Product Adaptation to Different Markets through Technology Innovation

Angela Musimiire
Maka Chakhnashvili

Linköping, Sweden
Spring Semester, 2012
Supervisor: Hans Sjögren
Abstract

Title: Product Adaptation to Different Markets through Technology Innovation
Authors: Angela Musimiire & Maka Chakhnashvili
Supervisor: Hans Sjögren

Background and Aim: Markets are getting increasingly complex, competitive and changing. A firm’s ability to respond to environmental challenges is a significant factor for its survival and success. To establish itself in the market, a company needs to adjust the product in a way that meets the expectations and required quality of the target market in other words, make relevant product adaptations. Many aspects of product adaptation have been discussed in the literature ranging from small changes in the product such as specification or design to modifying a company’s market strategy depending on which stage the product is in its life cycle. Technology innovation can enable a firm keep the market share and retain customers especially in a mature and technology driven industry where the market is saturated and consumers diffuse to competitors who easily copy the product. However, the role of technology innovation to adapt a product in the growth stage to mature markets is missing from the present literature. This present thesis will investigate the role of technology innovation in product adaptation and the factors to consider thereof the Swedish high tech company Saab will be used as the case study.

Methodology: Research method for the present thesis includes the qualitative approach with the case study design. For the purposes of this thesis the Swedish high-tech company Saab will be studied to explore the practices of adapting product (field hospital) to different markets.

Completion and results: Result of the study showed that there are similarities and differences between what literature provides and Saab does to adapt a product in markets. Analyzing the theory and practice recommendations for Saab were concluded. Suggestions drown for Saab can be useful for other high technology companies as well.

Key words: Product adaptation, technology innovation, product and industry life cycle, Saab, field hospital
Acknowledgements

These last five months have been filled with moments of excitement, knowledge sharing, interactions but there have also been moments of frustration and disappointment. However, this has been a memorable journey for us and it has culminated to the present research.

Firstly, we would like to thank the Saab representative who took time off to meet with us and give us useful information which has contributed greatly to our thesis. Secondly, we would like to thank our coordinating professor Hans Sjögren, postdoctor Lihua Zhang, and our fellow group mates whose feedback was useful for us when writing this thesis. Last and most importantly, we would like to thank our families and friends for their never ending love and support they have rendered us to pursue our studies.

Angela & Maka
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Abbreviations

PLC  Product life cycle
MTSF  Mobile transportable surgical facility
A&E Reception  Accident and emergency reception
CSSD  Central sterile supplies department
WHO  World Health Organization
PAHO  Pan American Health Organization
NATO  North Atlantic Treaty Organization
UN  United Nations
MCS  Medical Care Solutions
1. Introduction

1.1. Background and previous research

In 1792 during the Napoleonic wars, French surgeon Dominic Jean Larrey introduced the first field hospital. French surgeons used to set up aid stations near the frontline to treat those wounded during battles. This invention significantly decreased the mortality rate in Napoleon’s armies. The idea was later adopted by Great Britain and Prussia which improved the care of their soldiers (McCallum, 2008). With more than 200 years in existence, the field hospital is not only a product in a mature industry that has evolved over time but also a product that is still relevant even in today’s business setting. Firms in mature industries such as those in the field hospital industry have a growing interest in technology innovation for competitive advantage reasons in global markets (Hoffman and Hegarty, 1993). Additionally, Thompson (2002) asserted that firms remain in the mature stage until a new technology emerges in the industry that fulfils the same need.

In today’s globalized and dynamic business environment, firms whether technology driven or otherwise have at one point in time found themselves with the need to innovate as a way of not only gaining competitive advantage but also as a way of reacting to the changes in their external environments. In light of this, the focus of interest of this present thesis is the field hospital which is a product that has been in existence for over two centuries and the company in focus is Saab (Defence and Security) which is a Swedish company that thrives on high-tech and innovative products. However, it is noteworthy to state that Saab started to manufacture field hospitals in 2007 making this product relatively new to the company. Christiansen et al. (2010) argued that by understanding, identifying and defining the core design and values of products through the product life cycle (PLC), products of the past can be adapted, negotiated, and transformed to stay attractive to modern customers.
Additionally, Milling and Stumpfe (2000, p. 1) argued that “organizations develop innovations to adapt to their external environment and to react to perceived changes inside or outside the organization”. They also noted that innovation management occurs in highly dynamic and complex environments as there is always an interaction within the organization and between the organization and the external environment. Damanpour (1996) asserted that innovation implies a change in the status quo of an organization as a result of changes in the external environment or is used as a way of influencing the environment. “Innovation is the management of all activities involved in the process of idea generation, technology development, manufacturing and marketing of a new or improved product” (Trott, 2012, p.15). Ex ante Damanpour (1996) argued that innovation encompasses but is not limited to new products and production methods, new administrative systems and new technologies. The authors also mentioned that innovation activities can include but not limited to using high unit cost of production processes as well as technology innovation processes i.e. whether low unit cost or high unit cost. In concurrence with Damanpour (1996), Schilling (2008) noted that technology innovation is the main driver of competitive advantage in firms.

“Technology innovation is the process through which new (or improved) technologies are developed and brought into widespread use” (Sagar, 2006, p. 1). Utterback (1971) argued that the process of technology innovation goes through the following phases: idea generation, problem solving and implementation. However, since the product (field hospital) has been set as the unit of analysis in this context, the present thesis will move a step further than the latter stage (implementation phase) which Utterback (1971) defined as the introduction of the innovated product into the market and focus on the role of technology innovation when adapting such a product to markets that differ in their levels of technology. Additionally, the factors that Saab can consider to adapt the field hospital to markets that differ in their levels of technology will be discussed.

Hill and Rathaermel (2003) noted that most products that go through technology innovation fail in the market because they are not designed to meet customer needs. It can therefore be
argued that firms that carry out technology innovation need to adapt their products to the
different markets to meet the needs of the customers. Product adaptation has been defined
as the process through which a company adjusts and improves upon a product to make it
more appealing to the target market. Product adaptation can be based on the modification or
some improvements on existing or competing products, and not necessarily on pioneering
innovations. Ultimately, developing an effective product adaptation strategy is a critical
factor for all businesses that wish to attract customers in different markets (Balle, 2012).

As earlier noted, the distinction between different markets is based on a technological
context i.e. the level of technological development within different markets/countries.
According to a report from the World Bank (2008) on technological progress and
development, an analysis was conducted about different markets on the basis of level of
technological development within different countries. Accordingly, there is a technology
gap between the rich and poor countries and hence their markets. Technology development
level is related to the economic achievement of a country. The report noted that richer or
developed countries use technology more extensively than the poor or developing countries
because the developed countries/markets are not only able to afford these newer
technologies but also because most of the people within these markets have the necessary
skills to use the technologies and the reverse is true for markets in developing countries.

1.2. Problem statement

Milling and Stumpfe (2000) pointed out that technology innovation is cardinal for firms to
gain competitive strength and long term survival. Furthermore, these authors also stated
that effective technology innovation management results from interactions between process
and product innovations although a lot of the literature tends to focus on either product or
process innovation. Additionally, innovative efforts can be carried out either as product or
process innovation along the product life cycle. Although Utterback (1971) defined the
phases of technology innovation (idea generation, problem solving and implementation) and listed the components of the implementation stage, he did not elaborate on the role that technology innovation plays when adapting a product in the market. Additionally, Bruno et al. (2009) also carried out research based on how to manage technology innovation but did not go further into applying it in the context of how it can be adapted to different markets. However, these authors pointed out that the success of technology innovations is greatly influenced by the acceptance in the market. Schilling (2008) also addressed the issue of how firms engage in technology innovation but does not discuss its relevance in terms of its role in product adaptation to markets.

On the contrary, Hill and Rothaermel (2003) noted that to successfully implement technology innovation, firms need to understand the requirements of different customers. Understanding demands of the consumers may result in modifying and adjusting products to different markets. Moreover as a means to adapt the products to different markets, Barbu (2011) mentioned a number of characteristics necessary to enable product adaptability. Furthermore, Trott (2012) also highlighted three key factors that can ease product adaptation into the market as well as stimulate a product’s life cycle. Hence taking a point of departure from Hill and Rothaermel (2003), Barbu (2011) and Trott (2012), this present thesis will address the role technology innovation plays when adapting a product at its growth stage in a mature industry as well as the factors Saab can put into consideration to adapt the field hospital to markets that differ in their levels of technology.

1.3. Purpose of study

From the aforementioned, the purpose of our study is to enhance the understanding of the role of technology innovation when adapting a product which is at its growth stage within a mature industry. The factors that Saab has to put into consideration to adapt the field hospital to different markets that differ in their levels of technology will be discussed.
Additionally from a more practical perspective, we were interested in Saab (Defence and Security) as it is one of the most successful high tech companies in Sweden. We were fortunate enough to meet with a Saab representative who briefed us about the field hospital, which is a new product in Saab’s product portfolio. Moreover, he explained how Saab hopes to increase the share of this product in existing markets and get access to new ones. Hence, in this study, the answers to the research questions will allow us to understand how firms in technology driven industries, and more specifically those in the field hospital industry and for this particular study using the case of Saab, have managed to use technology innovation through their field hospital product in a way that has enabled the product become adaptable to markets. Noteworthy is that Saab segments its markets on a geographical location basis; however, this study focuses on segmentation of the markets on a technology level.

1.4. Research questions

From previous research and the above analysis, it can be argued that firms carry out technology innovation as a means of not only gaining competitive advantage but also as way of responding to the external environment. Furthermore, it was also noted that the technology innovation process undergoes three phases and the last one being the implementation phase which is the point at which the innovated product is introduced into the market. However, as Hill and Rothaermel (2003) noted, failure to adapt the innovated product to meet different market needs can lead to failure of a product in the market. Based on the above analysis, this study will be conducted to address the following research questions;

1) *What role does technology innovation play during product adaptation for a product at its growth stage in a mature industry?*
2) Which factors can Saab put into consideration to adapt a military field hospital to markets that differ in their levels of technology?

1.5. Contribution and target group

In what concerns our contribution to product adaptation and technology innovation, we believe that through this present thesis, we have extended the existing literature to see how these two concepts can be interrelated. As earlier pointed out, there has been research on technology innovation but none of the research focused on the role of technology innovation in a way that enables product adaptation and more specifically for a product at its growth stage in a mature industry. Hence, our research dwells more on how technology driven firms can adapt a growing product to markets that differ in their levels of technology. Moreover, this present thesis is targeted for technology driven companies and/or firms within the field hospital industry or for firms that are operating in a mature industry but have products that are still at the growth stage in their product life cycles. Furthermore, in this category we also include management students, professors and practitioners who might want to research further on our findings.

1.6. Method and research design

1.6.1. Research strategy

The present paper will exploit qualitative research strategy for studying and analyzing the role of technology innovation when adapting a product at its growth stage in a mature industry and the factors to consider thereof. Qualitative research implies studying things in their natural setting and employing empirical materials to better understand the matter (Denzin and Lincoln, 2000). It highlights the importance of the words and the meaning of
the process and actions rather than numbers. Quantitative data is not collected for the present thesis.

1.6.2. Research design and method

Research design provides a framework for the collection and analysis of data, it structures how to accomplish a research method and how to analyse data. For the purpose of the paper, we selected the case study method as our research design. The case study about Saab and its product the field hospital will be analyzed in detail. After choosing a research design, a research method needs to be defined for data collection (Bryman and Bell, 2011). The case study will be based on second hand materials including Saab’s annual reports, press releases, articles and information published on Saab’s web page.

1.7. Limitations

Although the research was carefully prepared, there are still some limitations. Findings of a single case study cannot be generalized to all the companies in technology driven industries. It is limited to firms involved with high-tech products. Moreover, the case study involves the characteristics of one organization. The behaviour of one company may not reflect the behaviour of most companies in the same field. The selection of the single case study design naturally brings forth many limitations as far as the generalisation of the results of the study is concerned. On the other hand, this also represents the whole idea of making a case study. By understanding something about this particular case more in depth, we might eventually also learn something about more general phenomena.

Additionally, the present paper will be based on secondary data gathered from various sources. Through an informal meeting with one of Saab’s representatives, we were able to
collect primary data which helped us to have a better understanding and interpretation of the secondary data. However, due to the high level of confidentiality of the primary data obtained, we were unable to directly use it in the present thesis.

The thesis will take the perspective of Saab while discussing different markets and adapting the product to them. It will not cover the views from the customer’s side. Another limitation is applied to the definition of different markets. Under this term, we keep in view the markets that differ by their development level of technology. The other factors that establish the differences between the markets are not considered in the present thesis.

In regard to the product, a field hospital is a mobile, self-contained, self-sufficient health care facility capable to be employed in the emergency situation to take care of the injured for a particular period of time (WHO and PAHO, 2003). Field hospitals can be used in cases of natural disasters, various accidents or military purposes. However, the focus of our case study will be on the field hospital produced and employed for military reasons.

