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E-business Str@tegy in the Acute Care segment in Europe

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ABSTRACT

The European health care industry in general has been rather backwards with e-business implementation compared to other industries. Only a handful of start-up companies have recently initiated trading medical products online. However, it is inevitable that e-business must be offered by the leading health care manufacturers in order to remain competitive.

As customers are the kings of businesses today, it is imperative for companies to understand their needs in order to deliver superior service and customer satisfaction. Especially within the supply chain, there are many existing challenges that can be solved using e-business. Through interviews and round table discussions with people from different professions within hospitals, it is obvious that the challenges are plentiful and the perceptions of e-business differ across functions. The deep-rooted and traditional hospital culture makes it even more difficult to gain mutual support for an effective and efficient e-business implementation. Therefore, the solutions that are designed to help the hospitals solve their supply chain challenges must be highly value-added and amenable to all parties. At the company level, the solutions offered will be based more on content and information. Through portals, the solutions could deal more with the transactions and the overall efficiency of the supply chain.

Key words: Germany, the United Kingdom, Acute Care, hospitals, e-business strategy, supply chain

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Göteborg, 08.12.2000

Miriam Fladvad Hui Li Kam

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1 INTRODUCTION

The aim of this chapter is to introduce the background of our research problem and why we chose Mölnlycke Health Care as a case company. We shall continue with our purpose and research problems, a research framework that describes the problem analysis, and, finally, conclude with the delimitations and the outline of the thesis.

1.1 Background

Mölnlycke Health Care (MHC) is one of Europe's leading health care manufacturers and suppliers of single-use products for surgical interventions and wound management, mainly used by health care professionals and their patients. Despite the fact that MHC is a global player in the health care industry, its main markets are in Europe. The company is organised in two divisions, Surgical and Wound Management, with the former generating approximately two-thirds of its revenues.

We are interested in the company because of the rapid development that it is undergoing, in line with its objective to be listed on the Stockholm Stock Exchange by 2001. Even more impressive is their substantially increased operating profit during 1999, which may result in an Initial Public Offering sooner than anticipated. The MHC report for 1999 shows a turnover of 2.100 MSEK, an increase of 20% compared to the previous year. Profits also show a dramatic increase, from 23 MSEK in 1998 to 172 MSEK in 1999[1]. However, after such a tremendous year, expectations for year 2000 are even higher and it is intriguing to follow the company's developments and see if it could live up to the expectations.

With regards to e-business potentials, the fact is that businesses are more willing than consumers to communicate, negotiate, buy and sell online. Boston Consulting Group estimated that one quarter of all business-to-business purchasing will be conducted online by 2003 – some $2 trillion over the Internet

[1] www.molnlyckehc.com, 17 September 2000

and $0,8 trillion over private networks using Electronic Data Interchange (EDI) (BCG 1999). Some of the reasons are[2]:

- Companies, especially the larger ones, are generally better equipped to communicate electronically. They usually have a high proportion of available computers, networks and bandwidth capacity, thus making Internet use faster and more convenient;
- Companies are more cost-conscious, since every dollar saved in procurement is equal to a dollar of new profit (Dobler, Lee et al. 1984);
- Network externalities (Katz and Shapiro 1985) will have a particularly strong impact, as corporations had invested substantial amount of money in developing their IT supply chain infrastructure, the natural reaction for these companies will be to encourage others to do the same and generate further efficiency gains;
- The diffusion of innovation literature has shown that products consumed in the workplace diffuse more rapidly than products consumed privately in one's home (Rogers 1983; Kardes 1999);
- Many businesses are already conducted at a distance (by fax, mail or EDI), thus it is easier to translate to the Internet;
- Companies have more opportunities to form strategic alliances/relationships and address customer problems in new ways.

Within the health care industry[3], the intensity of competition in the market has soared as a result of globalisation and industry consolidation, especially in the last decade. In fact, the international competition has further aggravated the existent price wars among competitors, thus creating stringent price-consciousness in the minds of customers.

Today, the major trends in the industry include increasing Internet adoption in all markets and socio-economic groups, as health care providers and consumers are using Internet increasingly in search of medical information. The awareness of health care costs and quality is also increasing.

[2] Coltman & Midgley, 2000, p. 7

[3] We define the health care industry as the manufacturers of medical devices and its customers (although some other parties may have a broader definition).

This creates an urgent demand in the business-to-business sector to bypass the intermediaries in the value chain in order to cut administrative and logistics costs.

Therefore, for the past two to three years, the European health care industry has started to get involved in e-business[4]. Several new start-ups[5] have been launched with the focus on content/information and to a limited extent, on the transaction itself[6]. However, there has been very little profit generated over the Internet at the moment, as e-business is still very much in the embryonic phase. As such, brick-and-mortar companies such as MHC are not too concerned over the revenues "lost" to their web-based competitors. In fact, MHC's E-business Manager considers competition as negligible. Even Allegiance and Johnson & Johnson, which are the pioneers in e-business in the health care market, have only just implemented online sales in the USA.

Industry trends

With health care marketplaces, there are currently two promising and supplier-driven e-business projects going on that are of major interest for MHC: 'Vamedis' (former 'HealthCo') and 'Global Health Care Exchange' (GHCX). Vamedis is a pan-European initiative, focusing on Europe, with Coloplast, Lohmann & Rauscher, Hartmann, 3M, B.Braun, Medimex, Ansell and MHC as initial founders. Meanwhile, GHCX is a US-driven initiative, founded by J&J, GE, Baxter, Medtronic and Abbott. Both of these marketplaces have just been launched and, thus, are only focused on content/information for the time being.

Vamedis is a service provider for all individuals, institutions and organizations involved in the healthcare community. It is an open Internet platform with its origin in Europe. It integrates all stakeholders in the healthcare industry - ranging from interested patients to physicians, hospitals, pharmacies, (specialist) dealers, suppliers, health insurances and other organizations involved in this sector.

[4] According to MHC, e-business is about expanding market coverage, attracting new customers, keeping existing customers, managing interactions and transactions and fulfilment in an efficient and effective way, by the use of Internet and web-based applications in combination with other electronic tools and processes.

[5] A start-up is a new company trying to link suppliers and buyers in order to facilitate the order and payment transactions. Some start-ups concentrate only on content/information.

In the initial phase, Vamedis concentrated largely on hospitals and clinics. These are given the opportunity to improve their processes and lower their costs, both within the hospital and between it and its suppliers, by having their pharmaceutical and medical product orders handled by Vamedis. To make this possible, the ERP-systems of the hospitals will be integrated into the Vamedis system. The transaction opportunities that Vamedis provides are aimed at improving the efficiency of the supply chain between hospitals, dealers and manufacturers of pharma and medical products.

In the future, Vamedis will offer its users a wide range of information and communication options. These will be aimed at all participants in the healthcare industry such as physicians, nursing personnel, patients, etc. Vamedis is planing the launch of the following services[7]:

Up to the minute information from the healthcare field:

- News on healthcare politics, etc.
- Event calendar with reminder function
- Job market for medical personnel

Product catalog:

- Electronic metacatalog for pharma & medical products
- Extensive information (e.g. instructions for use, pictures and videos of the products)
- Comfortable navigation options within the catalog (structured according to medical fields, product groups and manufacturers)

Specialist information:

- Results of medical research by topic
- Clinic studies
- New treatments
- Online training courses
- Information on hospital management (e.g. supply chain management)

[6] MHC Corporate Strategy Document 2001-2003
[7] We chose to elaborate on the services for readers to understand the concept of a health care portal better.

Discussion forums with the following focuses:

- Portals in the healthcare industry
- Medical networks
- Treatment methods
- Clinical studies
- Healthcare politics

References:

- Medical dictionaries
- Yellow Pages for hospitals, physicians, pharmacies
- Manufacturer and dealer register with addresses and contacts
- Register of buyers at hospitals and nursing facilities
- Link register for healthcare-related sites

In the first step, Vamedis will give the customers the opportunity of structuring their ordering process entirely electronically. After this, Vamedis will help them to further improve the efficiency of their supply chain through additional functions. In addition to transaction opportunities, it will also provide an information and communication platform ("one-stop-shop").

Vamedis will start its market activities in Germany at the beginning of 2001. A rollout into other European countries will follow later in the same year.

Apart from its involvement in Vamedis, the company has been conducting Electronic Data Interchange (EDI) transactions with some of its key customers in Sweden and the UK for some years now. In addition, it has a web presence since February 1, 1999.

Nevertheless, we foresee that prospects are very encouraging for MHC to invest further in e-business for the economic reasons mentioned above. On top of that, MHC's products are highly suitable for web-based transactions because they are relatively cheap, small and light, standardised, and frequently bought in high volumes. As such, there is little complication in logistics and huge savings can be made from the repeated purchases and, thus, any initial technological investments can be justified.

As a comparison, an X-ray machine that is expensive, bulky and has a long asset life would not be as suitable for e-business.

Whether one looks at MHC as a founder of Vamedis or on its own, e-business will give MHC possibilities to improve the existing business by increasing market coverage and sales, as well as reducing the cost per contact and transaction. In addition, a new organisation with new ways of working and new competencies could also be developed to capitalise upon new businesses, such as participation in an Internet portal for instance.

1.2 Purpose

Due to the competitive nature of the health care industry, most European health care companies regard e-business as an inevitable means to prosper in the near future. However, it is noted that the bottom line of an e-business implementation is simply to develop a new business model that will *add value* to the customers. Therefore, it is imperative for the health care companies to understand the needs of its customers and translate this understanding into actions that are beneficial to the customers and, naturally, to the companies as well. With such an understanding, the customers will get the right products at the right quality, accompanied with the excellent level of service that they expect. For the companies, when customers receive the desired products and services, customer satisfaction and detention would be high. This would create a competitive advantage for the company to sustain long-term profitability.

As mentioned above, the majority of MHC's revenues are generated from the Surgical Division. Within Surgical, the segments are divided between Acute Care[8] and Home Care[9]. Since the products and target customers are different in the two segments, the supply chains differ too.

8 The Acute Care market is defined as all hospitals with a sterile operating environment, conducting more than 500 surgical interventions per annum.
9 The Home Care segment is defined as the entire market outside of Acute Care, mainly Wound Management products.

It is noted that we are referring to the whole supply chain and not the purchasing process alone, because there are other aspects such as information search and inventory management that are not directly linked to purchasing itself, but can be possible areas of improvement.

In short, the purpose of this thesis is:

To analyse how MHC can use e-business to help its customers overcome the challenges that they currently face in the Acute Care supply chain.

1.3 Research problems and ways of approaching them

In accordance with our purpose, we identified one main problem for our study.

Main Problem:

How can a health care company design its e-business strategy for its marketing operations in the Acute Care segment in Europe to its own and the customers' benefits in the short- to medium-term?

To answer the main problem, we have also identified three underlying research problems for our study.

First, we have to identify, who the main decision- makers in the purchasing process are, in order to decide, to which persons we would like to talk. The first research problem is therefore:

Research Problem 1:

Who are the main decision-makers in the purchasing process?

In order to identify the most suitable e-strategy for its marketing, it is critical to understand what the features are that could add value to customers. But the customers, to begin with, are rather diverse. Some of them are already familiar with the use of Internet and other electronic media, but some of them still are unaware of the equipment and techniques.

Some categories of customers consider purchasing as a personal face-to-face operation, while others may consider it to be non-personal. In fact, some customers can also be assumed to see e-business as a problem, while others see it as a solution to their problems. The more precise problem statement is therefore:

Research Problem 2:

In the customers' opinions,
how can e-business help to solve the main problems
that exist in the purchasing process in the Acute Care segment in Europe?

When the answer to Research Problem 1 and 2 are clarified, it can be assumed that the actors in the Acute Care segment in Europe will focus on e-business. We will assume that MHC is such a representative and, thus, it is relevant to examine the resources and capabilities that are needed to succeed. Our third problem statement is therefore:

Research Problem 3:

What is required of Mölnlycke Health Care to provide
the e-business solutions?

1.4 Research Outline

Below is the outline indicating how we will approach the problem. We will first find out the problems from the round table discussions and then try to develop a strategy for e-solutions for those problems. However, it is also critical to analyse the resources and capabilities that are needed to implement those solutions and ensure that MHC has, or can develop, those resources and capabilities. The final recommendations will be based upon the results from the gap analysis.

Figure 1: Research outline

Source: Own

1.5 Delimitations

Consistent with MHC's focus on delivering high value to its key customers, the round table discussions are mainly carried out with its largest customers, in terms of profitability and volume; the exception will be the 'Städtische Krankenhaus' in Kiel, Germany, which is not presently a customer of MHC.

As sales from Acute Care is larger than Home Care, it is only natural for us to focus on the supply chain of Acute Care alone. Within Acute Care, MHC's main markets are concentrated in Europe; it is not present in the America and only limited penetration in Asia and Middle East. Therefore, we have chosen to consider only its e-business strategy in Europe.

Our main focus lies in the Acute Care segment. Therefore, the interviewees and the round table discussion participants will be the decision-makers in hospitals and group purchasing organisations. Due to the time constraints, the round table discussions will only be conducted with selected hospitals in MHC's main markets, such as Germany and the UK. Other important customer segments, such as distributors and wholesalers, are not within the scope of this research.

This research is also intended to provide some recommendations to MHC about its e-strategy on the business level (the marketing function in particular); therefore, strategy on the tactical level will not be included. Besides, technical details in the infrastructure and implementation will also be omitted.

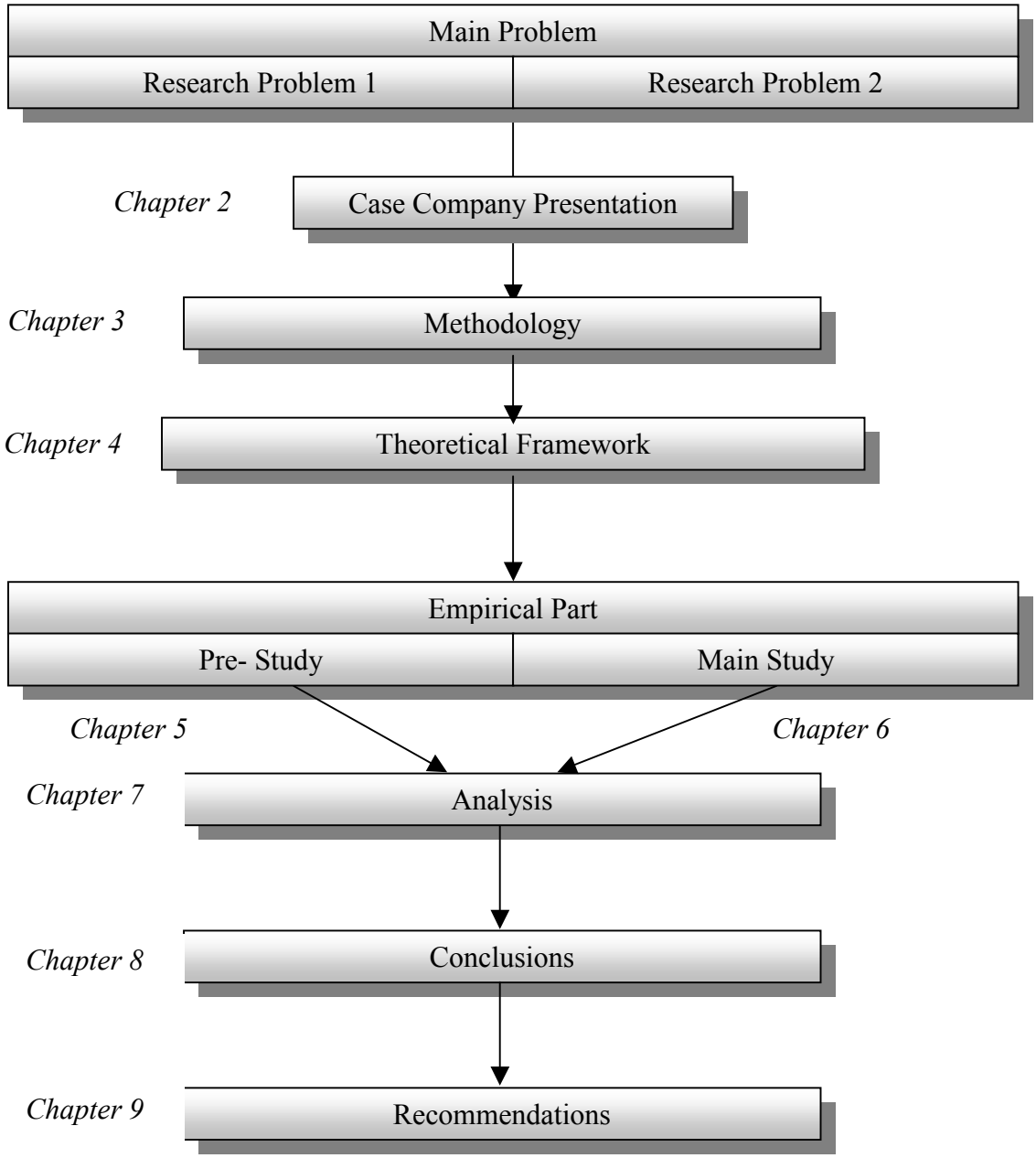
According to the MHC e-business manager[10], there is no 'real e-business market' in the health care industry at the moment. "Although several players are already prepared to enter the market, there are still no revenues. Nobody is threatening MHC to take away its business and profits."[11] Due to this, it is rather difficult to talk about a 'e-business market' at this point of time. Therefore, we are not doing any benchmarking or competitors analysis. Nevertheless, we are aware of the e-business efforts made by its key competitors such as Allegiance and Johnson & Johnson.

Lastly, our solutions and strategy recommendations would only help overcome the problems that we discovered during the round table discussions in Germany and the UK. We are aware that other e-business value-added features could be recommended, but they are not within the scope of this thesis.

[10] Discussion with Mr Claus Holmen, MHC E-business Manager, 17 November 2000
[11] Mr Claus Holmen, MHC E-business Manager, 17 November 2000

1.6 Thesis outline

Figure 2: Thesis outline



Source: Own

In order to solve our main problem statement, i.e. to help formulate MHC's e-business strategy for its marketing operations in the Acute Care segment in Europe, it is important for us to understand how the company works at present.

