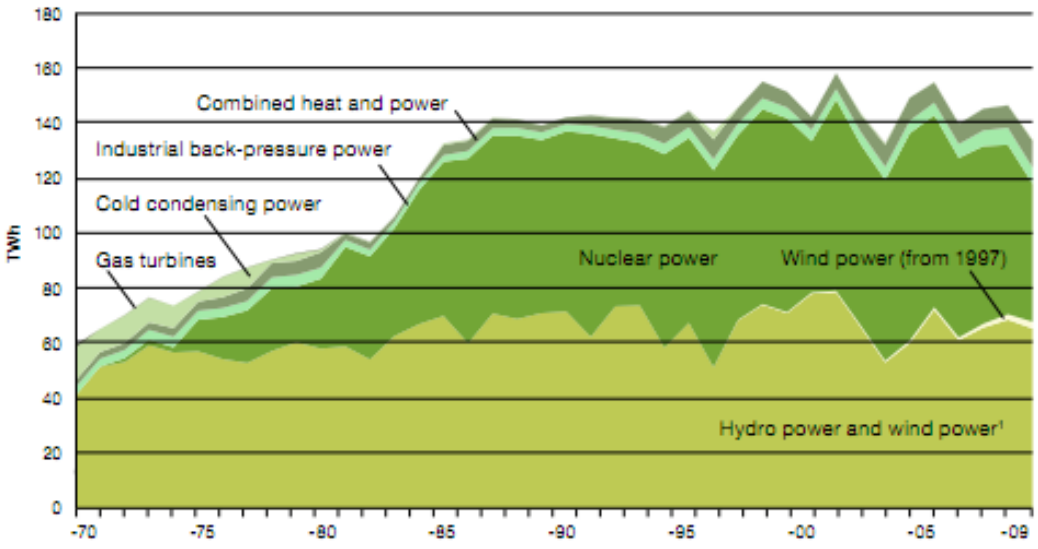
Wind power is an energy source that has advanced during the last 10-15 years, which can be seen in Figure 15. The energy type is from the beginning counted with hydropower as a renewable source, but from 1997 the wind power has been set as an own energy group. Hydropower is next to nuclear power Sweden's largest energy income source.

Hydropower had possible assignments that corresponded to Power Consultant service portfolio and this was principally risk analysis. However the hydropower assignments were of geotechnical, electrical and mechanical engineering character. This was not something that corresponded well with Power Consultants service portfolio. There is approximately 1800 hydro power plants in Sweden and out of those are 200 over 10 MV. (Svenskenergi, 2011) The plants are located in the northern parts of Sweden, which did not suit the geographical position of Power Consultant either.

Even though wind power is an upcoming market the work orders was similar to hydropower hence services such as contacting land holders, building permission, geotechnical aspects etcetera. Risk analysis could be a service that is needed before the wind power station is in place.

There are other renewable energy groups as well e.g. solar cells and wave power. Wave power has first and foremost been tested in experimental purposes, but there are some wave power parks in Norway. Solar cells have been around longer but they are though still expensive, not that effective in some countries and the materials that they are created out of are rare metals. Germany is one of the largest users of solar cells in the world today.

There was not another market segment in the energy industry that was that suitable for Power Consultant service portfolio. There were some corresponding services but other industries looked more promising.



Source: Statistics Sweden and the Swedish Energy Agency.
Note: 1. Windpower is included in the series up and until year 1996.

FIGURE 15 ENERGY THAT IS CREATED IN SWEDEN TODAY (ENERGIMYNDIGHETEN, 2010)

7.2.2 REFINED PETROLEUM AND COAL INDUSTRY

The petroleum industry has strong demands when it comes to environmental and safety questions. The reason for this is that the products are classified to be inflammable and harmful for the environment. Companies that are involved with the industry have to follow laws, ordinances and regulations.

Refining petroleum is done to separate crude oil in to other petroleum products. These types of products could be anything from asphalt, diesel oil, or gas, According to Swedish Petroleum Institute, there are in Sweden today five different refineries that produce different petroleum products. (SPI, 2011)

The segmentation for this chapter will only be to the geographical position. In other words only the refineries that are in the west part of Sweden were interesting, but not a specific type of refinery.

7.2.3 PHARMACEUTICAL INDUSTRY

The development process of making new pharmaceutical medication is an advance and expensive industry, which has high demands on resources, safety, infrastructure and documentation. It could take about 12-15 years to develop a new medication and could cost approximately 1-10 million Swedish crowns. (Unionen, 2008) This information indicates that the industry has many assignments that fits Power Consultant service portfolio.

Figure 16 shows the amount of employed people in the pharmaceutical industry in each segment. Pharmaceutical development (48%) and medical technique (28%) stands for a huge part of the total industry. (Unionen, 2008) Medical technique is how man and machine works together which match the human factor service. Safety analyses are used for both different medications and for fabrics and hospitals. Therefore, was the pharmaceutical development and pharmaceutical production a part of the market analysis. Designing validations for government requirements could be another task for these segments. Other segments were not that interesting because of the quality aspects.

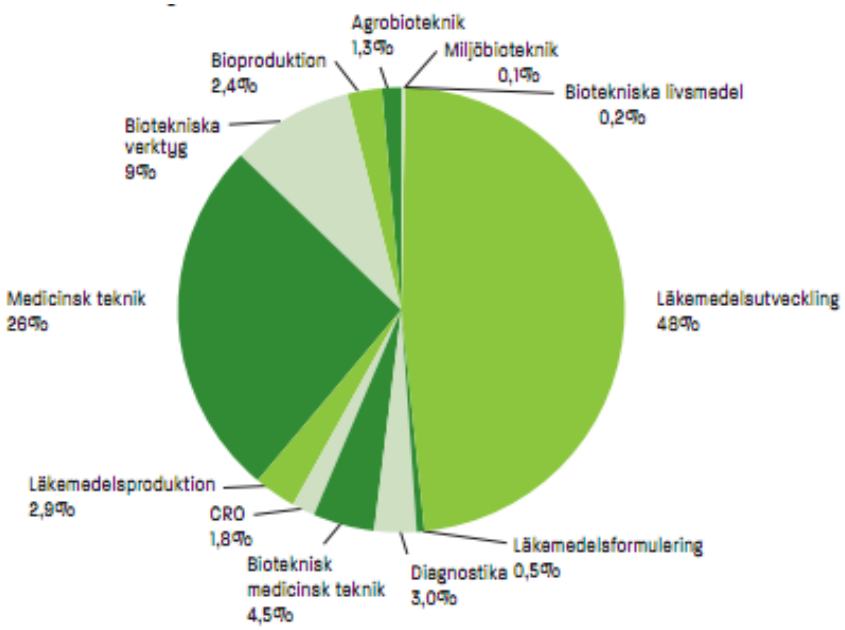


FIGURE 16 THIS IS HOW UNIONEN DIVIDES THE DIFFERENT SEGMENTS IN THE MEDICAL INDUSTRY (UNIONEN, 2008)

7.3 PORTER'S FIVE FORCES OF THE NUCLEAR MARKET

All Porters five forces were discussed for the nuclear market. There is a list at the end of the chapter buyers, with possible customers (Table 6) and the same thing for competitors (Table 7). The lists also provides information about possible assignments and what type of services the competitors are providing. The information is based on the research period.