1.8. **Research and chapter structure**

The present thesis will incorporate the structure provided by Flick (2006). According to the author, research is supposed to include theoretical literature about the study and empirical literature in the same or similar field. Additionally, research needs to review methodological literature and select the methods of the study. In the upcoming chapters, the paper will analyze methodology and explain the reasons for choosing the particular research method and overview of the relevant literature will follow the methodology chapter. The case study about Saab and its product the field hospital will be discussed in chapter four and an analysis and solutions will be provided thereafter. The last chapter will draw conclusions from the research and areas for future research will also be highlighted. Below is included the summary of each chapter:
Table 1 Chapter structure

| Chapter one | Presents previous findings on product adaptation, technology innovation, and the product and industry life cycles. States the problem, the purpose of the study and research questions, as well as limitations. Provides a short overview of the method and research structure. |
| Chapter two | Covers methodology and selected method. Provides comparison and description of different types of research strategies, research designs, research methods and data collection tactics. The relevant method selected for the present paper will be discussed in depth. |
| Chapter three | Gives an overview of the existing literature about the issues concerning product adaptation, technology innovation, the growth stage of the product life cycle, mature phase of the industry life cycle and different markets defined by their levels of technology. |
| Chapter four | Is dedicated to the case study. Short history and overview of Saab and the product (field hospital) is followed by the detailed description of Saab’s current and future markets, technology within Saab and the global trends currently affecting Saab. |
| Chapter five | Merges literature and case study findings and includes an analysis and discussion bringing together theory and empirics and answering the research questions, providing solutions to the problems stated in the case study. |
| Chapter six | Summarizes the present paper, draws conclusions and provides suggestions for further research. |

Source: Adapted from Riedel et al., 2010, p. 7
2. Methodology and method

2.1. Methodology

Research methodology implies how the research is done scientifically and which steps the researcher needs to undertake in order to solve the problem. Research is an investigation and inquiry for facts, a study for a problem or an issue; it is the process of seeking answers to the questions. Research tries to clarify and find the explanation to unclear phenomenon. Search for the truth can be done through arbitrary (unscientific) or scientific method. The arbitrary method is based on individuals’ opinion, imagination or belief as an answer to the question. It is subjective and differs from person to person. The scientific method is a “systematic rational approach to seeking facts”. It is objective and based on verifiable evidence. Therefore, to have believable and accurate results, research needs to be done through the scientific rather than arbitrary method (Krishnaswami and Satyaprasad, 2010, p.7). Kothari (2004, p.1) defined research as “an academic activity, scientific and systematic search for pertinent information on a specific topic”. The aim of research is to discover new facts or analyze, explain and illustrate the old ones, to disclose the truth and find the answers to the questions (Krishnaswami and Satyaprasad, 2010). Dhawan (2010) characterized research as seeking for knowledge by means of scientific investigation. In other words, it is a journey to bring to light unknown issues.

Dhawan (2010) illustrated the following types of research:

Descriptive vs. Analytical. Descriptive research implies collecting data through various surveys and enquires; its purpose is to describe the matter in its present condition. In analytical research, the researcher analyzes already existing information about the issue to make a critical evaluation.
**Applied vs. Fundamental.** Applied research aims to find a solution to the recent problem the society or an organization faces. The fundamental approach implies generalization and formulation of the theory.

**Conceptual vs. Empirical.** Conceptual research is concerned with abstract ideas. It is mainly used by philosophers to develop new theories or reinterpret the old ones. Empirical research is based on experience and personal investigation ignoring theories or systems.

**Quantitative vs. Qualitative.** Quantitative research measures quantity or amount. Qualitative research deals with qualitative phenomenon. Researching a representative sample in quantitative method gives the actual sense of the matter, while qualitative data contributes more to illustration (Flick, 2006). Qualitative research implies studying things in their natural setting and employing empirical materials to better understand the matter (Denzin and Lincoln, 2000).

Qualitative research differs from quantitative in several ways of addressing the same issue. For example, a qualitative researcher uses in-depth investigation through interviewing and observation to study an individual’s point of view while a quantitative researcher relies on remote, inferential empirical methods and materials (Denzin and Lincoln, 2000).

Bryman and Bell (2007, p. 425) listed the main differences between qualitative and quantitative research. The latter is a typically highly structured and concerned with measurement of social life, while qualitative approach is unstructured and researchers put emphasize on words in analysing the society rather than numbers. In quantitative research, the investigator is the main figure to structure the investigation while in qualitative research, perspective of studied participants is important, what they think as significant can shape the orientation point. Quantitative research implies minimal connections with people being investigated. To keep the objectivity, researchers prefer not to be involved with the people they study. Qualitative research on the contrary aims to get close to the participants to “understand the world from their eyes”.

Glaser and Strauss (1967) suggested that while doing qualitative inquiry, researchers should start collecting and analyzing data without looking for existing literature, while Flick (2006) suggested that during qualitative research, it is better to use several forms of literature: theoretical literature about the topic, empirical research done earlier in the same or similar field, methodological literature providing information on how to do the research. Literature overview gives general knowledge about the issue and contributes to a better understanding of what is already done and what is missing from the studies. Additionally, reviewing existing literature reduces the risk to “reinvent the wheel” (Bryman and Bell, 2011).

Bryman and Bell (2011) pointed out three main choices while doing a research: selecting a research strategy, research design and research method. The authors formulated research strategies as quantitative and qualitative. Quantitative research focuses on the number of collection and analysis of data. It uses a deductive approach, emphasising testing the theories and perceived social reality as an external, objective phenomenon. Qualitative research places the accent on the content rather than quantity of the collection. It uses an inductive approach highlighting generation of theories.

Bryman and Bell (2011) provided five types of research designs: experimental, cross sectional or social survey, longitudinal, comparative and case study. The classical experimental design entails establishing two groups, one is treated (experimental group) and the other one not (control group), measured variables of two groups are compared against each other. Cross sectional or social survey design involves collecting data on more than one case using quantitative data. The longitudinal design surveys samples several times. It is time consuming and rarely used in business. It is aimed to track changes over time in business and management research. Comparative design entails the study of several contrasting cases using similar methods. It can be realized in both a quantitative and qualitative way. Case study design implies a detailed and intensive analysis of a single case. The case study can be of a single organization or a single location. Flick (2006) explained cases as the broad term containing persons, social communities, organizations and
institutions and suggests that it is up to the researcher to define the relevant subject for the case analysis. Zainal (2007) argued that using case studies as research methods aid in understanding and exploring complex issues. The author goes ahead to state that by including both qualitative and quantitative data, case studies enable researchers to explain the processes and outcomes of a phenomenon through observation, reconstruction and analysis.

Zainal (2007) also noted that as a research tool, the way that a case study is designed is of paramount relevance. Hence, the author pointed out that researchers can adopt either a single-case or a multiple-case design. Single-case designs can be used where events are limited to a single occurrence and where there are no other cases for replication. However, the author also observed that one of the major drawbacks of using the single-case design is that is unable to provide a generalizing conclusion hence it is recommended that this method is used together with other methods in order to confirm validity of the results. Using multi-case design on the other hand can be used for numerous events through replication because this design supports and enhances previous results.

Moreover according to Bryman and Bell (2011), a research method is a technique for collecting data. The authors provide the following research approaches for data collection associated with the qualitative research:

- Ethnography/participant observation. Researchers using this method stay in the community to better observe and understand the social group.

- Qualitative interviewing (unstructured and semi structured). Unstructured interview is conversation type where the interviewer might ask one question and interviewee responds freely and elaborates the answer. In a semi structured interview, the interviewer has a number of prepared questions around the topic to be covered but the interviewee is free to reply the way s/he wants.

- Focus groups. This type of method entails interviewing groups of people in an unstructured way to share their experience.
• Language based approaches to the collection of qualitative data. These approaches treat language “as a topic rather than a resource”; language is more than the source of communication to conduct a research. (Bryman and Bell, 2007, p. 530)
• The collection and qualitative analysis of texts and documents. This method includes collection and analysis of various sources of data such as internal reports, newspapers, letters, memos, magazines, photographs.

The sources of data for conducting research can be primary and secondary. Primary data is first hand information collected directly from the original sources. It can be obtained through different methods such as interviews, mailing, and observation. Data from secondary sources is the information about the issue already collected for other purposes. The data can be reached through various reports, publications, journals or newspapers. There are a number of advantages for using secondary data: Secondary sources’ scope is broad, it can consist of all sort of material, published and unpublished records, it is not limited in time and space, it can be accessed anytime and anywhere, it is cheap and easy to obtain. However, there are some disadvantages of secondary sources as well: The researcher does not have control over the content of material; it may not be as accurate as desired and might not include the needed information. Analysis of the secondary data is part of research and is based on the researcher's own judgment and evaluation (Krishnaswami and Satyaprasad, 2010).

2.2. Method (case study)

Research methods are tools/techniques a researcher uses to conduct the investigation to accomplish the process of searching for the truth. The research method chosen for the present thesis is the qualitative approach with the case study design. For the purposes of this thesis, the Swedish high-tech company Saab will be studied to explore the practices of adapting the product (field hospital) to different markets. Being concerned with the
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descriptive details of Saab’s case we found the Case Study method the most relevant and appropriate. It allowed to collect and analyze information from various sources and to conduct an in-depth investigation of the case.

While Bryman and Bell (2007) defined a case study as a research design, Remenyi et al. (1998) formulated the case study as an approach or tactic for pursuing research to gather reliable and valid data about a topic of interest. Zainal (2007) described the case study as a widely used research method to conduct in-depth investigation and go beyond the statistical data.

As described in the introduction part, the present thesis is concerned with the role of technology innovation in adapting the product (field hospital) to different markets, which are distinguished by means of technology development level. The product is defined to be in the growth stage of its product life cycle while the industry itself is mature. We conducted literature review to gather the existing information about the issues covered in the paper. The overview of the literature presents the findings that have already been researched by various authors about the PLC and particularly growth stage, industry life cycle with the emphasis on the mature stage, technology innovation, technology development of different markets and product adaptation. The literature review is followed by the empirical section where the case study method is employed. The case study covers the facts about Saab, the product of interest, the field hospital launched in 2007, information about the current and potential markets as well as technology employed. Yin (1984, p. 23) defined the case study research method as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context when the boundaries between phenomenon and context are not clearly evident and in which multiple sources of evidence are used”. Zainal (2007) argued that case studies are aimed at exploring and investigating a phenomenon through detailed contextual analysis. Furthermore, case studies observe data at a micro level.
Case study research method will be employed to study the single case to collect valid and reliable evidence from different sources about the organization Saab and its product the field hospital. A key strength of the case study method involves using multiple sources and techniques in the data gathering process. Case studies as a research method can offer deep insights. However, the criticism against the case studies is that they are often labelled as being too long, difficult to conduct and producing a massive amount of documentation (Yin, 1984). Remenyi et al. (1998) defined several significant sources of evidence which include documents such as published financial accounts, marketing proposals, various reports and releases. According to Bryman and Bell (2007) data gathering methods associated with qualitative research are ethnography/participant observation, qualitative interviewing, focus groups, language based approaches such as discourse and conversation analysis, the collection and qualitative analysis of texts and documents.

The case study in the present paper will be based on the analysis of the texts and documents from secondary sources. We had an informal meeting with the representative of Saab who provided us with useful information about the product, its history within the organization, difficulties and future plans. The primary data gained through this interview helped us to thoroughly understand the secondary data and make connections between different information. However, due to the confidentiality of the information obtained through the interview, we were not permitted to directly refer to it in our thesis. The secondary data of the case study conducted for the present paper consists of articles from various magazines and journals, books, online publications, Saab’s annual reports and information published on Saab’s web site. The advantages of secondary sources are that they can be of all sorts of material, they are not limited in time and space, they can be accessed anytime and anywhere saves time and money (Krishnaswami and Satyaprasad, 2010).
3. Literature review

3.1. Product adaptation

Adaptation is a process that responds to the different contexts of surrounding. According to Hagberg-Andersson (2006) adaptation is the process of adjustment in order to increase the benefits for the buyer (markets) and seller (firms). The author also went beyond the physical adjustment in defining adaptation and stated that it also involves a mental attitude. Moreover, Beverland (2005) argued that adaptive behaviour can range from simple changes (tactical adaptation) in the product to the huge modifications (strategic adaptation). Brennan and Turnbull (1999) defined product adaptation as the modification in a product by a firm to meet the requirements of the markets. Furthermore, Brennan and Turnbull (1999) also introduced adaptation as a learning process and an outcome of negotiations.

Adaptations can occur in product specification, product design, delivery procedure, financial procedures or social relations (Hakansson, 1982). The outcome of product adaptation can be effective buyer-seller and market-firm relationships and improved product quality leading to stronger positions on the market. Product adaptation is necessary in that the delivered product needs to meet the expectations and required quality of the target market. The importance of product adaptation can be significantly emphasized in mature market conditions as a firm struggles to beat the competitors and establish a product in a saturated market. However, according to Hagberg-Andersson (2006) firms may experience difficulties to deliver the high quality of the product while keeping the costs moderate. Rama Rao (2008) noted that a product that is suitable for one market may have to be adapted for another. This can be as a result of different physical conditions, variations in functional requirements of the product and customers in different markets may use the product differently or for different purposes.
Markets are getting increasingly complex, competitive and changing. A firm’s ability to respond to environmental or market forces is a critical factor for their survival and success (Brennan and Turnbull, 1996). According to Beverland (2005) building up relationships with other firms can help a firm to face environmental challenges and adjust to market uncertainty. Business relationships can be affected by the different factors and the atmosphere they operate in. Hakansson (1982, p. 371) grouped them as market/country specific and company specific barriers of relationship. Among the macro (country specific) aspects influencing relationships are; different cultures, language, social distance, “political instability, currency fluctuations and inflation rates, together with unpredictable industrial disputes, government interference in free trade etc.”. Failing to build relationships between the companies (company specific) may be the company characteristics, objectives or strategies. Before starting interactions, firms need to consider these difficulties and allocate necessary resources to overcome the barriers. For example changes in the economic climate affect product adaptation and problems in the economy cause an overall reduction in sales. Some of the tactics firms can use in case of organizational mismatch are technical adaptation, restructuring of the company or changing the perceptions of the other party for example the target markets (Hakansson, 1982).