2 THE CASE COMPANY

The aim of this chapter is to present an overview of our case company, Mölnlycke Health Care (MHC), including its vision, missions and corporate strategy. As health care products are not consumer goods, we shall also introduce its product range, mainly its Acute Care products.

2.1 MHC's background[12]

MHC was formed on 1 February 1998 through a merger between the Swedish SCA Mölnlycke Clinical Products and the Finnish Tamro Division Kolmiset. The major shareholder is the Swedish private equity from Nordic Capital, which owns 64% of the voting power. Tamro owns another 26% and the remaining 10% is held by 40 executives in the company, with Mr. Finn Johnsson at the helm.

MHC is a multi-national corporation that operates and markets globally. Today, MHC employs 1.800 people in four manufacturing units in Europe and Thailand and ten regional sales organizations in Europe and North America. It is also represented in Eastern Europe, the Middle East and Asia through an extensive network of representative offices and distributors.

2.2 MHC's vision, missions and strategic objectives

Vision

"Quality in care for quality in life."

Mission

"Create long-term shareholder value through dedication to patients and professionals within health care.

Strategic Objectives

"We shall be the most profitable company in our business (*operational efficiency*).

[12] www.molnlyckehc.com

We shall be superior in growth rate in comparison with our competitors (*growth and expansion*).
We shall achieve outstanding customer satisfaction (*customer satisfaction*)."

For the past three years, MHC has been striving to achieve its three primary strategic objectives, namely operational efficiency, growth and expansion, and customer satisfaction. Through its internal efficiency program (4M program – **M**ölnlycke **M**etamorphosis **M**illenniu**M**) that will finish by the end of 2001, the company aims to create more than MSEK 300 in value creation and its current performance shows that it is on track to reach this objectives[13]. Therefore, the strategic focus of the company lies in growth and expansion, as well as the customer satisfaction. Consistent with this strategic direction, MHC is in the process of implementing e-business to exploit the ample opportunities in the market place.

2.3 MHC's products

MHC's range of products in the Surgical Division carry the brand name Klinidrape while the Wound Management products carry the brand name Tendra.

The Klinidrape product range consists of a competitive variety of different single-use draping and protection solutions used in the Operating Room.

The customers are in the Acute Care segment, mainly doctors and nurses in hospitals and clinics. The products are divided into five main areas:

- patient drapes – drapes that used to cover the operation table and the patient
- surgical gowns – gowns worn by the surgical staff in the Operating Room
- clothing products – include caps, masks, scrub suits and shoe covers
- equipment drapes – drapes that are used to cover the microscopes, C-arms, tubes, probes and X-ray cassettes
- surgical swabs – swabs, towels and sponges that are used during the surgical intervention

[13] MHC Corporate Strategy Document 2001-2003

The Custom Procedure Tray is a new product range that MHC is trying to promote in the European market. A Procedure Tray is a package containing all the sterile single-use products that are used for a surgical operation, including the drapes, gowns, caps, operating utensils, etc. This means that the staff in the Operating Room would only need to open one custom-made Procedure Tray (depending on the type of surgery e.g. cardiovascular, orthopaedic, urology, gynaecology or general surgery) instead of unwrapping various item separately for a particular operation. The use of trays help hospitals with greater staff efficiency, better inventory control, reduced waste, easy access to a large range of products, more time for patient care and thus reduced overall costs.

In the Wound Management Division of MHC, Tendra offers products and systems for different surgical interventions, traumatic wounds and chronic wounds. The customers are both the Acute Care (hospitals/clinics) and Home Care segment (nursing home, long-term care institutions, doctors, nurses and pharmacists). Surgical dressings, fixation, non woven swabs and advanced wound care products (under the trademark of Safetac) are of strategic importance for this in MHC.

2.4 MHC in Europe

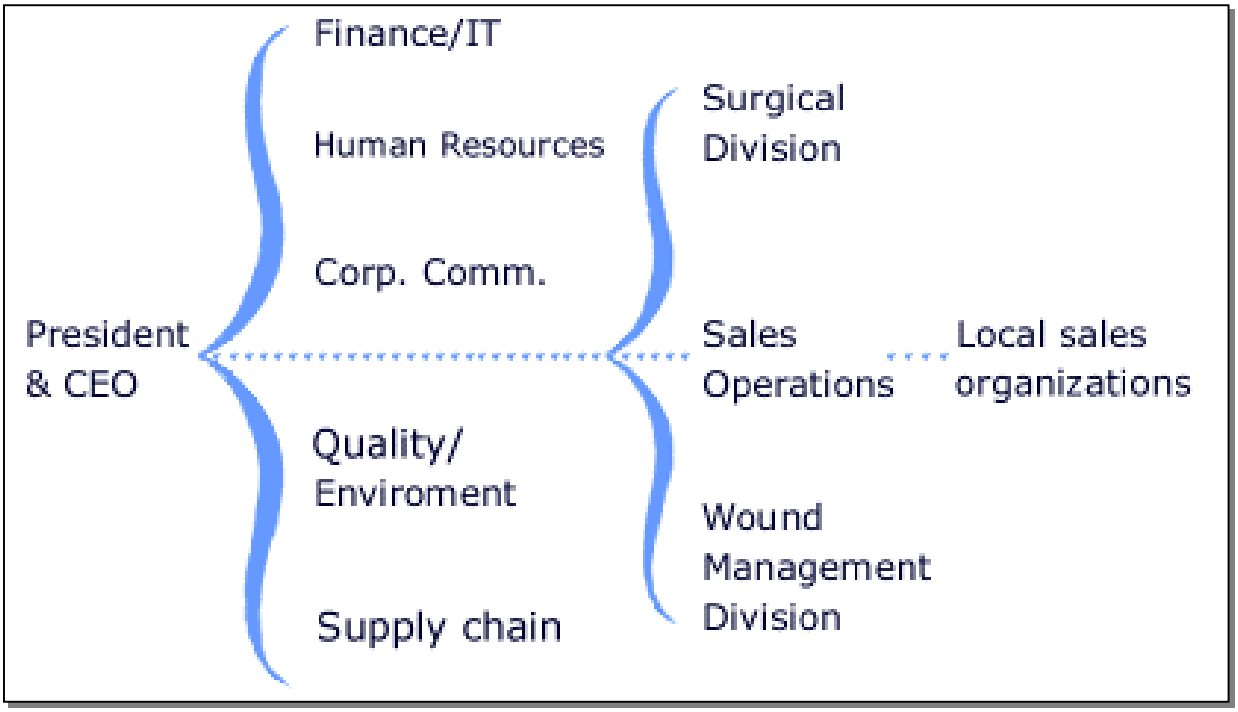
MHC is headquartered in Göteborg, Sweden, where it carries out the staff functions and divisions, including the Financial Centre, Sales Operations and New Market Developments. Three of its factories are located in Europe; the Waremme factory in Belgium and the Ilomantsi factory in Finland produce Surgical products, while the Mikkeli factory in Finland produces Wound Management products. Meanwhile, its Customer Service Centre and Distribution Centres are situated in Waremme, Belgium. In Europe, MHC also has representative offices in Vienna in Austria, Riga in Latvia and Dubai in the United Arab Emigrates.

MHC had gone through a structural reorganisation in 1998 to focus its sales operations on the Acute Care and Home Care segments, instead of just the Surgical and Wound Management divisions.

This change is mainly initiated for MHC in order to be more customer-oriented, as the needs and demands of the Acute Care and Home Care customers are different, and thus the marketing strategies differ. With the division into Acute Care and Home Care, MHC also has the possibility of developing different human skills to focus on the different segments. Previously, the Home Care sales force often lacked marketing skills, despite being an important segment for growth, because the skills were concentrated in the Acute Care sales force.

The new organisation structure now has three main "branches", as shown below:

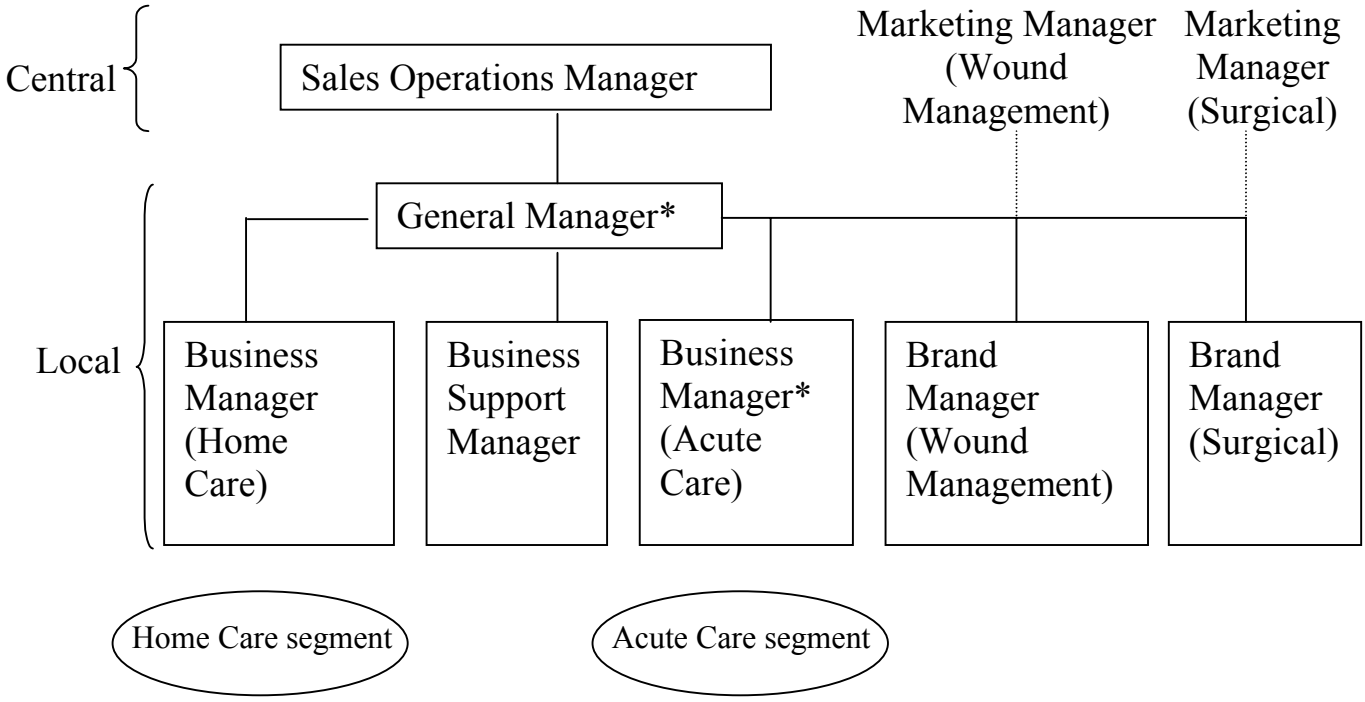
Figure 3: MHC's organisational structure



Source: www.molnlyckehc.com

The Surgical and Wound Management divisions still exist because the other activities in the value chain are very product-oriented. The R&D and production activities are based upon the products (i.e. Surgical or Wound Management products) and not upon the customers. Nevertheless, there is a strong degree of collaboration and information exchange between the Business Managers of Acute Care and Home Care with the Brand Managers and Marketing Managers of the Surgical and Wound Management.

Figure 4: Sales and marketing organisational structure



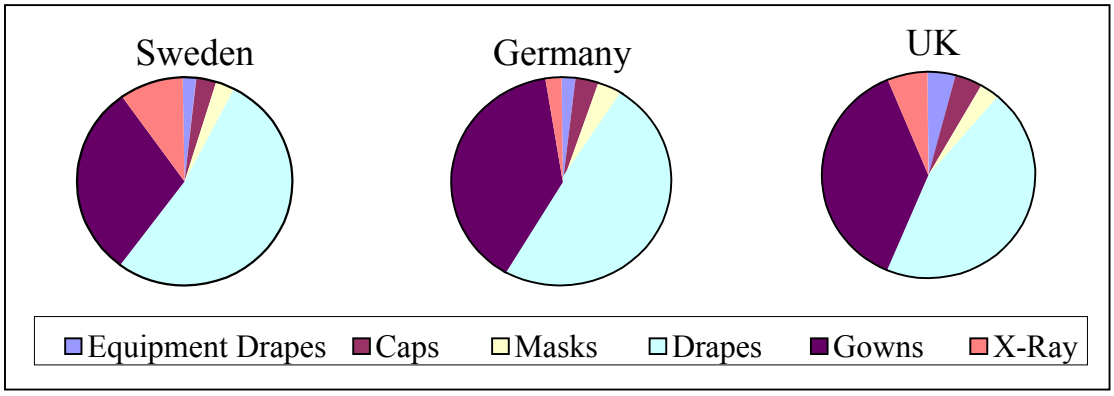
* Combined role in most countries

Source: MHC Vice President - Sales

2.5 MHC in Sweden, Germany and the United Kingdom

In each of the markets in this research, drapes and gowns account for more than 80% of the sales revenues. Today, half of the market for drapes is single-use (i.e. penetration rate is 50%), while the corresponding figure for gowns is 27%. The rest of the market that is not using single-use products opt for the traditional reusable textile-based products.

Figure 5: Sales of Acute Care products in Sweden, Germany and the UK.



Source: MHC Corporate Strategy Document 2001-2003

In the preparatory phase, it is also critical to develop a sound methodology that indicates what should be done when and why these actions are chosen, in order to produce valid and reliable outcomes.

3 METHODOLOGY

The aim of this chapter is to give an overview of the research method(s) used for collecting the data needed for this thesis. We also discuss and give reasons for our course of action. Lastly, we conclude with an analysis of the validity and reliability of our research data.

3.1 Research design and strategy

The research design is a basic plan established for the purpose of guiding the whole process of data collection and analysis. Included in the research design should be the kind of information that needs to be collected, where and from whom it can be collected and how it should be collected.

According to Yin (1994), there are several ways of conducting a social science research namely experiments, surveys, case studies, histories and the analysis of archival information. Yin says that case studies are generally used when "how" or "why" questions are posed, when the investigator has little control over the event and when the focus is on a contemporary phenomenon within some real-life context.

Meanwhile, Merriam (1998) believes that the case study is designed to gain an in-depth understanding of the situation and meaning for those involved. The interest lies in the process rather than the outcomes, in context rather than specific variables, in discovery rather than confirmation. Compared to other kinds of qualitative research methods, case studies are intensive descriptions and analyses of a single unit or bound system.

Since this research is conducted to discover *how* a global health care company, such as MHC, should formulate its e-strategy to create more value and to gather an in-depth understanding of the customer needs and demands in an e-business solution, we conclude that our research is a case study.

Yin (1994) is in favour of this approach when it represents a critical case in testing a well-formulated theory, when it represents an extreme or unique case, or when it represents a revelatory case which was previously inaccessible to scientific investigation. Since theories describing e-business solutions to the complicated procurement process in the health care industry are rare, we argue that our case is unique and that using a case study is justified.

Yin (1994) also recommends a pre-study when the authors have merely a vague idea of what are the key questions to ask the interviewees. Pre-studies are very useful to assist authors in obtaining a better understanding of the problem at hand and subsequently formulating the right questions. The interviews we conducted in Sweden are considered as our pre-study.

In addition, we are studying only one company, so we are using a single-case design. Within this single-case study, we involved more than one unit of analysis. We looked at several *mini-cases* (customers in Sweden) and *sub-cases* (customers in the UK and Germany). Therefore, we have used an embedded, single-case design.

3.2 Research technique

Although we are using the case study design, we are using marketing research for the data collection.

Marketing research is defined as the systematic and objective approach to the development and provision of information for the marketing management decision-making process[14]. *Systematic* refers to the requirement that the research should be well-organised and planned: the strategic and tactical aspects of the research design, the nature of the data to be gathered and the mode of analysis must be clarified in advance. *Objective* implies that marketing research strives to be unbiased and unemotional in performing its responsibilities. The remaining two elements of this definition are *information* and the *decision-making process*, which differentiate marketing research from research in other fields. The primary purpose of marketing research is to provide information, not data, for the management decision-making process.

However, there have been debates among practitioners about whether "market" research should be used instead of "marketing" research[15]. Kinnear & Taylor (1996) distinguish that "marketing" research is not limited to information about the market or consumers only. In fact, it provides information for marketing decision-making from all sources - the market, competitors, distribution structure, social and technological environment, and so forth. As our research includes information from the customers, we classify our research as marketing research.

Within the fields of marketing is industrial marketing, which is defined by the Industrial Marketing Research Association (IMRA)[16] as all businesses and activities involving or influencing the movement of industrial products from the manufacturer to the industrial or commercial user. In other words, industrial marketing would involve product offerings at certain prices, at certain places, with the use of certain means of promotion, in the business-to-business sector. In this case, MHC markets its Acute Care products to the hospitals, which in turn use those products to deliver health care to their patients. Therefore, to be exact, our research is called industrial marketing research.

3.3 Marketing Research Process[17]

Formal marketing research can be viewed as a series of steps called the research process. The figure below illustrates the nine steps in this process. It is crucial to anticipate all the steps and recognise their interdependence in order to conduct a successful research.