7.3.1 BUYERS

There are some larger prime customers on the nuclear market and those are the owners of the nuclear power plants in Sweden. Today there is three active nuclear power plants Company A and Company B own Company C, which has four reactors. They do also own Company D together with Company E and that power plant has three reactors. (Company A, 2011) Company B owns the last power plant together with Company F and that is Company G with three reactors. (COMPANY E, 2010)

To be involved with these companies it is essential to be able to take market shares. There is stated in media newly that Company A has interest to start building a new nuclear power plant in Sweden. A project like that would lead to many new assignments for the companies involved. (Energinyheter, 2011)

There are many organisations that are involved with these power plants that could be seen as customers too, Company H is a company that stores used radioactive waste. Company I is an organisation that is involved when it comes to safety reports; declaring to the public that everything is done properly.

In Norway the nuclear production is just for experimental usage. The organisation that owns the reactors today is called Company J and their goal is to become the leading institute of energy in the world. (COMPANY J)

The secondary type of customers would be companies that deliver different types of components to the nuclear power plant. The role for Power Consultant could then be for example to develop new control rooms or work with safety analysis on new components. There is one company in Borås called Company K that are working with control room development. This does not only apply to the nuclear power industry i.e. other industries with control rooms could be potential customers.

Company L delivers components to nuclear power plants, but they have customers in other industries too. If Power Consultant works towards secondary customers they can find other market openings.

The amounts of primary customers on the market are not that many this means that the buyers have much power over the sellers. There is though a high investment cost for the buyers to have these power plants running so the risk for a change of markets would only be if there were any political changes.

The customers are working with projects to contain and improve the efficiency of the power plants. The assignments are mostly in project forms and over a long time so there is a large investment for the customers.

7.3.1.1 POTENTIAL CUSTOMERS

Companies	Employees	Services Field
Company C	1524	All fields
Company L	1470	Human factors, safety analysis

Company M	933	Safety analysis
Company E	859	All fields
Company J	550	Safety issues in nuclear power
Company H	377	Safety report, safety analysis
Company I	270	Safety reports, safety analysis
Company N	170	Safety analysis, human factors
Company O	50	Safety analysis
Company K	12	Human factors (control room development)

TABLE 6 POSSIBLE CUSTOMERS IN THE NUCLEAR MARKET

7.3.2 COMPETITIVE RIVALRY

There are some huge competing consult companies on the market and they are investing money in their companies trying to expand. Company P stated in an article (Hall, 2011) that the customers on the market today are looking for a company that could deliver more services. The same type of trend has been seen in the car industry where the subcontractors have decreased during time. Car companies have start working with customers that could deliver whole assembles to them not single components. This has been done to cut costs because the product has reached a higher state in its lifecycle.

Many of the bigger competitors today are focusing on more than just the nuclear power, which could give them an opportunity to exit the market if there would be a decommissioning decision. They do though have a wider portfolio with services such as construction, which makes this possible. These types of services are not that depending on the industry.

Small competitors are trying to grow as well e.g. Company Q a company similar to Power Consultant are opening an office in Gothenburg in 2011. The office has as a goal to start working towards Company C.

All sizes of competitors are advertising to find new engineers in the nuclear power field. This is an indicator that the market still grows and that there is possible to find more assignments.

There is a high diversity of the companies on the market, from larger consult companies that are involved in many stages of the power plant, but also smaller companies that are, just as Power Consultant, focusing on a specific field.

7.3.2.1 EXISTING COMPETITORS

Companies	Employees	Service Field
Company R	4182	Risk analysis, investigations, higher efficiency, modernization, safety analysis, PSA-documentation
Company P	939	All service fields
Company M	933	Safety analysis, education, project management
Company S	767	Safety analysis, fire and risk analysis, project management, , control and analysis
Company T	736	All service fields
Company U	499	Safety analysis, project management
Company V	400	Maintenance, decommission, project management
Company W	156	Investigation, requirement specification, project management, control and investigation of systems
Company X	137	Risk and safety analysis, fire safety, project management
Company Y	72	Project management, nuclear waste
Company Z	66	Risk analysis, project management, human factors

Company AA	37	Safety analysis, safety reports, project management
Company Q	13	PSA analysis, human factors
Company AB	x	All fields

TABLE 7 EXISTING COMPETITIORS IN THE NUCLEAR MARKET

7.3.3 BARRIERS TO ENTRY

To be able to work towards nuclear power plants today there is a need to be well known by the owners of the plants. Company A has started ranking their suppliers in different categories A, B and C, where A is the one that they are trying to work most with and C least with.

The risks that other competitors will enter the market are possible but it is hard to believe that they could compete in the same business field as Power Consultant. Knowledge is important when it comes to safety analysis and safety reports. It is probably project management services that other companies can do more efficient.

The field that Power Consultant is targeting is services, which is something that is hard to put a price on. Costs that could occur for other companies trying to enter the market could be education cost to be certain about the industry or cost for program license.

7.3.4 SUPPLIERS

Today there would not be any specific supplier for Power Consultant because they are providing only services. The customer is the one that is in the middle of the network and are responsible for the connection with the suppliers.

Questions like these could be interesting if Power Consultant started working with CAM or CAD programs and they would then need a supplier for these services. However, that is outside the market analysis at the moment.

7.3.5 SUBSTITUTES

A substitute for the customers would be if they changed over to another type of energy source. All of the primary customers are today working towards other energy markets as well. The reason for that they do not change over to another type is, that there is no other energy form that is more efficient than nuclear power in Sweden today.

The biggest threat today is a political decision on decommissioning. This is investigated more in Chapter 8, a decision like that would lead to a loss of Power Consultants biggest customers and a harsh situation for them.

Another issue could be if there would be a decision by Company C to start solving their assignments by themselves and trying to decrease the consulting assignments.

7.4 PORTER'S FIVE FORCES OF PETROLEUM INDUSTRY

All five forces are investigated to see how much potential there is in the petroleum industry. There are lists of customers (Table 8) and competitors (Table 9) in the same way as the last chapter.

7.4.1 BUYERS

Company AC is the potential biggest customer on the Swedish market and they stand for 80% of all the crude oil that is refined in Sweden. They have two different refineries in Sweden these are located in Gothenburg and Lysekil. (COMPANY AC, 2011) Company AD is the new owner of Company AE refinery in Gothenburg and they would be another important customer on the market.

Company AF has a refinery in Gothenburg but they have changed their approach from fuel and diesel oil to special oils after the big oil crises in the 1970s. They have besides the refinery in Gothenburg also one in Nynäshamn and one in Dundee. (Company AF, 2011)

The customers do not have that many options when it comes to switching markets. Company AF has done it, but the switch is not that big and they are still dependent on crude oil to be able to produces their product.

The customers' distribution is comparable to the nuclear power market. Where there is one customer that has a big part of the market shares. This meaning that the customer has much power over the seller and can therefore control the prices. If it is not possible to target one of these bigger customers there would be a need to come in contact with secondary customers.

Secondary customers that are working towards the petroleum market are for example COMPANY AG and Company AH. Company AH are only focusing on the petroleum market but COMPANY AG is involved in many other markets than this one.

7.4.1.1 Potential Customers

Companies	Employees	Service Field
Company AG Gothenburg	906	Safety analysis, safety reports
Company AG Lysekil	600	Safety analysis, safety reports, human factors, project management
Company AC	300	Safety analysis, safety reports, human factors, project management
Company AD	220	Safety analysis, safety reports, human factors, project management
Company AH	74	Safety analysis, safety reports, human factors
Company AF	40	Safety analysis, safety reports, human factors

TABLE 8 POTENTIAL CUSTOMERS IN THE PETROELUM MARKET

7.4.2 Competitive Rivalry

Company T is a company that has a large part of the market shares today. The consulting companies are known from the nuclear market. The focus that they got in this market is not mainly the safety aspects but the infrastructure and constructions. There are many assignments that have to do with fluids in pipes.