Relationships can be seen as a network of resources and having long term stable connections can lead to retaining resources. The reasons firms interact with each other can be to gain knowledge and technological expertise, advance distribution channel and benefit from efficient business transactions (Hakansson, 1982). Additionally, successful relationships enhance the adaptation process. Firms having trust and commitment in their relationships will tend to be more adaptive (Brennan and Turnbull, 1999).

Defined by the specifics of foreign markets, firms can adopt one or more strategies to introduce a product to a new market: straight extension, promotion adaptation, product adaptation, dual adaptation and product invention (Boone and Kurtz, 2012). Employing product adaptation might require making changes in function, pricing, delivery or packaging of the product. Adapting the product features is also common in inter
organizational relationships. However, according to Hakansson (1982) product adaptation can have a form of marketing strategy whereby new products are based on modification or some improvement on existing or competing products, and not on pioneering innovations. Adaptation of a product can strengthen and promote long term relationships between firms.

With continuous changes in the environment, meeting the needs of the target market is a key factor in product adaptation. To attract customers, firms need to employ effective product adaptation. The latter is essential for a business to maintain a place in the market. However, too much adaptation can lock-in firms and increase dependability on one another (Hagberg-Andersson, 2006). Furthermore, according to Brennan and Turnbull (1999) product adaptation made for a single buyer only might imply additional costs with zero returns. Therefore keeping the right level of product adaptation is an important task for any firm. Moreover, Gourville (2005) stated that it is hard for any product to gain marketplace acceptance and more so if the product is highly innovative or a really new product. It is therefore the responsibility of firms to ensure that the innovative products succeed in the marketplace by understanding the degree of behaviour change the innovation needs and planning for it. Alternatively, the product can be tailored to suit the marketplace hence minimizing the behaviour changes consumers have to make.

3.2. Factors to consider for product adaptation within firms

Trott (2012) stated that how and when firms decide to enter the market can affect a product’s prospects on how it will be adapted in the market. Moreover, timing of an innovation to the market can make or break it. The author theorizes three factors that can ease adaptation of a product into the market as well as stimulate that product's’ life cycle. Firstly, the entry timing is crucial for firms. Trott (2012) argued that early entry is desirable as firms that enter the market first accrue ‘first mover advantage’. Additionally,
first movers are able to influence and shape customers’ expectations and evaluations of the product. In light of this, Schilling (2008) also noted that first movers are first to sell the product in a virgin market. Companies that are first to introduce a new technology product earn a longer lasting reputation as a leader in that technology domain. Having a first mover advantage can also enable a firm gain competitive advantage especially those that operate in technology based industries (Grant, 2010). However, many firms believe that being the "first mover" or first-to-market their product is the key to success. One of the key challenges of entry timing is that firms overvalue technology innovation, while consumers undervalue it. Hence, while consumers are skeptical about innovation and distrustful of the benefits of a new product, firms are convinced that consumers are begging for that innovation and will automatically believe that "new" equals "better" (Gourville, 2005).

**Scale of entry** is the second key factor that Trott (2012) highlighted. Scale of entry has an impact on the product performance within the market as well as its product life cycle. Firms need to invest a substantial amount of effort and resources depending on which stage the product is in its life cycle in order to increase market exposure and acceptance of the product. Rama Rao (2008) observed that firms have to evaluate the need for product adaptation on a continuing basis. Product adaptation may also be used as a strategy to enter a market which is dominated by the existing manufacturers. A slightly modified product that suits the market will have a better chance of success in getting a better position in the market than a product which is similar to the existing products in all essential aspects. The modifications in the product serve as the key selling points. Additionally, product adaptation results in cost reduction that will be an additional advantage. Furthermore, Nakra (2005) noted that product adaptation deals with a whole range of issues, ranging from quality and appearance of products, to materials, processing, production equipment, packaging, style and modelling. A product may have to be adapted in a number of ways to meet the physical, social or mandatory requirements of a new market. It may have to be modified to conform to government regulations or to operate effectively in country specific geographic and climatic conditions. It may be redesigned or repackaged to meet the diverse buyer preferences, or standard of living conditions.
The last factor that Trott (2012) pointed out was the **decision of positioning**. The author here argued that this factor can enable customers distinguish different products in the marketplace so that the already existing competitors do not over shadow firms that are relatively new in the industry. Moreover, innovation is not considered a success until it has established and fixed itself in the market place. This however depends on how it is implemented into the market, its reception by the consumers and the continuing attention given to its improvement (Trott, 2012). Furthermore, Rama Rao (2011) argued that marketing focuses on the needs of the customer, and therefore should begin with an analysis of customers’ requirements and attempt to create value of providing products and services that satisfy those requirements. Marketing techniques such as segmentation are most applicable to relatively mature and well understood products and markets and are of limited use in an emerging ill-defined market. Therefore before applying the standard marketing techniques, maturity of the technologies and markets must be defined. Nakra (2005) stated that despite having an obvious benefit to designing products to meet a variety of standards, the idea of a fully standardized global product that is identical all over the world is a “near myth”. Stated differently, to be successful in marketing products in international markets, most products require some level of adaptation or localization specific to the target market.

In addition to the above three factors, Rama Rao (2008) also noted that a **product’s size and packaging** may have to be modified to facilitate shipment or to conform to possible differences in engineering or design standards in a country’s markets. Product adaptations may even include changes in one or more combinations of brand name, color, size, taste, design, style, features, materials, warranties, after sale service, technological sophistication and performance. The author further noted that firms often find the need for some changes to be obvious while other changes may require in-depth analysis of societal customs and cultures, the local economy, technological sophistication of people living in the country, customers’ purchasing power and purchase behavior. Legal, economic, political, technological, and climatic requirements of a country market often dictate some level of localization or adaptation.
Moreover, a country's standard of living and the target market’s purchasing power can also determine whether a firm needs to modify a product. The level of income, the level of education, and the availability of energy are all factors that help predict the acceptance of a product in a foreign market. For example, if a country's standard of living is lower than that of the United States, a firm may find a market for less sophisticated product models that have become obsolete in the United States. Certain high-technology products are inappropriate in some countries not only because of their cost but also because of their function (Rama Rao, 2011). Thus, an important first step in adapting a product to a foreign market is to determine the degree of newness as perceived by the targeted market. The reaction to the newness and / or how new a product is to a market must be understood. In evaluating the newness of a product, firms must keep in mind that many products successful in developed countries having reached the maturity or even decline stage in their life cycles, may be perceived as new in developing countries or markets and thus must be treated as innovations (Rama Rao, 2011).

A climate of ever-changing technology also affects the opinions of consumers when adapting to a product. For example, if there is a trend developing such as a demand for a new feature for an existing product, adapting the product to that consumer need might help increase sales. Technology innovation is seen as the lifeblood of many technology driven industries and firms, and it must be seen as the driving force behind all functional areas and levels within an organization. Firms that make technology innovation a priority and operate with intimate knowledge of their customers will stand a much better chance of meeting their customers' needs. Successful technology innovations need to be the core of any business strategy with marketing, capital investments, manufacturing, and research and development expenditures allocated around innovation rather than being dealt with as an extension of any one these areas (Rama Rao, 2008; 2011). Kucsmarski (1999) mentioned that technology innovation should not be considered as any other activity to be carried out within a firm. Instead, the author argued that it should be viewed as a way of life for technology driven firms hence incorporate it in their way of thinking, managing and
feeling. Barrier (1994) mentioned that firms that make technology innovation a component of their corporate identity and place it in the centre of their overall strategy are best positioned to be leaders in product development. While continually updating products is a necessary function and often the driver of technology innovation, product adaptation will never outweigh technology innovation in strategic importance. However, according to Kucsmarski (1999) technology innovation, unlike product adaptation, creates or protects competitive advantage for a firm, thereby offering greater long-term success.

Zarecor (1975) observed that firms in technology driven industries need to have a thorough analysis of the market place before introducing the product to consumers. Moreover, high tech industries must be in position to create markets and not simply serve the already existing ones as well as be able to create a product from the technology and then create a market for that product. Additionally, whether or not the market accepts an innovation and the time it takes to do so depend on the product’s characteristics. Products new to a market are considered as an innovation to that particular market (Rama Rao, 2011). Zarecor (1975) further noted that firms need to determine how products can establish acceptable patterns of behaviour i.e. the product should be perceived as appealing as well as necessary enough for the customers. Ex post Zarecor (1975) argued that it is not enough to simply consider the capabilities of the technology but rather it is important that a market analysis is done to ensure that the product can be adaptable to meet the needs of the customers. Furthermore, the goal of any firm is to gain product acceptance by the largest number of consumers in the market in the shortest span of time. However, new products are not always readily accepted by the intended markets (Rama Rao, 2011). Newell (2012) pointed out that innovation is the act of developing a new process or product and introducing it to the market. Managers must develop processes to encourage and guide the changes taking place. Innovation generally stems from the purposeful search for opportunities.
3.3. Technology innovation

In the simplest formulation, innovation can be thought of as being composed of research, development, demonstration, and deployment. The word innovation originates from the Latin word ‘innovare’ which means to make new / alter /review (Bhat, 2010). Hoffman and Hegarty (1993) argued that when innovation is considered as a source of competitive advantage, it not only represents a strategic change but also becomes incorporated as part of a firm’s strategy. Noteworthy is that Damanpour (1996) pointed out that innovation can be analyzed at three different levels i.e.; the industry level, the company level and the individual level. Additionally, innovation can also be discussed from different aspects and taking an economic point of view, it can be analyzed at both the micro (customer, employees and the organization) and macro levels (nation). According to Ramadani and Gerguri (2011), innovation can be explained from different perspectives; the customers’ perspective (innovation implies better quality products and services), the organizations’ perspective (sustainable growth and increase in profits), the employees’ perspective (new and challenging jobs) and at a macro level, innovation implies more productivity and development for the entire nation.

Ramadani and Gerguri (2011, p.7) defined innovation as “the process of transforming the new ideas, new knowledge into new products and services”. According to Edquist et al. (2001, p.7) innovation equals to “new creations of economic significance normally carried out by firms”. These creations may be novel to the firm or simply a combination of already existing elements to gain better results. Moreover, firms that innovate are more likely to realize financial benefits owing to a growth in sales and an increase in the production scale (Bruno et al., 2009).

Furthermore, Lionnet (2003) defined innovation as the process by which a new idea is brought to the market where it eventually generates money.
Noticeably, the globalization of markets among other factors has accelerated the increasing need for innovation. For many industries today, technology innovation is the main driver of competitive success (Schilling, 2008). Similarly, Cabral et al. (2006) highlighted that as a result of an increase in technological change and globalization, technology innovation has emerged as an important aspect for business growth and survival. Through technology innovation activities, firms are able to increase productivity. These activities can include but not limited to using high technology processes, low unit cost technology processes as well as high unit costs of production processes (Beveren et al. 2010). Ex post Tornatzky et al. (1983, p.17) defined innovation as “technology new to a given organization”.

Furthermore, Tornatzky et al. (1983, p.16) also used Schon’s definition of technology which states that “technology is considered to be any tool or technique, any physical equipment or method of doing or making, by which human capability is extended”. These authors also observed that the definition entailed two key aspects namely the material artifacts and social processes which can be referred to as process technologies and the output made for consumption which can be referred to as product technologies. Hill and Rothaermel (2003, p.2) defined technology as “skills, knowledge, experience, body of scientific knowledge, tools, computers, machines used in the design and production of goods and services”. Technology innovation is the process through which new (or improved) technologies are developed and brought into widespread use. Moreover, Schilling (2008) noted that the rate of technological change in an industry determines the relevance of innovation for an organization. When technologies are changing, firms need to adapt and apply new technologies to innovate products.

Cheng et al. (2003) noted that most technologically oriented firms that are first to market their products enjoy the benefits of the added value of the innovated products especially at the growth stage since they entered the market before their competitors. Schilling (2008) argued that many innovative projects or ideas do not necessarily result into technically feasible products and those that do may fail to earn a commercial return. Hence, the author
further noted that for any innovation to be successful there is need for a clearly defined innovation strategy and management process.

Utterback (1971) theorized that the process of technology innovation occurs in three phases namely; the idea generation phase (originating of a design concept), problem solving phase (results in an invention) and finally the implementation phase (results into market introduction of the innovated product). Utterback (1971) pointed out that the implementation phase consisted of activities such as manufacturing, engineering and plant start-up required to bring an innovative product to market introduction. Slater and Mohr (2006, p.26) also argued that “technology innovation is based on the interaction between a firms’ strategic orientation and its selection of the target market and the way it implements its market orientation”. Broadly defined, technology innovation consists of introducing new features, performance and price attributes to existing products. Additionally, technology innovations create new products based on underlying technological underpinnings (Slater and Mohr, 2006).

However, Bruno et al. (2009) and Rama Rao (2011) noted that there is always a natural resistance from consumers in different markets to accept technology innovations and they pointed out that this can be due to skepticism about the new technology in terms of functionality and quality because it has not been used by these consumers and hence no evidence of success. Furthermore, Bruno et al. (2009) highlighted that firms must innovate on a global frontier in order to create and commercialize a new stream of products that shift the technological frontier in order to stay competitive in the industry. According to these authors the ability for firms to develop new products using technology innovation and become profitable at the same time depends on how adaptable these products are to the different needs of consumers in different markets.

