Title: Networked products create new business opportunities

Author: Anders Gustafsson

10 credits

Thesis

Study programme in
Master of Business Administration in
Marketing Management
Abstract: This work is performed as a pre-study to investigate new business opportunities for companies who are product-centric oriented but want to move in the direction of being a customer-centric organization by using technologies based on networked products.

The study describes IntelliCom, which is a company selling network enabling products. IntelliCom has also developed a customized server solution making it possible to network remote installed products and collect data from these products over Internet. This technology that IntelliCom have knowledge in could be a platform for providing data and different kind of services by connecting customer’s devices, which aim to generate a value for the customer and be a new business opportunity for product-centric companies.

The research is mainly based on observations and dialogs with management and sales people of IntelliCom to investigate how the marketing strategies and marketing mix is used when selling products. To be able to collect data and information about the customer’s value and opportunities, I have made an Interview with a potential customer of IntelliCom who is an OEM company already proving products and services in line with a customer-centric business strategy. This customer is Woodward and manufacturer of
GenSet controllers within the energy/electrical segment. The observations and information collected from customer were analysed to understand and to be able to describe how customer’s value chain and smart services opportunities relate to each other.

The study shows that the opportunity for IntelliCom to start using the new technology to increasing the sales of data and services, not only products, is good. The study points out that IntelliCom should chose a business model that targeting OEM companies. IntelliCom should limit the offer to provide unprocessed data and let the OEM customer process data to provide smart services to their customers worldwide.

Keywords: Networked products, smart services, added value, marketing mix, marketing strategies, value chain, business models.
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1 INTRODUCTION

This chapter gives the reader an overview of the background and describes the motivation of the study. Objectives and the disposition of the work are described to give the reader a good view of the coverage of the research.

1.1 Background and motivation for the study

Some industrial manufacturers have realized that the real money isn't in products but in services. Companies such as General Electric and IBM have famously made the transition and a large proportion of their revenues and margins come from providing value-added services to customers.

One of Internet’s big potential lies in its ability to connect millions of fast, smart sensors, devices, and machines into a global system. This technology makes it possible to completely automate most enterprise functions, allowing every type of business to achieve increased efficiency, optimization, and profitability (HRI, 2006)

The author of this work, works at a Company who develops, manufactures and sells communication products for connecting machines to the Internet. The Company sells the communication products to OEM companies and partners worldwide.

Recently the Company has been involved in OEM customized projects, developing software solutions for data collecting and data presentation. Our customer wanted to offer value-added information and information processing to their customers. These kinds of solutions that we started to developed are called Smart Services.

Today the Company is per definition a product-centric organization. The management needs to find out how it would be possible for the Company to use smart services technology to offer value-added services to our customers as a part of our business concept. The management needs to get a better understanding of the success factors within the theories of Marketing Mix, Marketing strategies and customers value-chain, when moving in the direction to a customer-centric organization with the new smart service solutions developed.
1.2 Research questions
IntelliCom wants to compete not only by providing the best products, but also by providing new kind of smart services that increase the value for customers. Today IntelliCom provides hardware products for connecting customer’s products/machines to the Internet. To be able to increase the sales and find new businesses opportunities, the company intends to offer value-added services, called smart services, on top of selling only hardware to the customer. With this intention there are some questions that need to be answered.

What are the opportunities for this kind of smart services?
How should IntelliCom bring the offering to the market?
What business architecture will build long term success?

1.3 Objectives and delimitation of the research
This research is about customer value from a management perspective. The main objectives of the research are to provide the management of IntelliCom with an understanding of where the opportunities with smart services are.

The research will not handle technical aspects of the smart service technology that is the base in value-added services more than in general terms. The study will describe the smart services from a user perspective, not in technical aspects.
1.4 Disposition

The disposition of the work will follow the frame of the Marketing Research Process described by Kotler & Keller (Kotler 2005, p.103). Figure 1 visualizes how the different Parts of the study relate to the marketing research process. The picture also shows how the objective relates to the different steps in the process.

Figure 1 - Visualization of the disposition (Gustafsson, 2006).
The figure shows how the chapters of the work relate to the marketing research process and the connections to the chapters.
2 METHOD

This chapter describes the research methods and covers the validity and reliability aspects of the work. Information of data collection approaches and what precautions that have been taken in the process of achieving validity and reliability are described here.

2.1 Research methodology and data collection

There are several methods to be found when referring theory and empiric data to each other. In general, there are two procedures that can be used: induction and deduction, which could be seen as the opposite poles of each other (Andersen, 1998). There is also a third approach which is called abduction (Saunders, 2003), which could be described as a combination of the inductive and deductive approach.

Within the abduction approach the research is based on reality and empirical data, which then is used together with known theories for the purpose of understanding and find patterns in the reality (Saunders, 2002).

There are two methods defined when collecting data, qualitative and quantitative method. Typical methods for qualitative methods are interviews and observations, where the interviews can be either verbal or in written. Qualitative methods are characterized by its purpose to give an understanding and explanation of a specific problem or phenomenon (Easterby-Smith et al, 2002). The Interview in this study was made with the Woodward Product Line Manager, Matthias Voloder, based in Stuttgart, Germany.

This study is per definition based on the abduction approach, where I have studied the Company and made observations in its everyday business. I have made interviews with the management and I have studied the sales and marketing material used by the company. With this information collected, I have used a framework of theory based on Marketing Strategies (Wikipedia MS, 2007), Marketing Mix (Kotler P & Keller K L, 2005, p.19), Value chain (Kotler P & Keller K L, 2005, pp.38) and value creation (Kotler P & Keller K L, 2005, p.41), to be able to understand how the company works.
today and being able to analyze and recommend how the company should work in the future.

2.2 Validity and reliability of the research
It is hard to achieve a high validity and reliability in a qualitative research. The validity has no central role within qualitative research while the purpose is to achieve a better understanding for a phenomenon (Holme & Solvang, 1997). Trying to achieve the highest validity and reliability possible, I have informed the management about my study and the purpose of it and I have also sent the questions in advance to the person I was interviewing at Woodward. By doing this, the person could prepare, and the answers should get a higher level of validity and reliability.
3 THEORY AND LITERATURE REVIEW

This chapter introduce the reader to the framework of theories that are used when analysing the empirical data collected from the two companies. This framework of theories reflects on the analyze phase but also is an important part to form the conclusions in the end of the research.

3.1 Marketing strategy

3.1.1 Defining marketing strategy

This chapter refers to three theories connected to each other and within the concept of the definition of what the marketing strategy embraces.

Porter (1998) writes about *Generic Competitive Strategies* in his book; Competitive Strategy. This theory is about the same principle as the theory *Value disciplines* defined in a book written by Treacy & Wiersema (1997). The third theory, which have interesting connections to the other two theories, is described in the book; *The Rule of three* written by Sheth & Sisodia (2002).

All markets are diverting, from one single product to a multitude. No matter what product or service, the development of the market follows a basic pattern (Håkansson, 2006). In the very beginning each market or category is always one product or one service. It might be products like ketchup, telephone or computers. But when the category once is established, there will be more companies fighting about the revenues. The winners are the companies that do not just copy other products, but also realize that buyers have different wishes and also different requirements of solutions.

The result of this evolution is that there will be more products and solutions developed in different directions on the market. This market development is not randomized, it follows a pattern that two American economics, Jagdish Sheth and Rajendra Sisodia, have studied and described in the book; The rule of three. Håkanson (2006) describes the three different stages of the market phase defined by Sheth & Sisodia:

- **Innovation phase**; fast growths of market and companies. A lot of experimenting with products and services.
• **Shake-out-phase**: this is the phase where there is capacity overflow. The market getting standardized and there are generally two, three bigger generalists appearing on the market.

• **Mature phase**: This phase starts when the differentiation starts on the market. The big generalists leave a lot of holes to fill on the market. This is where the specialists come into the picture.

Once the mature phase is entered, the total market can be described with picture 1 below.

![Diagram showing market phases with generalists and product- or market specialists](image)

Håkansson (2006) explains that the two halves do not compete with each other. The generalists compete with scale benefits targeting wide markets with big volumes. The specialists compete with each other by providing product leadership or by targeting specific segments. The benefits for the generalists do not help on the other side, the specialist side, and vice versa. And there is no room for companies to be in the middle of these two halves, companies that do not chose which side to join will not have any successful marketing strategy.

When the market looks like Figure 2 above, it is easy to understand the ideas of Michael Porter when he describes the Generic Competitive Strategies (Porter, 1998, p34). Porter means that if you are a company on the market, there are three potentially successful generic strategic approaches to outperforming other forms in an industry:

1. Overall cost leadership
2. Differentiation
3. Focus
Sometimes the company can successfully pursue more than one approach as its primary target, though this is rarely possible (Porter, 1998, p.35).