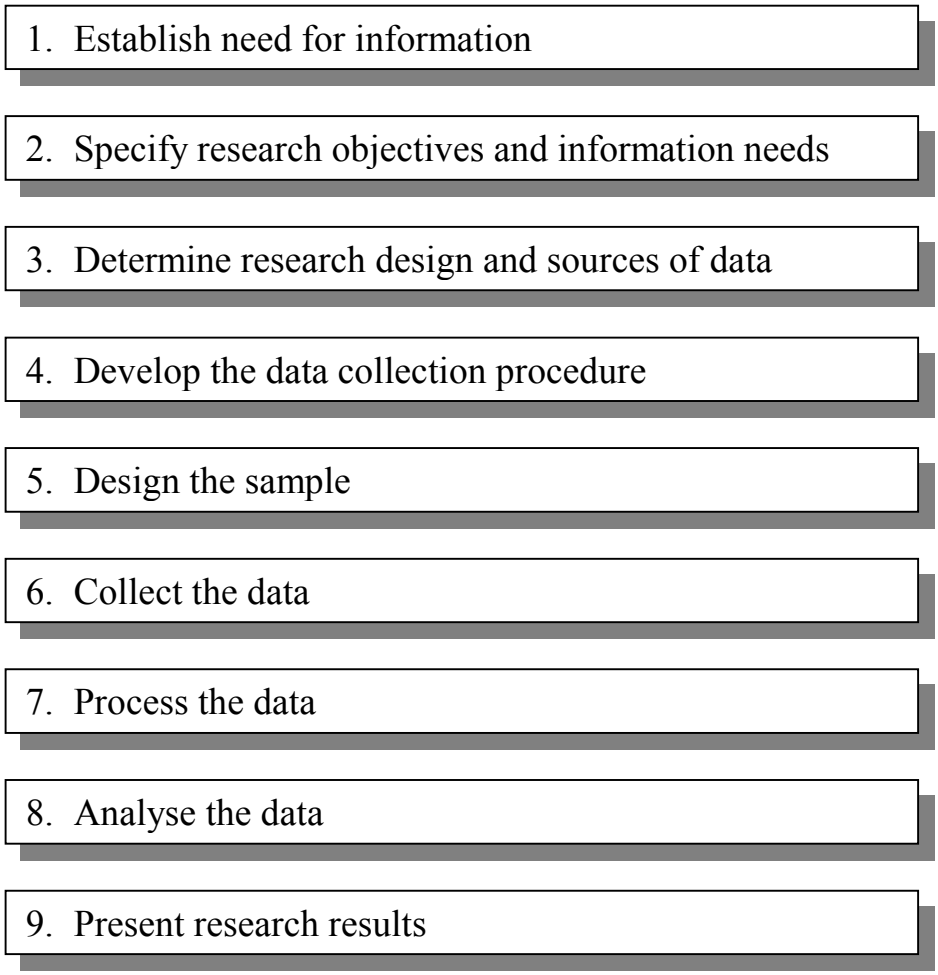
We have followed this process closely throughout our research. We established the need for information by contacting MHC's E-business Manager and subsequently specified the research objectives and information needs together. After that, we proceeded to decide on the research design as a case study and find relevant sources of data. Then we developed the data collection procedure using interviews in the pre-study and round table discussions[18] in the main

[14] Kinnear & Taylor, 1996, p. 6
[15] Neal, 1989, p. 1; and Gerhold, 1993, p. 6-7
[16] Industrial Marketing Research Association, 1969.
[17] Kinnear & Taylor ,1996, p. 66
[18] A round table discussion means that all the participants will be seated together for an open and interactive session to talk about a particular subject/topic that has been pre-determined.

study. To design the sample, we were determined to meet people from different functions at the hospitals, such as the buyers, clinicians, financiers, warehouse managers, etc. We contacted them with help from the local offices. The MHC headquarter in Göteborg and German local offices only gave us the contact persons and their telephone numbers, so we scheduled the interviews and round table discussions respectively, by ourselves. In the UK, the Business Manager in London assisted us in making those appointments.

We conducted a pre-study via personal interviews with its current customers in Sweden, mainly those who are already using the digital media to buy from MHC, to gather their general opinions. We also interviewed some MHC employees to obtain a more basic understanding on the topic. Subsequently, we conducted several round table discussions with the hospitals to gather the main problems that they face within the supply chain. It is also important for us to understand why they perceive these problems as critical for them. Then we processed and analysed how an e-business model can improve the procurement process. After some reviews by our academic and company tutors, we presented our final results.

Figure 6: Marketing research process



Source: Kinnear & Taylor, 1996, p. 66

3.4 Primary vs. secondary sources of information – a focus on the Swedish, German and British customers

This study will make use of qualitative data almost exclusively. As the main focus is on the key problems of the procurement process in hospitals and consequently the possible e-business solutions, the participants cannot possibly answer in an exact pre-determined way, perfectly comparable to the answers given by others. Every source of information is an individual set-up of thoughts and features that cannot be compared exactly to any other source of information. This means that qualitative data often gives more complete and deeper answers and reflects the true variety between the different sources of information.

For marketing research, primary data is normally regarded as the most appropriate source of information (Patzer, 1995). Since secondary data has been collected prior to the research for another purpose, it is usually not as relevant as primary data, which is exclusively collected to fit a specific research report. However, as it is often more costly and time consuming to use primary data, one might have to compromise and make use of secondary data as well, either exclusively or as a complement to the primary information collected. Primary data also guarantees that the information is relevant from a time perspective. As the world changes quickly, many sorts of information quickly become obsolete.

The information in this thesis has been collected primarily through interviews with MHC's existing customers in Sweden who are mainly already transacting electronically today and also the key decision-makers at the German and British hospitals, who are directly related to the research problem. All information is thus to be regarded as primary data, exclusively collected for the purpose of this report.

The secondary data used include the company information provided by MHC and some other literature regarding the health care industry and e-business implementations.

3.5 Pre-study and the main study

Before conducting our main study, we have chosen to carry out a pre-study via interviews with MHC's employees and existing customers in Sweden who are mainly using digital media (in this case EDI) in their business-to-business transactions. This pre-study is intended to broaden our knowledge about the current use of e-business in the health care industry in general and with MHC in particular, the level of customer satisfaction to date and the various demands and alternatives for improvement. The pre-study has an exploratory/inductive design to help us design the right questions to ask in the main study and, consequently, find the key problems that hospitals often have in the procurement process that could be solved with an e-business implementation.

Interviews are considered the superior method, as they allow interactive two-way communications. This is highly appropriate and valuable, as most questions that are posed are follow-ups based upon the customers' initial answers.

In addition, we also read materials obtained from the Internet, books, journals, magazines, newspapers, as well as reports and presentations from MHC and other companies.

The decision-making process for the procurement in hospitals is usually very complicated and involves many parties. In some large hospitals, the decision-makers may add up to seven persons consisting of the purchaser, the Purchasing Manager, the hygienist, the Material Consultant, the Operating Room nurse, the Central Sterilisation Department and the Finance department[19]. As it is not easy to determine who has the final say in this process, the opinions of all these people need to be evaluated. Therefore, we have opted for a round table discussion with all the key decision-makers in several hospitals and purchasing communities (mainly the largest) in Germany and the UK.

A discussion group will be set up separately for each hospital. The participants of the discussion will consist of the decision-makers and us. The discussion will be largely unstructured: there will be no formal questionnaire but, instead, it will be replaced by an interview guide, which lists the main points that the discussion should cover.

Our role in the group is more of a “facilitator”, rather than a formal interviewer. The group is encouraged to discuss the matter freely, while we keep the flow of the discussion within the boundaries of the interview guide. This means that we guide the conversation around the table without directly influencing by formal questioning. However, there are certain occasions when the participants are rather reserved, we use some excerpts that we have prepared to get the ball rolling.

[19] Mr Claus Holmen, MHC E-business Manager, 2 July 2000.

The excerpts are very useful because the participant can use them as a point of reference; they can tell us whether or nor they had the same experience or opinions.

We also try to establish the right atmosphere by adjusting our behaviour to suit the type of group involved, so that maximum co-operation is obtained. At the same time, we try to be sensitive to the value of the remarks, which may not be directly related to the subject, but may reveal interesting subconscious motivations, such as if the respondent is worried about his or her job security.

In the atmosphere of a group, individuals tend to react to one another and sharp criticisms of individual beliefs are frequently aroused, and thus the discussion generated among the group tends to become extremely frank.

The discussions are also recorded on tape, with the full knowledge of the audience, for later analysis. Although the use of tape recorders for research purposes often stirs up mixed reactions, Sampson[20] (1986) believes that the advantages outweigh the disadvantages. "A friendly relaxed approach and manner, and the clear guarantee of anonymity by the interviewer can very quickly allay any suspicion and anxiety about the tape recorder on the part of the respondent".

3.5.1 Error sources in the round table discussions

When conducting a research it is of great importance to keep a high level of quality within the research and to convince the reader about the accuracy of the work. Therefore, errors must be taken into consideration. To evaluate a scientific work, it is common to use the concepts of validity and reliability. Testing the quality of the information is however even more important in case of a case study since the validity and reliability cannot be decided upon in advance as with an experimental method[21]. Attention should be paid to potential errors when estimating the validity and reliability of a study.

[20] Sampson, 1986, p. 28
[21] Merriam, 1994, pp. 174-187

Errors can appear in every step of a marketing research. They can cause false results if the potential sources of error are not carefully addressed. Some potential sources of errors can be (Kinner & Taylor, 1996):

- *Short-term characteristics of the respondent*: personal factors such as mood, fatigue and health

We were conducting our round table discussions during the normal working hours. Shortage of personnel and lack of time are common problems, which can cause stress and might influence the mood and the state of mind of the participants. However, as all our discussions were very active and fruitful, we do not see any errors based on this. The only factor that affected our discussions were the two independent participants who were ill on the days of our appointment and, thus, could not be present to contribute to our discussions.

- *Situation factors*: Variations in the environment in which the findings are reached

Different hospitals had different facilities, which we were allowed to enter, and could conduct our round table discussions. However, we always ended up having a room to ourselves for some rather exclusive discussions. The only interruptions that we encountered were some phone calls and people walking into the room, wanting to talk our participants. Sometimes the phone calls were left unanswered or answered shortly, and the people walking into the room would leave almost immediately, thus we could easily catch up from where we were interrupted. The effect to our results was almost negligible.

- *Data collection factors*: Variations in which the questions are administered and the influence of the interviewing method (e.g. personal contact, phone call, mail)

During the round table discussions, there were no formal questions as with those for interviews or questionnaires, and thus the information flow is generally free. Our influence was minimal. We did have a discussion guide though, which outlined the important points that we should address. So there was very little variation in the way the questions were administered.

As we were talking to all participants in person, we could also ask them to clarify or elaborate unclear statements. We believe that the data collection factors were just to a minimal extent influencing our results.

- *Evaluating instrument factors*: the degree of ambiguity and difficulty of the questions and the ability of the respondent to answer them

Prior to our field trip, we had sent the participants a little background about our research, our problem statement and the questions we wanted answered through the round table discussions. Before starting our round table discussions, we briefly explained the goals of our research again, so the degree of ambiguity and difficulty of the questions are low. We also arranged for people from different departments to participate in the discussion, so the participants have no problems answering the questions. This is because they are already aware of our purpose and the topic of discussion is very much related to their daily tasks. There was only one exception when the purchaser that we intended to meet fell ill and, therefore, the nurse who was present could not tell us any purchasing experiences.

To systematically assess the evaluation in a data collection process, the total error of valuation is separated into two components, namely systematic and random error. Systematic error is a uniform distortion of the data. Random error consists of all influences that unsystematically bias the valuation. The concepts of validity and reliability take these two error components into account in estimating the quality of the evaluation instrument. In our case, we believe we experienced some minor random errors, as mentioned above.

3.5.2 Internal Validity: triangulation and a lot more

The internal validity deals with how the findings of the research harmonize with reality. The less errors there are, the higher is the internal validity. It has to be considered how congruent the findings are with reality, if the findings really capture the reality and if the investigators are evaluating or observing what they do.

Merriam (1998) mentioned six strategies to enhance the internal validity:

- *Triangulation* (multiple investigators, multiple sources of data or multiple methods to confirm the emerging findings)
- *Checks* (taking data and tentative interpretations back to the people/ sources from whom they were derived and asking them if the results are plausible)
- *Long-term observation/ repeated observations* (gathering data over a period of time in order to increase the validity)
- *Peer examination* (asking others/ colleagues to comment on the findings as they emerge)
- *Participatory/ collaborative modes of research* (involving participants in all phases of research from conceptualising the study to formulating the findings)
- *Researcher's biases* (clarifying the researcher's assumptions, worldview and theoretical orientation at the outset of the study)

To assure that a high internal validity was obtained, we conducted a pre-study in Sweden to deepen our knowledge about the topic by talking to multiple sources (*Researcher's biases).* We read about the subject from various sources on the Internet, books, journals and magazines. We were also constantly validating our findings along the way with people from the company or other experts, to see if the results were plausible (*Triangulation*). Besides, we discussed our findings with colleagues and other people immediately when the finding emerged, to get the opinion of a neutral third party (*Peer examination*).

We had also conducted a trial of the round table discussion with our supervisor and some experienced colleagues from MHC, who are working closely with e-business. Based on a carefully designed discussion guide, our methodology was reviewed, commented upon, modified and finally approved before we proceeded to the UK and Germany. Throughout the research, we have had a high involvement from both academic tutors and representatives from MHC, which we believe is another factor that strengthens the internal validity of our research (*Checks and repeated observations*).

During the actual round table discussions, we had direct contact with the respondents, so that we ourselves could safely determine our evaluation results.

Relatively high *face validity* is achieved. The round table discussions are a flexible way to gather a lot of information, as the respondents feel free to express their opinions and inspire each other. This makes the *content validity* rather high. It is noted that content validity is in fact triangulation by using multiple sources of data.

It is essential to point out that our secondary data was collected from reliable sources and then compared to primary data. We tried our best to reach a high validity in our research.

3.5.3 Reliability – a quest of strict recording and, finally, a view on generalisation

Reliability is concerned with the consistency and accuracy of the results. It refers to the extent to which the evaluation process is free from random errors. It is a prerequisite for validity. An investigation with good reliability is not affected by whom it is conducted or by the surrounding circumstances. To some extent, if research is reliable, this means that the same results would be obtained if the research would be carried out again under the same circumstances. To increase the reliability of an investigation, the evaluation process has to be performed every time as identically as possible to avoid random errors.

While carrying out our round table discussions, we were recording everything that was said. Directly after the discussions, we started to put our results down on paper in order not to forget something important. Merriam argues that there is reliability if the findings from different respondents are consistent (Merriam, 1998); something we actually detected. The collected primary data was throughout the whole study carefully compared to the secondary data, which we collected earlier to check the reliability.

However, we are aware that discussing reliability in case studies is difficult, as the world is not static. Everyday, there are new findings concerning the e-business phenomena and the environment is changing really fast.

A repeated study might give different results, although possibly not directly next year, as the hospitals are rather traditional institutions. However, sooner or later they will adapt to the changes and our present results will not be up-to-date anymore. The results connected to e-business, such as cultural barriers, are more reliable.

The external validity is concerned with the extent to which the findings in the study can be applied to other situations; this means the extent the study can be generalised. Due to the fact that we made as defined above, a qualitative single-case marketing research, it is difficult to construct any statistical generalisations. The generalisation has to be more of an analytical nature.

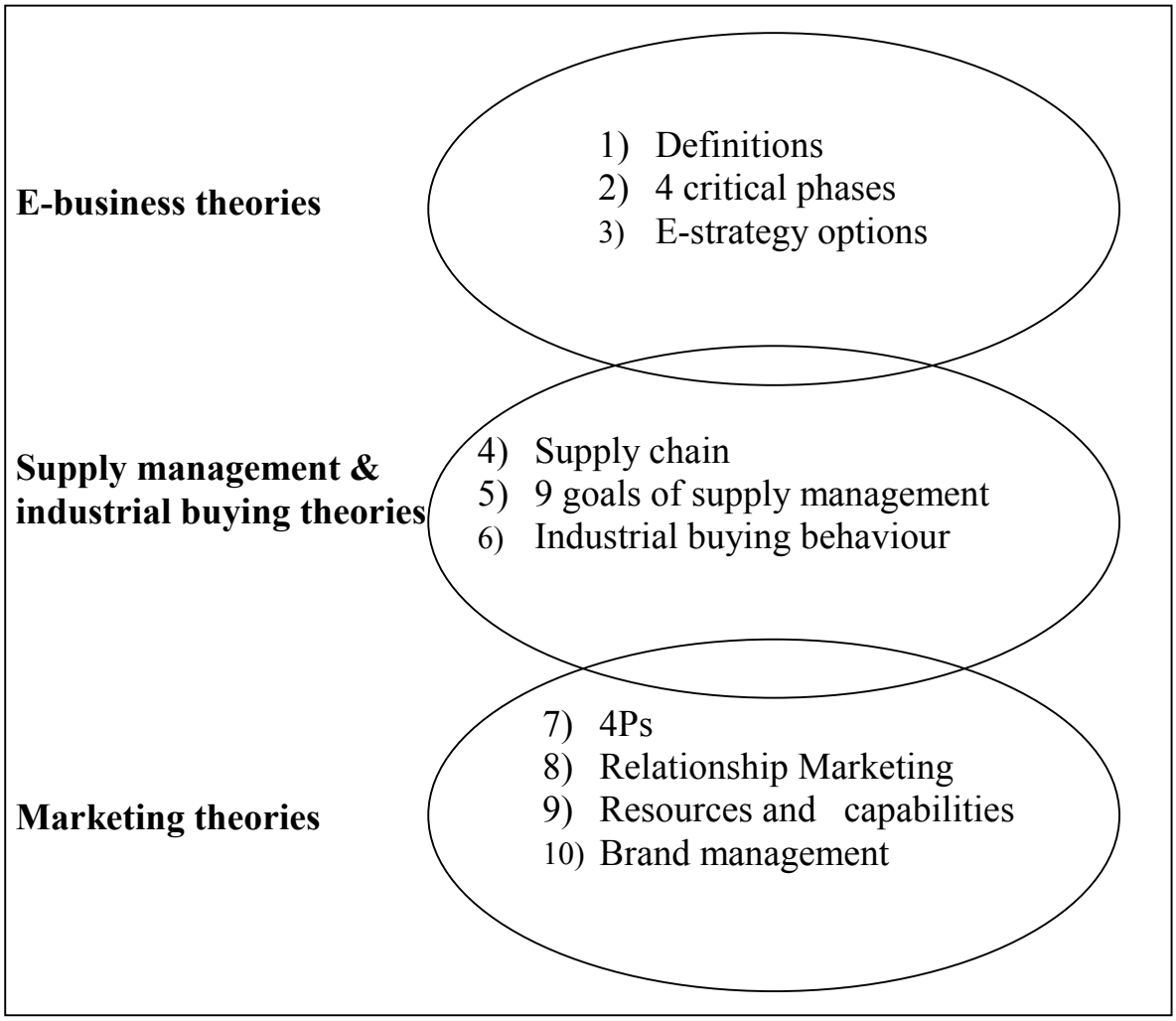
We believe that our research fulfils the basic criteria for having a decent level of external validity, since we have focused on having a high level of internal validity to begin with. We gave a detailed description of the challenges and problems that hospitals are facing in their Acute Care supply chains, which can be solved with e-business. As we discovered that the hospitals in three different countries (Sweden, the UK and Germany) face similar problems, we argue that our findings are also applicable to any hospital in West Europe, and thus increase our external validity.