Trott (2012) noted that commercialising technology and products to the market is a key challenge for many firms. The author also pointed out that firms that engage in technology innovation need to examine the different market targets as well as how the product will be
consumed. Trott (2012, p.64) stated that “marketing can provide the necessary information and knowledge required by the firm to ensure the successful development to innovative new products and the successful acceptance of the new products”. In addition, creating a bridge between technology innovation and the market is critical for a commercially viable product because understanding and appreciating what the market will and will not embrace is cardinal.

### 3.4. Product and industry life cycle

Levitt (1965) introduced the product life cycle concept as a management tool for managers in organizations. Additionally, Grant (2010) noted that one of the best known marketing concepts is the product life cycle because products have life cycles i.e. they are born, their sales grow, they reach maturity, they go into decline and they ultimately die. The author further noted that just like products have cycles, so do the industries that produce them. According to Grant (2010, p.271) the “industry life cycle is the supply side equivalent of the product life cycle”. In the same vein, Christiansen et al. (2010) also pointed out that products in terms of their value and life are usually expected to follow the life cycle, where they move from being an investment to a profitable product and are gradually phased out. According to Komninos (2002, p. 3) “the product life cycle refers to a period from a product’s first launch into the market to its final withdrawal and split up into phases”. The product life cycle consists of five stages namely; the product development stage, the introduction stage, the growth stage, the maturity and finally the decline stage as illustrated below.
Christiansen et al. (2010) pointed out that authors like Rogers (1962), Tushman and Anderson (1990) and Abernathy and Utterback (1978) depicted different life cycles for customers’ adaptations to new technologies, dominant designs and for industries, firms, products and technologies respectively. On the contrary, authors like DeBresson and Lampel (1985) criticized the relevance of the life cycles stating that these cycles create complex relationships and accumulate diverse information. However, Levitt (1965) argued that the product life cycle is a helpful management tool that can be used in deciding competitive decisions and moves for firms. In addition, Klepper (1996) also mentioned that the product life cycle is driven by the way new technologies evolve. The author noted that when a product is introduced, there are uncertainties as to the user preferences and technological means of satisfying the users. Products ultimately go through their life cycles, their markets and development characteristics and hence change at each stage (Noori, 1991). The different stages of the product life cycle are further discussed below;
3.4.1. Stages of the product life cycle

The product development phase begins when a company develops a new product idea. This stage involves translating various pieces of information and incorporating them into a new product. The products that survive the test markets are then introduced into a real marketplace and the introduction phase of the product begins (Komninos, 2002). Egger and Drukker (2010) referred to the introduction stage as the “pioneering phase” and they noted that it starts after the product is launched onto the market. Smith (2007) argued that when a product is introduced, there is a period of slow growth. However, according to Egger and Drukker (2010) if a product is not rejected at this stage, the growth stage will set in leading to an increase in sales turnover.

After the successful introduction of a product, a company tries to increase its market share, which is its percentage of sales volume compared to competitors in the same category. The growth phase offers the satisfaction of seeing the product take-off in the marketplace (Komninos, 2002). The growth stage is a key phase for a product because there is rapid increase in sales at this stage as a result of a wide range of consumers accepting the product (Smith, 2007). Additionally, Egger and Drukker (2010) stated that this stage is characterized by high levels of imitation from other producers of the same or similar product which in turn leads to an increase in competition in the market.

At the maturity stage the market becomes saturated with variations of the basic product, and all competitors are represented in terms of an alternative product. This phase is characterized by “decreasing growth rates in sales and the elimination of weaker competition” (Egger and Drukker, 2010, p.47). According to Moon (2005), firms with products at this stage need to focus on product augmentation, product differentiation and building brand reputation due to fierce competition. As a result of low sales of the product that generates little cash, the product declines gradually (Smith, 2007). The decision to withdraw a product is always a complex task but is sometimes inevitable. Usually a product decline is accompanied with a decline of market sales. This is the time to start withdrawing
variations of the product from the market that are weak in their market position (Komninos, 2002).

### 3.4.2. Growth stage of the product life cycle

As the introduction stage of product life cycle ends, the product has spent considerably moderate time in the market where customers get familiar with the product and start buying the product and or consuming it. For many manufacturers, the growth stage is the key stage for establishing a product’s position in a market, increasing sales, and improving profit margins. This is achieved by the continued development of consumer demand through the use of marketing and promotional activities, combined with the reduction of manufacturing costs. With the product now in the market, it becomes more strengthened and faces more intense competition. This competition now offers greater choice to the customer in the form of different product type, packaging and price. The market base expands as more customers buy the product. To remain competitive over a period of time, firms initiate product improvement or modification in the product to stay in the market (Solomon et al., 2009).

The growth phase offers the satisfaction of seeing the product take-off in the marketplace. This is the appropriate timing to focus on increasing the market share (Komninos, 2010). If the product has been introduced first into the market, (introduction into a “virgin” market) then it is in a position to gain market share relatively easily. A new growing market alerts the competition’s attention and hence a firm must show all the products offerings and try to differentiate them from those of the competitors. A frequent modification process of the product is an effective policy to discourage competitors from gaining market share by copying or offering similar products. This period is the time to develop efficiencies and improve product availability and service (Komninos, 2010)

Managing the growth stage of a product is essential. Firms sometimes consume much more effort into the production process, overestimating their market position. Grant (2010) noted
that this stage is characterized by a high rate of market penetration as a result of technical improvements and increased efficiency. In concurrence with the latter, Dhalla and Yuspeh (1976) also observed that this stage is characterized by increased market penetration and emulators of the same or similar product. At the growth phase, the quality of the product is maintained and developed by adding features in addition to implementing support services. At this point in the product's life cycle, firms put their efforts into increasing the product's market share and creating a brand preference for the customers. This is a period of rapid growth in both sales and profits for both the product and firm. A firm’s profits rise through an increase in output and more competitive pricing. Firms should also consider increasing distribution channels to cope with additional demand as well as targeting a wider audience (Solomon et al., 2009). Moreover, Dhalla and Yuspeh (1976) noted that at this stage of the product life cycle, profits reach their peak levels as a result of increased demand of the product.

The emphasis in the growth stage is on sales growth and early product diversification. Product lines are broadened, but this generally results in a more complete array of products for a given market rather than new positions in widely varying markets. Efforts are also devoted to incrementally tailoring products to new markets, while less stress is placed on major or dramatic product innovations (radical innovation). Market segmentation begins to play a role, with firms trying to identify specific subgroups of customers and to make small product modifications in order to better serve them (Vendetti, 2010). Additionally, Day (1981) also pointed out that during the growth stage of the product life cycle, as the market expands, there are new opportunities for segmentation and adaptation of the product to meet the needs of the different customer groups. Hence, firms may attain profitability during this phase. This is primarily the result of the growth of the existing product line being sufficient to drive the organizational success without taking significant risks. In addition, Vendetti (2010) noted that the existing customer base begins to influence the product evolution and resource allocation through smaller feature enhancements and product improvements.
At the growth stage, the product of the firm starts to grow. At this stage, a very large amount of the firms’ resources are spent on promoting the product for example in terms of advertising and promotions. The underlying reason for this is that a firm aims at informing the consumer how much better their product is than the competitors’ products. Once sales begin to increase, a firms’ share of the market will stabilize (Vendetti, 2010). Moreover, customers at this stage are usually considered as early adopters and early majority. The early adopters are customers that aid in promotion of the product through word of mouth. During the latter part of the growth stage, the first major segment of the mass market, called the early majority, enters the market. This category of consumers is more price sensitive and lower on the socio-economic spectrum (Thompson, 2002; Schilling, 2008). As a result, these consumers are somewhat more risk averse and, therefore, somewhat more hesitant to adapt the product (Thompson, 2002).

Vendetti (2010) pointed out some of the shortcomings of the growth stage which include:

- **Increased Competition**: When a firm is the first one to introduce a product into the market, they have the benefit of little or no competition. However, when the demand for their product starts to increase, and the firm moves into the growth phase of the product life cycle, they are likely to face increased competition as new firms look to benefit from a new and developing market. Additionally, there is an influx of firms producing the same or similar product at this stage of the cycle as Grant (2010) noted.

- **Decrease in Prices**: During the Introduction stage, firms can very often charge early adopters a premium price for a new product. However, in response to the growing number of competitors that are likely to enter the market during the growth phase, firms may be forced to lower their prices in order to achieve the desired increase in sales. Schilling (2008) also noted that customers at this stage are price sensitive.

- **Different Marketing Approach**: Marketing campaigns during the Introduction stage tend to benefit from all the hype that surrounds the launch of a new product. But once the product becomes established and is no longer ‘new’, a more
sophisticated marketing approach is likely to be needed in order to make the most of the growth potential of this phase hence the relevance of the early adopters who promote the product through word of mouth (Thompson, 2002).

However, Vendetti (2010) also highlighted benefits associated with the growth phase and these include:

- **Reduction in costs**: With new product development and marketing, the Introduction stage is usually the most costly phase of a product’s life cycle. In contrast, the growth stage can be the most profitable part of the whole cycle for firms. As production increases to meet demand, firms are able to reduce their costs through economies of scale, and established routes to market will also become a lot more efficient.

- **Increased Consumer Awareness**: During the growth phase more consumers become aware of the new product as a result of better marketing techniques. This means that the size of the market will start to increase and there will be a greater demand for the product; all of which leads to the relatively sharp increase in sales that is also a characteristic of the growth stage.

- **Accelerated Profits**: With lower costs and a significant increase in sales, most firms will see an increase in profits during the growth stage, both in terms of the overall amount of profit they make and the profit margin on each product sold.

### 3.4.3. Maturity phase of the industry life cycle

An industry that has passed the emerging and growth stages can be categorized as a mature industry. According to Grant (2010) the industry life cycle is defined as the supply equivalent of the PLC goes through the stages; introduction, growth, maturity and decline. Williamson (1975) defined three stages in an industry's development: an early exploratory stage, an intermediate development stage, and a mature stage. The first or early formative
stage involves introduction of new products with relatively primitive design in a low volume. Additionally, firms have a high degree of uncertainty at this stage. The second stage is the intermediate-development stage in which market demands are not satisfied and output grows rapidly. In a mature industry, buyers (customers) are aware of the product and suppliers (firms) know the market needs. Earnings and sales grow slower in mature industries than in growing and emerging industries. Markets may continue to grow, but the rate is more regular and predictable. Future growth is limited and firms in it might grow by taking sales from competitors or by diversifying. Marketing techniques in mature industries are more focused on monitoring competition and on pricing and promotion strategies (Vendetti, 2010).

Grant (2010) highlighted that this stage of an industry's life cycle is characterized with market saturation and this implies that the product is in a position where it can be wholly replaced by other similar products in the same industry. As the competition increases, customers diffuse to different companies, sales decrease which in turn leads to a decline in revenues. Therefore, product features are enhanced at this stage to differentiate the product from that of the competitors, though “significant innovations tend to be fewer and are mainly of an improvement character” (Klepper, 1997 p.147). Any expenditure on research and development is likely to be restricted to product modification and improvement and perhaps to improve production efficiency and quality. Additionally, firms at this stage have trouble satisfying their stakeholders such as employees, customers and shareholders.

Furthermore, Frost (1984) mentioned some of the features of which are characteristic to a mature industry and these include; low variety of products, growing competition, slow growth in total demand, innovations in productivity and cost reduction. Ultimately, the crisis that strikes firms at the maturity stage is the envisioned or actual progression to the decline stage (Vendetti, 2010). However, it is noteworthy to state that a mature industry is not always stable (Haberberg and Rieple, 2008). These authors noted that price wars, acquisitions, new products, technology or business model introductions can shake firms and encourage them to come up with the innovative ideas.
Despite the aforementioned shortcomings a mature industry might be characterised by, Fuller and Stopford (1992) argued that the business milieu still displays many opportunities that firms can benefit from. Even though the competition in such industries is severe and businesses can perform poorly, mature industries are still profitable due to the number of creative and innovative participants. Moreover, a profitable industry is able to attract more companies and grow its revenues. In the same vein, Vendetti (2010) observed that at the maturity stage, sales levels stabilize due to a high level of competitive activity and market saturation making firms highly profitable at this stage. Metaphorically stated, just as a caterpillar can turn into a butterfly, a mature industry can be rejuvenated into a profitable industry for a creative company (Fuller and Stopford, 1992).

Managers of firms in mature industries are imprisoned by the environment and blame it to be the main factor of deteriorating business performance (Fuller and Stopford, 1992). The authors contrast the view of successful managers who see the mature environment as a source of new opportunities and consider the failure as the responsibility of managers not the environment. The key factors for success are to understand how the firms’ technology, customers and environment work. Among the important production factors during the industry life cycle, Frost (1984) pointed out technology as one of them. Furthermore, innovation in the employment of technology determines the company’s competitive advantage (Fuller and Stopford, 1992).

According to Fuller and Stopford (1992) firms operating in the mature industry can challenge this phase of the life cycle and create value for all their interest groups through technology innovation. Choosing the right strategy within the firm is more important than industry related factors in shaping business performance. To maintain high variety, quality and speed at low cost is the effect of strategic innovation. Furthermore, careful focus and relevant employment of technology in the innovation process should be part of a firms’ strategy. Fuller and Stopford (1992) gave the example of Bank One (US) which considered itself successful because of its willingness to try a number of new things. Innovations can bring about competitive advantage and help firms discover the ways to solve related
challenges. Additionally, Fuller and Stopford (1992) referred to Schumpeter who pointed out that doing things differently inside the business is the real source of improvement.