Treacy and Wiersema proposed three "value disciplines," as a way to focus on an organisation's activities (Treacy & Wiersema, 1997, p.39-50). Successful organisations concentrate their efforts on a particular area and excel at it, rather than trying to be all things to all people and failing to excel at anything. The theory pretty much reminds about Porter’s Generic Competitive Strategies. Treacy and Wiersema have been studying dozen different industries for 3 years, trying to find the success factors. They ended up with the conclusion, described as their theory, that each company needs to chose their position and then consequently follow it. In their theory, they claim that there are only three ways of positioning, three value disciplines:

- **Operational Excellence**
  This discipline corresponds to the left half of figure 2, where the generalists are. Actors within this discipline are companies like: McDonalds, Walmart, Dell and IKEA, striving to find the big broaden segments. The companies within this discipline offer a combination of price, quality, availability and service that no other company on their market can match (Treacy & Wiersema, 1997, p.39). Products are purchased at low prices and in large volumes. The information systems follow the flow of goods closely and remove inefficiencies. Activities within the value chain are closely aligned with one another. Production is standardized and automated, if possible. The staffs maintain a high level of productivity and management steers activities tightly in a centralized manner. Characteristics of the company culture, performing operational excellence, are that efficiency among the stuff is rewarded and waste is despised (Osarenkhoe, 2007).

- **Product Leadership**
  This discipline corresponds to the half to the right of figure 2. Companies that are specialized in product leadership always strive to take their products to the unknown, the innovative or to the strong desire. What a product leadership offers
is simply the best product there is to get Treacy & Wiersema (1997, 43). Examples of this type of company include Bang and Olufsen, Mercedes, Swatch, Nike, Apple and small tour operators that specialize in a specific country. This type of company must be creative, inspired and must have many ideas Osarenkhoe (2007).

- **Customer Intimacy**
  Just as the discipline above, this discipline corresponds to the half to the right of figure 2. Companies that offer value to the customers by close relationship create a relation similar to those between neighbours. Companies offering customer intimacy do not offer what the market wants, but what the specific customer needs (Treacy & Wiersema, 1997, p.46). A company which employs customer intimacy strategy looks at the *lifetime value* of a customer, not only (the actual value) at the profit or loss of transactions. Emphasis in these types of companies shifts from acquiring *market share* to *share of mind*. A great deal of attention is focused on the development of the desired customer base: who do we want and who do we not want as our customers? The company is built up based on the knowledge of the individual customers and their preferences. Products and services are continually adapted to customers’ wishes, without asking excessively high prices for doing so. Although, all companies today proclaim they employ customer or relationship-focused strategy, examples of companies that implement this type of strategy are hotel chains such as Ritz Carlton, Scandic, Hilton, private bankers, etc. (Osarenkhoe, 2007).

### 3.1.2 Segmentation and Positioning

All marketing is built on STP – Segmentation, Targeting and Positioning (Kotler & Keller, p.310). In the chapter of fundamental marketing concepts, trends, and tasks it says: “A marketer can rarely satisfy everyone in a market. Not everyone likes the same cereal, hotel room, restaurant, automobile, collage or movie. Therefore, marketers start by dividing up the market into segments” (Kotler & Keller, 2005, p.24).
Segmentation is often the key to developing a sustainable competitive advantage based on differentiation, low cost, or a focus strategy (Aaker, 1995, p.49). It is difficult to identify segments, but typically you consider five, ten or more segmentation variables. These variables needs to be evaluated on the basis of their ability to identify segments for which different strategies are (or should be) pursued (Aaker, 1995, p.51). Once the segments are defined, it is possible for the marketers to evaluate what segments presents the greatest opportunity for business and make an offer to target this specific segment. The useful segment variables for this are: (1) Parameters unrelated to the product (demographic, gender etc) (2) Parameters related to the product (3) Competitor segmentation (4) Benefit segmentation (5) Price Sensitivity (6) Loyalty (7) Application segmentation (Aker, 1995, p.52-54).

No company can win if its products and offerings resemble every other product and offering. Companies must pursue relevant positioning and differentiation. In the line of making these strategies, each company must represent a distinctive big idea in the mind of the target market. Positioning is the act of designing the company’s offering and image to occupy a distinctive place in the mind of the target market (Kotler & Keller, 2005, p.310).

This way of positioning works for static businesses like the shampoo and the washing powder businesses for example. Products in a more dynamic environment like PC’s and semiconductors, where things change often, fast and dramatically, need another way of thinking which is described below:

"Standard approaches to positioning do not necessarily work. A company that is #1 today has no guarantee that it will be #1 tomorrow. New technologies can turn a seemingly solid position into a fragile one almost overnight. No amount of advertising can prevent that from happening. Even with the best of slogans, a company can lose its position in the market." McKenna (1985, p.15)
Positioning is not something that you do with the product, positioning is what you do to the mind of the prospect. That is, you position the product in the mind of the prospects. This is described in the book Positioning (Ries & Trout, 2006), who claims that the market place today is an overcommunicated society where there is too much of information communicating its offer (Ries & Trout, 2006, p.6). This is the reason of why we need positioning. We need positioning to be successful in communicating our message on the market place in the overcommunicated society.

Positioning is a concept that has changed the nature of advertising, a concept so simple, people have difficulty understanding how powerful it is (Ries & Trout, 2006, p.2). According to Trout the history within the advertisement on the market place, which now is overcommunicated, have been in three different eras (Ries & Trout, 2006, p.22-24):

- Product era; where Unique Selling Points were communicated, but was destroyed by Me-too companies.
- Image era; where successful companies found image more important than product features. This era was also destroyed by the Me-too companies.
- Positioning era; to succeed in our overcommunicated society, a company must create a position in the prospect’s mind. In this era, strategy is king and there is not necessary to invent and be first with the product, but you need to be first in the mind of your customer.

In our overcommunicated society, the paradox is that nothing is more important than communication. With communication going for you, anything is possible. Without it, nothing is possible. No matter how talented and ambitious you may be (Ries & Trout, 2006, p.19). Positioning is about communication. Positioning is to say the right things to the right person at the right time, NASA call this a window in space. In other words, positioning is an organized system for finding windows in the mind. It is based on the concept that communication can only take place at the right time under the right circumstances. With this in mind, it is also important to keep the position statement oversimplified, to be able to reach the mind of the prospects (Ries & Trout, 2006, p.7)

According to Ries & Trout, there are two possible ways to get into the mind of a person, the easy one and the hard one. The easy one is to be first, the hard one is to be second or
later. Most of the people know the name of the first man on the moon, a lot fewer know
the name of the second. But even if you are second, there are strategies for this kind of
situation. These situations are described as repositioning by Ries & Trout (2006, p.63).
Once you are in the mind of the person, the positioning requires consistency. It should be
kept year after year. It is very common that companies forget what made them
successful, and change the positioning communication. This is normally wrong strategy
according to Trout, and refers to when Avis changed their successful slogan: “Avis is
only No. 2 in rent-a-cars, so why go with us? We try harder.” to the less successful;
“Avis is going to be No. 1”.
The explanation behind this logic is that to be successful you need to touch base with
reality. And the only reality that counts is what’s already in the prospect’s mind (Ries &
Trout, 2006, p.5). In this case, Avis was not destined to be No.1, unless it could find a
weakness in Hertz to explore.
To develop an offer, you need to know your strategies of what you are going to sell to
whom. If you are working according to the suggestions in Michael Porter’s book
Competitive Strategies (Porter, 1998, p.35), where he claims that you need to choose
between (1) Product differentiation, (2) Low price or (3) Niches to be successful, then
you need to form a clear offer for that specific segment. You can only have success by
being the best in one segment, if you try to combine you will most likely have trouble
with resources and risk that another company wins this area. When you know the
segment, you need to decide about your specific positioning. Kotler recommend the
company to evaluate between 7 specific sources of positioning (Kotler, 1999, p.78):
(1) Attribute positioning (2) Advantage positioning (3) Application positioning (4) User
positioning (5) Competitive positioning (6) Category positioning (7) Quality/price
positioning. Further on Kotler (1999) writes that companies must not do the following
mistakes:
• Under positioning: Fail to offer a strong benefit or reason to buy the product
• Over positioning: To create a position that is too tight, which results in that you
miss customers.
• Confusing positioning: To offer two or more benefits that interfere with each
other
• Irrelevant positioning: To offer benefits to customers that doesn’t matter for them.
• Doubtful positioning: To claim a benefit that customers will doubt the company to achieve.

In the book “Crossing the chasm” by Geoffrey Moore, he claims that the positioning is the single largest influence on the buying decision. Not only for the final decision, but also for how to evaluate alternatives leading up to the final choice (Moore, 2001, p.144).