However, a systematic research task needs a framework. This can be based upon theories and empirical findings. We have chosen to introduce conceptual theory-oriented frame of references.

4 THEORETICAL FRAMEWORK

In this chapter, we will give an overview of all the theories used. We have divided the theoretical framework into three parts: we will begin with the main topic regarding e-business, followed by supply chain and industrial buying and finally linked to marketing. We conclude with how each of these theories are related to the total context of the thesis.

Figure 7: Theoretical framework



Source: Own

4.1 E-business

4.1.1 Definition of e-business vs. e-commerce

There is a common confusion between e-business and e-commerce. In order to distinguish the difference, some of the documented definitions of e-business are:

- Arthur D. Little: *"... is the creation of new, and the redesign of existing value chains and business processes through the application of information technology"*[22]
- Kalakota: *"... includes both front- and back-office applications that form the engine for modern business ... it's about redefining old business models, with the aid of technology, to maximize customer value… is the overall strategy, and e-commerce is an extremely important facet of e-business"*[23]
- Mölnlycke Health Care: "*… about expanding market coverage, attracting new customers, keeping existing customers, manage interactions and transactions and fulfilment in an efficient and effective way… by the use of Internet and web-based applications in combination with other electronic tools and processes"*

Meanwhile the definitions of e-commerce are quoted as:

- Westland and Clark: *"...the automation of commercial transactions using computer and communications technologies"*[24]
- Kalakota: *"...buying and selling over digital media"*[25]
- Bill Gates: *"...commercial activity that takes place by digital processes over a network"*[26]

The definitions given by another author, David Kosiur, do not vary much from the ones mentioned above. However, he distinguishes the fact that e-commerce is not static, as new opportunities constantly arise due to the fast developing technological possibilities.

[22] Arthur D. Little, 2000
[23] Kalakota, 1999, p. 2
[24] Westland & Clark, 2000, p. 1
[25] Kalakota, 1999, p. 2
[26] Gates, 1999, p. 3

In short, the scope of e-business is larger because it touches every element of the value chain. Therefore, it does not limit the type or reach of the information exchange. Customers, suppliers, employees or regulatory authorities - anybody, or for that matter anything - can be the target or subject of this information exchange. Most e-business innovations today have very little to do with "commerce".

4.1.2 Four critical phases in engineering industry development[27]

After distinguishing the difference between e-business and e-commerce, we use the four critical phases model to establish a basic understanding of e-business. This model clearly maps the general benefits of e-business, which could contribute to the sustained profitability of a company. As mentioned above, e-business can help the end-customers reduce cost by selling directly to the customers and avoid the profits, commissions and other additional margins incurred by the middlemen. It can also increase the work efficiency of the customers and suppliers, thus reducing the administrative costs.

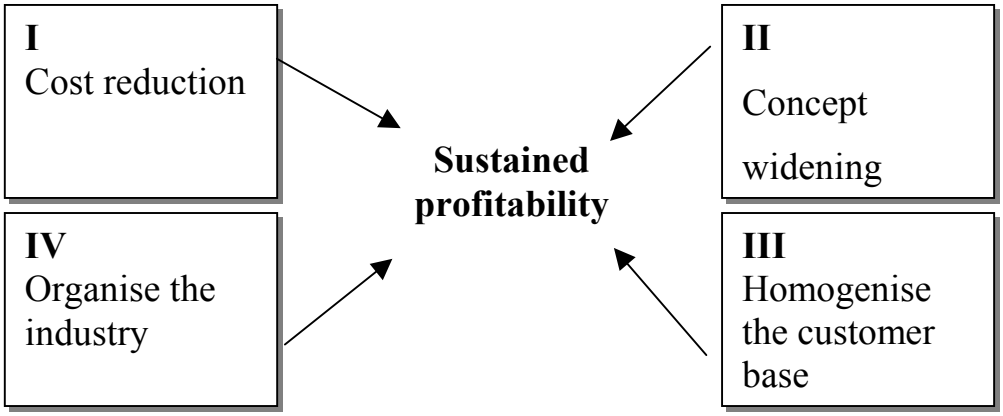
Besides, e-business is a whole new concept of commerce and customer service. Products and/or services can now be sold over the Internet or other electronic media with no geographical barriers. In fact, e-business offers companies a combination of *both* reach[28] and richness[29], whereas traditional business always had to make a trade-off between the two[30].

E-business also gives suppliers the opportunities to homogenise their customer base and focus on their profitable customers. More value-added services, in particular, can be offered to those customers via the Internet or other electronic media to reward their loyalty.

[27] Sten Söderman, lecture for Marketing and Management in New Europe, Handelshögskolan, May 2000
[28] Reach simply means the number of people, at home or at work, exchanging information.
[29] Richness defined by three aspects of the information itself. The first is bandwidth, or the amount of information that can be moved from sender to receiver in a given time. The second aspect is the degree to which the information can be customized. The third aspect is interactivity.
[30] Evans & Wurster, September-October 1999

Lastly, e-business also contributes to the re-organisation of the industry, as it heightens transparency, intensifies the competition and shifting the industry focus on producing high quality products alone; services for instance, are gaining recognition and strategic attention.

Figure 8: Four critical phases in engineering industry development (adapted)



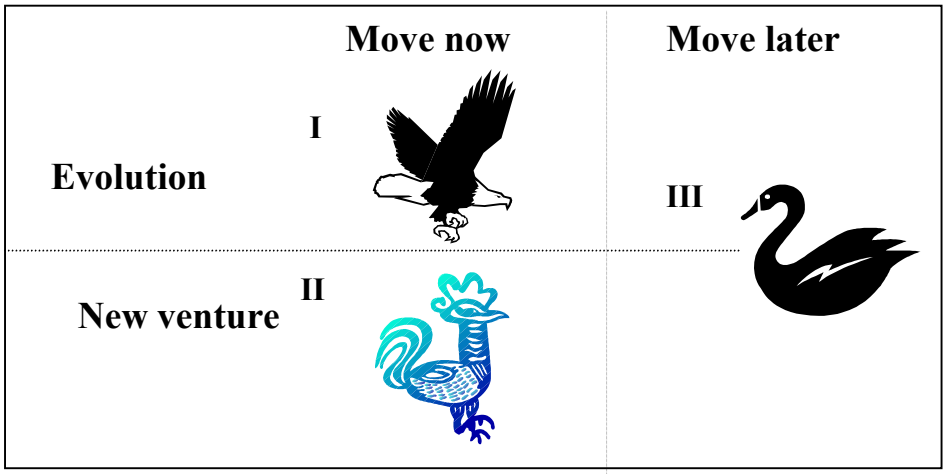
Source: Sten Söderman, May 2000

4.1.3 Arthur D. Little E-business Strategy Options[31]

Knowing the many benefits of e-business, it is crucial for companies to know *how* they can exploit e-business to increase revenues or reduce costs. There are three e-strategy options that a company can adopt to resolve issues with an e-business implementation. They are the "Eagle", "Phoenix" or "Swan" options. The choice depends on the timing (move now or later) and type of change (evolution or new venture). The Eagle takes off from its current situation and *gradually* transforms itself for the new e-environment. The Phoenix *drastically* shifts focus from its traditional business to a new, independent operation as it starts on an e-business track. Therefore, the main actors in the Phoenix option will be external stakeholders, rather than employees of the established company, since the latter for most part will not participate in the new venture. Both the Eagle and the Phoenix represent companies that are ready to move now. The Swan, however, takes a wait-and-see approach until uncertainties decrease, and start-ups show which e-business techniques work and which do not.

[31] Arthur D. Little, 2000

Figure 9: The three e-business strategy options for established companies



Source: Arthur D. Little

To help decide on which options to select, companies can use the following sets of criteria to help their decision-making.

Criteria for determining when to move, include:

- When can we expect the current business to deteriorate?
- How much change is required?
- How many competencies and resources do we have available to move ahead?
- What is the size of the immediate opportunity?
- What are the risks of not moving?

Criteria for the structural option are:

- What level of e-business innovation can we expect to reach after the transition?
- Will the new company retain many characteristics of the existing business model and value chain, or are we talking about entirely new structures?
- How much time pressure is there to enter the e-business market?
- Which portfolio options do the stakeholders want to retain for themselves?

There are six recommended steps to follow:

- Step 1: Develop a long-term vision of the company and a scenario analysis
- Step 2: Identify a business model
- Step 3: Decide structure and resource requirements
- Step 4: Plan and implement
- Step 5: Align and motivate employees
- Step 6: Maintain a scorecard of progress

The Eagle should opt for an ambition-driven strategy following a development process that involves a relatively systematic review of opportunities, competencies and capabilities and leading to targets and a work plan, as in the six steps mentioned above. Meanwhile, the Phoenix also uses the six steps in strategy development, but their priorities lie in the new venture and the interest of the external stakeholders. Lastly, the Swan focuses on preparing the company to act when the time comes. Significance is placed on tracking the progress of both the current and new business. When the time has come to act, the Eagle or Phoenix model can be adopted.

For the purpose of our research, we have modified the steps slightly to better fit our problem statement. Instead of the six steps, we now have five:

- Step 1: Develop a long-term vision of the company
- Step 2: Identify a business model
- Step 3: Identify solutions
- Step 4: Identify resource and capability requirements
- Step 5: Maintain a scorecard of progress

4.2 Supply Chain Management and Industrial Buying

4.2.1 Conventional vs. e-business supply chain

E-business has its impact on every part of a company's business, which also includes the company's supply chain management. It should also be noted that we investigated the whole supply chain and not the purchasing process alone, because there are problems arising even *before* the actual purchase itself, or *after* the purchase, which can be solved with e-business, such as information search and after-sales service respectively.

All in all, supply chain management is concerned with achieving a more cost-effective satisfaction of end customer requirements through buyer-supplier process integration[32].

Traditionally, a supply chain depicts the conventional product flow from the suppliers, manufacturers, distributors, retailers and, finally, the end customers.

Figure 10: Conventional supply chain

Source: Christopher, 1997, p. 72

However, e-business brings a new perspective into supply chain management. It cuts down the level of intermediaries, so that the manufacturers can deliver direct to the end customers. With this, not only will the administrative and logistics costs be reduced, there will also be a higher level of collaboration and two-way communications from the manufacturer to the customers, and vice versa. However, in our case, the distributors (i.e. the local offices) are going to remain in the supply chain because their sales and marketing roles are critical for retaining old customers and obtaining new ones. Only the retailers are removed.

Figure 11: E-business supply chain

Source: Own

[32] Christopher, 1997, p. 72

4.2.2 Nine goals of supply management[33]

To manage the supply chain effectively and efficiently, whether with the traditional methods or e-business, it is essential to identify the existing problems or challenges. This can be achieved by looking closer at the general goals of supply management. If a goal is not achieved, there is obviously a problem that needs to be addressed.

A more specific statement of the overall goals of purchasing includes the following:

Obtaining uninterrupted flow of materials

Stockouts of raw materials and production parts would shut down an operation and be extremely costly in the terms of lost production, escalation of operating costs due to fixed costs and inability to satisfy delivery promises to customers. This is probably *the* most important goal of supply management.

Maintaining or improving product/service quality

However, it is insufficient to have the supplies, if the quality is not satisfactory. To produce a desired product/service, a certain quality level is required for each input. Otherwise, the end product or service will not meet the expectations or will result in higher-than-acceptable production costs. In fact, globalisation and increased competition have reinforced the need to improve supplier quality continually to produce competitive end products/services, as well.

Inventory management

One way to ensure uninterrupted material flow is to keep a large inventory. But, inventory requires the use of capital, which cannot be invested elsewhere; the cost of carrying inventory may be 20 to 50 percent of value per year. Therefore, it is important for the supply department to keep inventory investment and loss at a minimum.

[33] Leenders & Fearon, 1997, p. 35

Achieving lowest product cost

Besides good inventory management, it is also advantageous to obtain low product costs naturally. The purchasers should strive to obtain the needed items and services at the lowest possible cost after considering the quality, delivery and service requirements. The lowest total cost would give any organisation a competitive edge to excel.

Standardising the items bought

Product costs are lowest when there are substantial economies of scale. One way of achieving this scale is through standardisation. This means that the purchaser would buy a quantity of one item that has the same function as two or more different items previously did, to obtain efficiency gains through lower initial price. This price advantage is obtained through the quantity discounts, lower total inventory investment without lowering service levels, reduced costs of personnel training and maintenance costs in the use of equipment and increased competition among suppliers. Hence, it is economic to standardise the purchases and buy in bulk.

Reducing administrative costs

Besides the costs of the products itself, administrative costs should also be minimised. The purchasing manager is responsible for ensuring an effective and economic use of resources to operate the purchasing department, such as salaries, telephone and postage expenses, supplies, travel costs, computer costs and accompanying overhead. He/she should be continually alert to improvements possible in purchasing methods, procedures and techniques, such as better software utilisation and team-based approach to the buying process.

Finding or developing competent suppliers

It is also essential to find and develop suppliers that are competent and interested in helping their customers save costs, as well. Thus, the success of the purchaser also depends on his/her skill in locating or developing suppliers, analysing supplier capabilities, selecting the appropriate supplier and collaborating with the supplier to obtain continuous process improvement in a win-win situation for both the purchaser and the supplier.

Developing cross-functional relationships

All the above could not be effectively achieved without the co-operation from colleagues in other departments. It is useless for the purchaser to try to standardise the products if the users refuse to use them. Even finding and developing competent suppliers is no longer the job of the purchaser alone; another colleague from a different department might discover an excellent supplier that is worth dealing with. As such, it is important to have good relationships and information flow between functions.

Improving competitive position

The ultimate goal in supply management is to help improve the competitive position of the company. All the goals above (good control of the supply, inventory, quality and total costs to avoid non value-adding activities, coupled with a strong level of integration within the organisation and with suppliers) would eventually result in high quality products/services at competitive prices. This would create a competitive advantage for the organisation because in the long run, its success is dependent on its ability to satisfy the increasing demands of its existing and new customers.

4.2.3 Industrial Buying Behaviour

An essential part of the supply chain is the purchasing process itself. As industrial buying processes are generally more complex than consumers' buying decisions, we will delve further into industrial buying behaviour. Often, several executives, from different departments, are involved in buying the many goods and services used by the company in the production of their manufactures.

Five roles have been identified[34] as typical of the industrial buying processes: user, influencer, buyer, decider and gatekeeper. In many cases, users are the ones initiating the purchase. Influencers are organisational members who directly or indirectly influence buying or usage decisions. Typically, they exert their influence either by defining criteria that constrain the choices that can be considered in the purchase decision, or by providing information with which to evaluate alternative buying actions. Buyers are the organisational members with formal authority to select suppliers and arrange the terms of purchase. Deciders are members who have either formal or informal power to determine the final selection of suppliers. The buyer may be the decider, but it is also possible that the decision is actually made by someone else (e.g. users) and left to the buyer for implementation. In reality, it is not always easy to determine when the decision is actually made and who actually makes it. Lastly, gatekeepers are members who control the flow of information into the group, and thus actively influence the feasible set of buying alternatives. One example of a gatekeeper may be the buyer who has formal responsibility and authority to allow salesmen from certain vendors and potential vendors and to approach the group.

There are occasions when the same person fulfils all the functions mentioned, but, more often than not, different people are active in their various roles in a particular buying situation. The degree of decision-making power one has depends on his/her specialised knowledge and status in the management hierarchy.

[34] Webster & Wind, 1972, p. 78-80

Particularly for products of a highly technical nature, functional specialists tend to have more influence than the buyers. If the quality of the product is unacceptable, the supplier will be dismissed, irrespective of how cheap its products are. The table below summarises the most likely influence of the organisational members at each of the five stages of the buying decision-making process.

Table 1: Decision stages and roles in buying

	User	Influencer	Buyer	Decider	Gate-keeper
Identification of need	✓	✓			
Establishing specifications and scheduling the purchase	✓	✓	✓	✓	
Identifying buying alternatives	✓	✓	✓		✓
Evaluating buying alternatives	✓	✓	✓		
Selecting the suppliers	✓	✓	✓	✓	

Source: Webster & Wind, 1972

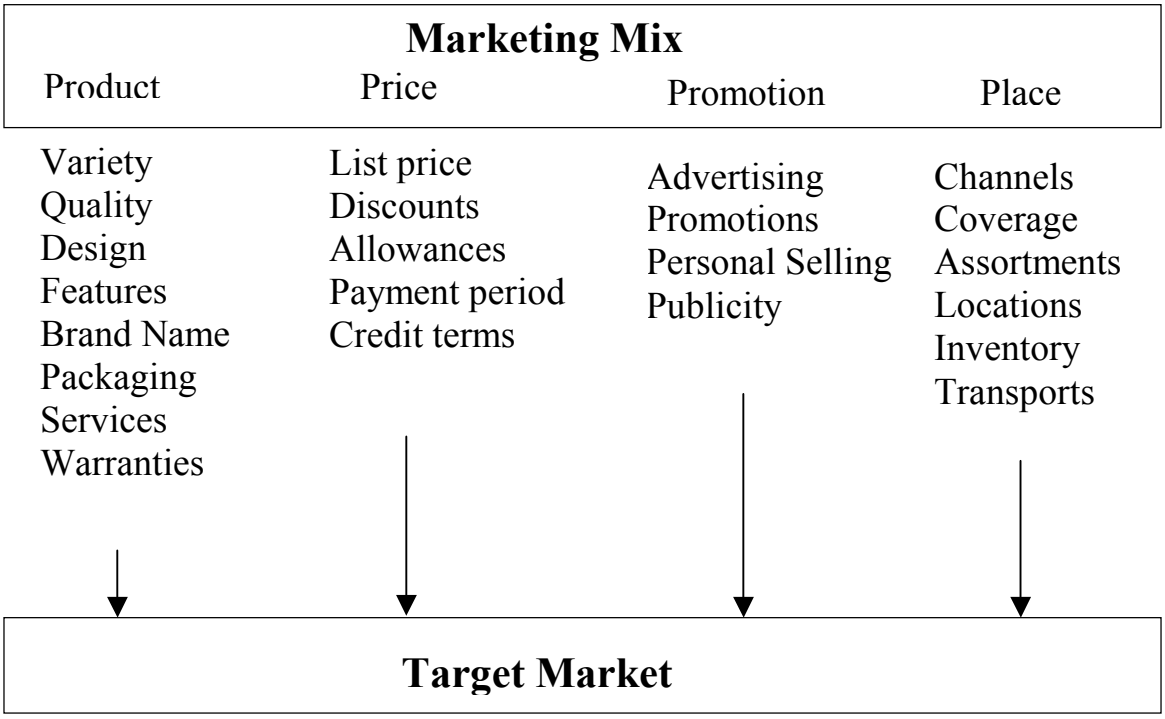
4.3 Marketing

4.3.1 Four Ps - the marketing mix[35]

Up to this point, we have been looking at the supply chain from the customers' point of view. From the supplier's side, it is reasonable to begin with the very basic marketing principles – the marketing mix. The mix consists of a set of controllable tactical marketing tools that the firm blends to produce the response it wants in the target market and can be clustered into four groups of variables, known as the '*four Ps*' (Product, Price, Place and Promotion).