3.5. Product adaptation and technology innovation

At the growth stage, firms aim at building brand preference and increasing market share (Vendetti, 2010). Additionally, Jichuan (2005) noted that firms need to be in position to build their own brand names and become profitable in a technology driven environment. Thus, firms need to enhance their investment in technology development, and make self-reliant innovation for consumer requirements in light of the market share while introducing new technologies that are adaptable to the target market. Moreover, technology innovation includes but is not limited to basic and applied research, product development, manufacturing, marketing, distribution, servicing, and later product adaptation and upgrading (Garcia and Calantone, 2002).

Ceridon (2010, p.14) observed that “using life cycle thinking can help facilitate innovations rather than limit them”. The author further asserted that it is important for firms to examine a product from the time it is introduced into the market until the end of its life in order to set strategies that can aid in gaining competitive advantage for them. Ex post, Subrahmanya et al. (2010) emphasized that technology innovation is unavoidable especially for firms that seek to gain competitive advantage and / enter new markets. They also argued that firms that are technologically innovative need to have in-house technological competence as well as market demand for the innovated product in the form of explicit customer demand or implicit market opportunities. Hence, as noted by Zarecor (1975), firms need to have a thorough analysis of the marketplace in order to create a product from the technology and then create a market for that product. A thorough analysis of the marketplace would imply that the delivered product has to meet the requirements and expectations of the target
market thus the need to adapt the product to the specifications of the target market (Hagberg-Andersson, 2006).

A product throughout its life cycle creates endless opportunities to innovate it hence creating more sustainable and successful products in the market. The timing associated with the product life cycle depends on the nature of the product i.e. whether it is a wholly new product or enhancing an existing product (Ceridon, 2010). Cheng et al. (2003) noted that at the growth stage, products that have superior functions and quality tend to replace the existing ones if they are accepted and appreciated by the customers. However, Hill and Rothaermel (2003) observed that most products fail in the market because they are not designed to meet customer needs. As pointed out by Hagberg-Andersson (2006), firms need to deploy effective product adaptation in order to attract customers and maintain a place in the market.

Jichuan (2005) noted that technology innovation is paramount for firms that operate in environments that experience rapid technological development and have high levels of competition. He also stated that firms that operate in such environments need to follow up on the technological trend as well as open up new markets through technology innovation. In light of the above, Cheng et al. (2003) observed that as an industry matures, product and technology innovation between firms in the industry intensifies and hence firms need to enhance the performance and or redesign the products to meet customer requirements. The authors highlighted that technology innovation is of increasing importance to countries and businesses because it provides an essential competitive edge for current and future markets. Brown (2002) argued that growth in mature industries can be achieved through merging of product and application technologies to create new and better processes and systems that do not already exist. The author also goes ahead to assert that firms in mature industries can also improve their products through integration, alliances and innovation.

Utterback (1994) theorized that a technology's or industry's life cycle comprises three development phases: fluid, transitional and specific. In the fluid phase, there is great
uncertainty as to a company's product, process, competitive leadership and management structure while in the transitional stage, a dominant product design emerges. However, in the specific phase, an industry has entered its maturity phase and the value of the quality / cost ratio becomes the basis for competition. At this stage, innovations to the product are incremental and modifications at this stage are costly. There are few firms, producing standardized or slightly differentiated products, or commodities, which enjoy stable sales and market shares. Notably, Jichuan (2005, p.6) stated that “Without technological innovation, there will be neither increased momentum nor new products suited to the market for enterprise continuation and development”. In concurrence to the latter, Norman (1998) also noted that technology innovation drives the shift from a high tech-product to a customer commodity. Furthermore, Christensen (2003) argued that a technology product is considered ‘good enough’ for customers if it is able to meet their basic needs.

Technology innovation can include a new product, a new production process, internal functions resulting into improved productivity and cost reductions as well as an improvement in the methods used in the innovation process (Utterback, 1994). However, Ziberman (2005) theorized that technologically innovative products cannot be optimal in all markets as there are ecological, cultural and socio-economic factors to consider. Firms need to adapt such technologically innovative products to specific conditions of their target markets. For example, a product might have different versions to meet the needs and specifications of the different markets.

3.6. Defining market by levels of technology

Technology is an essential component of a firm’s efficiency and competitiveness. In enhancing productivity, adapting to the technological changes by targeted markets can be crucial for companies. Smith (2007, p.216) defined a market as “actual or potential buyers of a product”. The author also pointed out that this definition of the market implies that it
Product Adaptation to Different Markets through Technology Innovation

does not only include individuals but also private and public sector organizations. According to (Sala-i-Martin et al., 2011) the standard of living at the macro level can be enhanced only by technology innovation which can occur through invention and innovation. Low income countries where the technological development is deficient need to invest in Research and Development to enhance innovation abilities (World Bank, 2008).

Heeks (1995) stated that technology availability, technological skills and economic development are related to each other. Developing countries have low access to technology and fewer opportunities to apply them to increase productivity, thus quality of life. They depend on imports from the developed countries and sometimes they are unable to adapt to the imported technology. Furthermore, findings in the World Bank report (2008, p.4) mention that technological progress contributes in development by “lowering costs, improving quality, creating new products, and helping reach new markets”. Additionally, employing relatively simple skills to improve living conditions is an achievement of technological development. Geographical location can play a role in economic growth of a country, for example poor states situated close to the rich ones can benefit from the wealthy neighbours exploiting new technologies.

Low income countries i.e. developing states have quarter of the technology level of developed countries. Rich (high income) countries use technology rapidly due to its availability and having the necessary knowledge of usage. According to McArthur and Sachs (2002) technology innovation encourages another innovation and works as a chain therefore fuelling economic growth. For example The United States and Canada, Western Europe, Japan accounted for nearly 99 percent the patents issued for new inventions by the US Patent Office and main innovators in the world (McArthur and Sachs, 2002). Thus economic development of a country can be the determinant of the technology development level. Advanced countries have higher technology level and developing ones are characterised with low performance of technology. Moreover, Archibugi and Coco (2004) noted that on the example of many African countries low technological level is associated to the very low income levels.
The factors which cause the difference between the developed and developing (high and low income) countries are political, economical, cultural and technology. Technology innovation and its proper implementation contribute in the development process. However, technology innovations can provide solutions to developmental problems (Heeks, 1995). The significant division between countries is based on their ability to achieve technology innovation at a high rate (McArthur and Sachs, 2002). Furthermore, Dahlman (2007) pointed out that innovation should be considered broadly as improved products, processes, organizations and businesses. However, the author argued that innovation in the context of developing countries is more of a challenge because it involves the first use of a new technology in the local context.

Therefore for the purpose of this thesis, market division will be based on the level of technology innovation as defined by McArthur and Sachs (2002). Under the term different markets is meant high and low technologically developed countries which are corresponding to high and low income states. The economies that reach at least 15 patents per million populations are called innovative, therefore rich countries. The economies meeting these criteria in 2000 are listed in the table 1. Indeed these are the richest countries with sustained economic growth. The rest of the countries are less innovative therefore less developed.

### Table 2 Countries with more than 15 US utility patents registered per million population in 2000

<table>
<thead>
<tr>
<th>Australia</th>
<th>France</th>
<th>Italy</th>
<th>Singapore</th>
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<tbody>
<tr>
<td>Austria</td>
<td>Germany</td>
<td>Japan</td>
<td>Sweden</td>
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<tr>
<td>Belgium</td>
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<td>Finland</td>
<td>Israel</td>
<td>Norway</td>
<td>United States</td>
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Smith (2007) emphasized that firms that hope to introduce their products into the markets need to carry out extensive market research in order to study the market carefully. Moreover, he also highlighted some characteristics that firms need to take into consideration and some of these include; the people and organizations that make up the market, the nature of the product that is being introduced into the market, the purpose for which this particular product will serve to the market to mention but a few. Dahlman (2007) stated that technologies must be adaptable in order to be applicable in specific conditions. Arguably, Smith (2007) also noted that markets may differ in various ways for example in terms of size, competition, barriers and dynamism. However, Dahlman (2007) noted that using new technological products requires literacy as well specialized training on how to operate that particular product.
Figure 2 Concept map
4. Case study

The case study is based on the collection of sources from secondary data such as journals, articles, books, Saab’s annual reports, online publications and information published on Saab’s official web page. Additionally, we had an informal meeting with the representative of Saab who provided us with useful information about the product, its history within the organization, difficulties and future plans. The primary data gained through this interview helped us to thoroughly understand the secondary data and make connections between different information. However, due to the confidentiality of the information obtained through the interview, we were not permitted to directly refer to it in our thesis.

4.1. History of product and industry

The field hospital industry has had a long history of existence. It dates as far back as the 17th century in France when Napoleon's army assigned people to help the wounded. Those assigned were known as litter-bearers and comprised mostly of inept and expendable soldiers. In the US, the American Colonel Army which was led by George Washington also had litter-bearers during the Revolutionary War. In 1862, due to the unexpected size of casualty lists during the battle of Manassas where it took one week to remove the wounded from the battlefield, Dr. Jonathan Letterman, Head of Medical Services of the Army of the Potomac, revamped the Army Medical Corps. His contribution included staffing and training men to operate horse teams and wagons to pick up wounded soldiers from the field and to bring them back to field dressing stations for initial treatment. Dr. Letterman also developed the 3 tiered evacuation systems which are still used today.

- Field Dressing (Aid) Station which was located next to the battlefield.
- Field Hospital - close to the battlefield (during the Civil War it would be barns or houses). They were used for emergency surgery and treatment.
• Large Hospitals - which were away from the battlefield and were for patients' prolonged treatment (1st Cav Medic, 2007).

Fast forward to today, there are still places in the world that are affected by wars and turmoil and unfortunately, there are people who get wounded as a result of this. Moreover, there is barely a period in human history when wars and people getting injured has not taken place. Hence, taking care of those wounded in battle has been and still is an issue. Field hospitals have been used successfully for number of years to provide immediate care to victims.

A field hospital can be defined as “a mobile, self-contained, self-sufficient health care facility capable of rapid deployment and expansion or contraction to meet immediate emergency requirements for a specified period of time”. Field hospitals can be used for three purposes and relatively with different periods of time: early emergency care lasting up to 48 hours, follow up care from 3 to 15 days, work as temporary facility from the second month to two years or more (WHO and PAHO, 2003, p.6). Furthermore, according to WHO and PAHO (2003), the general requirements for the field hospital are listed below:

• Field hospital needs to be constructed near the site in a short period of time (depending on the purposes of the hospital, for example in case of an emergency the time needed to construct is 24 hours after the disaster/attack)

• Be entirely equipped with technology, tools, medical supplies and the necessary staff and minimally depend on the support of the community.

• Personnel needs to be trained and qualified to treat sufficiently the patients with variety of injuries

• To have information about the health system and culture of the country is desirable. This knowledge can help to make communication with local authorities or patients easier. Medical personnel who are unfamiliar with the environment prove to be less efficient and even a burden for the host community

• As the field hospital is an expensive product, the details of costs need to be agreed beforehand between the supplier and buyer.
Additionally, Bricknell (2001) noted that field hospitals need to be easily deployable and capable of being sustainable in a hostile military environment. The author however observed that the biggest challenge for the field hospitals is to be activated and maintained in a “green field” area. A field hospital design should include four major functions: clinical services, command, administrative support and accommodation (Bricknell, 2001).

![Figure 3 Layout of standard field hospital](image)

MTSF - Mobile transportable surgical facility  
A&E Reception - Accident and emergency reception  
CSSD - Central sterile supplies department  

Source: Bricknell, 2001, p. 166

Additionally, McLaughlin and Papadopoulou (2008) also listed some factors portable field hospitals can be evaluated against some of which include means of transport, transportation size, weight, size when deployed, footprint to deployed ratio, time to deploy, number of people needed to deploy, modularity, adaptability, security, number of patients, life span, shelter from the elements to mention but a few.
4.2. SAAB (Defence and Security)

When Saab, Svenska Aeroplan Aktiebolaget, was founded in 1937, its primary aim was to meet the needs for a domestic military aircraft industry in Sweden. Today, Saab (Defence and Security) is a Swedish company that has extensive experience in supporting ground forces with solutions designed to meet the needs for enhanced operational capabilities and a higher level of effectiveness (Saab, 2010a). Moreover, Saab is one of the world’s leading high-technology companies, with its main operations in defence, aviation and civil security. Additionally, Saab’s operating and management structure is divided into six business areas, which also represent operating segments. These include; Aeronautics, Dynamics, Electronic Defence Systems, Security and Defence Solutions, Support and Services, and the independent subsidiary Combitech. Saab’s internal goals are focused on four areas: 

* Profitable growth* - continuously evaluating its positioning and identifying growth opportunities; 
* Portfolio* - adapting portfolio to areas with strong competitive advantages and growth opportunities; 
* Performance* - working with efficiencies and continuous improvements and 
* People* - considering employees as the backbone of offering and growth.

Focusing on growth, Saab considers expanding internationally in military and civil security by investing in and strengthening positions in selected markets (Saab, 2012).

**Business concept**

According to the annual report (Saab, 2012) Saab constantly develops, adopts and improves new technology to meet changing customer needs. Saab serves the global market of governments, authorities and corporations with products, services and solutions ranging from military defense to civil security.

**Vision**

It is a human right to feel safe- Saab strives to keep society and people safe. Saab makes this possible through its product systems and solutions.
Mission
To make people safe by pushing mental and technological boundaries- By improving and updating technological systems and solutions, Saab increases security in society, for its citizens and for those whose job is to maintain security. It also contributes insights into how threats to our security change and develop innovative new solutions that make society secure.