The competitors on the market are bigger companies, so there is not that much of diversity in that aspect. This would probably lead to a harsh business environment if a new company should try to take market shares.

It is already mentioned that the competitors in this market are targeting many other market segments. There is also clear that many other consulting firms from the nuclear market have left out this market segment.

7.4.2.1 Existing Competitors

Companies	Employees	Service Field
Company R	4182	Risk analysis, investigations, higher efficiency, modernization, safety analysis, technical calculation
Company S	767	Safety analysis, fire and risk analysis, project management, investigation, control and analysis, calculations,
Company T	736	All service fields
Company U	499	Safety analysis, project management

Company V	400	Product development, maintenance, decommission, project management
Company W	156	Investigation, requirement specification, project management, control and investigation of systems
Company Z	66	Risk analysis, project management, human factors
Company AI	18	Safety analysis, project management
Company AB	x	All fields

TABLE 9 EXISTING COMPETITORS IN THE PETROELUM MARKET

7.4.3 BARRIERS TO ENTRY

There is a need for knowledge about how to create safety analysis concerning fire aspects, risk evaluation and environmental questions to enter the market. The process is controlled in a similar way as the nuclear industry. Though there are many aspects on pipelines and how they are affected during the process.

Company AC would be an important company to get in contact with to attempt the market, because of their market shares. This could be a hard task to complete because over the power they have of the market.

The customer contact would be the hardest barrier to pass for this market. The customers control the market and their influence is what the sellers have to adapt to.

7.4.4 SUPPLIERS

The supplier situation would be the same for the petroleum industry as for the nuclear power plant. Boats will ship the crude oil or pipelines where the petroleum plants are responsible for the connections and the spare parts for the plants are brought from the sub industry.

7.4.5 SUBSTITUTES

There is a growing interested for more environmental friendly solutions. These are not as efficient as petroleum but it could be something that in the future could put the customers in petroleum market out of business. The customers are still making a good profit of the market and they have not been spending that much money on other types of engine fuels

This market does not have the same issue with laws or political decisions on decommissioning. Oil is an ending source and the fact that people have start talking about peak oil is a sign that it will not last forever.

7.5 PORTER'S FIVE FORCES ON THE PHARMACEUTICAL MARKET

The analysis with Porters five forces investigated three different segments these are pharmaceutical development, pharmaceutical production and medical techniques. These segments are considered as the pharmaceutical market in this analysis. The analysis was done in the same way as previous chapters and customers (Table 10) and competitors (Table 11) could be found at the end of each chapter.

7.5.1 BUYERS

In Sweden today about 800 different pharmaceutical companies exists and there is about 50 000 employees. The industry does approximately have a turnover of 24.6 billion Swedish crowns a year and of this does Company AJ stand for 12% and Company AK 11%. About 20% of the companies are in the Gothenburg area and 60% are located in Stockholm, the reason for this is that the companies have strong connection to the hospitals and the universities. The industry stood for six percent of the total of Sweden's export 2006. (Unionen, 2008)

Company AJ and Company AK are two actors that almost stand for a quarter of the pharmaceutical industry. For Gothenburg is Company AJ a possible customer and for Stockholm is Company AK a possible customer. The Company AJ facility in Gothenburg is working with medical development. They have their production plant in Södertälje, one of the largest fabrics that they got in the world. (Company AJ)

The research gave that the largest companies in the medical techniques are these, Company L, Company AL, Company AM, Company AN, Company AO and Company AP. Many of these firms are also co-operating with either or both Company AJ and Company AK. Company L got their facilities in Gothenburg close to the Company AJ offices. Company AQ does only have a visitors address in this region and their offices in Solna. Company AM does only have an office in Gothenburg so no work opportunities. Company AN has their head office in Halmstad and has expanded a lot during the last ten years. Company AO has their research and production in Lund. Finally does Company AP have production in Uppsala and facilities in Solna.

Companies regarding medical production in the west parts of Sweden are not that many. There are some companies that create the boxes and description for the medication but not the pharmaceutical product itself. This segment would be a much more interesting one for the employees in Stockholm. That segment is therefore no longer relevant in the market analysis.

Prices have been pressed lately from the American market and from the price control system in Europe. There has also been a demand of larger shipments of medication. This has lead to that many customers have had to fire employees. The analyst's blames this on those companies who have not been well prepared for the end of their patents. (Dey, 2010) This type of information implies that the market could have low price elasticity, because the customers have to lower their prices.

There are many companies that are doing an attempted at this market and there has been an explosion of smaller companies in this field. A reason this could be the downsizing from the larger companies.

7.5.1.1 POTENTIAL CUSTOMERS

Companies	Employees	Service Field
Company AJ	2027	Safety reports, safety analysis
Company L	1470	Human factors, safety analysis
Company AR	865	Safety analysis, human factors
Company AN	545	Safety analysis, safety reports, human factors
Company AS	323	Safety analysis
Company AT	119	Safety analysis, human factors
Company AU	116	Human factors
Company AV	100	Safety analysis
Company AX	96	Safety reports, safety analysis
Company AY	63	Human factors

TABLE 10 POTENTIAL CUSTOMERS THE PHARMCEUTICAL MARKET

7.5.2 COMPETITIVE RIVALRY

There is a different range of competitors in the medical market. Some of the same consulting firms that are targeting the petroleum and nuclear power are working towards this field as well. COMPANY R the company that Power Consultant has an arrangement with is working in this field to, one way could be too co-operated with them in this field to start gaining knowledge about the market.

Company AZ has a similar service portfolio as Power Consultant. This is a good indication that these services are something that is needed on the market. The company is smaller than Power Consultant and they have not targeted the human factors in any way.

The size on the competitors targeting the market has a high diversity so not one competitor has a huge part of the market. The types of assignments for the market are spread so many competitors can function in the market.

7.5.2.1 COMPETITORS ANALYSIS

Companies	Employees	Service Field
Company R	4182	Risk analysis, investigations, higher efficiency, modernization, safety analysis, PSA-documentation, technical calculation
Company P	939	All service fields
Company T	736	All service fields
Company U	499	Safety analysis, project management
Company BA	473	Safety reports, safety analysis
Company W	156	Investigation, requirement specification, project management, control and investigation of systems
Company BB	42	Management, safety analysis
Company AI	18	Safety analysis, project management
Company AZ	5	Safety reports, safety analysis

TABLE 11 EXISTING COMPETITORS IN THE PHARMCEUTICAL MARKET

7.5.3 BARRIERS TO ENTRY

To enter this market there is a need of knowledge about the pharmaceutical rules and this could be the hardest field to attempt. To get a pharmaceutical accepted on the market Medical Products Agency (Läkemedelsverket) has to approve it. The documentation for an approval of a medication could easily fill up a midsize-truck.

Medical techniques where human factors are the most suitable service might be the easiest way into the market. Developing equipments is also a field with high knowledge but this is something that Power Consultant has in its portfolio. There are also many companies that are working with medical techniques in Gothenburg.

7.5.4 SUPPLIERS

The same thing for this market as for the other earlier markets, Power Consultant will be working with services that are not depending on any specific supplier.

7.5.5 SUBSTITUTES

A substitute to these segments would be if the customers would change to more biomedical products. This is growing segment but there is not a segment that would be interesting for Power Consultant because of the quality level.