Geoffrey Moore describes the positioning process in four components (Moore, 2001, p.147):
• The claim: The fundamental position statement
• The evidence: Develop sufficient evidence for the statement
• Communications: Address the right audience in the right sequence with the right message
• Feedback and adjustments: Competitors can be expected to respond to the statement trying to poke holes in the effort, this might require a patch up.

There are different tools to use when evaluating the status of the position. Some of them can be found in the handbook of Andberg & Eliasson (2005, p.47-54) where they are mentioned: 1) Marketing positioning diagram 2) Marketing roles 3) Marketing stairs 4) Profile diagram.

Sjöström, R. (1996, p26) have made a deep analysis of positioning and found out that there are four different groups of how to see positioning: Product-, Competition-, Relation-, and Phase oriented Positioning.

3.2 Marketing Mix, Four P’s
The Marketing Mix model also commonly known as the 4P’s Kotler (2005, p.19), describes the marketing tools and variables used by a company to pursue its marketing objectives.

In other words, the Marketing Mix approach to marketing is a model used to assist in implementing marketing strategies. The Marketing Mix principles are based on
controllable variables which can be used by companies to meet the changing needs of the target group. Typical controllable variables are product variety, quality, list price advertising and channels. The function on the model is useful helping companies to develop an optimal package (mix) of variables that will not only satisfy the needs of their customers within the target markets, but also simultaneously maximize the performance and profit of the company. Pricing is an important but difficult issue in this model, important because it is the only mix that generate a turnover for the company, all other P’s in the model are connected to costs, and “Pricing is difficult because the various products have demand and cost interrelationship and are subject to different degrees of competition” Kotler (2005, p.387).

Figure 3 - The 4P’s Components of the Marketing Mix (Kotler 2005, p.19)

The Marketing Mix model is described in figure 3, describing the mix of Product, Price, Promotion and Place. Working with the model, also means working with sub-mixes of each different P. For example, the Promotion variable can be further decomposed into a promotional mix consisting of variables like; sales promotion, advertising, sales force, public relations and direct marketing. Within the promotional mix, advertising can be further broken down into an advertising media mix that specifies how much emphasis is placed on television ads, radio ads, newspaper ads, internet ads, magazine ads, etc.
I would like to reflect on some variables within each group of the model that I find interesting when analyzing a Marketing Mix of a company.

3.2.1 Product
The mix of products in each company is defined in one or more product lines, and each line has its own length depending on the companies strategy and competition. The lengths (amount of products) can be stretched to cover wider area of products or it can be filled (features of product within the range), both activities strive to find new customers and increase the sales and market share. The product line is also an interesting object for analyzing, to find out which product line to grow, maintain, harvest or divest. The quality is a variable to benefit from when communicating the message of the product/brand, but also when dealing with warranties, services and returns, while services and returns cost money.

3.2.2 Price
Pricing is as mentioned above, a complex issue. There are both internal and external parameters to consider, with internal I mean manufacturing and marketing costs that need to be covered and with external I mean that you should consider the need of the market, the competition etc. I have read about 6 different situations only involving different product-mix pricing Kotler (2005, p.387). Pricing is also about credits, discounts, interests and leasing. It is all about to find out the most beneficial method for the company and in the same time give the customer maximum satisfaction according to his expectations.

3.2.3 Promotion
Promotion is a group that handles variables like advertising and sales promotion. These two variables I mentioned affect each other in a positive way. According to a study described (Kotler, 2005, p.387), a price promotion resulted in a 15% increase in sales volume, combined with feature promotion the product sales increased 19%. Most affect was when also POP (Point-of-Purchase) was added to the campaign, like demonstrations. The tools to use are many and some will work better than others depending on the product and market. The main different areas when talking about
3.2.4 Place
I find the variables channel and location in the group “Place” to be important variables to have control of. The channels are about moving goods from producer to consumer. Location is about where to find and get the product, not only physical but also places like web pages on the Internet. When discussing channels, functions and flow (Kotler, 2005, p.473) are easy to understand for me. Functions like physical or promotion creates a forward flow, from company to customer, and functions like ordering and payment create a backward flow. I find it more complex to understand, control and implement the Vertical marketing System Kotler (2005, p.486), Horizontal Marketing System (Kotler, 2005, p.488) or the most common of them, the Multi channel Marketing System (Kotler, 2005, p.488) into the strategies of a company. But this is the strength of this model I think, because if you can control all the independent variables in this model, you will most likely have good success in the sales volume.

3.2.5 Seven Ps
As well as the standard four Ps (Product, Pricing, Promotion and Placement), services marketing calls upon an extra three, totaling seven and known together as the extended marketing mix. These are (Wikipedia, 2007):

- People: Any person coming into contact with customers can have an impact on overall satisfaction. Whether as part of a supporting service to a product or involved in a total service, people are particularly important because, in the customer's eyes, they are generally inseparable from the total service. As a result of this, they must be appropriately trained, well motivated and the right type of person. Fellow customers are also sometimes referred to under 'people', as they too can affect the customer's service experience, (e.g., at a sporting event).
- Process: This is the process involved in providing a service and the behavior of people, which can be crucial to customer satisfaction.
• *Physical evidence*: Unlike a product, a service cannot be experienced before it is delivered, which makes it intangible. This, therefore, means that potential customers could perceive greater risk when deciding whether or not to use a service. To reduce the feeling of risk, thus improving the chance for success, it is often vital to offer potential customers the chance to see what a service would be like. This is done by providing physical evidence, such as case studies, testimonials or demonstrations.

### 3.2.6 SIVA

A formal approach to this customer-focused marketing is known as SIVA (Solution, Information, Value, Access) Chekitan & Schultz (2005). The model focuses heavily on the customer and how they view the transaction. This system is basically the four Ps renamed and reworded to provide a customer focus.

The SIVA Model provides a customer centric version alternative to the well-known 4Ps supply side model (product, price, place, promotion) of marketing management.

<table>
<thead>
<tr>
<th>Product</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promotion</td>
<td>Information</td>
</tr>
<tr>
<td>Price</td>
<td>Value</td>
</tr>
<tr>
<td>Place</td>
<td>Access</td>
</tr>
</tbody>
</table>

The four elements of the SIVA model are:

**Solution:**
How appropriate is the solution to the customer’s problem/need

**Information:**
Does the customer know about the solution, and if so how, who from, do they know enough to let them make a buying decision

**Value:**
Does the customer know the value of the transaction, what it will cost, what are the benefits, what might they have to sacrifice, what will be their reward?
Access:
Where can the customer find the solution? How easily/locally/remotely can they buy it and take delivery?

3.2.7 Weakness of the Marketing Mix model
Against the marketing Mix called the four P's, some claim that they are too strongly oriented towards consumer markets and is not an appropriate model for industrial product marketing. Others claim it has too strong of a product market perspective and is not appropriate for the marketing of services. When dealing with services, further P’s like People, Process and Physical evidence have been used to get a more appropriate tool.

The model can effectively be used to make changes in long term, but in short term it is hard to change the variables of the Product group.

3.3 The Value chain
The value chain divides the firm into different activities, which a company uses in designing, producing, marketing and distributing products. These activities can be identified in the generic value chain model defined by Porter referred by Andersson & Ivarsson (2003).

Figure 4 - The generic value chain (Andersson & Ivarsson, 2003, p.)
By performing the activities within the value chain efficiently, the company can generate a margin and a competitive advantage. Porter E (1998, p.38) refers to the margin as “...the difference between total value and the collective cost of performing the value activities.” A firm’s value chain is part of what Porter E (1998) calls a value system. In the value system different suppliers provide a firm with upstream value when they deliver inputs to products and services. Therefore Porter E (1998) argues that a firm’s suppliers have a big impact on a firm’s activities. Products or services produced by a firm later become part of a buyer’s value chain. The buyer’s value chain determines a buyer’s needs. Porter E (1998) states that the ultimate for differentiation is the role of a firm’s product in the buyer’s value chain. Every company’s value chain is according to Porter E (1998) constructed of nine categories of activities, which are linked in different ways. These activities can be viewed in figure 4. The value chain is used for every firm and demonstrates the specific activities for that firm. The different activities are also linked to suppliers, channels and buyers and affect the competitive advantage. Porter E (1998) divides the activities into primary and support activities.

3.3.1 Primary activities
The primary activities are directly correlated to the production of a product or service. The primary activities can be divided into five categories, which are inbound logistics, operations, outbound logistics, marketing & sales and service (Porter E, 1998p.39). In order to identify value activities, a firm has to define the activities that are strategically and technologically distinct. Primary activities that fall under inbound logistics are according to Porter E (1998, p.39) receiving products, storing and disseminating products for example, inventory control, warehousing, vehicle scheduling and returning to suppliers. Primary activities that are involved in producing the products such as machining, packaging, and facility operations are categorized under operations. Outbound logistics handles primary activities such as collecting, storing, and physically distributing the product to the buyers, which includes finished goods warehousing, material handling, delivery vehicle operations, order processing and scheduling (Porter, 1998, p.40) Marketing and sales are associated with activities such as advertising,
promotion, sales force, quoting, channel selection, channel reflection and pricing. Primary activities that enhance or maintain value to the product for example installation, repair, training, parts supply and product adjustment are categorized under *service*. The importance of each category of primary activities depends on each firm and industry.