[35] Kotler, 1999, p. 110

Figure 12: The marketing mix



Source: Kotler, 1999

The four Ps concept represents the sellers' view of the marketing tools available for influencing buyers. In this marketing research, we are concentrating on the Product, particularly the 'service' component. This is mainly due to the competitive nature into which the health care industry has evolved. A high quality product per se is no longer sufficient to create sustainable a competitive advantage.

4.3.2 Relationship Marketing

There have been comments that the marketing mix is a little "outdated" for the modern world of today; having the four Ps alone is insufficient to create a sustainable competitive advantage. This is where Relationship Marketing comes in and adds value to the company. Coupled with a good marketing mix, building and maintaining a long-term relationship with valued customers will help companies create the competitive edge to excel in a highly competitive business environment.

"A relationship that exists only as imperative of the vendor will certainly flounder. The challenge is to identify meaningful ways for customer and supplier to associate in the long term and build strategic value together from which both benefit"[36]. This means that it is important to take care of the established relationships and make the relationships more profitable, because the cost of obtaining a new customer is more than the cost of keeping an existing customer, especially in the health care industry. This can be done by RM, which emphasises the creation of trust and commitment among the involved business partners in the long run.

RM basically encourages companies to build *long-term* relationships, put their customers in the middle of all business processes and deliver *value-added* and *customised* products/services to them. It is about creating and sharing values with *major customers* (in terms of profitability or other strategic reasons). Therefore, *communications, interactions*, *collaboration* and *integration* between suppliers and customers are key.

There are certain conditions that have to be fulfilled for a successful RM implementation. Firstly, all the key customers must be amenable[37]. In addition, the customers must want to repeat the purchase. If there is no desire for the customer to repeat the purchase, there is no incentive for MHC to invest in the relationship. Finally, distribution must be accessible.

[36] Gordon, 1998, p.4
[37] Customer amenability is whether or not customers want to have a closer relationship with the company

New technology makes it possible for companies to add value; but distribution remains a problem. It is often costly for companies to transport and ship products[38].

RM is not a solution for every business. However, companies in high fixed cost industries where there is a long-term commitment of financial resources should be very interested in building customer loyalty to provide the long-term revenue stream to support the investment.

Figure 13: RM in relation to other strategies

Customer lifetime profitability			
	High	Specialisation and niching	**Relationship Marketing**
	Low	Mass marketing	Cost management
		Low	High
		Communication interactivity and process flexibility	

Source: Gordon, 1998 (modified)

Resources and Capabilities not enough. To be successful, the company also needs to fulfil several internal requirements. With help of Grant's (1998) resource-based view and Gordon's Relationship Marketing Capabilities, we will be able to answer our second research problem - if the company has the internal resources and capabilities that could help to ensure a successful e-business implementation.

According to Grant, a company's resources may be comprised of tangible (financial, physical), intangible (technological, reputation, culture) and human resources (specialised skills and knowledge, communication and interactive abilities, motivation)[39]. It is noted that resources are what companies *have* and capabilities are what companies can *do*.

[38] Gordon, 1998, p. 143
[39] Grant, 1998, p. 113

Resources are not productive on their own. As an example, technological resources, such as computers, are not productive, but coupled with the technological capability to compile customer information files, the company will end up with a rich customer database with valuable information for decision-making.

Relationship Marketing Capabilities

To be able to pursue proper RM and to succeed in competition, certain capabilities are needed. Gordon's (1998) model of 'Relationship Marketing Capabilities' outlines the main capabilities a company needs to develop. These capabilities are People, Process, Technology, and Knowledge and insight.

Taking a closer look at these components, it is obvious that relationships are all about *People* - their culture, attitude, professionalism, empathy, skill, focus on quality, team-based thinking and relationship orientation – and all must be advocated in the company. The same accounts for *processes*, which consists of real time interaction, customer involvement and integration, mass customisation, decentralisation, mutual innovation, joint planning, joint issue management, resolution and restitution, and customer-initiated marketing. Meanwhile, *knowledge and insight* about product and services, business environment (including the customer's competition and technology), metrics of mutual importance, customer behaviours, preferences, and profitability are also key to support RM. Last but not least, *technology* such as customer information files, data warehousing, data mining, point of sale cross and up sell, systems open to customers, inter-enterprise communications and internal communications, is also very important, especially when discussing e-business.

4.3.3 Brand management

An essential resource of a company is its brand reputation or the way its brand is perceived among the customers. Kalakota and Winston (1996) mentioned that with the new electronic capacity to buy and sell online, there would be a major potential threat to brands and making brand strength weaker than ever before. General consumer inertia and unwillingness to try something new are weakened when a competitor is only a click of a mouse away.

However, recent evidence indicates that these predictions have yet to approximate reality. Ernst and Young reported that 69% of respondents to a survey on e-commerce stated that brand names play a significant role in their online buying decision. As Barwise (1997) argues, in a busy over communicated and untrustworthy world, consumers continue to gravitate towards brands as a way to simplify choices, reduce search costs and build trust.

Based on the survey above, we decided to reinforce the importance of brand strength. There are two different types of brands, where one is better suited to e-business than the other. They are brand-as-belief and brand-as-experience[40]. Companies can promote brand-as-belief by conveying facts or beliefs about product attributes through branding; such as Sony's superior technology, high manufacturing quality, etc. In the e-world, this branding strategy is highly risky, as the brand message is basically a navigator message. This means that any objective navigator that could promote the superior technology and high quality of Sony products, would be a direct competitor to Sony. In addition, if people respect Sony products *because* of the navigator's endorsement, Sony is at the losing end again. Worse still, if the navigator could repeatedly reveal that Sony could not deliver those beliefs, the brand name will be damaged. Meanwhile, the other alternative is to use branding to communicate an experience. Coca-Cola, for instance, is a whole experience: the taste, the curvy bottle, the logo, the joyous feelings and other associations and memories.

[40] Evans & Wurster, November-December 1999

No navigator or competitor could steal its customers and market share because they cannot provide the same experience that the customers seek. So, Coca-cola's brand name is less vulnerable and, thus, more sustainable.

4.4 What did we use the theories for?

Table 2: Use of theories

Theory	Chapter	Objective
1. Definitions	4.1.1	To differentiate e-business from e-commerce
2. Four critical phase	4.1.2	To understand the roles of e-business
3. E-business strategy option	4.1.3	To formulate e-business strategy
4. Conventional vs. e-business supply chain	4.2.1	To compare the supply chain with and without e-business
5. Nine goals of supply management	4.2.2	To categorise the problems and use it as a base for our solutions
6. Industrial Buying Behaviour	4.2.3	To understand and map the different roles of the hospital staff
7. Four Ps	4.3.1	To determine which marketing mix to focus
8. Relationship Marketing	4.3.2	To use as a base for our solutions
9. Resources & capabilities	4.3.3	To determine the resources and capabilities that are available or need to be developed
10.Brand management	4.3.4	To manage branding with e-business

Source: Own

After having discussed the methodology, as well as the theoretical aspects, we now have to focus on the reality.

5 EMPIRICAL FINDINGS - PRE-STUDY

This chapter describes our findings, mainly from interviews with MHC's Swedish customers, about the general Swedish health care system, the health care purchasing process, and the existing problems that they face in the supply chain.

5.1 Preparations

In order to achieve our ultimate intention, to understand the British and German health care market in general and their procurement systems in particular, it is essential to identify and understand the existing purchasing process and the factors that influence the development in the procurement systems in the hospitals. To get as broad an overview as possible, we spoke to different people who are all involved in the hospital procurement system in Sweden.

Among the interviewees were several warehouse managers; among whom some use EDI or even Internet solutions for ordering the products, while others still use the traditional ways of ordering via fax or phone. We also spoke to several salespersons at MHC, MHC's Customer Service Centre in Belgium and head nurses in Swedish hospitals about the procurement process and problems/areas of improvements concerning this process.

5.2 Swedish health care system – some system views[41]

Health care in Sweden is organised in three levels; primary care, county care and regional care.

Primary care includes health care centres, district nurses and maternity/child health care. Primary care is also responsible for public health and preventive care within a given area. From January 1992, the municipalities were given the responsibility for home care and nursing homes. In 1995, there were 952 health care centres. A family doctor system was introduced in 1993. By November 1994, there were 4 188 registered family doctors, of which 16% were in private practices.

[41] www.tradeport.org, 17.09.2000

County care for somatic care patients is carried out at central county and district county hospitals. There were 53 district county hospitals and 26 central county hospitals in 1995.

Regional care is carried out at the highly specialised regional hospitals in six health care regions. Regional health care is regulated by agreements among the county councils in the respective regions. There were nine regional hospitals in 1995.There are totally nine private hospitals with many specialities and wards for planned care.

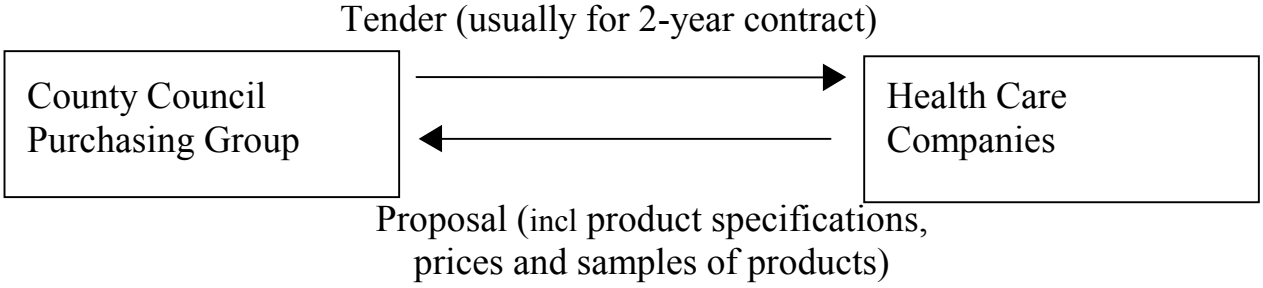
Procurement of products and services concerning hospitals is handled by each County Council, and in some larger counties, directly by the larger hospitals themselves. Also, when it comes to the primary care, the procurement is handled by the County Councils (in a few cases also by municipalities). The procurement procedure is regulated by the Law of Government Procurement (Upphandlingslagen).

A wait-and-see trend has been evident when it comes to IT-investments in health care. This is a consequence of continually decreasing investment resources. This circumstance has somewhat slowed down development, but there are no signs that it is starting to change.

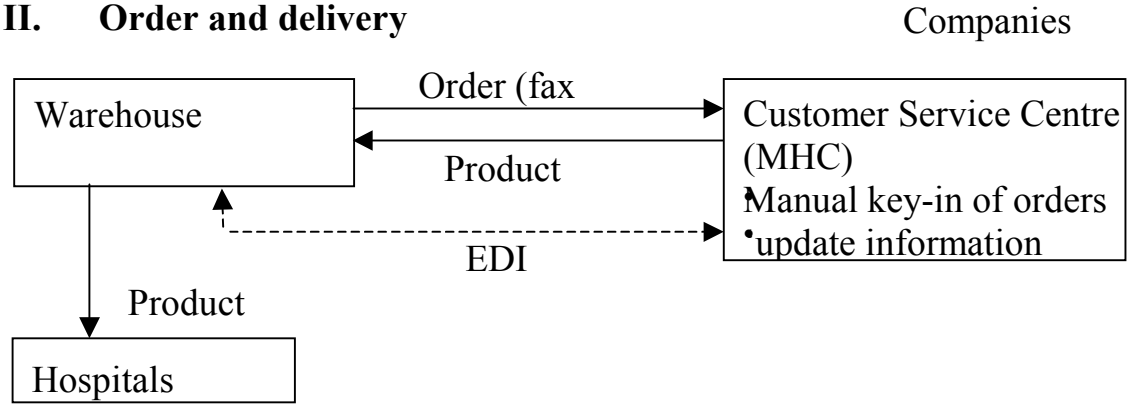
There is also a lack of IT-education in the health care. Large groups of doctors and nurses are, or feel themselves to be, computer illiterate. The IT-maturity and IT-competence among doctors and nurses must be developed.

Figure 14: Mapping of the Swedish Acute Care purchasing process

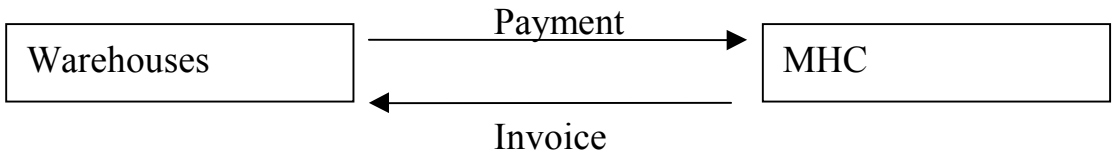
I. Tender



II. Order and delivery



III. Payment



Source: Own, based on interviews

The responsibilities of the health care provision and financing lie within the 26 county councils. The political composition of the county council is decided by popular vote every four years (Glennester & Matsaganis, 1994). The 26 central county hospitals are gathered into 15 county council purchasing groups. Besides the politicians, the decision-makers in the purchasing groups usually consists of Purchasing Managers, IT Managers, Warehouse Managers, Business Development Managers and Head Nurses, to name a few. These people meet and discuss the most suitable products to use and the final decision is made by the Head of the Purchasing Group based on the collective results of the groups.

All purchases by the public hospitals are made via tenders on a two-to-three year contract basis. This means that whenever the hospitals need a new product or if the old contract has expired, they issue a request-for-proposal (RFP) for that particular product that they need, usually in the form of a spreadsheet. In return, suppliers reply with their proposals, indicating clearly the product specifications, such as size, materials, packaging, prices and other information. The hospitals select their suppliers based on the proposals submitted.

In Sweden, 95% of the hospitals are public ones and, therefore, tenders are common. Some of the private hospitals even sign contracts with the public hospitals to buy via tender in order to achieve the economies of scale.

For each product group, there is one dominant supplier. Naturally, hospitals may choose different suppliers for different products if it wishes, but this scenario is rather rare. MHC is the dominant health care company in Sweden.

As shown in the figure above, logistics are handled efficiently, as MHC only delivers the products to the central warehouses that are run by the county council. For instance, in the West coast with a population of 1,5 million inhabitants, there are only two delivery points – Sisjön and Skaraborgdepån in Göteborg. These warehouses deliver the products to the respective hospitals that made the orders. The deliveries are made almost on a daily basis.

At present, only three of MHC's customers are using electronic media in the form of Electronic Data Interchange (EDI) for purchasing purposes, which are, as mentioned above, Sisjön in Göteborg, Lundadepån in Lund and Ryhov in Jönköping. These three warehouses are among MHC's key customers, as the three of them account for more than 30% of the sales in Sweden. However, the EDI system that is used seems to be more backward than it was 5 years ago. This is mainly due to the organisational barrier for using IT in a professional manner. Hospital personnel prefer to use the traditional means of communication (such as telephone, fax and ordinary mail) to make the orders. In addition, the focus of the hospitals lies in the automation of its internal functions. For instance, the hospitals and warehouses are connected via EDI to ensure higher purchasing efficiency and lower transaction costs, but, the interest in buying electronically from the suppliers is less important to the hospitals and, thus, tends to be neglected.

An interesting observation is that, generally, quality and service are the most important purchase criteria; price is less significant when it comes to medical devices. Clinical opinions always take precedence over the purchasers' preference to cut costs.

5.3 The resulting key problems within the Swedish Acute Care segment

Although we talked to different people and organizations that were at different stages of the e-business development, after examining the five minicases about Lund, Sisjön, Jönköping, Jämtland and Luleå (see Appendix 1), some key problems in this segment clearly stood out:

- The so-called '*age-problem*'. This problem occurs because many elderly employees are unwilling or scared to work with computers.

- The '*cultural-problem'*: The cultural-problem has many different aspects. It may involve the doctors who think that they are the "bosses" and will not allow anybody else to touch their computer, which may be the only one with Internet access in the whole department. In addition, it can also have to do with old habits – clinicians are particularly reluctant to changes in general. For instance, nurses who are used to a particular brand name and have been using that product for years tend to decline changing brand names and having to learn about the new product. Besides, the hierarchy is also very evident in the decision-making structure. Clinicians tend to have traditional thinking that they are the brain of the hospital and, thus, should have superior decision-making power. On the other hand, the contemporary purchasers prioritise getting the best value for money. This conflict of interests and internal power struggle makes the decision-making process overly complicated and time-consuming.