Core values
At Saab, values are shared which are inherited from generation to generation and reflect the company’s soul.

Drive – a passion for innovation, open to change and are committed to being fast and flexible.
Expertise – combined knowledge, skills and constant learning.
Trust – Saab considers itself as a global citizen, honest and reliable and keeps its promises.

In 2007, Saab (Support and Services business area) started to manufacture field hospitals making this product relatively new to the company although this particular product has been in existence for over two centuries thus making the field hospital a mature product and industry. Saab’s turnkey Medical Care Solutions (MCS) are cost effective, flexible and can be quickly deployed into the international arena. Adapted to fit the individual requirements of each mission, Saab’s medical care system is suitable for a range of field applications and meets the demands of remote or challenging areas. Saab provides end-to-end support including equipment, operation and maintenance services, ready for immediate use by any medical team. Medical Care Solutions units are based on a modular system and are currently configured to provide support for pre hospital Care or a complete Field Hospital (Saab, 2010b)
4.3. **Saab’s Field Hospital**

Since December 2007 when the Forward Surgical Unit and Dental Care Unit supplied by Saab for the Nordic Battle Group became operational, its partnership with the Swedish Armed Forces has been extended so that Saab now provides all their field medical care solutions. Saab is able to offer this world-class capability to a wider military market to support Humanitarian and Disaster Relief Operations with its solutions meeting the North Atlantic Treaty Organization (NATO) and the United Nations (UN) requirements. Field hospitals are based on a modular system hence Saab can supply anything from a basic in-patient unit to a full field hospital anywhere in the world. Standard modules include surgical theatre, units for intensive care, trauma, out-patients, x-ray and ultrasound and a multi-functional unit with pharmacy, sterilization and storage for blood and test results. Equipped with standard civilian medical equipment and instruments, additional training is minimized. Saab integrates the equipment and provides a complete infrastructure support solution, including maintenance, transportation, logistics and storage, as well as essential services, such as power supply, sanitation, IT and camp security systems (Saab, 2010c).

Saab provides completely customized products, a fully-equipped field hospital, or a total camp solution. These operations offer reliable, cost-effective service and support for all markets where Saab is active. This primarily includes integrated support solutions, technical maintenance and logistics, and products, solutions and services for military missions in locations with limited infrastructure. The goal is to create a more market-oriented company with even greater focus on customers’ future needs and requirements. This means, among other things that Saab will continue to grow in the global market and develop distinctive customer offerings.

Saab has a proven record in supplying completely packaged multi-function field facilities and camp sites for armed military forces. Acting as an integrator and prime contractor, Saab and its trusted partners have experience in camp construction for several international
missions. Although all the field facilities are customizable to specific requirements, these facilities can be categorized into three basic stages; quick response, temporary and long-term. These types are not mutually exclusive, and customers can combine the three stages as needs dictate.

The field hospitals provide scalable accommodation for up to 2000 personnel and can include airfields, headquarters as well as ammunition storage and protection. Essentially, the entire infrastructure, both operational and living aspects are conveniently packaged in one solution. The field hospitals are adaptable to meet specific customer requirements and can be provided as an integrated part of a total support solution or as a stand-alone product. Saab offers some standard optional modifications and functions. In addition to these, customer specific modifications are also available as well as modifications to meet operational requirements of certain countries (Saab, 2010c).

4.4. Technology in Saab

Saab has been among the most engineering and innovation focused companies of Sweden. Around 20 per cent of sales is reinvested in research and development to invent or develop new products/services/solutions. Investing heavily in research and development is critical due to the company’s commitment to maintain a high technological level, further improve competitive advantages and create long-term value for shareholders (Saab, 2012).

Saab has built a solid foundation of competences and capabilities and hence does not buy technologies off the shelf. Instead, Saab domestically develops and produces its own technologies and products. This works to the advantage of both Saab and Sweden as pioneering technologies stay in-house. Additionally, Saab is involved in a number of extensive development projects that entail developing world class technology. Noticing the need for a long term perspective, Saab actively participates in transformational processes in
order to maintain a place in the technological forefront. Consequently, the technology priorities set by the customers and partners are crucial to Saab (Saab, 2012).

Saab has managed to retain its position as a technological leader in its product areas because it frees up its resources to increase marketing and development and thus become more efficient and sets up more stringent priorities. Moreover, Saab has for many years proven it has engineering expertise of the highest international class. This capability is fundamental to future growth in new markets and innovative solutions (Saab, 2008).

Saab invests heavily in the research and development of its own products and systems as well acquisitions of technology. For example, in 2006, Saab acquired world leading radar technology from Ericsson Microwave systems. From the Czech Republic, Saab acquired E-COM, a company which specialises in the development and production of virtual simulators. Investments in new systems and products are made after an analysis and assessment of future business opportunities. By acquiring the defence group Celsius in 2000, Saab brought a large part of over a century Swedish defence industry history together under one roof and created Scandinavia’s dominant company in the field (Saab, 2012).

Sweden has historically had an innovative business sector, where Saab is one of a number of key players. Saab has long been one of the country’s most engineering focused and innovation focused companies, where around 20 per cent of sales is reinvested in research and development. This has not only led to major export successes but also created a number of new operating areas and spin-offs, where technologies that originated in defence solutions have found broad civil application. In this way, Saab has served as an incubator for Swedish high-tech innovation. However, staying innovative in a changing financial, geopolitical and market landscape is a challenge for Saab. It is in no small measure a question of access to capital for the necessary investments in Research and Development (Saab, 2012).
4.5. **SAAB’s geographical markets**

Saab addresses traditional defence needs with a core offering consisting of products and systems to safeguard national borders. To a growing extent, Saab also address the functional and security needs of the global low society, which includes the civil security market. Geographically, Saab has a strong position in Sweden and good positions in South Africa and Australia. However, the goal is to consolidate and strengthen its position in the other Nordic countries and selected countries in Europe, while building strong positions primarily in North America, Brazil, India and Southeast Asia. To reach new markets and strengthen its current position, Saab continues to expand its local presence by utilizing cooperative projects and partnership solutions (Saab, 2008).

Moreover, the United Nations (UN) has quickly become an important and growing market for Saab. The journey that culminated in the UN becoming a market began in earnest in 2009. A contract was signed to supply maintenance and technical services for the UN’s missions in East Africa. Three of Saab’s six business areas are participating and initially have focused on logistics and training for peacekeeping missions – in particular, solutions for energy, water and waste management. One of the biggest reasons why Saab’s business relationship with the UN has grown is Saab’s local presence. Saab already has an office in Nairobi, Kenya and is now looking at opportunities to increase its presence in Entebbe, Uganda as well (Saab, 2012).

Saab is faced with two market dimensions which face different conditions and work in different ways. The first market is dominated by national governments and military organizations, while the second is dominated by cities, companies, organizations and individuals. The conditions Saab faces in its operations continue to change, as they do for other defence companies. Moreover, fiscal challenges are forcing many governments to cut their defence spending. At the same time, international defence alliances and civil security needs are increasing (Saab, 2012).
The goal of Saab is to have an annual organic growth rate of five percent over the business cycle and this growth is expected to come from outside their current markets. Saab continuously evaluates positioning and focuses on areas with a strong market position. Furthermore, Saab identifies areas with good growth opportunities and works on strengthening its presence in them. However, the growth must be profitable hence targeting markets where opportunities are right for the profitable growth. With sales in around 90 countries, Saab generated revenue worth 23,498 MSEK with net income of 2,217 MSEK in 2011. The net income indicated significant increase compared to 2010 when it reached 454 MSEK (Saab, 2012).

The competition for resources and living standards is a strong driver of social development and is impacting defence and security companies like Saab. Essentially, it is a question of which products and services Saab offers the market and how it’s done. According to the United Nations’ World Population Clock, the global population passed seven billion on 31 October 2011. In recent years, Africa, Asia and Latin America have seen the largest population gains and economic growth, in contrast to the U.S. and Europe, where the population growth and economic growth has been lower. Economic growth is important to social development, and economic stability and social stability are closely interlinked. As society develops, competition increases for resources such as capital and people, which are critical to drive innovation and growth. The competitive picture has become more complex. While Western Europe and North America are struggling with tough challenges and slow economic growth, Africa, Latin America and Asia also face challenges, but are experiencing higher growth. When this competitive dynamic changes, conflict patterns change as well. Customers in both military and civil markets increasingly want broad-based, integrated solutions that include more services: education, training, support and maintenance. Solutions are evaluated based on not only performance but also in terms of cost of ownership and operation. The trend is shifting toward full operational and functional commitments covering the entire lifecycle (Saab, 2012).
Sweden and rest of the Nordic region
The Nordic region accounts for about one per cent of global defence spending, a figure that is expected to rise slightly in the years ahead. Sweden is the single largest market for Saab, and it is where the majority of the research and development is conducted.

Rest of Europe
After the U.S., Europe is the largest defence market in the world, representing about 23 per cent of global spending. Economic uncertainty and the sovereign debt crisis have led to delays in many defence projects, due to which the market is expected to shrink in the coming years. France, Germany and the UK are expected to account for the largest relative cutbacks. The civil security market is anticipating growth. A large share of Saab’s sales is from the rest of Europe.

North America
The U.S. is the world’s largest defence market, accounting for about 43 per cent of global spending. The market is expected to shrink due to the sovereign debt crisis and changing defence priorities. The U.S. civil security market is also the largest in the world and is expected to continue to grow. Saab strengthened its position in the U.S through the acquisition of Sensis in 2011.

Central and South America
The South American defence market is relatively modest in size. Brazil, one of the strongest economies in the region, represents the largest market. Saab has been established in the region for many years. In 2011, it strengthened the presence by opening a new research centre in Brazil.

Asia, Middle East and Australia
These regions have maintained their strong economic growth. Military spending is expected to continue to increase in the years ahead. The civil security market is relatively immature and strong growth is expected, driven in part by increasing infrastructure needs. A growing
share of Saab’s sales is in these regions, and in 2011 Saab strengthened its presence in India.

**Africa**
The African continent has experienced positive economic growth in recent years. However, several countries face political turbulence and tough economic situations. Spending on defence and civil security is expected to increase in coming years. Since the acquisition of Grintek in 2005, Saab gained a strong position in South Africa (Saab, 2012).

**Figure 4 Geographical markets of Saab 2011 (%)**

According to Saab, the key to success is an approach that focuses on partnership, collaboration and information sharing. This is because it is not about the number of technologies and systems; it is about having the right technology and systems for each customer’s specific needs – the right capabilities at the right price delivered in time.
4.6. Global trends affecting Saab

The Chairman of Saab Marcus Wallenberg in the annual report 2010 observed that, “the global economy is being driven by demand from emerging economies, which is leading to more competition for natural assets from a global perspective” (Saab, 2011, p. 9). Saab is a pioneer in many respects. From a historical perspective, it has been an innovation powerhouse for advanced Swedish technology, and it is important that this capacity remains in place – for both Saab and Sweden. Many innovations generated here have later been further developed outside Saab. Thus, it is important to keep this in mind when looking at Saab from an overarching perspective.

CEO and President of Saab Håkan Buskhe also noted that “It is clear that we live in a globalized world. As security conditions change, our customers’ needs change as well. Consequently, we have to strengthen our local and regional presence and continue the international expansion”. Innovation means not only coming up with new ideas but applying them in practice. Saab’s strength is that it has both technical and social capabilities. Social systems and co-operation between different cultures are extremely important and contribute to improved efficiency. Personal relationships are an important part in succeeding with complex development projects (Saab, 2011, p. 10).

Saab is currently among the twenty-five largest defence and security companies in the world, and probably one of the three or four top in terms of international market coverage. However, macroeconomic factors and geopolitical developments ultimately create the framework for Saab’s business. The defence market traditionally has little co-variation with the global economy. Instead, political developments are the decisive factor globally, regionally and locally. Fiscal constraints are obviously affecting defence spending, however. Additionally, these factors below were highlighted in Saab’s annual report 2010 as factors that Saab considers when adapting a product to their target markets;
The increase in international alliances and system coordination at the same time means that the defence industry can expect to finance less of its development work through national defence budgets. Defence authorities increasingly want access to the best the market has to offer regardless of country of origin and want it delivered on short notice. As a result, a larger share of research and development must be self-financed by the defence industry. Hence this has led to an increased percentage of self financed research and development.

Customers in both the military and civil markets increasingly want broad-based integrated solutions with more service content. The trend is shifting toward full operational and functional commitments covering the entire lifecycle, where solutions are evaluated not only based on performance but also in terms of the cost to own and operate. Outsourcing of activities that had previously been performed internally is becoming increasingly common, including in the military field. This has led to a need for broad and deep long term solutions.

Despite the trend toward international alliances, the need for a strong local presence is crucial to success in both the military and civil markets. Customers want integrated solutions from companies that understand local conditions. This significantly increases opportunities to be selected as a supplier and, no less importantly, have a portion of their development financed through defence appropriations or gain access to local product development.

Continued global integration and new international structures have led to more cross-border and supranational (United Nations, European Union, etc.) co-operation with a shift toward net-centric defence and international joint forces. Civil and military alliances are becoming more common – within, outside and between the major political, economic and military blocs – and require open systems and coordination, where a larger share of development work is done collaboratively. At the same time, it is becoming more common that large development projects are conducted as part of public-private partnerships (Saab, 2011).
4.7. Examples of competitors in the industry

Weatherhaven’s line of portable shelters and camp systems provide comfortable and effective operational environments for militaries deployed around the world, using advanced fabric structure, expandable containers and systems technology. With 30 years of experience, the company provides individual shelters to complete turnkey camps, including field hospital systems and services to its military customers. Weatherhaven has manufacturing and military deployment in South Africa, Eritrea and Ethiopia (Weatherhaven, 2007).