### 3.3.2 Support activities
The support activities support the primary activities through firm infrastructure, human resource management, procurement and technology development. Associated with the firm’s *infrastructure* are activities such as general management, planning, finance, accounting, legal, government affairs and quality management. The firm’s infrastructure supports the entire value chain and not specific primary activities.

*Human resource management* involves activities such as recruiting, hiring, training, development and compensations for types of employees. Human resource management also supports the entire value chain. It affects a firm’s competitive advantage since it can identify employees’ competence and motivation. Human resource management is important for the competitive advantage, since they are in charge of hiring and training. (Porter E, 1998, p.42) refers to *procurement*, as the function of buying inputs that are used in the company’s value chain. Raw materials, supplies, and other consumable items are categorized within procurement. Machinery, laboratory equipment, office equipment and buildings are also included under procurement activities. Procurement is most often spread in many parts of the firm. However, the cost of purchasing often represents a small portion of the total cost but has a large impact on the overall cost of the company. *Technology development* helps to improve the product and the process. It can support the activities functioning within the value chain. According to Porter E (1998, p.42) “technology development takes many forms, from basic research and product design to media research, process equipment design and servicing procedures.” Technology development is important for a firm to create competitive advantage. The dotted lines that are found in Porter’s (1998, p.37) value chain model (see figure 4) illustrate that procurement, technology development, and human resource management support the entire value chain as well as each specific primary activity.
3.3.3 How to define a firm’s value chain
In order for a firm to identify its value chain it is according to Porter (1998) important to distinguish and isolate activities “...that have (1) different economics, (2) have a high potential impact of differentiation, or (3) represent a significant or growing proportion of cost.” Moreover, Porter E (1998) argues that value activities should be assigned to different categories, which generate most contribution to the competitive advantage. For example, the manufacturing costs of producing a garment should be assigned to the operation activities in the value chain.

3.3.4 Linkages within the value chain
Even though the different value activities are essentials in creating a competitive advantage, the value chain is according to Porter (1998, p. 48) “…not a collection of independent activities but a system of interdependent activities.” Linkages connect every activity within the value chain. By linking activities, competitive advantage can be gained in two ways: optimization and co-ordination. A high quality fabric might for example reduce defected garments. Linkages are important in order to make a firm more efficient.

The most easily identified linkages are those between the primary and support activities, which are represented by the dotted lines in the value chain (see figure 4). The linkages between the different activities can be characterized by the following reasons:
The same function can be performed in different ways
The cost or performance of direct activities is improved by greater efforts in indirect activities
Activities performed inside a firm reduce the need to demonstrate, explain or service a product in field
Quality assurance functions can be performed in different ways (Porter, 1998, p.49)

A firm should analyze their activities in order to change or perform them in a different manner. Managing and identifying linkages can be a more difficult task than managing value activities themselves. “Given the difficulty of recognizing and managing linkages,
the ability to do so often yields a sustainable source of competitive advantage.” Porter (1998, p.50). Therefore, it is important for a firm to identify linkages.

3.3.5 Vertical linkage

Vertical linkages (Porter, 1998, p.50) are linkages between a firm’s value chain and the value chain of suppliers and channels. To reach this linkage a firm should build close relationships with its suppliers. Channel linkage can be characterized similarly to a firm’s linkage to its suppliers. The firm has to build a relationship with the channels, build linkages, coordinating and jointly optimizing with its channels to gain competitive advantage.

3.4 Smart Services

3.4.1 Overview

The ability to monitor, repair and control equipment remotely over the Internet – particularly using Wireless M2M technologies - has changed the concept of service for manufacturers in key industries around the world. By increasing customer satisfaction with faster turnaround times and enabling concrete savings on service costs, new technology has allowed implementers to introduce smart services and gain competitive edge over those still using traditional service methods.

The picture below shows the value stack and how it is predicted to change in the future, according to Harbor Research Inc. The staples are divided in parts, where it shows that the future importance of products will decrease when it comes to future opportunities. Products today will be a part of a system, a system that gives the possibility to collect data from the products even when they are installed at remote sites.

The figure shows that when the products are networked, the products themselves are of less importance for future business opportunities. The new opportunities are to handle the data available from the products. Product Services changes from the way it works today, to a way where collected data is processed and creates a value to the customer. Big opportunities for today’s product-centric companies are when Product Services changes to Value-Added Services.
3.4.2 What is different about Smart Services?
To be able for a company to provide smart services when selling a product, the product itself needs to be connected to a network using technologies like Ethernet or GSM/GPRS. The idea about smart services is to go far beyond the kinds of upkeep and upgrades often sold alongside products today. Smart services will be able to provide proactive actions. When a product is networked, there is always data available for analysis and processes. This is what smart services are about, to find opportunities where this data are of importance for the customer. Data becomes important for the customer when it saves cost, reduce human errors, reduce number of field service trips etc.

“We believe most product companies and OEMs in Europe now recognize the importance of services growth to maintaining a sustainable position in their markets. But services require a transition to a customer-centric business model that most product-centric companies are ill-equipped to make. Pervasive machine enablement can turn a company’s products into “invisible partners” in automated customer
relationship management, and yet most companies are not making device-based “field intelligence” a core component of their services thinking” Harbor #89 (2007).

Pervasive machine enablement means networked products. The networked products and the possibility of collecting and processing data is important for the new concept of defining value added services. Networked products could be seen as the new partner for product-centric companies.

Harbour (2005) describes different segments where opportunities for smart services could be found. The picture below shows the map of different segments and how they are divided into further segments and niches, which all can benefit from using smart services. Each segment and niche will have its own type of parameters, creating value for the user or the customer. The map can be used as a tool for positioning products and services.

Figure 6 - Overview of Segments within Smart Services (Ebeklint, H., 2007)
3.4.3 What networked products can do
The networking and management of connected products is the kernel of the concept of delivering smart services. Connected products will be able to perform the following applications (Allmendinger & Lombreglia, 2005):

- **Status.** Status applications capture and report on the operation, performance and usage or a given device or the environment being monitored.

- **Diagnostics.** Diagnostic applications enable a device to self-optimize, making it possible for a service person to monitor, trouble shoot, repair and maintain the devices.

- **Upgrades.** Upgrade applications augment the performance of a given device. They prevent problems with version control, technology obsolescence and device failure.

- **Control and Automation.** Control and automation applications coordinate the sequenced activity of several devices. They can also cause devices to perform one-off, discrete actions.

- **Profiling and behavior tracking.** Profiling and behavior-tracking applications monitor variations in the location, culture, performance, usage and sales of a device. These applications can create more customized or predictive responses for end users.

- **Replenishment and Commerce.** Replenishment and commerce applications monitor consumption of a device and buying patterns of the end user. These applications can initiate purchasing orders or other transactions when replenishment is needed.

- **Location Mapping and Logistics.** Location Mapping and Logistics application track and optimize the service support system for a device. These applications also support supply chain and sales activities.
All these applications can be found as customer activities somewhere in the Device “In-Use” Life Cycle as the picture shows. All these activities, Harbor Research calls *Life Cycle Opportunities*. But it might also be possible to find opportunities that aren’t necessarily connected with the product itself, but are somehow adjacent, so that the product might be a gateway to those opportunities. Harbor use *Kodak* as an example, where the digital camera is the product, and the adjacent value would be the value of making high quality printing of the photos taken with the camera. These activities which not are connected directly to the product are called Adjacency Opportunities (Harbor, 2005, p.7). Depending on what kind of smart services to offer, including adjacent applications, there are different business model to choose between.

### 3.4.4 Business models based on Smart Service

The consultancy company, Harbor Research Inc., describes 4 different business models when working with networked products offering smart services. Which business model to use depends on how the smart services are aimed to be implemented to the customer application, and what opportunities there are at each product application.
The first fact about a networked product, which is so obvious that no one needs to be told, is that it will capture and convey data. The second fact, not quite so obvious, is that these new data become a core asset. The third fact, not an obvious leap for many managers, is that information as an asset makes for fundamental changes in a company’s business. The fourth fact, which makes things simple but by no means easy, is that most changes brought about when information becomes central have the effect of moving a company toward a service business model (Harbor, 2005).