A substitute would be if companies would start working more with in-house services and the need for consultant services would not be needed.

7.6 RESULTS FROM THE MARKET ANALYSIS

This section will summarise the results from the market analysis and it is divided in each researched market.

7.6.1 NUCLEAR POWER MARKET

After the screening process was done, there were three different industries considered as most promising. The industries were segmented to find the most suitable markets. The first market, the nuclear market that Power Consultant is targeting today is considered to have much potential. There is though important to have a good relationship with the prime customers because they have a huge part of the market and they are therefore very powerful.

Many of the existing competitors are the same for all the markets. The reason for this is that they have a larger service portfolio and services that are easier to adapt to other markets for example construction.

The risk that companies start working with more in-house services is a substitute service for any market. As long as the services that are provided give the customers a higher value this is not a risk.

7.6.2 PETROLEUM MARKET

Petroleum market had more a promising opening before the analysis than after. The product portfolio was suitable and the industry had many similarities to the nuclear power, for example large investments in facilities. The facilities are well located for the Gothenburg office, where four out of five refineries are located in the western part of Sweden.

There is one big participant, Company AC, which would be an essential customer for Power Consultant because they own bigger part of the market share. The assignments' that was present on the market was many times connected to construction.

The result for the competitors showed that there was mostly larger consulting firms that where involved with the market. COMPANY T was considered having a large part of the petroleum market and would therefore be the biggest threat. Many of the services that were executed by the competitors were connected to constructions and fluid mechanics.

These results indicate that the customers have much power, big threat from large consulting companies and just some possible assignments.

7.6.3 PHARMACEUTICAL MARKET

The pharmaceutical market has a high diversity when it comes to the customers. The companies are spread in both sizes and possible work assignments. The market has the opportunity to work with more human factors, when working with developing new medical equipments. Company AJ and Company AR are two important participants and co-operation with one of them could lead to many assignments. The pharmaceutical production was a segment that was not that interesting, but both pharmaceutical development and medical technique have many openings to Power Consultant service portfolio.

The range of competitors was spread and it is a similar situation as in the nuclear market where some competitors have focus on certain field while others have a wider portfolio. There was also a sign of many new started firms.

The knowledge about the pharmaceutical laws and the regulations are something that has to be dealt with if there would be a focus on this market. The medical technique has more focus on the human factors, this could be an easier way in to the market for Power Consultant.

To sum up the situation, many possible customers, similar competitor situation as in the nuclear market, new knowledge about pharmaceutical laws is needed and many human factors openings.

8 SURROUNDING WORLD ANALYSIS

There was a surrounding world analysis done, to get a better understanding on how the rest of the world looks upon nuclear power. The analysis separates between nuclear power in Sweden and other happenings around the rest of the world that can affect the nuclear industry.

8.1 PESTLE ANALYSIS ON THE SWEDISH MARKET

The PESTLE analysis was done for the Swedish market and all the factors were discussed to make a fair description on nuclear powers future. The analysis was done to assure that the nuclear market had a future in the Swedish society.

8.1.1 POLITIC

There are eight parties in the Swedish government today. To be able to vote you have to be 18 years old and there is an election every fourth year. There are 349 mandates in the Swedish government, which is called Riksdagen. These are the following parties that are voted to represent Sweden for 2010-2014. (Riksdagen) The distribution of mandate can be seen in Figure 17.

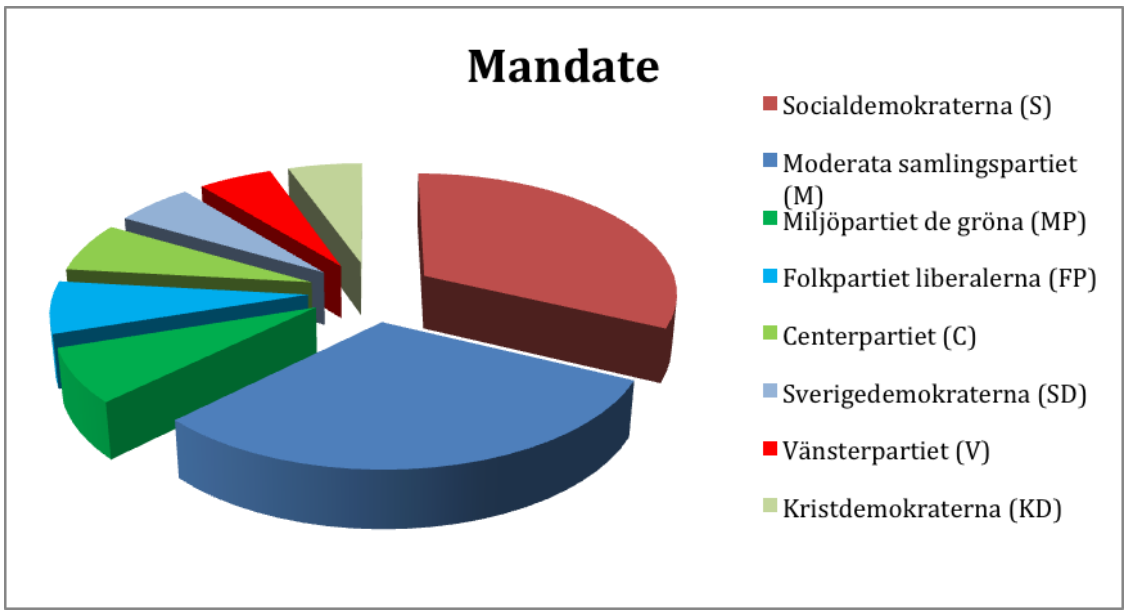


FIGURE 17 HOW THE PARTIES ARE DISTRIBUTED IN THE SWEDISH GOVERNMENT

The 17th of July 2010 came the decision from Riksdagen, with two votes in favour for, that there will not be a decommissioning of the nuclear power. The old law against building new reactors were taken away at the 1st of January 2011 and it is now possible to replace old once but Sweden should still just have 10 reactors. (Socialdemokraterna, 2010)

There are four parties that would like to keep and develop the nuclear power these are Folkpartiet, Kristdemokraterna, Moderaterna and Sverigedemokraterna. The parties that would like to decommission the nuclear power are Ceterpartiet, Miljöpartiet, Socialdemokraterna and Vänsterpartiet. The parties that represent Sweden today are pro nuclear power and they do not think that the power should be replaced until there is a better way to create electric power.

8.1.2 ECONOMICAL

The Swedish economy has been promising during the last years. When other countries had struggling finances and some have even had to declare bankruptcy have Sweden still been doing well. Lately there have been some uncertainties on the Stockholm Stock Exchange (Stockholmsbörsen).

The employment progression is on a positive trend see Figure 18, which is a positive sign for the Swedish economy. The minister of finance, Anders Borg, has estimated that this positive trend will continue and the unemployment rate will decrease.