Turkish (TURMAK’s) Mobile Surgical Field Hospitals are designed for medical intervention in case of natural disasters and emergency activities to perform all the required evacuate, diagnose, cure, and temporarily hospitalize the patients as a fully functional hospital. Turmak’s Field hospitals are mobile, transportable by any means (Air – airplane and helicopter-, Road, Sea, and Railway). TURMAKS is a member of ALKE Group of companies that was established in 1955 and became one of the major contracting companies in Turkey. The company’s markets are in Asia, Europe, East Europe and the Middle East (Turmak, 2008).
Table 3 Summary of the case study

<table>
<thead>
<tr>
<th>Company (Saab)</th>
<th>Product (Field Hospital)</th>
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<tbody>
<tr>
<td>• Founded in 1937</td>
<td>• Launched in 2007</td>
</tr>
<tr>
<td>• One of the world’s leading high technology company</td>
<td>• Mobile health care facility</td>
</tr>
<tr>
<td>• Six business areas: Aeronautics, Dynamics, Electronic Defence Systems, Security and Defence Solutions, Support and Services, and the independent subsidiary Combitech</td>
<td>• Standard modules include surgical theatre, units for intensive care, trauma, out-patients, x-ray and ultrasound and a multi-functional unit with pharmacy, sterilization and storage for blood and test results</td>
</tr>
<tr>
<td>• Goals: Profitable growth, portfolio, performance, people</td>
<td>• Customized product for armed forces</td>
</tr>
<tr>
<td>• Products, services and solutions ranging from military defence to civil security</td>
<td>Equipped with technology, tools, medical supplies, staff</td>
</tr>
<tr>
<td>• Mission-to make people safe by pushing mental and technological boundaries-Drive – a passion for innovation, open to change and are committed to being fast and flexible.</td>
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<table>
<thead>
<tr>
<th>Technology in Saab</th>
<th>Global Trends</th>
<th>Markets</th>
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<tbody>
<tr>
<td>• Focus on engineering and innovation</td>
<td>• Self financed R&amp;D</td>
<td>• Strong position in Sweden and good positions in South Africa and Australia</td>
</tr>
<tr>
<td>• Develops, adopts and improves technologies to meet customer's needs</td>
<td>• Customers in both the military and civil markets increasingly want broad- based, integrated solutions with more service content</td>
<td>• Focus on a number of key markets, including the US, Sweden, India and the UK</td>
</tr>
<tr>
<td>• Gains access to technologies and knowledge through acquisitions, contracts and building relationships with other companies</td>
<td>• Need for a strong local presence</td>
<td>• United Nations - an important and growing market</td>
</tr>
<tr>
<td>• Develops and produces its own technologies and products</td>
<td>• Civil and military alliances becoming more common</td>
<td>• Sales in 90 countries, presence in 30 countries</td>
</tr>
<tr>
<td>• Acquires technologies, for example world leading radar technology from Ericsson Microwave system</td>
<td>• Local and regional presence, Personal relationships, technical and social capabilities</td>
<td>• Examples of market presence: Offices in Kenya, UK, India, research centre in Brazil</td>
</tr>
<tr>
<td>• 20 per cent of sales is reinvested in research and development</td>
<td>• Potential of emerging economies</td>
<td></td>
</tr>
</tbody>
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5. Analysis and discussion

The purpose of the present thesis is to enhance the understanding of technology innovation and in particular the role it plays when adapting a product at its growth stage in a mature industry and the factors to consider thereof. In the analysis chapter, we will mirror the literature review with the case study findings and draw conclusions from the similarities and differences. By doing so, we will highlight the gaps that exist between the literature on technology innovation in product adaptation. From the data and information collected and generated about Saab in regards to its current and future markets as well as its technology, an analysis will be made about the factors that Saab currently considers when adapting the field hospital to its current markets on a more general perspective and later the factors that Saab can also put into consideration to adapt a military field hospital to the markets that differ on their levels of technology will be discussed. Suggestions will be provided and supported with an analysis.

5.1. The role of technology innovation in product adaptation

Not only the products presented on the market go through the life cycle but also the industries they belong to. According to Grant (2010) the industry life cycle is the supply side equivalent of the PLC. Therefore, it can be argued that products and industries sometimes go through the same stages of life cycle (introduction, growth, maturity and decline) at the same time. However, there might be exceptions and the field hospital is one of them. Saab started producing field hospital in 2007 making this product relatively new to its product portfolio. From Saab’s perspective, the field hospital is moderately new hence in its growth stage. Nevertheless, the field hospital itself has been in existence for centuries with different names but with the aim of taking care of injured and wounded victims of war.
and disaster. It can be argued that the industry with its long history of existence is in a mature phase.

The growth stage is the key phase for establishing a product’s position in a market, increasing sales and improving profit margins (Solomon et al., 2009). Additionally, it is also the appropriate phase when a firm should focus on gaining market share. After innovative activities in the introduction phase, the product takes off in the market at its growth stage (Komninos, 2010). Sales increase rapidly as more customers become aware of the product. Costs are declining on a per unit basis because of scale economies in production (Vendetti, 2010). From the aforementioned, it can be argued that with the product in the growth stage, it would seem that there is no need for Saab to consider upgrading the technology or incorporating innovative ideas into the product/process to maintain the market share. However, during the growth stage competition continues to grow as rivals recognize profit potential of the market. Competitors try to enter the market with their own versions of the product. Moreover, the field hospital is displayed in the mature industry which is a phase that does not offer many opportunities for firms. Grant (2010) highlighted that this stage of an industry's life cycle is characterized by market saturation and severe price competition. As the competition increases, customers diffuse to different companies. Marketing techniques in mature industries are more focused on monitoring competition and on pricing and promotion strategies (Vendetti, 2010). However, Fuller and Stopford (1992) observed that even though the competition in such industries is severe and businesses can perform poorly, mature industries are still profitable for creative and innovative participants. Therefore, it can also be argued that to keep the consumers from switching to the competitors instead of reducing prices, companies can employ innovation and modify the old products or develop new ones. Saab by actively developing technologies in house and acquiring them from outside maintains its innovative character and tries to provide customers with the product/services/ solutions that best matches their needs.
According to Fuller and Stopford (1992) firms in mature industries need to perceive the saturated environment as a new opportunity for development and to invest in knowledge of how technology, customers and the environment work. The authors further stated that, innovation in the employment of technology determines a firm’s competitive advantage. Saab has proved that staying innovative and proposing new solutions to the market can work in its favour even under the unfriendly conditions of a mature industry. Through analysing and assessing future business opportunities, firms in mature industries can consider investing in research and development and acquiring technology. Saab is one of Sweden’s most engineering and innovation focused firms, where around 20 per cent of sales are brought back in research and development. Saab through emphasizing on research and development aims to strengthen its local and regional presence and continue its international expansion. Additionally, Saab believes that investing in research and development is fundamental to maintain a high technological level, further improve competitive advantage and create long-term value for the shareholders.

Milling and Stumpfe (2000) pointed out that innovation is cardinal for firms in terms of competitive strength and long term survival. Cabral et al. (2006) also highlighted that technology innovation has emerged as an important aspect for business growth and survival. Beveren et al. (2010) emphasized that through technology innovation activities, firms are able to increase productivity. Hence it can be argued that to maintain the market share and stable revenue stream, companies need to stay creative and incorporate technology innovation. However, staying innovative in a changing financial, geopolitical and market landscape is a challenge for Saab. According to the annual report (2011), Saab has a strong position in Sweden and good positions in South Africa and Australia. Saab is currently one of the twenty-five largest defence and security companies in the world, and probably one of the three or four top in terms of international market coverage. Acquisitions of technologies and other companies, investing in research and development can be highlighted as some of the reasons for Saab’s successful financial performance. Additionally, Saab believes that success is not derived from the number of technologies and systems; it is about having the right technology and systems for each customer’s specific
needs – the right capabilities at the right price delivered in time. Saab has sales in around 90 countries around the world and own presence in around 30. Sales in 2011 generated 23,498 MSEK with net income of the year 2,217 MSEK. The latter showed significant increase compared to 2010 when the net income reached 454 MSEK (Saab, 2012).

Continued success has enabled Saab to form new international alliances and relationships and build on the established ones. Brown (2007) suggested that growth in mature industries can be achieved through merging of product and application technologies to create new and better processes and systems that do not already exist. Saab decided to take opportunities derived from merging and acquisitions and acquire Celsius in 2000. Saab believes that an approach that focuses on partnership, collaboration and information sharing is a key to success. In 2011, Sensis Corporation a US Company was acquired, which is expected to strengthen Saab’s offering. The acquisition provides a growth platform from which Saab can build on the combined installed base and skills in systems engineering, design and integration. Sensis’ customers and partners will benefit from Saab’s product portfolio and global support operations. In the Czech Republic, Saab acquired E-COM, a company active in training and simulation.

Through acquisitions and contractual relationships, Saab not only strengthens its presence in the local market but enhances its technologies as well. For example, in 2006, Saab obtained world leading radar technology through acquisition of Ericsson Microwave systems. This transaction had also a positive influence in operating income which increased by 49% in 2007 (Saab, 2008). As earlier mentioned, technology innovation is a must for firms that seek to gain competitive advantage and / enter new markets (Subrahmanya et al. 2010). Future goals of Saab is to focus on a number of key markets, including the US, Sweden, India, the UK and get access to new markets in East Africa through establishing contracts with the United Nations.

Besides the acquisitions, Saab is actively engaged in cross border cooperation and building up relationships. By trying to establish itself locally and understand local requirements,
Saab increases its chances of being selected as a supplier or subcontractor. Beverland (2005) stated that building up relationships with other organizations can be seen as a network of resources and can help a firm to face the environmental challenges and adjust to market uncertainty. The reasons firms interact with each other can be to gain knowledge and technological expertise, advance distribution channels and benefit from efficient business transactions (Hakansson, 1982). Additionally, firms that have trust and commitment in relationships tend to be more adaptive (Beverland, 2005). Therefore, it can be suggested that Saab by establishing contacts with other companies can go beyond understanding local markets and get access to knowledge, benefit from business transactions and increase adaptability.

Therefore, it can be argued that Saab’s emphasis on a number of actions such as research and development, acquisitions, and building relationships are focused mainly to support and enhance technology development. Moreover, through acquisitions and relationships Saab aims to strengthen its position and gain knowledge about the local markets to create relevant and adaptable products. According to Saab, customers demand the solutions that meet local requirements, demonstrate high performance and have reasonable costs to own and operate the system. Acquired knowledge hand in hand with innovative technologies can enable firms to create new or modify existing products in a way that best matches to customer needs. According to Beverland (2005) adaptations can range from simple changes in the product to the huge modifications. It can be argued that technology innovation enables companies to make vast scope of changes including product specification, product design and delivery procedure. However, Brennan and Turnbull (1999) suggested that product adaptation made for a single buyer only might imply additional costs without returns. Therefore keeping the right level of product adaptation can be an important task not only for Saab but for other companies as well.

As earlier highlighted in the literature review, product adaptation is defined by various authors like Hagberg-Andersson (2006); Beverland (2005); (Hakansson, 1982); Brennan and Turnbull (1999) as a process that involves modifying a product to suit a firms’ target
market. The modifications can be in the form of product specification, product design, delivery procedure, financial procedures or social relations. The outcome of product adaptation can be effective buyer-seller relationships and improved product quality leading to stronger positions on the market for firms. Product adaptation is necessary in that the delivered product needs to meet the expectations and required quality of the target market. From the case study, Saab provides completely customized products i.e. fully-equipped field hospitals. Moreover, the goal of Saab is to create a more market-oriented company with even greater focus on customers’ future needs and requirements. This means, among other things that Saab will continue to grow in the global market and develop distinctive customer offerings. The field hospitals are adaptable to meet specific customer requirements and can be provided as an integrated part of a total support solution or as a stand-alone product. Additionally, Saab offers some standard optional modifications and functions. Customer specific modifications are also available as well as modifications to meet operational requirements of certain countries. Hence, Saab modifies the field hospitals to meet the product specifications and designs that are specific to their current markets.

5.2. Factors to consider while adapting a product to markets

The relevance of product adaptation is emphasized in mature market conditions as is with the field hospital industry. Firms respond to environmental changes through present or future business relationships hence the different factors and the environment they operate in can affect the relationships between firms and customers. In Saab, local presence is decisive because customers want integrated solutions from companies that understand their local conditions. This significantly increases opportunities for Saab to be in position to adapt the field hospital to the local conditions of their target markets. Furthermore, Saab’s strength is its technical and social capabilities. Social systems and co-operation between different cultures is extremely important and it contributes to improved efficiency. Saab
also takes an initiative to build personal relationships with their target markets as a means to succeed with complex development projects. As noted by Hakansson (1982) failure on the part of firms to build relationships with their target markets would lead to an organizational mismatch in terms of the product adaptation technique used.