- The '*resource-problem'*: The lack of money after the reduction of governmental aid is a crucial factor, as substantial technological investments are needed to pursue e-business. In addition to the money, human resources are also lacking. There is an acute shortage of health care professionals in Sweden and, thus, workload is pretty heavy in nursing and care. On top of that, plenty of time is also needed to give a proper education to the nurses in computer-usage, as most of them are not computer-literate and have no idea how to handle EDI/Internet.

- The '*information-problem'*: Price or volume changes are not communicated in time or not at all. It happens that MHC fails to inform warehouses about such details in due time. This shows that information is not flowing efficiently. The interviewees would like to receive advance notice if a delivery cannot be made on time or if there are any other changes, and even an order confirmation automatically after the order has been placed.

- The '*inefficiency-problem*': The ordering-process is still dominated by loads of paper- and double- work. Order forms and invoices are plentiful. Information has to be written down and keyed-in in several times, as the computer systems are not integrated and there are no information sharing facilities.

- '*Security concerns':* At the moment, most of the interviewees were still concerned about security aspects when thinking of purchasing via the Internet. Validity of virtual signatures, contracts and payments are dubious. Hacking activities are feared. Confidentiality of patient records must be kept at all times. These problems have to be solved before they would consider the Internet as an essential part of their coming procurement strategy.

Besides the identified keys problems, the different interviewees had several other worries that were not shared by all, but are still considered important to themselves. The Ryhöv warehouse, for instance, mentioned that personal contact is not as good as it used to be with MHC. The fluctuation among MHC's employees is too high; they are missing the continuity in relations with the representatives of the company due to the constant reorganisation.

On the same note, one respondent also mentioned the need for personal contact with the suppliers. These contacts are needed, for instance, in order to get an appropriate explanation of how to use a new product or when discussing the new terms and conditions of a contract. She sees the personal contact as essential and does not believe that the relations would be as good, as they are at the moment, if everything would be done via the Internet.

Lundadepån is more concerned about the product deliveries. The warehouse does not handle the whole delivery right to the operating theatre. Their influence stops at the entrance of the hospital, which means that they do not have the possibility to check if product arrives in the right condition, quantity, etc. Occasionally, the product is damaged within the hospital and the warehouse is not able to prevent this.

Based on the insights gained from the pre-study in Sweden, we will now investigate in a wider European context whether e-business can help solve the main problems that exist in the supply chain.

6 EMPIRICAL FINDINGS - MAIN STUDY

In this chapter, we present our findings in Germany first, followed by the UK. For both countries, we touch upon the general health care industry, the perception and developments of e-business and, finally, the existing problems in the supply chain that we have discovered.

6.1 Germany

In preparation for the round table discussions, we feel it is necessary to describe and explain some system views pertaining to Germany.

6.1.1 The German Health Care System[42]

At present, the German health care system is facing tremendous challenges. Following a higher life expectancy, elderly people are requiring longer medical care. The number of elderly committed to hospitals or nursing homes because of geriatric disorders or chronic diseases is, consequently, on the rise as well.

Structure of the health care system

In Germany, the term "health care system" encompasses all institutions and individuals who contribute to, support, and restore the health of the population. The Federal and State (Länder) governments, as well as local authorities or corporations under public law, to whom specific tasks have been assigned, are responsible for the maintenance of the public health care system. Statutory health insurance funds play a significant role. Their statutory mandate guarantees complete coverage to the insured in case of sickness. Almost 90% of the population is insured through the statutory health insurance fund.

Legislative authority in health care matters is divided between the Federal and State governments. The German constitution regulates the major responsibilities relating to the health care system. Legislative authority in specified areas is automatically transferred to the state governments in cases where the Federal Government does not apply its legislative power.

[42] www.tradeport.org, 10 September 2000

The Public Health Service

The Public Health Service performs important governmental tasks within the health care system. It carries out its activities through the health departments of the states and through approximately 520 municipal Health Offices. Its main duties are:

- Prevention and control of infectious diseases;
- Monitoring the environmental condition;
- Supervising the activities of health care institutions;
- Supervising public facilities;
- Providing health education, including counselling.

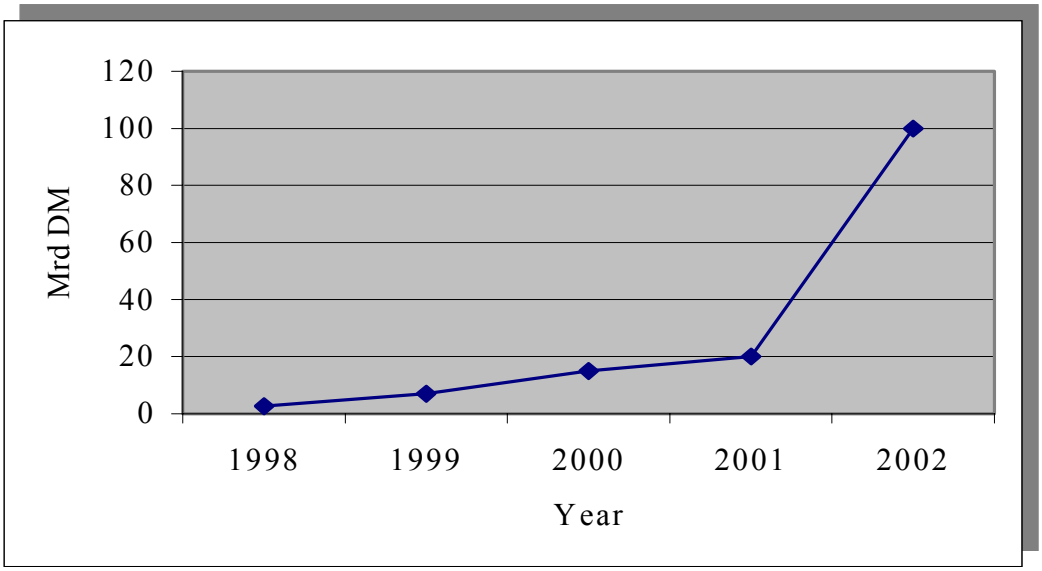
In 1995, the 'Professional Group Germany Certified' counted 524,694 nurses and 273,880 Doctors (practicing physicians). Germany claims one of the highest doctors per capita ratio worldwide, averaging 3.3 doctors per 1,000 persons. Total expenditures on health care reached approximately DM 373 billion (US$ 249 billion) in 1996 amounting to 10.5% of Germany's GDP (in the United States, expenditures amount to 14.2% of the GDP).

Present E-Business situation in Germany[43]

E-business is becoming more and more important in business nowadays all over the world. It will soon be part of all everyday routines in business life. The e-business turnover development shows clearly the tremendous changes that have occured between 1998 and today, and what is expected to happen in the near future in Germany.

[43] Beeres, M., Berlin, 26 September 2000

Figure 15: E-business turnover development in Germany (volume)



Source: Beeres, 26 September 2000

The German Health Care System and E-business[44]

Examples of e-business in the health area already exist in Germany, although they have mainly sprung up in the past couple of months. Therefore, it is still difficult to assess the extent to which start-ups such as Praxisline.de or Medimall (Antwerpes AG) will gain a foothold in the market.

The main German companies in the e-business medical device industry are at the moment:

- Praxisline.de (www.praxisline.de) aims to become an innovative trading firm in the field of medicine. Some 4.000 articles are currently deliverable on call, approximately 70 of which are in stock. The Wiesbaden company has some 400 registered customers on its books since November 1999 (predominantly doctors' practices). Praxisline works together with a logistic partner and aims to deliver within 24 hours for online orders. Now that doctors in private practice have been reached, Praxisline intends to set up its marketing activities in the area of hospitals and clinics.

[44] Schmitt, J.M, Beeres, M. Wiesbaden, 27 June 2000

- GloMediX (www.glomedix.com) aims to become the leading distribution channel for medical devices. Through the use of state-of-the-art information technologies, GloMediX AG aims to become an online marketplace for manufacturers of medical devices, hospitals, and rehabilitation clinics, as well as other medical institutions.

- Praxisshop.de (www.praxisshop.de) is an online shop for practice, consulting-hours and medical-supply-shop requirements as well as medical technology with approx. 5000 articles, where purchase communities and routine orders are possible.

- MediMall (www.medimall.de) has approximately 800 products. The orders can be stored as a shopping list and an overview of material consumption is given, thanks to a materials' management system. Purchase communities can be formed.

- Multimedica (www.multimedica.de), which is an online shop for practice requirements. Special offers are sent out via e-mail and the entire range of practice, medical and hospital requirements can be found in the Albert Geisselmann Online Shop (www.geisselmann-medizintechnik.de).

- MediShop (www.medishop.de) is a medical online shop with approximately 1500 products. When it was set up in 1998, it was the first shop of this kind.

- Med2Med (www.med2med.de) is a B2B market place for the health care sector.

- The hospital portal (www.krankenhausportal.de) intends to establish itself as an online marketplace for hospitals in Germany. It aims to act as a broker, marketplace and community for the clinics.

- Smart Mission Medical (www.smartmission.com/med/) wants to be the leading European online marketplace serving hospitals, surgeries, chemists, laboratories and research institutes.

They want to focus on the specific requirements of medical purchasers and make sure the customers find the supplier who will deliver the goods and services needed quickly and simply.

Present situation

Use of E-business in hospitals

At the moment, e-business is mainly used for six different purposes:

- Offering information to the hospital on the Internet
- Use of the Internet as an medium for hospital personnel
- Networking of several clinics via Internet/Intranet
- Networking of inpatient and outpatient areas
- Telemedicine via Internet/Intranet
- Use of software on Internet technology/ Intranet.

In this list, there is no mention of purchasing or procurement. This is because most hospitals currently do not use e-business to buy online. According to a study made by the Centre of Hospital Management at the University of Muenster, although all of the 2.260 hospitals have an Internet connection, the question remains of how to use it. In most of the cases, it is preserved of the doctors for medical research. The study also reveals that 70% of the hospitals also have their own web site but only 5% of the surveyed hospitals have vague ideas about the use of the Internet for requesting delivery of goods ordered or price comparisons.

Predictions

E-business is still in its infancy in most hospitals. This will change very soon. The health care market in Germany will be revolutionised by the Internet and E-business over the next few years, not only changing the availability of information about health, but also the way of conducting business by electronic means. E-procurement offers will result in considerable potential savings for all those involved in health care. Once recorded, data will be integrated into all processes and systems, with a substantial reduction in logistic costs; for instance, through the new XML (see Appendix 5) standard in the Internet[45].

[45] Beeres, 27 June 2000

Over the next three years, the turnover achieved through e-business in the medical sector is predicted to increase more than ten-fold in Germany. The best potential for the medical sector is expected to be electronic shopping and purchasing and the operation of independent commercial platforms.

Medical e-business in Germany has started to include the presentation of general or product-specific information on the Internet, interactive online consumer advice, logistic integration and independent information sites[46].

The potential of the Internet seems to be unlimited. Even the necessary education and training for the staff can be done via the Internet (E-learning). Likewise, the procurement itself and all other involved responsibilities, such as the catalogue-management, ordering, order confirmations, payment and after-sales services, such as controlling of complaints and refunds, can be changed from a manual method to the Internet. Moreover, stocks can be controlled more easily when the products are all bar-coded.

With the implementation of E-business, the health care industry can save costs substantially. Arthur D. Little believes that about 15 to 25 percent of all expenses in the health care industry can be avoided if the Internet is used for the business processes. Ernst & Young are predicting a lowering of the costs of about 3,6 billion Dollars per year in the whole industry when changing to an electronic ordering system, and Praxisline has faith that 3,3 billion EURO per year can be saved alone in Germany through an implementation of electronic processes within the supply chain; this would equal approximately 80 percent of all ordering costs, which could be saved.[47]

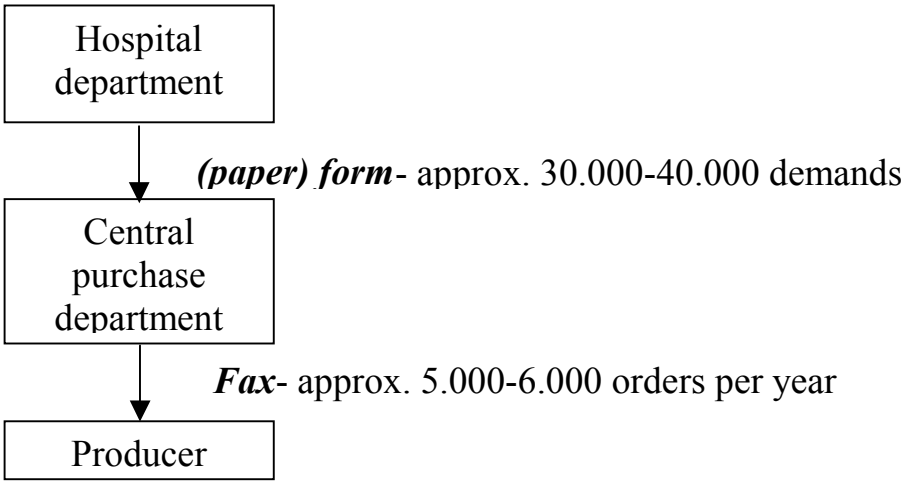
6.1.2 Procurement process in Germany

Present Procurement in hospitals

At present, most hospitals co-ordinate their purchasing activities with help of paperwork. A rather common purchasing process may look like the one below:

[46] Beeres, 27 June 2000
[47] Beeres, 26 September 2000

Figure 16: Papers generated from purchasing



Source: Beeres, 26 September 2000

One purchasing process generates costs for the customer of about 120-300 DEM, plus additional costs for the supplier. This means, that for some small parts the purchase costs are higher than the actual value of the product.

6.1.3 Round Table Discussions in Germany

In Germany we managed to organise round-table-discussions in five different hospitals, namely Zentral Krankenhaus Sankt-Juergen-Strasse, EKG Niederrhein, Sana Kliniken, Uniklinikum Kiel and the Städtische Krankenhaus Kiel. Geographically, they are spread all over Germany, from the very north to the very south (see Appendix 3).

General perception of e-business

The perception of e-business at the different institutions varies, although the general outlook is rather receptive. Purchasers from three out of the five institutions are very receptive towards e-business. Two others had mixed reactions due to the high uncertainties in the e-market, and, thus, are taking the wait-and-see approach. Meanwhile, two of the institutions we spoke to are 'purchasing communities' and nurses' opinions cannot be obtained here.

But among the three hospitals we visited, the response is rather diverse – one hospital is receptive, another is unreceptive, while the third is still unexposed to the topic of e-business[48].

Common key problems

Lack of standardisation

At present, all the different hospitals are mostly using different brands of Acute Care products. Even in the same hospital, it is not unusual for different departments to have different product preferences. To optimise the purchasing process, it is absolutely necessary to standardise the product usage in hospitals and to tighten up the offered product lists. By standardising the assortment, the order process will be more efficient and time and money will be saved. Time, because it takes less time to order one product from one supplier than from several and at the same time the delivery will be less time consuming and more co-ordinated; money, as the hospital has more bargaining power if they order bigger volumes from one supplier.

The hospitals, however, are aware of the fact that a drastic standardisation will be impossible due to the distinct philosophies of the doctors and nurses, who have worked with a special product throughout their entire carreers and are used to the ways they handle the product. Changing the product range will cause resistance. Nevertheless, it is a crucial step to carry out in order to work more efficiently and capitalise on the economies of scale.

The search for a system-supplier

In line with the standardisation of the product-assortment is the search for a 'system-supplier'. By using system-suppliers the hospitals believe that costs can be cut tremendously. The majority of the hospitals would prefer to have as few suppliers as possible; some believe that the best-case scenario would be just one single supplier. Hereby, the arising problem is the fact that the whole assortment has to be offered to the hospitals.

[48] see table 3, pp.67-69

It is not unusual that some products of the chosen suppliers are not in line with the requirements of the hospitals, or the chosen suppliers are not able to offer the whole product range that is required.

Culture

In hospitals, traditions are very deep-rooted. When a doctor is accustomed to work with a specific product, it is unlikely for him to change his habit just because a person in the administration wants to standardise the assortment. He is not interested in the economic point of view, as he has to carry out his job in the best possible way for the best interest of his patients.

Another problem is the nurses' rejection of any changes that would increase their workloads, especially those that are not directly linked to nursing or caring for patients. Although some nurses are computer-literate and have experienced working with PCs, it can cause problems to change all the paperwork into computer-based work. This is due to their rejection of working with something other than the patients and the directly to the patients linked actions. Computers have not been needed before, so why are they suddenly necessary? Some nurses are even of the opinion that it is easier for them to work manually, than using a scanner or even a computer, as they are used to work with papers and love to do this. Moreover, they strictly believe that they are faster in the traditional way of working than they would ever be, using the computer. This problem is partly founded on the age structure. Having worked in a specific way all their professional lives, some nurses and doctors, that may be just a few years from retirement, do not see the "need" to learn the computerised work-flow all over again.

Besides the fear of new ideas and ways of working, the human behaviour is very much based on familiarity and repetition. For instance, using scanners and bar-codes to keep track of the inventory level may sound very feasible. However, the plan will not be fruitful if nurses forget to scan the products before taking them out of the inventory, which is highly likely considering that they are so used to the idea of going into the store-room and simply rushing out with the products.

Even the scanners themselves are a risk as it is to be expected that the nurses will forget to return them or put them somewhere where the other nurses cannot find them. As long as human beings are involved, these problems will never be totally eliminated.

Also when it comes to discussing contracts, the mind-set in hospitals can be rather traditional. Still, it is pretty common to sit down with the supplier and to discuss the new 'agreement' on a face-to-face and handshake basis instead of putting it on paper. One other hospital mentioned culture as a secondary problem and not as a main problem.

Different aims of involved actors

All internal problems are based on one dilemma: the different decision-makers have distinct or even opposing objectives when making their decisions. It is crucial that the doctors, the nurse management and the administrative management work closely with each other and do not allow the so-called hierarchy to further complicate the decision-making process. Power struggles and vanity are common problems when it comes to changes in this traditional and conservative industry. The aims of the above three groups have to be brought together strategically in order to obtain the highest quality products at the best prices. In fact, with such collaboration, it is believed that the other internal problems will be solved instantly too, such as the inefficient information flow within the hospitals.