In chapter 3.5.3 typical applications are described where networked products can be used for enabling smart services. These applications are also what Harbor calls customer activities. To be able to know what business model to fit in, the company providing a product to customer should ask 3 questions regarding the customer (Harbor, 2005):

1. What are the activities the customer engaged in, in order to procure, own, use and dispose of our product?
2. For each of these activities, what also is the customer close to or in contact with when performing the activity.
3. What other activities proceed and follow the activities uncovered by question #1

The first question leads to what Harbor calls “Life Cycle Opportunities”, while the second and third lead to “Adjacency Opportunities”. If an opportunity is primarily or completely made up of elements that are uncovered by our question #1, then it is likely that it is possible to tap the opportunity alone (solo opportunity). If the elements of an opportunity are mainly adjacencies, probably there have to be a partner in order to seize the task (team opportunities).

Within each category of opportunities, solo and team, there are two business models. Within each category, what business model a company models itself to depends on a second criterion that relates to the opportunity. That second criterion is unique to each category (Harbor, 2005, p.8).
Describing the four business models:

- **Embedded Innovator.** Embedded innovators allow traditional standalone services to be embedded directly into the product. This traditional service is typical application for maintenance of the product. In general, what characterizes an embedded innovator is the low scope of activities which makes up the economic value of the overall opportunity.

- **Solutionist.** Solutionists provide many or all of the services around the total lifecycle of a product. The scope of activities which makes up the economic value of the overall opportunity is high. For instance, the solutionists do not only handle maintenance of the product, but also installation, updates, monitoring and operations of the product.

- **Aggregator.** Aggregators integrate the sales and service of the product, as well as the interaction with the customer. The opportunities cannot be tapped by a single device and a single vendor. There are situations in which a device may
collect valuable data, but not valuable enough in and of itself to create the opportunity. Instead several disparate devices work within an environment, and only by connecting all or most of them is a body of data created that is of high value. The characteristic of an aggregator is that he controls the application data aggregation and central processing power.

- **Synergist.** Synergists are contributors and participants in an alliance web where no single company “owns” the aggregator function. The devices of a synergist contribute valuable data and/or functionality which is controlled by the application.

### 3.4.5 Characterizing for the models
Embedded Innovator and Solutionist are differentiated by the scope of customer activities which make up the economic value of the overall opportunity. An Embedded innovator is characterized to have a narrow scope of customer activity and the Solutionist is characterized to having broad scope of customer activity.

GE Healthcare manufactures a MRI scanner. Examples of customer activities for this scanner are:

1. Determining requirements and whether having a scanner is justified
2. Financing the scanner
3. Installing
4. Testing, calibration, validation
5. Maintenance and replacement of parts
6. Replenishment of materials (gases and image media)
7. Training personnel to use the scanner
8. Determining the need for a scan (preliminary diagnosis)
9. Preparing the patient for a scan
10. Scanning the patient
11. Interpreting the scan
12. Updating software (firmware)
13. Upgrading the hardware
Many of these activities are high valued opportunities, and GE Healthcare decided to make a service organization handling these opportunities. Only 8, 9, 10 and 11 are primary medical matters and thus cannot be the province of the manufacturer. Since the other activities represent an opportunity for GE Healthcare, the company is defined as a Solutionist.

HP is a manufacturer of laser printers. There are many activities around a printer, but it has only a few activities that represent an economic opportunity for the manufacturer. The printer is in many cases too cheap to find the same opportunities as the MRI scanner. The opportunities presented by adding connectivity to a laser printer is fairly narrow, there was one opportunity found. This opportunity is to detect toner level and initiate a just-in-time order for more toners. In developing a networked printer, HP steps into an Embedded Innovator model (Harbor, 2005, p.10)

The other two models, Aggregator and Synergist, are those in which the opportunity cannot be tapped by a single device and a single vendor. There are situations in which a device may collect valuable data, but not valuable enough in and of itself to create the opportunity. Typically example would be a simple table lamp at home. There are no economic value in collecting data from it and even be able to turn it on or of using the network connectivity. But if all electrical devices were networked, then that aggregated body of data can be of high interest.

Where a system aggregates and processes data from a number of devices, there are two roles for a device to play in such a system: it can be central or peripheral; the hub or a spoke; the brains of the operation or an eye, an arm, or a finger; the team captain or a role player.

These last variables characterize our third and fourth business models. When an aggregating system is required in order to define and tap an opportunity, then there will be an Aggregator, who controls the application’s data aggregation and central processing power, and there will be Synergists, whose devices contribute valuable data and/or functionality which is controlled by the application (Harbor, 2005, p.11)
Eaton, with its launch of a system for monitoring devices in the home, is well on the way to being an effective Aggregator (Harbor, 2005, p.16)

Figure 9 shows the matrix of business models with the different characterizing parameters that are described in the chapter.

![Figure 9 - Figure shows the characterizing parameters for business models (Harbor, 2005, p12)](image)

### 3.5 Conclusions from the literature review

All marketing is built on STP – Segmentation, Targeting and Positioning (Kotler & Keller, p.310). In the chapter of fundamental marketing concepts, trends, and tasks it says: “A marketer can rarely satisfy everyone in a market. Not everyone likes the same cereal, hotel room, restaurant, automobile, collage or movie. Therefore, marketers start by dividing up the market into segments” (Kotler & Keller, 2005, p.24).
Porter means that if you are a company on the market, there are three potentially successful generic strategic approaches to outperforming other forms in an industry:

1. overall cost leadership
2. differentiation
3. focus

Sometimes the company can successfully pursue more than one approach as its primary target, though this is rarely possible (Porter, 1998, p.35).

Once the segments are defined, it is possible for the marketers to evaluate what segment presents the greatest opportunity for business and make an offer to target this specific segment. The useful segment variables for this are: (1) Parameters unrelated to the product (demographic, gender etc) (2) Parameters related to the product (3) Competitor segmentation (4) Benefit segmentation (5) Price Sensitivity (6) Loyalty (7) Application segmentation (Aker, 1995, p.52-54).

To develop an offer, you need to know your strategies of what you are going to sell to whom. If you are working according to the suggestions in Michael Porter’s book Competitive Strategies (Porter, 1998, p.35), where he claims that you need to choose between (1) Product differentiation, (2) Low price or (3) Niches to be successful, then you need to form a clear offer for that specific segment. You can only have success by being the best in one segment, if you try to combine you will most likely have trouble with resources and risk that another company wins this area.

The Marketing Mix model also commonly known as the 4P’s (Product, Price, Promotion and Place) (Kotler, 2005, p.19), describes the marketing tools and variables used by a company to pursue its marketing objectives. In other words, the Marketing Mix approach to marketing is a model used to assist in implementing marketing strategies. There are also 3 more P’s as suggestion (People, Process and Physical evidence) (Wikipedia, 2007).
The value chain divides the firm into different activities, which a company uses in designing, producing, marketing and distributing products. These activities can be identified in the generic value chain model as Primary activities and Support activities described by Porter (1998, p38).

To be able for a company to provide smart services when selling a product, the product itself needs to be connected to a network using technologies like Ethernet or GSM/GPRS. The idea about smart services is to go far beyond the kinds of upkeep and upgrades often sold alongside products today. Smart services will be able to provide proactive actions. When a product is networked, there is always data available for analysis and processes. This is what smart services are about, to find opportunities where this data are of importance for the customer. Data becomes important for the customer when it saves cost, reduce human errors, reduce number of field service trips etc.

Within each category of opportunities, solo and team, there are two business models. Within each category, what business model a company molds itself to depends on a second criterion that relates to the opportunity. That second criterion is unique to each category (Harbor, 2005).
4 EMPIRICAL STUDY

This chapter covers a summary of the qualitative method used to collect data and reflect the observations made at IntelliCom. Data is collected from a customer of IntelliCom who could be an important customer for future business within the subject of the study. The Chapter describes the opportunities for IntelliCom with a focus on the customer’s applications. The reader will get an understanding of the market strategies used today by the company and what parts of the value chain that is affected if smart services were to be implemented in customer’s products.

4.1 IntelliCom overview

History:
IntelliCom was founded in April 1996. The company is a Swedish private held company based in Halmstad with 11 employees.

For the first years the core business was to develop communication interfaces and gateways, primarily to network enable products within the building automation and utility market. These products have been used to convert/translate between different communication protocols such as LonWorks, Modbus, CAN and Metasys. In year 2000 the core competence was the knowledge within different protocols and the ability to make custom software development on consultancy basis.

Today:
Today, IntelliCom have its core competence within M2M (connecting Machine to Machine). Having a core competence within this area, means that IntelliCom are experts in using different technologies to connect remote machines to each other for data exchange. The connection makes it possible to aggregate information/data from remote machines/product and store it on a central server or present the data via remote installed product by the machine.

The former core competence and experience within protocol converters are not included in the main offer today, but it is a very useful competence and used for some big customized projects. The knowledge and competence within different communication
protocols is still important to IntelliCom, because it is an important competition benefit when it is part of a Remote device management project.