As highlighted in the literature review, Trott (2012) pointed out three factors namely entry timing, scale of entry and decision to position as factors that can affect how a firms’ products are adapted by the market. With entry timing, the author argued that this enables firms accrue the first mover advantage and hence shape customers evaluations and expectations of a particular product. As Saab currently has the UN in East Africa as one of its target market, and the field hospital industry is a mature industry, the applicability of this factor is questionable for the case of Saab. Although the field hospital can be categorized as a mature product and industry, it is a growing product in Saab. However, as Schilling (2008) observed, firms that can benefit from entry timing are those that are targeting virgin markets. In the case of Saab, this can imply that the company can benefit from entering into the East African market provided they are the first to sell the field hospitals there. However, there are other companies (competitors) in the same industry already within the same market area, for example Weatherhaven. Thus entry timing might not work to the advantage of Saab.

Trott (2012) noted that scale of entry affects a product’s performance as well as its life cycle. This is because firms need to invest a substantial amount of effort and resources depending on which stage the product is in its life cycle in order to increase market exposure and acceptance of the product. Saab has managed to retain its position as a technological leader in its product areas because it frees up its resources to increase marketing and development and thus enabled it to become more efficient. Thus scale of entry can be useful and applicable for the case of Saab. Accordingly, this capability is fundamental for future growth in new markets and innovative solutions for Saab. As mentioned before, the field hospital is a product in a mature industry although it is relatively new in Saab’s product portfolio thus making it a growing product. Trott (2012)
argued that through decision of positioning by firms, customers are able to distinguish different products in the marketplace so that the already existing competitors do not over shadow firms that are relatively new in the industry. Given that Saab is operating with a mature product that is new to its portfolio, decision of positioning might not necessarily apply to the case of Saab.

5.3. Suggestions for Saab

Saab divides its markets by geographical location and tries to strengthen its presence in each market with various products/services/solutions. The information about geographical markets displayed in the case study enables us to analyze the current market situation and propose future prognosis for Saab and particularly the field hospital.

Table 4 Market analysis

<table>
<thead>
<tr>
<th>Geographical area</th>
<th>Share in global defence spending %</th>
<th>Future forecast for spending on defence</th>
<th>Reason</th>
<th>Saabs position</th>
<th>comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden and rest of Nordic region</td>
<td>1</td>
<td>Rise</td>
<td>-</td>
<td>Sweden</td>
<td>-</td>
</tr>
<tr>
<td>Rest of Europe</td>
<td>23</td>
<td>Decrease</td>
<td>Economic uncertainty and the sovereign debt crisis</td>
<td>UK, France, Germany, Finland</td>
<td>Civil market growth</td>
</tr>
<tr>
<td>North America</td>
<td>43</td>
<td>Decrease</td>
<td>Sovereign debt crisis and changing defence priorities</td>
<td>USA</td>
<td>Civil market growth</td>
</tr>
<tr>
<td>Central and South America</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Brazil</td>
<td>-</td>
</tr>
</tbody>
</table>
Asia, Middle East and Australia | - | Increase | Strong economic growth | India, Thailand | Civil market growth |
---|---|---|---|---|---|
Africa | 2 | Increase | Economic growth | South America | - |

Source: Adapted from Saab, 2011

According to the annual report (2011) Sweden and the rest of the Nordic region’s share in the total global defence spending is only 1%. It can be argued that based on this information Saab does not have to spend a big percentage of its resources on expanding in the Nordic region. Nevertheless, due to the forecasted increase of financing within the defence sphere and the fact that the Nordic region has high levels of technology, demand on a high technology product like the field hospital is likely to grow.

Though the rest of Europe and North America spend significantly more on defence than the Nordic region, further investments in the defence is going to reduce. Downsizing is caused by the economic uncertainty, sovereign debt crisis and changing defence priorities of the regions (Saab, 2011). However, the markets along with African region have increasing demand on products for civil purposes. Hence, it can be suggested that instead of focusing on the development of a military field hospital, Saab needs to modify and adapt field hospital to civil markets in Europe and North America.

In Asia, Middle East and Africa strong economic development may allow the states to increase spending on their defence and security. Grant (2010) also noted that products at the growth stage need to be extended in terms of markets i.e. from advanced markets to the rest of the world which in this context would imply from developed markets / countries to developing markets/ countries. Therefore Asia, Middle East and Africa regions are promising markets for Saab and strengthening positions there can be prioritized.
The goal of Saab is to have an annual organic growth rate of five percent over the business cycle and this growth is expected to come from outside the current markets. However, the growth must be profitable hence targeting markets where opportunities are right for the profitable growth as is the case of the UN mission in East Africa. Moreover, Saab has been among the most engineering and innovation focused companies of Sweden. Investing heavily in research and development is critical due to Saab’s commitment to maintain a high technological level, further improve competitive advantages and create long-term value for shareholders. It is for these reasons that the authors of this thesis put forward the suggestions below which can aid Saab to adapt the field hospital to the target markets that differ in their levels of technology and not by geographical location, as is the current practise.

As mentioned earlier in the literature review countries can be categorized by the level of technology such as high and low. The level of technology corresponds to the levels of development of the state, for example developed countries have high levels of technology and greater knowledge on how to use them. Developing countries do not possess high technologies and sufficient knowledge to operate them as well.

The authors of this thesis suggest that Saab incorporates medium level technology in the manufacture of the field hospitals as compared to using very high technology as is the current practise. By medium technology in this context, we mean that the field hospital should still have the basic standard requirements as stipulated by WHO and PAHO. However, the field hospitals that are made specifically for the markets that are categorized as having low levels of technology should have minimal technical operations in terms of functionality, usability and cost in comparison to the field hospitals that are designed for the markets with higher and more advanced levels of technology. This means that Saab should be able to sell its field hospital without requiring incurring any costs in regards to training the users in the markets.
The field hospitals with medium technology do not have to be as costly as those that require very high and sophisticated technology although they should still be able to serve the same purpose as those with high technology. Given the market analysis above, most of the developing markets will have an increase in defence spending hence Saab needs to invest in these markets in order to reap the benefits i.e. increase market share. Although Saab aims at maintaining a high technological level in its product portfolio to increase competitive advantage, investing in medium technology for the markets that show perspectives of growth might seem a viable investment. By developing field hospital equipped with the technology of medium level, Saab will be able to enter the markets with the low levels of technology without sacrificing the image of the high tech company. Moreover, by using medium technology in the field hospitals, Saab is able to ease the adaptation of the product to these markets hence lessening the possibility of facing rejection of the product by the markets because of being very technical (in terms of technical functionality); implying the customers are unable to fully comprehend how to use the product or being too costly for the governments of these markets. Together with this framework, the factors that Rama Rao (2008, 2011) pointed out will be used to complement it and an analysis presented thereof.

A product’s size and packaging may have to be modified to conform to possible differences in engineering or design standards in a country’s markets. Product adaptations may also include changes in technological sophistication and performance. Rama Rao (2008) further noted that firms often find the need for some changes to be obvious while other changes may require in-depth analysis of societal customs and cultures, the local economy, technological sophistication of people living in the country, customers’ purchasing power and purchase behaviour (Rama Rao, 2008). Saab has a proven record in supplying completely packaged multi-function field facilities and all the field facilities are customizable to specific requirements. However, most of the customization is based on other factors and not on the level of technology development within the markets because Saab invests heavily in research and development to maintain a high technology level. Moreover, Saab’s business concept, mission and drive are all geared towards innovation.
and technology. However, by employing medium level technology in the field hospital, Saab is still able to adapt the field hospital to the developing countries (current target market which have increasing economic growth) whose levels of technology are still growing without compromising a lot of its business concept values, its mission and drive as these are some of the foundations for Saab.

A country's standard of living and the target market’s purchasing power can also determine whether a company needs to modify a product. The level of income, the level of education, and the availability of energy are all factors that help predict the acceptance of a product in a foreign market. Certain high-technology products are inappropriate in some countries not only because of their cost but also because of their function. An important first step in adapting a product to a foreign market is to determine the degree of newness as perceived by the targeted market. The reaction to the newness and / or how new a product is to a market must be understood (Rama Rao, 2011). From the market analysis in the case study, results showed that there is a steady increase in the economic growth of markets in Africa, Asia and the Middle-east and a decline in some parts of Europe and North America. Thus, the way forward is that Saab can consider manufacturing field hospitals of medium technology for markets like those in Africa to ease adaptation of the product as compared to continuously manufacturing very high tech field hospitals for the markets whose economic growth is declining. This is a trade off Saab might have to consider in order to increase its market share and presence within the industry given that the field hospital is relatively new to the firm but the industry is a rather mature one.

Finally, a climate of ever-changing technology also affects the opinions of consumers when adapting to a product. Firms that make innovation a priority and operate with intimate knowledge of their customers will stand a much better chance of meeting their customers’ needs (Rama Rao 2008, 2011). Moreover, firms that make innovation a component of their corporate identity and place it in the centre of their overall strategy are best positioned to be leaders in product development (Barrier, 1994). As a business concept, Saab aims at constantly developing and improving technology as a means to meet their customers’
needs. Additionally, Saab has a drive for innovation and flexibility. The business foundations of Saab complement their internal goals that focus on profitable growth, portfolio, performance and people. As noted by Kucsmarski (1999), continually updating products is a necessary function and often the driver of innovation. However, the author pointed out that product adaptation will never outweigh innovation in strategic importance. This is because innovation unlike product adaptation creates and protects the competitive advantage for a firm, thereby offering greater long-term success. In contrast to the aforementioned, according to Saab, the key to success is an approach that focuses on partnership, collaboration and information sharing. This is because it is not about the number of technologies and systems; it is about having the right technology and systems for each customer’s specific needs – the right capabilities at the right price delivered in time (Saab, 2011).
6. Conclusions

With today’s globalized and technology driven world, studying the behaviours of companies that take advantage of these aspects seemed keenly interesting to us hence we decided to do research on the concepts that we found rather interesting. Additionally, Saab is currently faced with the dilemma of how to go about maintaining its reputation as a high tech company that manufactures high tech products while at the same time trying to enter new markets that are not very developed in the technology area. This dilemma is never ending because most high tech companies tend to have market dimensions based on geographical location whilst ignoring the technology levels of developments in their current or target markets and this affects the ability of customers within these markets to adapt to the products.

Product adaptation can range from simple modifications in the product to strategic changes which can enable firms to better meet market requirements and hence increase benefits for both markets and firms. Making appropriate changes to the existing product or developing a new one can help to keep the market share and retain customers in a mature industry. An important factor for product adaptation that is highlighted in the literature and that Saab also practises is building up relationship with other companies. These companies can be buyers, partners and even competitors. By doing so, Saab tries to get access to local markets, acquire or enhance technologies and gain competitive advantage. Additionally, establishing contacts with other companies enables Saab to get access to knowledge, benefit from business transactions and increase overall adaptability.

One of Saab’s high tech products is the field hospital, which is a mobile self-sufficient health care facility. The selected product is unique because it is in its growth stage of the product life cycle and industry is in its mature phase. From Saab’s perspective, the product is moderately new launched in 2007 though the field hospital industry has been in existence for centuries. Even though the growing stage is considered as the most profitable one, Saab
still needs to focus on innovation because the field hospital is a mature industry. Saturated markets full of competitors trying to attract customers characterize the latter. Hence, firms that employ technology innovation can stand out from their rivals and gain an increase in sales. Additionally, according to Cabral et al. (2006) in the present world full of technological change and globalization technology innovation has emerged as an important aspect for business growth and survival. Considering Saab’s actions, it can be concluded that Saab follows the global trends and continuously acquires technologies or develops them in house. Around 20 per cent of sales are reinvested in research and development. By doing so, Saab focuses on innovation and provides new products/solutions/services to customers to best satisfy their needs.

Among the factors to be considered in product adaptation process Trott (2012) highlighted entry timing, scale of entry, decision of positioning as the significant ones. However we observed that for the case of Saab, these factors are not very applicable. With entry timing, the author implied gaining first mover advantage in virgin markets. Saab operating in a mature industry already has competitors providing a similar product in the markets. Through decision of positioning by firms, customers are able to distinguish different products in the marketplace so that already existing competitors do not over shadow firms that are relatively new in the industry. Given that Saab is operating with a mature product being new to its portfolio, decision of positioning might not necessarily apply to the case of Saab. Scale of entry can be a useful factor and applicable for the case of Saab as it can invest resources to increase market exposure and acceptance of the product.

The purpose of thesis is to offer the way forward for Saab because it aims at having an organic profitable growth annually while staying true to its values, mission and business concept. Hence, we believe that by offering this example of Saab (how it has to adapt its newly added product, the field hospital to its product portfolio to markets that differ in their levels of technology within a mature industry), we have paved way for other interested parties who have an interest in firms that operate under similar circumstances.
In what concerns recommendations that we can offer to Saab, we have summarized suggestions that can be beneficial to Saab and firms in a similar situation as derived from our proposed framework:

- Saab needs to consider segmenting its markets based on levels of technology development as compared to geographical location
- Saab can incorporate medium level technology for the field hospitals to the markets that are regarded as developing / low level technology markets and more specifically for those that will increase their defence spending
- When employing medium level technology, Saab needs to put into consideration factors such as product size and packaging, a country’s standard of living and the ever changing technology environment
- Saab can also consider making field hospitals for the civil market due to its growth and not necessarily for military purposes

6.1. Areas for further research

The present thesis with a focus on high tech product outlined some of the factors important while adapting a product to markets. These are size and packaging, a country’s standard of living and the ever changing technology environment. However we did not go into details how they can be interrelated and in which way they influence the adaptation process. Studying these factors in the further research can contribute to understanding the product adaptation deeply. The present thesis was from the perspective of the firm hence research from the customers’ perspective is also an area to consider. Additionally, a case study of other firms needs to be conducted to explore which other aspects are important for technology driven companies when adapting a product to markets. Single case study puts limitations to generalizing findings to the whole industry.
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