The different opinions are particularly obvious when it comes to the e-business development. The administration and the nurses do not share the same sentiments in this issue. Whereas the nurses are not truly convinced of the necessity of the Internet in the hospital, the administration is really enthusiastic. This is mainly because the purchasers and nurses have different priorities. The purchasers are the cost controllers and very seldom understand the workflow of the nurses in the operating theatres, which are constantly under intense time pressure.

Any item or process that could help the hospital cut costs is naturally very well received. Due to the lack of understanding between these two parties, it is difficult to come to a compromise.

One other hospital mentioned this as a secondary problem and not as a main problem.

Lack of transparency

The lack of transparency in information is one of the key problems the hospitals face in purchasing. There is not a single source that can provide fast, accurate, complete, and easily accessible information about health care products and developments. Hospitals mostly do not know which offers are respectable and which companies are reputable. More transparency is needed. Presently, the hospitals have to compare or position the suppliers in comparison to the competitors themselves and no supplier approaches the hospital with a direct contest of the products pertaining to the price and the features. Ample time and human resources need to be invested to search for the superior suppliers in the market. On the same note, price transparency is even poorer.

Two other hospitals mentioned the lack of transparency as a secondary problem.

Poor traceability

The information flow from the suppliers is definitely an area to improve. It is quite common that the purchaser does not get any information about stock problems and delayed or wrong deliveries, which can cause problems, especially if the delivery is of essential importance for a patient who is fighting for his or her life. Besides, as soon as the products are sent out, it is difficult to track them and to find out their whereabouts.

High transaction costs

Purchases always incur high transaction costs. In each hospital the transaction costs add up until approximately DM120-300 for the customer per purchasing process.[49]

[49] Beeres, 26 September 2000

Hospital-specific key problems

Lack of unloading space

A key problem that only the ZKH St-Jürgen-Strasse is facing is the lack of unloading space. The architecture of the hospital is such that the space in between the pavilions is rather limited and impossible to reconstruct. Therefore, Mrs David does not believe that it would be logistically possible for all the suppliers to be responsible for their deliveries and send out their own trucks to the hospital. It would result in congestion if too many trucks were at the unloading area at one time.

Complicated and inefficient decision-making process

In the Sana hospitals, the VOL[50] demands the product evaluation by groups of specialists, thus making the decision-making process very complex and time-consuming. The representatives from all over the country have to come together and discuss the different products. Time is a scarce commodity for doctors and nurses and to fix one date that suits everyone is not an easy task. Discussions can sometimes be tough as experience and habit are important, but not always rational factors that influence the decisions made.

Lack of order

In the Uniklinik Kiel, the bar-codes are at the moment collected in a special folder. The separate bar-codes are given to Mrs Kürschner, the head nurse, on separate papers and not in one connected catalogue. The bar-codes are not systemised and, therefore, difficult to find. This system is rather confusing and difficult to organise.

Other problems

Narrow-mindedness in hospitals

In order to create a successful solution concerning the organisation of the purchase, substantial investments are needed, among others in logistics.

[50] 'Verdingungsordnung fuer Lieferung und Leistung' (Rules for delivery and service)

Most hospitals are not aware of this and save on these investments by trying to find a second best solution that is less costly. They do not dare to look for powerful investors and instead of, for example building new facilities, they rent containers. The same accounts for all kinds of other investments. As long as these investments do not have a direct impact on themselves, they try to save on them as much as possible. For instance, concerning the infrastructure; the hospitals are mostly rather poorly equipped with computers. Except for the head doctors or head nurses, the other employees generally do not have the opportunity to use a computer as not enough computers are available to the staff.

Lack of time

Another problem is the lack of time. There is an acute shortage of nursing personnel, which causes a rather tight schedule for the working nurses and doctors. Every additional formality, such as scanning the products that they have taken out of the stock, is seen as a burden and even counter-productive, as it delays their "actual" work. Without communicating the benefits for themselves, the patients or even the hospital, the nurses or other users will never be convinced to use the new system.

Inefficient invoicing

One hospital also has a problem with the many invoices it receives on a weekly basis and the huge amount of paperwork that follows up. In Germany, there is still a law called 'Archivierungsrecht' (archive regulation) which means that everything has to be filed into archives and these archives have to be kept for six years. So, even if hospitals would change to electronic invoicing, the whole correspondence still has to be printed out and archived in the cellar. As long as this law is not changed, electronic invoicing will not diminish the paperwork.

Inefficient costing/budgeting process

According to the Hospital Financial Law, it is compulsory for each hospital to have its internal budget each year. This means that every department in the hospital is given a certain amount of funds to cover its expenditures for the year. One common problem in some mismanaged departments is the lack of funds at year-end due to careless buying at the beginning. On top of that, there are often complications due to incorrect cost centres.

Control and management tools that could improve the hospital's efficiency in its financial matters and, simultaneously, reduce system costs, are still missing.

Security concerns

At present, most administrators in the hospitals do not trust the given security of the Internet. There are too many hackers around and the statements of the so-called experts are too contradictory.

Summary

Table 3: Summary of key problems in Germany

Institution	Perception of e-business	Key problems in purchasing	Why is it a problem?
EKG Niederrhein	Purchasers ☺ ▪ Very keen, especially with marketplaces/ portals ▪ Order online from March 2001 onwards ▪ Has a logistics partner	▪ Lack of product standardisation ▪ Lack of a system supplier ▪ Different aims of decision-makers	▪ No economies of scale ▪ Work duplicates ▪ Waste of human resources ▪ No economies of scale ▪ Power struggles and internal conflicts => inefficiency in decision-making

ZKH St-Jurgen-Strasse	Purchasers ☺☹ ▪ Wait-and-see, though aware of e-benefits Nurses ☹ ▪ Mixed reactions, have not been exposed to the topic, are afraid of computers	▪ Lack of standardisation ▪ Culture ▪ Lack of storage space	▪ No economies of scale ▪ Work duplicates ▪ Waste of human resources ▪ Reluctant to computerisation ▪ Refuse additional responsibilities that are not directly related to patient care ▪ Individual deliveries by suppliers would increase workload and more inefficiencies
Städt. KH	Purchasers ☺ ▪ Receptive ▪ Recently installed new computers & training Nurses ☺ ▪ Receptive, as they are already using computers daily now	▪ Culture ▪ Poor traceability	▪ Reluctant to changes ▪ No opportunity to source elsewhere if there is a back-order
Uniklinikum Kiel	Purchasers ☺ ▪ Receptive, ▪ Have e-business plans but no	▪ Poor traceability ▪ Poor internal	▪ No opportunity to source elsewhere if there is a back-order ▪ Manual => waste of

	action yet Nurses ☺☹ ▪ Mixed reactions, as they are open-minded but still unexposed to the topic ▪ Doubt if they will exploit the Internet for personal reasons	system ▪ Culture	human resources ▪ Reluctant to computerisation => more time-consuming
Sana	Purchasers ☺☹ ▪ Keen, especially with marketplaces/ portals but because there is no clear solution in the market, they'll wait-and-see	▪ Lack of transparency ▪ Complicated and inefficient decision-making process	▪ No source of fast, accurate, complete and easily accessible information ▪ Difficult to compare prices ▪ Too complex ▪ Time-consuming

Source: Own

☺ Receptive

☹ Sceptical or reluctant

☺☹ Mixed reactions

6.2 United Kingdom (UK)

As with Germany, we attempt to describe and explain some system views about the British health care in general before presenting the problems found in the hospitals there.

6.2.1 The UK health care system

Introduction

The Government's plans for the Health Service are outlined in its White Paper - The new NHS, published in 1997. The Government aims to build a modern and dependable health service that is fit for the 21st century; a National Health Service which offers people high quality treatment and care when and where they need it.

The National Health Service (NHS) is Europe's biggest organisation. It has a workforce of around one million people who provide care and treatment for many millions more every year. The NHS spends in excess of £42 billion, the largest item of central government expenditure after social security.

In a nutshell, the purpose of the NHS is to secure the greatest possible improvement in the physical and mental health of the nation through the resources available. This is done by promoting health, preventing ill health, diagnosing and treating injury and disease and caring for those with long-term illness and disability who require the services of the NHS.

The Prime Minister has put the improvement of the NHS at the heart of the New Labour project. However, according to Barry Jackson, the President of the Royal College of Surgeons and a member of the Government's Modernisation Board, change within the NHS is so slow that it would be 2010 before the public could be happy with the service they were getting.[51] He fears the lower training standards; the arrival of foreign doctors to practise cardiac surgeries, and a lack of nurses would put patient care at risk.

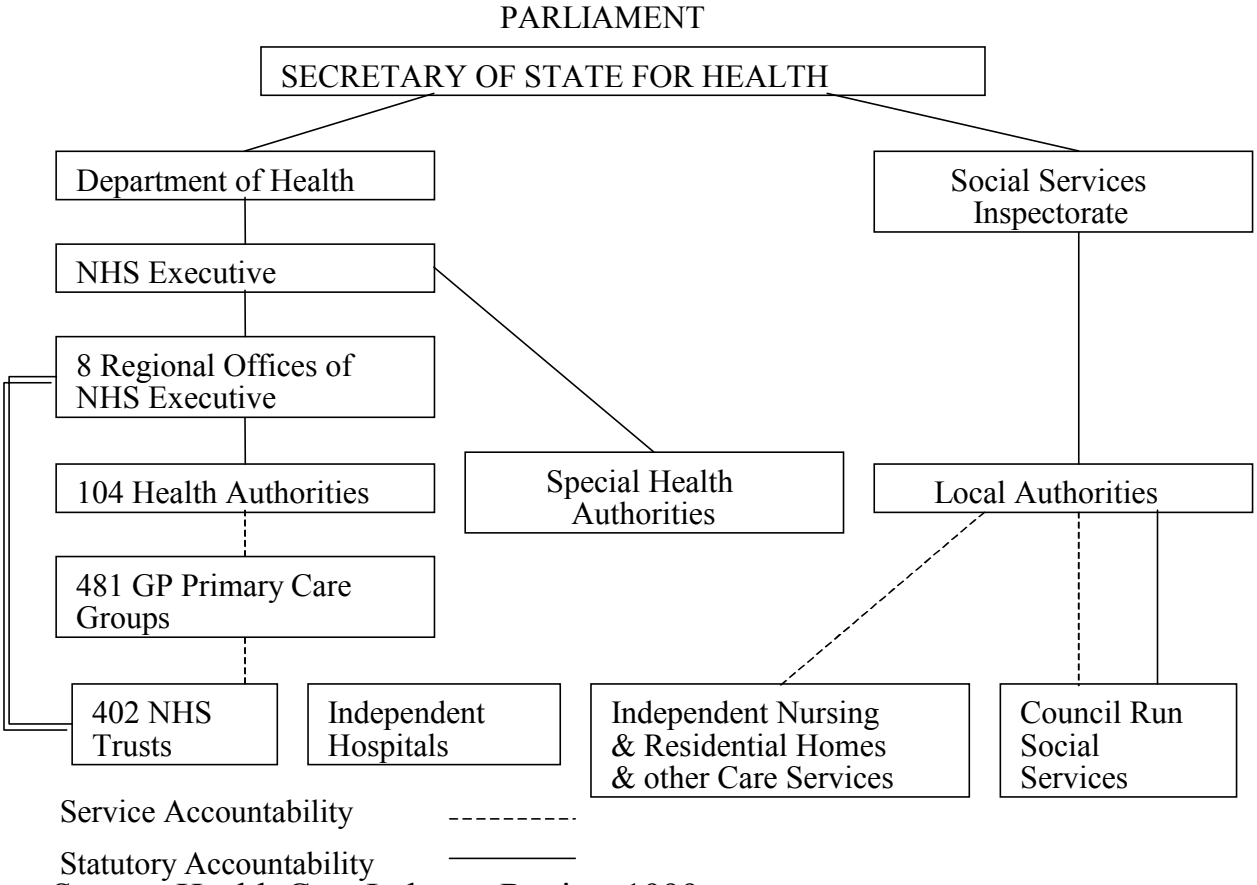
[51] The Observer, "Better NHS is 10 years off – top surgeon", 15 October 2000

On a more political note, if the quality of the NHS services fail to improve, Downing Street strategists admit that it will have a bad effect on the mood of voters[52].

The Structure of Health and Social Services[53]

The NHS is managed by a Secretary of Health, supported by Ministers of State and Junior Ministers in the House of Commons and Lords. They are responsible to the Parliament, and its Members, who are able to raise relevant issues through letters, parliamentary questions and debates. At the functional level, the Department of Health (DoH) issues major policy statements, set out in White Papers, while detailed advice is circulated to managers through Executive Letters. The DoH is also responsible for establishing the right management and resource framework. It negotiates level of funding for the NHS and allocates resources to NHS authorities.

Figure 17: The structure of health and social services



Source: Health Care Industry Review 1999

[52] The Observer, "Better NHS is 10 years off – top surgeon", 15 October 2000
[53] Health Care Industry Review 1999, p.10-16

The Department of Health (DoH)

The DoH came into existence in July 1988, when its predecessor, the Department of Health and Social Security (DHSS) was divided into two departments. Its three main areas of responsibility are:

- Public health, including health promotion and communicable diseases
- Social care, local authority and voluntary social services
- Health care

NHS Executive

The NHS Executive advises ministers on policy-making and is responsible for the effective management of the NHS. It sets the strategic framework for the NHS, ensures that the policies are closely adhered to and improves the knowledge base of the services. It is headquartered at Quarry House in Leeds and has eight reorganised regional offices.

Regional Offices

The regional offices are empowered to make health and local authorities work together through the Health Improvement Programme, but have no strategic financial or planning role. The latest reorganisation, effective from April 1999, creates one region to cover the whole of London and a new South East region.

Health Authorities

District Health Authorities (DHAs) and Family Health Services Authorities (FHSAs) were abolished in April 1996 and replaced with 100 health authorities. They collaborate with GPs, hospitals and community services, local authorities, local people and other agencies to develop strategies to meet national and local priorities. They also monitor the quality of care in hospitals and community services. At present, each authority serves about 500.000 people on average.

General Practitioners (GPs)

Most people have their first contact with the National Health Service through their general practitioner (GP), sometimes called a family doctor. GPs usually work together in small groups, forming local "practices" which serve a particular neighbourhood or area.

Every UK citizen has a right to be registered with a GP. Consultations are free, although there are flat charges for prescriptions for a minority of patients.

GPs are just one part of the front line of the National Health Service that deals with most people's everyday health needs - the part of the NHS often called "primary care". Many other health professionals work as part of this front line team called the Primary Care Group (PCG). Nurses, health visitors, dentists, optometrists, pharmacists and a range of specialist therapists can all be an important first point of call for patients; in some cases working alongside family doctors in local GP practices, in other cases from local practices of their own.

PCGs also have a wider role in meeting the health needs of local people. Working closely with the patients and the health authorities, they help to plan the full range of health services needed by local people and help decide how best such services should be provided for integrated care. This role will evolve over the next few years, with doctors and nurses in primary care taking on more responsibility for helping to shape the overall pattern of local health services. The White Paper proposes that each PCG should serve about 100.000 people, while a health authority might contain four or five PCGs.

NHS Trusts

Trusts can be a single hospital, a group of hospitals, community health services provided in health centres and clinics, or an ambulance service. They are managed by a board that is comprised of a chairperson, five non-executives (largely local residents with a commercial background), and five non-executives (usually include the chief executive, medical director, finance director and director of nursing). Working within a broad set of ground rules, their status as ‘Trusts’ means they have maximum freedom to decide exactly how they make these services happen.

In accordance with the Labour Government's policy of encouraging integrated care, co-operation in the health care industry looks more promising than ever, as witnessed by the numerous mergers of hospital trusts in order to create cost savings.

It is estimated that the total savings from the most recent 17 sets of mergers could amount to about £12 million annually; almost all of which come from the wages of executive directors and their support staff.

The Private Sector

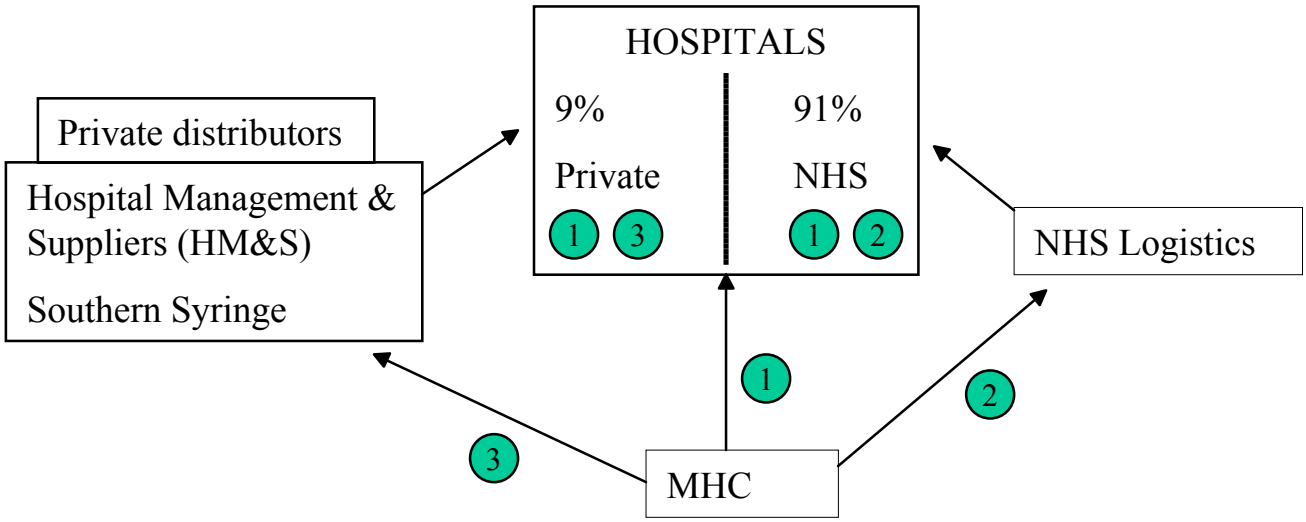
The NHS generated £288 million for Trusts in 1997-98 (an increase of 15,7 percent over previous year) and private patient income accounted for more than ten percent of the total core income for all Trusts in that year. Despite the fact that there is a steady growth in the NHS private beds, the medical insurance growth seems to be rather static and, thus, private patient service is still regarded as a peripheral activity. As such, companies still need to target larger private sector hospitals in the UK. On top of that, there is also a network of private family doctors that was set up by health insurance companies.