### 4.1.1 Vision and Mission

**Vision**

*IntelliCom shall be a leading provider of Remote Device Management solutions.*

**Mission**

*We offer solutions to manage remote automation devices at any location at any time.*

*This saves time throughout the organization.*

### 4.1.2 Products

IntelliCom has a range of products that enable monitoring, control, data logging and alarm management of remote products, using common infrastructure like the Internet and mobile networks. The picture below shows the concept of remote monitoring and where in the project/application the products they selves are installed today.

![Figure 10 - IntelliCom products, own construction.](image)

Figure 10 - IntelliCom products, own construction. Figure shows IntelliCom products (yellow background) installed next to customer’s devices and connected to Internet making it possible to see data remote via a web browser.
4.1.2.1 Brand

NetBiter® is the brand of the product family, owned by IntelliCom. The product family NetBiter is based on a platform with two serial connectors and one Ethernet connector. There are at the moment three different hardware versions within the NetBiter family Brand, all in the same type of encapsulation. The products look the same, but one also includes a GSM/GPRS modem (in addition to the serial and Ethernet connectors) and another one is a unit with only inputs and outputs and one serial connector (no Ethernet connector).

The brand only consists of the NetBiter text, with no symbol etc., see figure 11. IntelliCom also offers the customer to put their brand on the products. There is a minimum quantity of ordered products and a special cost involved in this offer.

NetBiter®

Figure 11 - The NetBiter Brand
This is a registered brand by IntelliCom Innovation AB.
4.1.2.2 Product line

Today IntelliCom have a product line based on 4 different NetBiter products, Serial Server, RTU-TCP, I/O Extender and webSCADA. Customers have asked IntelliCom to do some line featuring (Kotler 2005, p.386) to Serial Server and webSCADA to fit the customer’s needs. IntelliCom has also made some other software customized development which resulted in a platform called “netbiter.net” which is a server software used for collecting remote data from machines/products to a central place.

When this new platform will be implemented in our product range, it will be a line-filler (Kotler, 2005, p.386). This line-filler gets IntelliCom new business opportunities within data collection and remote monitoring services. The line-filler netbiter.net is the core technology of future data collecting.

Figure 12 - IntelliCom Product line, own construction.
The core technology netbiter.net includes a central server with a database collecting and storing data from networked products, as picture 12 shows below. The strength of the netbiter.net concept lies within the technology used for collecting data from remote products. The technology eliminates installation problems like firewall pass through, special GPRS subscription, complex networking configuration etc.

Figure 13 - IntelliCom products, own construction. Figure shows IntelliCom products installed next to customer’s devices and how they connect to a central server where all data from customer devices is stored.

Further line featuring on the netbiter.net solution makes it possible to forward data to customer enterprise systems direct from the netbiter.net database. This concept solution is described in the picture below, where data transfer between netbiter.net server and customer server is made by using XML, ODBC, OPC or similar standards.

Figure 14 - IntelliCom server solution, own construction. Figure shows how the server will exchange data with customer server by using XML, ODBC, OPC or similar standards.
4.1.3 Price
All products in the product line of IntelliCom are set by sales management and based on a combination of *going-rate pricing* (Kotler, 2005, p.447) and *maximum current profit* (Kotler, 2005, p.437). The products are discounted to sales channels of IntelliCom world wide. List price is global and there is no *differentiated pricing* (Kotler, 2005, p.453) on the market.

IntelliCom uses 30 days net payment for all customers and partners. Shipment cost is excluded in the pricing and DHL is used as a partner to get good prices.

4.1.4 Promotion
IntelliCom has a sales force of three salesmen, where all three are partly dedicated to other activities. One salesman is building a network of partners, another salesman is dedicated to the role of managing director including marketing management and the third salesman is dedicated for specification of future products.

IntelliCom pay Google ad-words for getting hits on the web page. The web page is the main marketing tool for presenting the products and services to customers. On the web page there is a contact form that is used by interested customers. Interested customers are from all kind of branches and segments within communication and remote data monitoring. IntelliCom usually participate in 1-2 exhibitions every year, normally in Germany. The exhibitions are within automation, but very wide in the applications and users. Newsletters by email are sent once a month to customers who been in contact with the company. Also press-releases are sent to online and paper magazines.

During 2007 there is a partner network cooperation going on (sales channels), where partners market the NetBiter products on their web pages, to explore the brand. 2007-05-01 IntelliCom have 16 other web pages exposing the NetBiter Products.

4.1.5 Place
IntelliCom is based in Halmstad, Sweden. Even if IntelliCom have 75% of their products on export, there are no local offices abroad. IntelliCom is building up a global network that market and sell the NetBiter products world wide. Working with non-exclusive agreements makes it possible to sign more than one partner in each country/region. There will be no internal competition between the partners, while they are all specialists
within and representing different branches. Today IntelliCom is represented in 19 countries through 24 partners covering countries in Europe, Asia and Middle East. All purchasing that is made directly via IntelliCom is shipped with DHL. IntelliCom have a stock of NetBiter products in Halmstad and can normally ship within 1 day. Customers can get the products delivered with others than DHL if requested, but only if they have an account with them. Partners in different countries are effective for having good support locally, but international customers purchasing direct from IntelliCom in Sweden does not experience any problems dealing with IntelliCom directly.

4.1.6 People, Process and Physical evidence

All people at IntelliCom are aware of the importance of customer contacts. Since the company is relatively small, all personnel usually get in contact with customers in different processes. Because the size of the company and limitation in resources, engineers at IntelliCom often handle advanced support and project specification. Even if IntelliCom offer free trials to customers, there is a need of understanding and proof of concept before purchasing. Recently there have been decisions taken that application notes, demo sites and activities that helps the customer feel safe and reliable in the purchasing process will be developed. The time frame for these activities lies in Q3, 2007.

4.2 Customer overview

Founded in 1870, Woodward Governor Company designs and manufactures hydro mechanical and electronic controls, fuel-delivery systems, actuators, valves and related components. Corporate headquarters is in Fort Collins, Colorado (USA). Woodward serves its customers worldwide through manufacturing facilities and sales offices, central distributors and authorized dealers, and authorized independent service facilities (Woodward, 2005).

The company's products are used in two major markets:

- Aircraft Engine Systems
- Industrial Controls

The networked products discussed in this study are within the Industrial Control area.
4.2.1 What applications will networked products be part of?

At Woodward Company, the networked products will be implemented within the Industrial Control area used in the customer segmentation of GenSet applications. A GenSet is a diesel engine with a control panel for monitoring and control. Today Woodward uses its service organization network around the world to sell ordinary services within maintenance. This is typically services like changing oil, checking levels and parameters etc., often made on regular basis with a time interval in agreement with the customer. With the technology offered from IntelliCom, there will be new possibilities to network products. The networked products will offer the service organisation of Woodward complete new possibilities to collect data from remote installed machines. Even if Woodward already has the possibility to connect machines remotely with existing technology, the new technology offered by IntelliCom creates new network architecture with beneficial’s that Woodward requires being able to offer new value added services. Earlier there has been one computer connecting to the industrial control unit, one at the time. With the technology from IntelliCom, it is possible to let all industrial controllers be networked and connected to the central server for collecting valuable data simultaneous.

The first customer group defined by Woodward for the networked products would be the end-users within the segment of GenSet applications.

Figure 15 - Figure shows how the NetBiter connects to remote equipment, own construction.
There are many different customer activities included in this type of applications. The GenSet involves a diesel engine, a generator and the controller. This makes it relatively expensive compared to the cost of a NetBiter, which is the part that makes this equipment networked.

A GenSet project typically consists of all activities and applications mentioned in chapter 3.4.3, which are:

Activities: Finance, Design, Sell, Build, Install, Start-up, Operate, Maintenance
Applications: Status, Diagnostic, Upgrades, Control and Automation, Profiling and behaviour tracking, replenishment and commerce, Location mapping and logistics.

The maintenance activity with service and reporting are requests that most customers of Woodward have for the moment. Today the service personnel of Woodward often needs to go to the installation to make service and reports, software updates or to get the diagnostic out of the controller by connecting a laptop to the controller. With networked products it is possible to offer many parts of these requests without physically going to the installation, but by reading data remote from the installation using netbiter.net technology.

GenSet installations can be found within many different areas. One is the power back-up system for mobile phone radio-stations. These often include a UPS (Uninterruptible Power Supply) and sometimes also leak-detection systems (water leakage etc) that also could be connected to the GenSet controller and data could then be collected from these devices as well.

Woodward is one of the leaders doing controllers for the GenSet. There are in total about 3-4 major manufacturers and then some smaller manufacturers. Only Woodward sells about 5,000 controllers a year world wide through their network of distributors. An estimation of networked products during one year would be about 20% of these units first year. In the coming years the estimations would be about 60-70% of total sales according to Woodward.
4.2.2 What are the benefits with networked products?