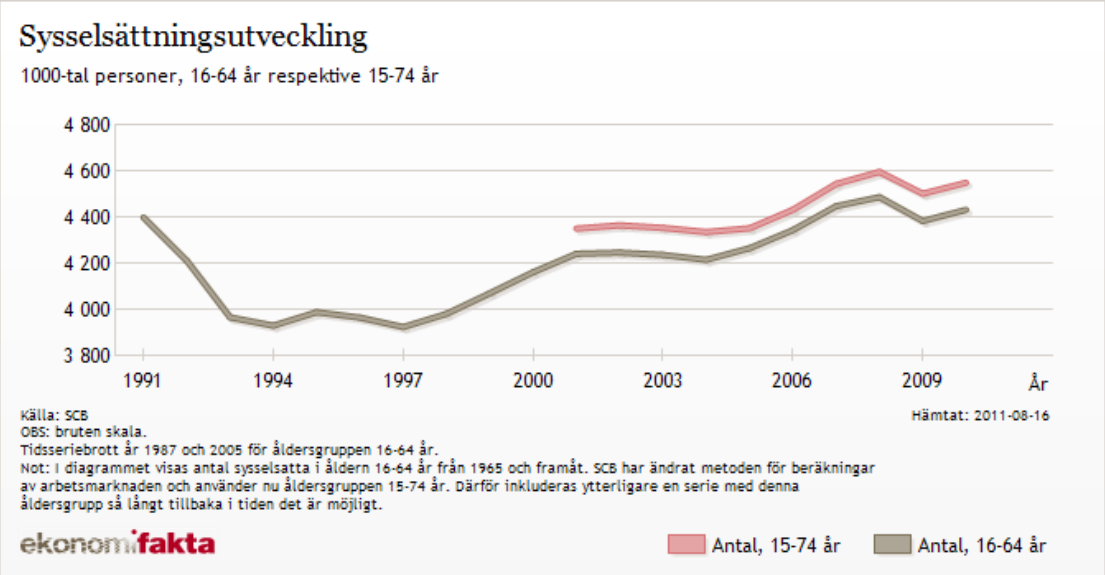


FIGURE 18 THE EMPLOYMENT RATE IN SWEDEN FROM THE AGE OF 16-64 YEARS (BLACK PLOT) AND 15-74 YEARS (RED PLOT)

8.1.3 SOCIAL

Sweden has a long history of using nuclear power, the first reactor (R1) was installed in November 1954. (SverigesRadio, 2008) The nuclear power source has been one of the two biggest power sources that have provided Sweden with electricity for decades.

There has been one referendum of decommissioning in Sweden in 1980. There were three different choices 1, 2 or 3, where 1 and 2 were supposed to be the pro nuclear power and 3 against nuclear power. All the options were formulated about when decommissioning of the nuclear power should take place and not any option were about improving the nuclear power, which got critics. The poll was 75.7 percent, which was considered to be low comparing to the Government election the year before where 90.7 percent voted. Option 1 and 2 got 58 percent of the votes and option number 3 got 38.7 percents of the votes. (Kärnkraftsinformation)

The trust from the Swedish people for nuclear power has decreased after the accident in Japan. The power source is not considered as a long times energy source anymore and other renewable sources are more preferred. (Nordiskaprojektet, 2011)

8.1.4 TECHNOLOGICAL

There are many technological aspects that indicate that the nuclear power has a bright future. Today ten countries are participating in what is called the Generation IV international forum (GIF). The meaning with the GIF project is to develop reactors, which will only leave nuclear waste that will be radioactive for decades instead of thousands of years. The plants will also be about 100-300 more efficient than the nuclear power plant today and they could use existing

nuclear waste as fuel. The power plants are scheduled to become available in 2030 except one reactor form, very high temperature reactor (VHTR), which is supposed to be for commercial use in 2021. The history and the expected future of the nuclear power technology are shown in Figure 19. (US Department of Energy, 2011)

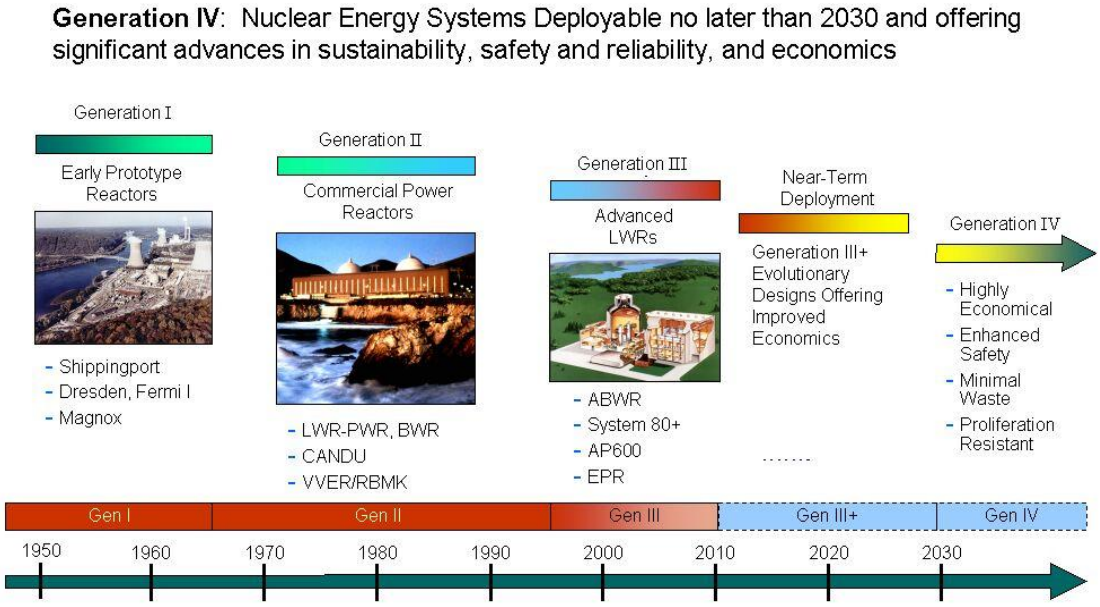


FIGURE 19 THE HISTORY LINE OF NUCLEAR POWER PLANTS

8.1.5 LEGAL

There is a high regulation of the nuclear power plants, this is due to the nature that the nuclear power plant could create irreplaceable damage to a certain area. The plants are today regulated by three different laws, which are miljöbalken, kärntekniklagen and strålskyddslagen.

There will be new laws that the nuclear power plants have to adapt to after the happening in Japan. These are regarding how the companies should deal with insurance issues when it comes to replace the environment after an accident. Also how safety should be upgraded to ensure that something like that could never happen again.

8.1.6 ENVIRONMENTAL

The biggest issue with nuclear power is how to store the nuclear waste that is created by the power plants. The waste is radioactive for thousands of years and therefore it needs to be stored at a safe location. There have been many discussion on how to store it and where.

Radiation is something that is hard to deal with because it is not visible and it could damage people for a long time after that they been in contact with it. The threats from a failure from power plants are the biggest thing that the industry has to deal with. To assure safety, it is essential to be able to run a power plant.

8.2 WORLD EVENTS

What types of events all around the world is on the agenda and what could affect the nuclear industry in Sweden? The fact was based on nuclear events on the news in the nuclear industry.

8.2.1 NUCLEAR POWER IN GERMANY

In Germany Angela Merkel, the federal chancellor, has decided together with the government that they should decommission all their nuclear power plants by 2022. The reason for doing this

earlier than scheduled was because of the accident in Japan. Some of the oldest nuclear power plants have already been shut down. Nuclear power stands for about 23 percent of the electricity produced in Germany. (DN, 2011)

What affects does this have on Sweden? Company A which owns two power plants in Germany have approximately 20 000 employees there and that stands for half of the concerns staff. The company have control over 7.2 percent of the nuclear market in Germany with their power plants. (DN, 2011)

This will affect the Swedish market negatively with the risk that Company A could move employees from the plants in Germany to their plants in Sweden. There is also a risk that they will have to do cut backs in Sweden because of the causes. The affects of this may take time before it strikes the Swedish market.