Woodward would be able to offer customers much more accurate data and functions with networked products. If the products were networked, then it would be possible to add further functionalities in the future in a very simple electronically way. Developers or service people do not need to travel to the installation site for updates, it can be made remotely. This makes the installation more future safe considering bugs, updates and new features.

The most beneficial application is initially the maintenance with cost savings at errors and services due to less travel cost and expenses. This is an important issue for both Woodward service organization and the end-customer. But as the competition within the industry is important, new features and better technology are of importance. The fact that it would be possible to connect other peripheral equipment like UPS’es and leak-detection system is an interesting point of view in the long run, even if no aspects have been taken to that at this level.

End-customers often use a HMI (Human Machine Interface) for monitoring and controlling including functions like getting alarms. This HMI can collect data from different databases, which makes it possible to let the HMI connect to an external database to get customer specific data (IntelliCom database).

When discussing benefits with Woodward, they claim that having their products networked, will affect many parts of the organization. To start with, no internal knowledge within this area exists to make the products networked. There are a lot of experts in services and customer caring though, but they would benefit from external expertise within communication solutions to get the product networked. As the business model with services are up running, networked products will affect the cost of existing procedures in a positive way with lower cost and higher profit as a result. Better services often mean happier customers, and satisfied customers will stay as customers in the future also, which means more sales and higher future profits.
By summarizing my study shows that IntelliCom have been focused on selling products to customers, to network enable customer’s products. Sales force and sales channels are built for marketing and sale of existing products. Also the pricing strategy based on one time purchasing for each product strengthen the view of being a product centric organization. The study of the product line shows that the line-filling products, based on netbiter.net technology, offer IntelliCom to collect data from remote networked products in an efficient way making it possible to offer customer valuable data and services to IntelliCom customers. The study shows that the customer of IntelliCom will benefit in the same way as IntelliCom, making it possible to increase their sales of value added services to customers, not only products.
5 Analysis

The reader gets an overview of data collected and how it relates to the theories described in earlier chapter. The analysis made in this chapter covers the value chain of the customer and how value could be increased. This chapter also gives the reader information on the findings of opportunities for smart services. This analysis of data is of importance to forming the conclusions and recommendations of the study.

5.1 Increasing customer value

When studying the value chain of Woodward, it is obvious that Services, which is a primary activity, is the activity that is most affected when adding smart services to its value chain. The result of adding IntelliCom technology to this activity, which provides smart services, will be that Woodward can differentiate even more on the market when it comes to service activities of their customer’s equipment.

When implementing networked products and smart services, it will strengthen the Woodward differentiation on the market, results in the increased value generated by many different activities/opportunities. Woodward is one of the three largest manufacturers of GenSet controllers. This would make it possible to assume that their marketing strategy would be like generalists, performing Operational excellence (Treacy & Wiersema, 1997, p.39). But even if large scale manufacturings at the company do have a positive effect on the revenues, the company strive to differentiate their products and services. To fit Woodward within the theories of Treacy & Wiersema (1997), I would say that they strive to have Product Leadership. Treacy & Wiersema pointed out that only one value discipline can be performed at the time, I think that customer Intimacy will get more and more important. And with smart Services, it will be possible to differentiate products and services on the market, but also achieve to get closer the other discipline which will be more and more of importance for future business, the Customer Intimacy.

This study shows that the service activity at Woodward will be able to reduce travel cost upon an error or failure. Instead of dedicating personnel to visit the installation, cost savings will be possible by looking at collected data first, deciding the level of urgent, the size of the failure and it will then be easier to make a schedule for visiting the site if
it necessary at all. When the networked products make all this new data accessible by service personnel at Woodward, it would also be possible for Woodward to offer the end-customer more information. This would most likely result in less phone calls and questions from end customers, and there will be an increased value of efficiency at Woodward.

The increased value is not only caused by reduced cost at Woodward, but also it will be possible to add new features of the services they sell today. By improving data collection and adding new features like smart services, Woodward will be able to find new services to charge for, more valuable data to sell. This kind of business is valuable for the service activity within the value chain.

This technology provides easy made updates on the products in the future, which is a key issue to after sale activities. The networked products are valuable in a perspective of future businesses, not only as a solution increasing the value of today or the near future. Looking at the value chain of end customer gives us an understanding of where the value activities are in Woodward value chain. End customer will get access to more accurate data which gives the opportunity to purchase reports and extra services including updates.

The value chain of Woodward would also be affected at the vertical level when implementing smart services. Today Woodward does not have the knowledge or resources to develop this kind of core competence that IntelliCom have. When looking at the support activities, it is clear that technology development within the generic value chain will not require any more resources or additional cost of personnel starting using smart services if this is purchased from IntelliCom. This study does not handle how the cooperation should be made between the companies, but it is interesting to mention that licensing the technology could be one thing that increases the value. The value then lies in the short time-to-market access and the fact that no development cost would be necessary.
5.2 What are the opportunities for Smart Services?

Analyzing of the opportunities starts with the understanding the benefits of end customers. These benefits have been described by Woodward, who is the company that should be able to provide the right services to get the increased value in the primary activity Service. The opportunities for smart services are different depending of whose perspective activities are viewed from. The opportunities for Woodward within the area of providing smart services, by using networked products, are:

- Offering visualisation of real time data from end customers equipment
- Offering data for historical trends and analyzing
- Offering efficient event and alarm handling
- Creating reports
- Connecting nearby equipment to the system (adjacency opportunity)

Before analyzing the value chain of IntelliCom, it is as important to be able to identify a segment where the opportunities for the company are big. The identification of what segment to target should be based on five or ten variables (Aaker, 1995, p.51). In this research, Smart Services are targeting a company that works within power distribution offering GenSet equipment. Variables that are important and relevant for the opportunity of IntelliCom within this segment are:

1. GenSet equipment is expensive compared to IntelliCom product
2. End customers are used to purchase some sort of services
3. Access to remote data and alarm has a great value for the end user
4. Global market of potential customers
5. Smart services offer good possibilities for ROI

Smart Services could be implemented in many different segments. The 5 variables are all valid in Energy-Electricity segment. Many of the variables could also be found within the industrial segment, which makes it possible to develop the market in the future.
When studying the value chain of IntelliCom, the opportunities within smart services seems to be within the Sales & Marketing activity. Looking at the fact that external manufacturing of the hardware is up running, purchasing working close to optimal, no operating activities that the smart services will affect and a working product return procedure including the support issues of the product. With this in mind, the opportunities seem to be within the Sales & Marketing activity, when introducing the new smart services to the market.

The development and its cost for smart services at IntelliCom are within the support activities, where software engineers is the major cost. The future development is an ongoing activity during and after a marketing introduction of the smart services concept, with no remarkable change to the support activities in general.
6 Conclusions

*In this chapter, after the analysis of the empirical data, presentation of key findings regarding opportunities and increased customer value are described. Relevant findings from the analysis phase are combined with the framework of the theory, presented in chapter 3, and described as conclusions. Recommendations are made to IntelliCom management to be able to bring smart services to the market from a management point of view.*

6.1 Key findings of the research

When analysing the Marketing Mix of IntelliCom, it shows that the product line of IntelliCom needs to be added with further products. These line-filling products would enable the customers the products to increase the value in customer’s value chain. Also the analysis showed that a line filling in combination with line-featuring of the NetBiter products seems to be important for having the right features for smart services. IntelliCom has a brand, which is used as a product family name for all 5 products included in the product line. The expose of the brand is stronger than the company name. There is no differentiating in the pricing of the products, no matter of which segment customers are active within. The prices are based on a combination of going-rate pricing and maximum current profit.

There is no doubt that the IntelliCom web page and the traffic to the page is the dominated market communication channel of IntelliCom. Google ad-words is used to create traffic to the web page. IntelliCom only have three sales persons who are not 100% dedicated to sales activities, therefore IntelliCom has a global partner network that also do marketing and sales of the NetBiter products to compensate internal sales. Partners need to expose the NetBiter products on their web pages. IntelliCom is based in Sweden, 80 % of total sales is export. Standard order confirmation and deliveries are within 1 day and Customized products will require 1-2 weeks of delivery without keeping any in stock.

All personnel at IntelliCom work close to the customers and are well informed and aware of the importance with good customer relation.
The interview with Woodward was a good help in understanding the opportunities and to understand what activities creating value, in a customer perspective. IntelliCom has identified 5 variables that are of importance to the business opportunity when choosing industry segment. Interview with Woodward confirms the relevance of these variables.

Woodward strives to differentiate their products to be able to achieve a better primary activity in their value chain. When looking at increasing the value within the Woodward value chain, it is within the Services that most value is created. There is a vertical effect also within the chain, looking at the technology development within supply activities. Using IntelliCom technology will not require any additional development resources or costs at Woodward. The Supply activity Technology Development will not suffer when Woodward use technology from IntelliCom to network enable their products.