8.2.2 Nuclear power in Saudi Arabia

There is a positive trend in Saudi Arabia recently where there was a decision to invest 600 billion Swedish crowns in the nuclear market. This will in the long run lead to 16 new reactors and a good trend for the nuclear power market. (GP, 2011)

8.2.3 The earthquake in Japan

The earthquake that stroke Japan, Fukushima, have started the discussion on how safe nuclear power really is. Fukushima has been classified as the seventh level on the radiation scale, which is the same level as the nuclear power plant in Chernobyl has. The accident in Chernobyl took place in 1986 and there is still not possible to live even close to Chernobyl. The accident in Japan is considered to be even worse than the one in Chernobyl. Other accidents have happened to nuclear industry, one that has been debated is the one at Three Mile Island in 1979. (Reuters, 2011)

8.3 Results from the surrounding world analysis

The results from the surrounding world analysis indicate that the nuclear power is a sensitive subject in Sweden, still after being around since the 1960s. The political situation is even and it is approximately fifty-fifty pro and against nuclear power. With the new law not to decommissioning and be able to build more reactors, has to be seen as something positive for nuclear power. It is still the political decisions that will control the market.

The biggest treat would be another accident in a near future, there has been inputs that people changed side after the happening in Japan. Fukushima was even the breakpoint for the decommissioning decision in Germany. There are other countries that have decided to invest in nuclear power after theses accidents for example Saudi Arabia. The GIF project is also something that indicates that nuclear power will live on and evolve.

9 DISCUSSION AND CONCLUSIONS

Each part that has been important for the master thesis is discussed and conclusions were drawn from these. The chapter is divided in to five parts, starting with the survey, followed by the service portfolio, then the market strategies and finally the surrounding world influence. At the end of the chapter is there a discussion on what things that could have been done differently.

9.1 THE SURVEY

The answer to SQ1 is that the employees are positive to start work towards new industries. This is an important tell to the board of directors, that if they took such a decision, the employees at the Gothenburg office would be behind them. The employees have genuine interest for the organisation and there was many good inputs from the survey about other industries.

There seems to be different opinion when it comes to project management between the board of directors and the staff. Their wish to start working with more project management missions is not something that the board of directors has as a vision today. The explanation for this is that Power Consultant does not have project management as a core business.

9.2 THE SERVICE PORTFOLIO

SQ2 gave many new inputs and thoughts about things that could be done differently. This was not something that was expected from the beginning, but something that emerged through the project. To continue evolving the service portfolio with new services could improve Power Consultants position as company with high competes on the nuclear field market. This would lead to more assignments and this could also make the change between markets easier.

Regardless if there will be any more new building or upgrading of nuclear power plants, there is a need to take care of the parts that exists in the old power plants. Therefore, there is a promising idea to investigating services that could fit for disassembling of nuclear plants. This thought is especially interesting if Germany goes through with their decision to decommission all their nuclear power plants. Work opportunities could open up there and a more international market could open up.

If Power Consultant decides to continue working with only the nuclear power industry it would be a good idea to start focus on services that covers the whole life cycle of the product. In other words, the improvement should lead to that that they cover everything from start-up to close down of the power plant.

9.3 THE MARKET STRATEGIES

There are many opportunities in the researched markets, which is the answer to KQ2. To attempt a new market can be done in many ways. To find another co-operating company could be one way to both improve the position on the nuclear power industry and also to start working to other markets. The company does not have to be larger than Power Consultant there are pros and cons with both aspects. A larger company would have more power over the situation, which could be a problem. The cons with this are though that they are targeting more than just one market. To have a partner in business could also help Power Consultant to enter the international market. Where there are countries not that far Sweden are focusing on the nuclear industry.

The pharmaceutical market had many openings but there can be problems entering this market. Thus, today Power Consultant works with energy safety and start working towards another field that does not have with energy might damage the brand. The petroleum market could be seemed as an energy industry but not as promising as the pharmaceutical market.

To enter another market could be done by co-operate with companies like Company L that Power Consultant already has a relationship with today. The investment will be lower than if Power Consultant should start working with a completely new company. This is because of the existing relationship with the company.

It is important that if Power Consultant decides to changes market that they move the good reputation from nuclear market on to the new market. Otherwise is there a risk that they just disappear in the new field.

9.4 SURROUNDING WORLD INFLUENCE

SQ3 shows that the nuclear power is a subject that is debated over the whole world. Different decisions around the world affect the Swedish market too. The biggest threat towards Power Consultant is the risk of a decommissioning decision in Sweden. This is not something that seems to happen in a near future, especially not after the new laws that were introduced this year and Company A:s vision of building a new plant.

The technical aspect looks promising and many other countries are focusing on the nuclear power industry. So to look for assignments on the international market could be something to have in mind for the future. It is though essential that Power Consultant has knowledge about the new technical solutions that are evolving.

After Company A ABs huge investment in the nuclear power plants in Germany could it be drawbacks of job opportunities over time in Sweden. There is still a need to see how things turn out in Germany. The nuclear power leaves a large hole in energy industry that has to be solved in a near future to make the decommissioning possible.

9.5 REFLECTION ON THE REPORT

This section describes things that could have been done differently and also a reflection on the validation of the research.

There could have been more questions in the survey, for example it would have been interesting to know which types of new services the employees would have found important. This was though something that was corrected for the interview with the board and CEO. The question about if the employees thought that it was a good idea to start working towards new markets could have been divided in more questions. To answer the question with a yes is pretty easy because that does not focus on what the downsides of this could be. A supplemental question like, are you ready to take the risk working towards other markets?

It would have been interesting to make an interview with the employees at the office in Stockholm. To find out if there is an interest for them to work with other markets than the nuclear power. At this moment are the recommendations for the board of director based on the interests of the staff in Gothenburg. The thought is though that the entire organisation will follow the recommendations.

Porter's five forces had one force that was not that important as the others. This was the supplier's force. Power Consultant is providing services that are not that depended on any supplier. This could though be changed in the future if they decide to start working with services that are depended of software companies.

To get more knowledge about the markets deeper interviews could have been done with customers and competitors. The way the project turnout was to get a wider view on more markets. There could have been a decision to focus on one market and get in contact with the

customers on that one, but at this stage was the thought to get a wider look on many markets. Plans to start another master thesis looking on the existing customers are under consideration.

10 RECOMMENDATIONS FOR THE FUTURE

This chapter gives the final recommendation and the answer to KQ1, should Power Consultant start working towards new industries or should they continue focusing on the nuclear power industry? The answers were based on the results from the master thesis. At the end of the chapter there are other research suggestions.

For the expansion of Power Consultant will the recommendation be to keep the main focus on nuclear power and try to get a stronger position on this market. Attempting a new market will be costly and time consuming. The pharmaceutical market will fit in with the services that Power Consultant has and the market could bring assignments to the whole company in a better way than the petroleum market. Still, the pharmaceutical market is not an energy industry and can therefore damage the brand.

To be certain about if it is worth attempting the pharmaceutical market a closer interview with the potential customers is needed, to be able to know what type of assignments they are interested in. Company AJ, Company AK and Company AR are companies that would be the most interesting new clients in this market.

If it is possible to continue co-operation with COMPANY R and help them on another market this could be a good idea. They are involved in a lot of other markets where Power Consultant can operate and COMPANY R has a large contact network. This type of action could make the introduction of a new market smother. Working with an existing customer like Siemens is another suggestion. It is important to find an opening and a way for Power Consultant to leverage their company in to the new market.

Investing in new services that covers more customer needs in the existing market seems like a better plan, before start looking at new markets. By doing this the service portfolio will be more prepared for other markets.

The services should cover more of the product life cycle than it does today, from the start up of the nuclear power plant until the decommissioning. The recommendation is to investigate what types of services the customers need. Then see what type of competence the employees on Power Consultant got today. To continue developing the existing technical calculation group could be the first step.

Services such as technical-, 2D- and 3D-calculations can create new assignments for the company. The services are not locked to a specific market so it is a good investment. Risk management is another service that could open up for new assignments and still function on other market. Management was also something that the employees would like to work more with.

The market has a bright future if it stays out of any more serious accidents. There are many investments going on around the world and looking on international assignments should therefore not be forgotten. It is also important to follow the technical development of power plants, so that Power Consultant has services that could provide these in the future.

Finally, other research that could be done after this master thesis is for example, other ways of pricing the services than how it is done today. Value based pricing is for example something that could be analysed. There could also be a good idea to work with external and internal communication so that the customers know what values Power Consultant stands for and make the company more united.

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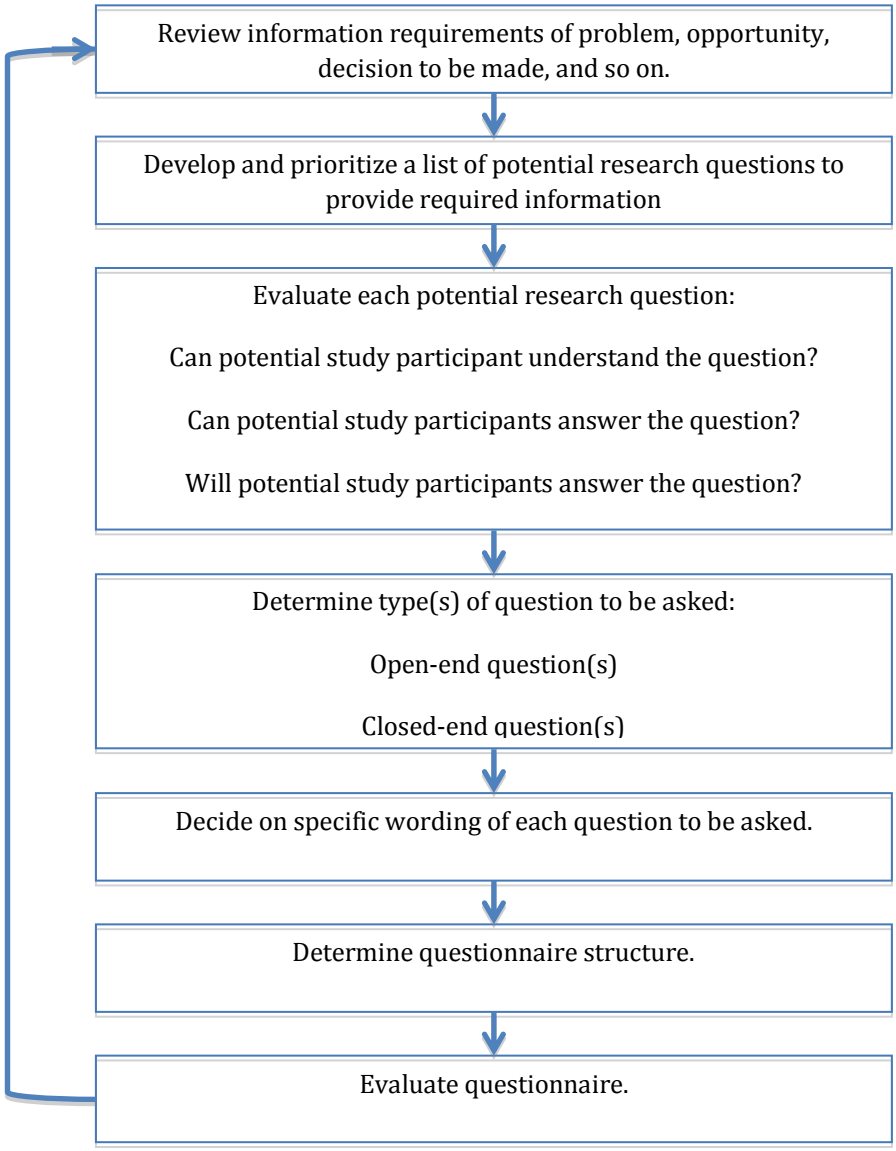
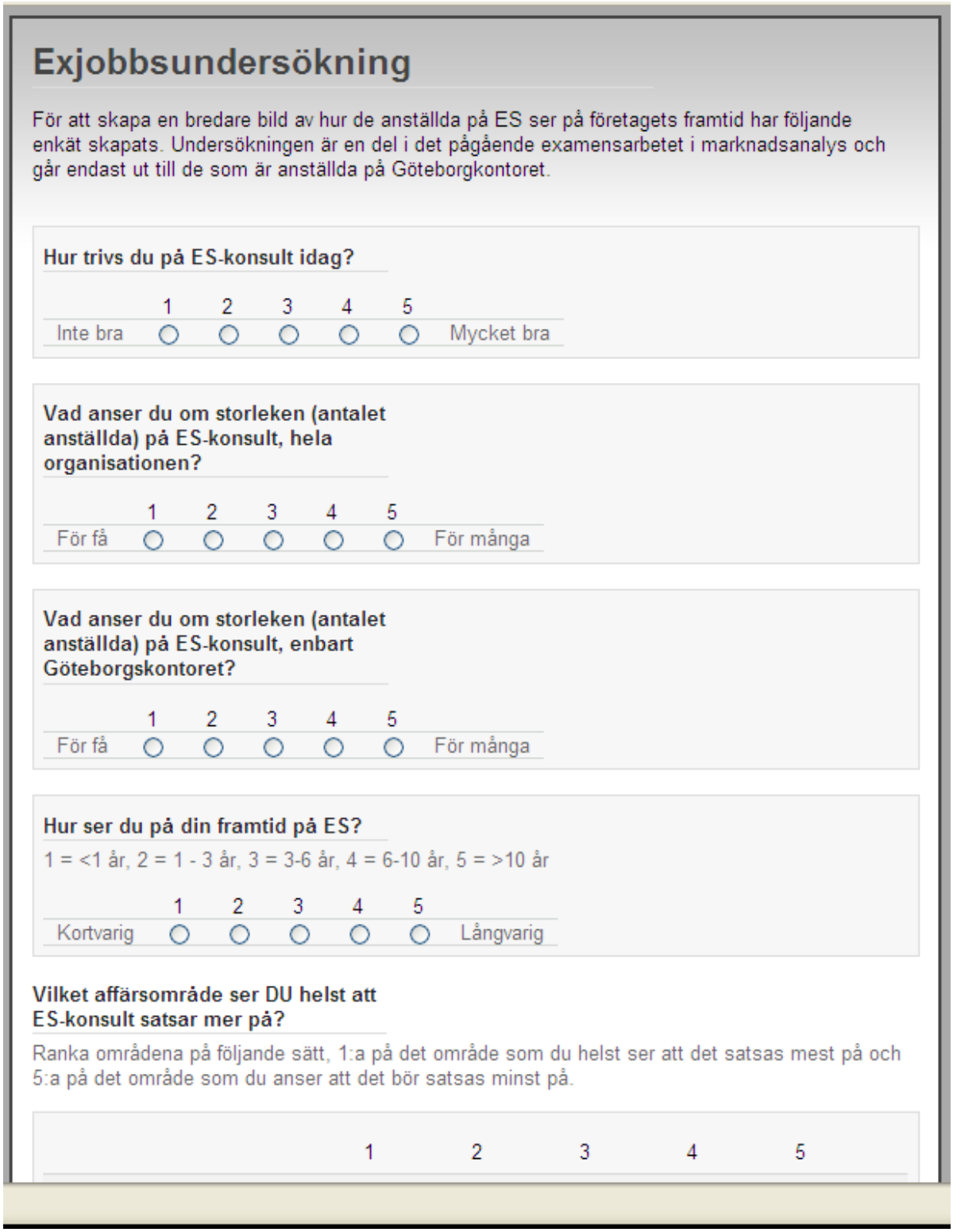
APPENDIX A

CREATING A QUESTIONNAIRE



APPENDIX B



Exjobbsundersökning

För att skapa en bredare bild av hur de anställda på ES ser på företagets framtid har följande enkät skapats. Undersökningen är en del i det pågående examensarbetet i marknadsanalys och går endast ut till de som är anställda på Göteborgkontoret.