Analyzes of the opportunities was made with two perspectives in mind, both from Woodward point of view, but also from IntelliCom point of view, and resulted in the following findings;

Woodward perspective: The primary opportunity was found within maintenance of the remote products. Maintenance means possibilities to offer better service of equipment, failure can be monitored when they occur with no need to visit the site, more available data for remote monitoring using a web browser, easy access to data which can be used to process for analyzing performances of equipment. Woodward does offer customer services today, but the benefits with networked products will differentiate their possibilities within the primary activity. These opportunities mentioned will turn into benefits for Woodward’s buyers, which benefits from increased value of their inbound logistic and operations. This value consists of cost reduction and optimized process performance. Typically, Woodward would fit working according to the Aggregator business model.
**IntelliCom perspective:** The opportunity for IntelliCom within smart services is to provide data and processed data to customers. The creating of value in the value chain seems to be within Marketing and Sales. The opportunity seems to be to provide data as a service to customers, who can offer smart services on their product to their customers. In a perspective of intelllicom, the Embedded Innovator business model would fit.

### 6.2 Recommendations

IntelliCom management aims to understand the opportunities within smart services and how to bring the offer to the market. The approach to get this understanding would be to consider the opportunities described in the chapter of key findings above. IntelliCom management should study the parameters creating value for Woodward’s customers, to be able to offer Woodward the right solution.

Having in mind that IntelliCom have limited sales resources, and also limited technical development resources, I recommend this kind of business where IntelliCom provides products for networking and also making the collected data available for customers, but the customer offer value added services to many of their customers.

This kind of business relationship means that IntelliCom will work according to the Embedded Innovator business model, offering Woodward to have their products networked. But IntelliCom will not strive to sell and fulfil the opportunities to the end customers. Instead I recommend having Woodward as gateway between IntelliCom and end users. As long as IntelliCom have the central server with all data, which is essential, IntelliCom will be able to sell data or processed data to Woodward with very limited efforts of the sales force. And Woodward will then use all their distributors and service network to sell smart services to their customers world wide.

Working like this will provide IntelliCom to sell data access, which would be the first step to sell smart services. Doing some product line-featuring would give IntelliCom the possibility to fulfil the smart service opportunities in the future.
Providing only data access as the offer to a specific segment would then fit with the SIVA marking model, similar to the Marketing Mix. To bring the offering to the market, I would recommend the management of IntelliCom the following within the SIVA model:

**Solution:** Develop the necessary software to get what Woodward needs. When this business is up running with GenSet controls, I recommend implementing new features to the solution which would make it possible to do some market development and find new applications within other segments in the Woodward company group. In parallel with Woodward, the competitors of Woodward should also be addressed with this solution.

**Information:** To have a strong focus targeting Woodward first, followed by other GenSet controllers. Information and marketing needs to be more efficient and cover more than only web pages as today. I recommend direct marketing and personnel visits, as the amount of companies within the segment is relatively small.

**Value:** I would recommend the management to inform the value of smart services with different messages depending on the receiver. Addressed to executives, smart services are revenue generation and ROI. Addressed to Management level, smart services are Ease of integration in processes. Addressed to the developers, the message should be speed of development, latest technology and simplicity.

**Access:** By targeting OEM companies and work with them as described earlier in this chapter, would be ideal for IntelliCom with limited resources of sales force. Access to our product and services would then be depending on our OEM sales organisation and our ability to manufacture and store products. Access to the data will never be a problem.

If IntelliCom offers this kind of limited opportunity within smart services, it would also be easier to position the offer on the market. I recommend to do further research of how to positioning the offer to the market.

It is my recommendation to target OEM companies to be able to work according to the embedded innovator business models, letting the OEM companies work according to the Aggregator business model. Working this way, implementing new custom specific
features, would place IntelliCom on the Product specialist half of the theory of Sheth & Sisodia (2002) proving OEM customer with technology for differentiating their services. I recommend the management of IntelliCom to have a look on the Customer Intimacy theory of Treacy & Wiersema (1997. p.46) which I think would be a good approach to the future marketing strategies and to get a high life time value for future customers of IntelliCom.

The content of this study is useful for product-centric organizations that have an interest of increasing their service offer or changing business model to find new ways of increasing revenues within a mature market or segment.

I think the method in this study fulfilled the requirements of collecting relevant information in a subjective way, to be able to analyse and draw some conclusions. The questions in the interview were made to be as subjective as possible. The method could have included yet another customer or two, to get a wider perspective of the market segment. I think that more interviews would only change some details on a technical level, and not affect the recommendations made in this study.

When the need within the GenSet market is saturated, I suggest that a future study covers the investigation of the possibility to target another market with the same business model. An alternative is to study the consequences of using another business model than the recommended.
REFERENCES

Literature


**Articles**


**Web-sources**


**Unpublished electronics source**
APPENDIX 1

Interview
Phone interview with:
Company: Woodward Governor Company
Person: Matthias Voloder, +49 (0)711 789 54-330
Title: Product Line Manager

1. **Do you sell networked products?**
   We can connect to remote sites and installations, and we offer as good service as we can through our service organization, but we do not offer remote installed networked products like you offer. Today most services is made on regular basis once a year or whatever customer agrees on. With your technology implemented in our products we will be in a new position of offering the end customer more advances services and access to valuable data wherever and whenever he wish. It would be interesting to let our engineers here in Germany and your engineers work together to find a solution that fit our and our customer’s needs. This would help us a lot to bring new interesting functionality to our products.

2. **What group of customers could use your networked products?**
   Typically all GenSet installations where our controller is used, no matter of segment or country. All use central distributors and authorized dealers, and authorized independent service facilities for selling and services. There will also be other segments like valves, pumps and actuators that could be networked in the same way as GenSet Controllers, also using our network possibilities.

3. **Primary customer activities**
   Activities like installing, start-up, operate and maintenance activity all of interest absolutely. But maintenance where our service organization will be able to have
access to remote product data is the primary activity we think. This will give
advantages like fully control of equipment with almost real time performance.
Real-time performance is not very important in GenSet applications, the very
most benefit is that you can monitor the equipment without visiting the site. This
will save a lot of time and cost for personnel that doesn’t need to go to site. We
also offer our customer HMI (Human Machine Interface) today, your product
could provide our HMI with further data which the end customer will benefit
from.

4. **Which activities represent opportunities?**
   Maintenance, alarm, service and trend reporting is what we know the customer
   are willing to pay for today. This is also what we see as the biggest advantage to
   add features to when using networking products. In the future we would be
   interested in analyzing data to improve customer’s application.

5. **Adjacent activities**
   I think other segments like valves, pumps and actuators would be in a focus
   before we try to add adjacent activities like UPS monitoring etc. But UPS’es are
   common where we have our equipment and it is a typical application that our
   service organization also could handle. In some places we do offer this support,
   but then we are using another program interface. Monitoring both GenSet and
   UPS in one program would be great. Leak detection systems and temperature
   surveillance are common at 3G radio stations for example. It would be possible
to connect this equipment as well I suppose. We have not yet considered these
kind of possibilities yet.

6. **Estimated need of networked products during first and second year?**
   Today we sell about 5,000 controllers each year within GenSet applications, my
   guess is that 20% of these controllers the first year would be reasonable and we
   would be aiming for about 60-70% in the future. The smallest controllers might
   never be interesting to network, and in some installations we can use one product
   of yours for connecting several controllers/products.
7. **What benefits can be added over time and what advantage will they bring you?**
   Starting to use networked product will add benefits our distributor and service offices from day one, who can offer better services with more accurate data available to end customers. Probably this is the kind of services that end-customer can pay for. I am sure there will be a combination of saving cost and increase sales for both our service organization and for end-customer application. More features would probably mean more information available for analysis. Services on machines could be more efficient, strategic actions being pro-active might be possible due to analysis of data. Overall different possibilities to reduce cost for our distributors at the same time they will increase perceived value to end customers.

8. **Will your HMI system overlap our system for remote monitoring?**
   Our own HMI system will be used in most of the cases where our service organization will be responsible for service and maintenance, but it is possible to get data from other external databases. Our HMI will get data from the networked products through your server. We might consider having IntelliCom server at our facilities if that is possible.

9. **How will networked products make profit for you?**
   Cost reducing and better service are the main issues here, both for Woodward, our distributors and also for the end-customer using our equipment. But there are other aspects of importance to consider. Woodward is one of the leaders within GenSet controllers. We need to offer the best solutions on the market to be competitive, this also includes communication solutions and solutions like you offer. With the right technology we will be able to increase the profit within many areas of our organization. In the future we might need to embed your technology even closer to our products to further reduce cost, get more performance and increase the profits. We know that satisfied customers will stay customers to us.