Hur trivs du på ES-konsult idag?

	1	2	3	4	5	
Inte bra	○	○	○	○	○	Mycket bra

Vad anser du om storleken (antalet anställda) på ES-konsult, hela organisationen?

	1	2	3	4	5	
För få	○	○	○	○	○	För många

Vad anser du om storleken (antalet anställda) på ES-konsult, enbart Göteborgskontoret?

	1	2	3	4	5	
För få	○	○	○	○	○	För många

Hur ser du på din framtid på ES?

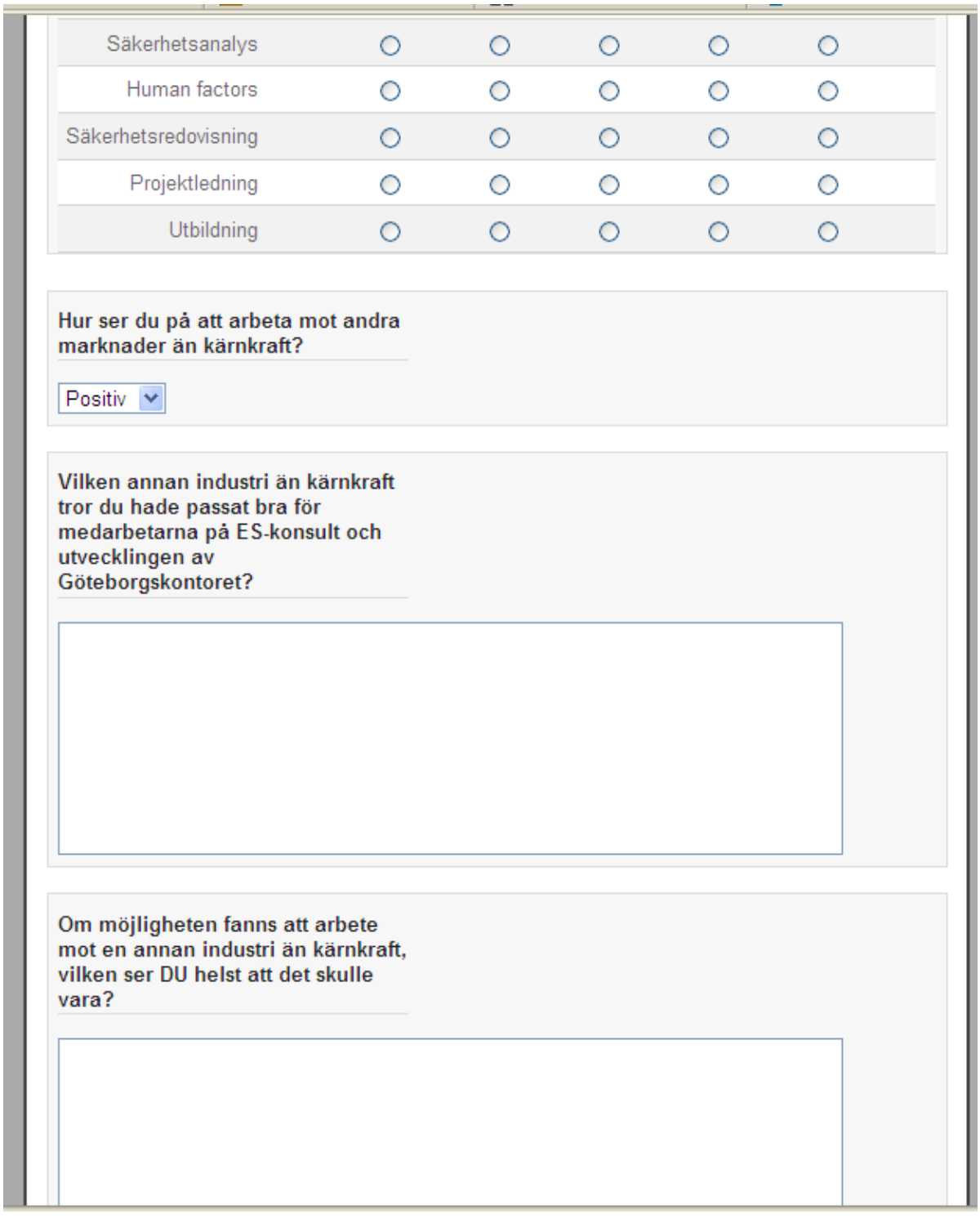
1 = <1 år, 2 = 1 - 3 år, 3 = 3-6 år, 4 = 6-10 år, 5 = >10 år

	1	2	3	4	5	
Kortvarig	○	○	○	○	○	Långvarig

Vilket affärsområde ser DU helst att ES-konsult satsar mer på?

Ranka områdena på följande sätt, 1:a på det område som du helst ser att det satsas mest på och 5:a på det område som du anser att det bör satsas minst på.

	1	2	3	4	5


Säkerhetsanalys
Human factors
Säkerhetsredovisning
Projektledning
Utbildning
Hur ser du på att arbeta mot andra marknader än kärnkraft?
Positiv
Vilken annan industri än kärnkraft tror du hade passat bra för medarbetarna på ES-konsult och utvecklingen av Göteborgskontoret?
Om möjligheten fanns att arbete mot en annan industri än kärnkraft, vilken ser DU helst att det skulle vara?

Någon specifik kund(er) som du har varit i kontakt med tidigare från andra industrier?

Någon specifik kund(er) som du skulle vilja komma i kontakt med framöver?

Övriga kommentarer/synpunkter

APPENDIX C

FRÅGOR TILL VDN OCH STYRELSEN

MARKNADEN

Hur du och styrelsen/vdn samma åskiter om att Power Consultant ska jobba mot andra marknader?

Har Power Consultant några invändningar att jobba mot någon annan bransch än kärnkraft, så som en med hög koldioxid utsläpp, olja kol. Eller en etiskt svår brasch så som vapen eller tobak?

Vilket annat energiområde än kärnkraft tror du skulle passa ES bäst, tjänstemässigt sätt, olja&gas, vattenkraft?

Tror du att det är ett för stort steg att gå utanför energi industrin och in till en ny industri, t ex medicinindustrin, kemiindustrin, tågindustrin?

TJÄNSTEPORTFÖLJEN

Är det något om serviceområde som ni vill jobba mer med idag, av era befintliga?

Har ni diskuterat några tilläggstjänster till den befintliga serviceportfolion? Isf vilka?

Vet du om det finns någon specifik kunskap på företaget som skulle kunna användas till en ny service, tex fe-analyser?

FRAMTIDEN

Hur du på framtida kärnkrafts efterfrågan? Nya reaktorer kan byggas med ny lag.