6.2.2 Procurement process in England

In England, there are three channels of selling health care products[54]. A health care company can sell directly to the hospitals, through the NHS Logistics or through private distributors like the Hospital Management & Suppliers (HM&S), Southern Syringe and others. In the case of MHC, the sales made to NHS Logistics in 1999 equated £500 million. NHS Logistics would buy in bulk from MHC to achieve economies of scale, break the bulk into smaller packages and make daily deliveries to the hospitals in need of those products. The majority of the products that is delivered via the NHS warehouses are Wound Management products. For Acute Care products, MHC would deliver directly to the hospitals. MHC also sells to the private distributors that deliver mostly to private hospitals, which account for merely nine percent of all sales made to the English hospitals.

[54] Discussion with Phil Cooper, Managing Director UK and Ireland, 25 September 2000

Figure 18: Distribution of MHC Acute Care products in London



Source: Phil Cooper, 25 September 2000.

As NHS accounts for the majority of the Acute Care products sold to hospitals, it is highly relevant to discuss the role of the purchasing department of NHS. The NHS Supplies Authority was set up in 1991 to handle the central procurement for the Trusts. However, NHS Supplies[55] was seen as rather fragmented because there was no consistency in the terms and conditions of procurement, little sharing of product analysis between Trusts, and limited sharing of best practice. It had only partly managed to fill the role of a "centre" in providing knowledge and advice, providing a hub for innovation and providing communication links. In certain aspects, NHS Supplies did not completely fill its role as a "centre", as it cannot commit on behalf of all Trusts and cannot direct the best interests of NHS as a whole.

Therefore, the NHS Purchasing and Supply Agency was established to overcome the weaknesses of its predecessor. Its main responsibilities are to:

[55] http://www.bipcontracts.com/focus/sellingtonhs/chris/sld001.htm, 23 September 2000

- Co-ordinate and guide NHS procurement policy (including legal advice)
- Ensure procurement issues are taken into account in developing national health policies
- Contract for strategic products or where significant financial savings

Decision-making in procurement

Health care is a very traditional industry that witnesses a cross-functional and thus complicated decision-making process in procurement. Very often, the decision-making group may consist of a combination of medical staff, technicians, nurses and managers (often from finance and purchasing), although their job titles may well differ. One example of a group could be[56]:

- Procurement Manager
- Theatre Manager
- Senior Nurse
- Business Manager
- Operation Manager

In hospitals, there is often an official purchaser who finally endorses every purchase made. However, one interesting observation is the accountability of other "informal" decision-makers, such as the personnel mentioned above. The role of these "informal" decision-makers cannot be overlooked as, in certain cases, their opinions are the dominant ones influencing the choice of purchase.

At the corporate level, procurement is often neglected. The Audit Commission has suggested that only about six percent of NHS Trust Boards currently discuss supply matters[57]. Meanwhile, among a sample of 300 trusts, only 19 percent have a supply strategy and set annual targets, and merely 28 percent of Trust Boards have an annual report on purchasing and supply matters.[58]

In addition, the systems and processes used in many parts of the NHS have been in place for a very long time.[59] Very often, they are manual and generate huge amounts of paper.

[56] Discussion with Phil Cooper, Managing Director UK and Ireland, 25 September 2000
[57] Health Care Industry Review 1999, p.108
[58] NHS Procurement Review 1998, p.18
[59] Health Care Industry Review 1999, p.131

The processes are also very time-consuming, and thus frustrating, for both the user and the persons responsible to examine those procedures.

A fragmented buying process, coupled with the frustration of users, will lead to buying outside the centrally-managed system from companies who are not on the approved supplier list, otherwise called "maverick buying".

Fortunately, the NHS Supplies Agency stepped forward to overcome the inefficiencies mentioned above by providing electronic access to 20.000 price-guaranteed products in their stock catalogue and 3.000 contracts listed in its purchasing contracts catalogue, all of which comply to the EU public procurement regulations.[60]

E-business

British companies are now beginning to explore the use of the Internet to carry out their business, according to a research report published today by Parity Solutions, part of Parity Group Plc., the international IT consultancy group. The report[61] concludes that approximately 20% of UK businesses already have initiatives in place for trading using the Internet, while a further 39% are planning their e-business strategy. Around 40% of businesses have yet to start the planning process. However, moving from the planning stage into implementation appears to be slow.

The report also concludes that businesses need a better understanding of the benefits to be gained from e-business, as well as advice and guidance on making the transition. In the survey, 52% of senior business managers whose companies are not trading over the Internet either felt that it did not suit their business or they were unclear about the benefits in doing so. Furthermore, when asked about the perceived benefits of conducting business over the Internet, 47% cited speed of communications and 14% said reducing costs. Only 10% cited new business opportunities.

[60] Health Care Industry Review 1999, p.131
[61] www.dpa-corpcomms.co.uk/parity290999.html, 23 September 2000

In the UK health service, NHS has already taken some initiatives to use electronic cataloguing and ordering. The NHS Supplies Authority is the leader in this field.

With IBM Global Services, they have developed SupplyStream, an electronic requisitioning and ordering system that is available via the NHSnet. Many of the trusts today are already connected to the NHSnet and, thus, no additional IT investment is required for maintaining the infrastructure. In fact, there are few systems that are more advanced and provide further integration through the purchase order and invoice budget systems.

Most of these will allow:

- Paperless electronic requisitioning and ordering
- Integration with a trust's existing finance systems
- Improved management information and control

Even better, SupplyStream allows the trusts to add products and services from their own chosen suppliers, thus creating a complete and customised catalogue for each trust.

6.2.3 Round Table Discussions in the UK

In the UK, we also conducted five discussion rounds in different hospitals, among which were St. Peter's Hospital, Frimley Park Hospital, a Private Clinic, St. Anthony's Hospital and St. George's Hospital. These hospitals are all located in London or on the outskirts of London.

General perception of e-business

Similar to Germany, the overall perception of e-business is rather optimistic. Four out of five of the purchasers we spoke to are receptive towards e-business. The fifth purchaser did not turn down the idea completely, but would rather take a wait-and-see approach, as she believes that the uncertainties and risks are too high. Meanwhile, the responses form the nurses are somewhat mixed. Nurses from two of the hospitals were totally amenable to the idea of incorporating computer usage and e-business exposure to their nursing duties,

while two others are totally pessimistic. One interesting observation though is in the fifth hospital, where the purchaser said that he expects the nurses to decline working with computers and additional administrative tasks related to e-business.

The nurse however, seems to think the opposite and expressed an open-minded view of the issue! We also gathered from one institution that it can be very difficult to convince the Board of Directors of the benefits of e-business, mainly because of their traditional mindsets.[62]

Common key problems

Poor internal infrastructure

One of the main problems British hospitals have to face is the lack of information flow between the departments. This is due to the isolated internal system in the hospital and the manual order placements. There are frequent occurrences when different departments in the hospital would buy separately from a similar supplier, or they would buy the same products but from different suppliers. Two significant consequences are: firstly, lead-time is lengthened due to the time lapse before the purchasers are informed of the need to place an order and, secondly, system costs are increased due to the high transaction costs and lack of scale economies.

This poor infrastructure is also a problem because most of their efforts are duplicated and very time-consuming, such as the order placements. Even with the use of EDI the order is made online with the suppliers, but the same information still need to be updated manually in the internal computer system. As far as the nurses are concerned, time is already a very scarce resource and coupled with the lack of infrastructure, they have very little motivation to use the computers to seek out new products, suppliers or other medical updates.

[62] For more detailed information per hospital, refer to Table 4, page 85-87.

Manual inventory control

At present, most inventories are monitored manually, i.e. a hospital personnel would make his rounds everyday to count the stock and inform the Purchasing Department which products need to be replenished. Despite the fact that products from certain suppliers are already bar-coded (such as MHC), most hospitals are not using the bar-codes to manage their inventories.

This is a problem because if is a waste of human resource to count, record and re-order the stocks manually when there is an automatic and more efficient solution. Ideally, inventory should be managed electronically and storage would be nil or at a minimum.

On the other hand, some purchasers are not too keen to have their internal systems linked with the suppliers' systems, so that the suppliers could help them set up an automatic replenishment system. The hospitals do not wish to be dependent upon the suppliers. The issue of patient confidentiality was also brought up, as the hospital feels uncomfortable that the suppliers might have access to the patient records when their computer systems are linked.

Presently, the purchase of products in large volumes (like the single-use Acute Care products) is handled by either standing orders[63] or call-off orders[64]. These sort of orders require ample re-negotiations and, when the limits are reached, generate even more additional costs and workload.

Three other hospitals mentioned the manual inventory control as a secondary problem.

Poor traceability

Discussing the possible areas of improvement with suppliers, it is mostly mentioned that traceability is an important issue when it comes to purchasing Acute Care products.

[63] A standing order is a contract made with a supplier for certain amount of money, where certain products are delivered on a regular basis within the year. A new standing order needs to be signed when the limit of the contract is reached.

[64] A call-off order is similar to the standing order but allows more flexibility, as the products and deliveries are not pre-determined and may change according to the hospitals' demands.

It should be clear who places or authorises a particular order and where the products are in the supply chain, especially when there is a delay in delivery. Traceability is important for the hospital management to control product costs and also gives them the opportunity to source for the product elsewhere if there is a back-order.

In fact, the concern lies, not only in tracking the products that have been ordered, but also in tracking used products that need to be traced back when a hazard occurs (e.g. infections). The latter is of importance to the hospital to prevent further infections to more patients. Moreover, for a company like MHC, which has been certified with ISO 9002, it is expected to produce the trails of sold products whenever requested by the health authorities. At the moment, gargantuan efforts and long hours will be spent should any hazard occur in the hospital, as there are huge piles of paperwork that need to be scrutinised before a trail is recovered.

More often than not, the hospitals are unaware of the total products used on a particular patient, inducing considerable waste. In the hospitals, being a part of the NHS has further aggravated the problem as most hospital staff and the patients themselves are not the least bit concerned about the costs involved because all medical expenses are borne by the Government.

Culture

As in Germany, one major barrier that the hospitals have is the human element. As the hospitals are well established and traditional, there exists great resistance to change in general. First and foremost, in some private hospitals it is extremely difficult to convince the Chief Executive Officer and the Board of Directors that e-business is the way to excel in the near future, as many of them cannot understand why such a change is needed. Some nurses also think the same way. It is usually the purchasers who are keen on e-business, although there are slight differences in each hospital (see Appendix 4).

However, at present there is no determination or pressure from the top management to embrace e-business. For this reason, we are not surprised to find nurses and clinicians at hospitals being very reluctant to support any e-business initiative. The acute shortage of nurses and clinicians in the country has worsened the situation. As these professionals are such scarce resources, they simply do not have the time to pause and think about (and definitely not following through!) management issues like inventory control and costing. Their primary concern is only to provide optimum medical care to their patients.

A good example of this scenario is the implementation of the peel-and-stick process in the private clinic. Instead of using a scanner to read the bar-codes on the products, this clinic attempted to make the bar-codes as stickers that can be easily removed and stuck onto the respective patient records. This may sound like a feasible solution to better inventory control and costing, but unfortunately, they had suffered quite heavy losses because the nurses and clinicians had forgotten or misplaced the stickers, and thus the patients could not be billed correctly.

On top of that, the nurses are also reluctant to use the computers to search for a particular product due to the lack of computer knowledge. They remain unclear on whether the search was adequate and, therefore, often opt for a more convenient solution – to call up the Procurement Department directly.

One other hospital mentioned culture as a secondary problem.

Inefficient invoicing

Although frequent deliveries help the hospital reduce its inventory to quite a low level, the problem instead arises with the high number of invoices produced. This large amount of invoices follows a load of administrative tasks that need to be made to follow up invoices received. Also the suppliers have to bear with the consequences, as they do not receive the payments until a few weeks or months later.

One other hospital mentioned inefficient invoicing problem as a secondary problem.

Scepticism in quality of information

As the health care industry develops rapidly in the Information Technology arena, one concern is also the accuracy of the information available on the Internet. Information Technology is aimed at increasing speed and efficiency through the opportunity to obtain information with a click of the mouse. However, this statement is only true if the information obtained is proven to be accurate and up-to-date.

For instance, it would be pointless for a hospital to receive an order confirmation from a particular supplier via an automatic e-mail reply, and still have to spend additional time to verify the information manually anyway, due to the lack of confidence in the quality of the information received.

Hospital-specific key problems

Poor budget forecasting

In Frimley Park hospital, Mr. Glover, the Clinical Practitioner, also made an extraordinary comment on the problems with the current budgeting within the hospital. He is disturbed by the fact that even critical products for the Operating Theatres, such as anaesthetics and X-rays, are not necessarily given the priorities in the budget due to lack of funds. This deficit is mainly a result of poor forecasting of the expected asset lives of the products. When a new budget is prepared, it is often a replica of the previous year's budget, with a few expenditures being replaced by some more urgent materials. But because of the poor forecasting, there are many instances when many products are out of stock, but the hospital has little financial means to replenish all the inventories. As such, Mr. Glover would like to implement an internal system within the hospital, where the persons involved with budgeting would be able to track the expected asset lives of the materials used in the hospital. That information should be used as a basis for more accurate forecasting and, thus, would overcome those deficits.

Misleading terms and conditions of contracts

The private clinic considered the misleading terms and conditions in contracts as another key problem. As most suppliers would only provide the clinic with the terms and conditions of purchase *after* the deal has been made, there is a high tendency for the level of service provided to be much lower than desired. In this case, buying out-of-contract[65] is the main source of the problem, as the nurses or clinicians rarely possess the purchasing skills and experience to detect such a scam before the deal is signed.

Heavy workload of Purchasing Department

The Purchasing Department of St. George's hospital handles the contract formation, order processing and also invoicing. Many efforts are duplicated and, thus, are a waste of human resources.

High transaction costs

In St. George's, the Head of Procurement is also particularly concerned with the high transaction costs that are incurred when purchases are made. The transaction costs easily add up to a substantial amount of £3-3,5 million per annum. Particularly, as St. George's is one of the NHS trusts, there have been talks about giving the trusts an exemption from paying transaction costs over health care portals. Although none of the talks are substantiated and the hospitals do realise that the product price would be increased slightly to cover the transaction charges, the general outlook is optimistic about such cost rationalisation.

Other problems

Inefficient information flow from suppliers

Most hospitals are also concerned with the slow information flow, or lack thereof, from the supplier (MHC in this case) when there are changes made to the product features such as the quantity, packaging and other specifications. There exists a communication breakdown between the internal staff of MHC itself, mainly between the production sites and the sales offices.

[65] Buying out-of-contract means buying from a supplier(s) when there is no agreement made prior to this purchase, usually by staff other than those from the Purchasing Department.

When the changes are made at the production sites, the salespersons are not informed and, thus, are incapable of informing their customers in time of the changes. In fact, there are instances when the notices never arrived!

Most hospitals seemed to be only partly satisfied with the information flow between the hospital and the suppliers. The hospitals would appreciate it if the suppliers could provide more value-added information, such as:

- new products or medical updates
- an instant electronic order confirmation,
- a tracking device to trace an order in the supply chain in case of a back-order
- a tracking device to trace a particular batch of product when there is a hazard

Validity of e-contracts

In the legal sense, the purchasers are also worried about the validity of any agreement made over the Internet. The key question is whether an agreement made via e-mail for instance constitutes a legal contract.

Paper work overload

Another problem is the huge amount of paper work generated. There are too many forms to fill in and too many invoices to keep. For instance, St Anthony's as a charity organisation is also entitled to receive Value Added Tax (VAT) refunds on medical goods. Therefore, it has to issue tax exemption certificates to its suppliers on a yearly basis, generating more paper work again.

Summary

Table 4: Summary of key problems in the UK

Institution	Perception of e-business	Key problems in purchasing	Why is it a problem?
St. Peter's	Purchasers ☺ ▪ Receptive, as long as value added exceeds costs Nurses ☺ ▪ Very willing, as long as there is adequate computers ▪ Lack of time can be a deterrence	▪ Poor internal infrastructure ▪ Poor traceability ▪ Inefficient invoicing	▪ Inefficient flow of information => long lead time and high system costs[66] ▪ Work duplicates ▪ Waste of human resources ▪ Substantial wastage ▪ No cost control ▪ No opportunity to source elsewhere if there is a back-order ▪ Time and efforts spent on tracing back sources of hazards ▪ Paper work overload
Frimley Park	Purchasers ☺ ▪ Very keen, as traditional culture makes it extremely tough to improve the internal efficiency Nurses ☹	▪ Manual inventory control ▪ Poor traceability	▪ Work duplicates ▪ Waste of human resources ▪ Substantial wastage ▪ No cost control ▪ No opportunity to source elsewhere if

[66] System costs increase because of high transaction costs and lack of scale economies.

	▪ Reluctant, as they are not computer-literate & it increases their workloads	▪ Poor budget forecasting	there is a back-order ▪ Time and efforts spent on tracing back sources of hazards ▪ No funds to buy even urgent medical products
Private Clinic	Purchasers ☺ ▪ Very keen, as it increases efficiency & lightens their workloads Nurses ☹ ▪ Reluctant, as it is too time-consuming Directors ☹ ▪ Sceptical, as there are no proven e-benefits and the traditional way has worked all the this while	▪ Hospital culture ▪ Misleading terms and conditions of contracts	▪ Difficult to implement changes ▪ No commitment from top management => no commitment from staff ▪ Service provided less than desired
St. Anthony's	Purchasers ☺☹ ▪ Wait-and-see, though aware of e-benefits Nurses ☺ ▪ Receptive, if there are adequate	▪ Poor internal infrastructure	▪ Incapable of e-mailing or surfing the web ▪ Work duplicates ▪ Waste of human resources

	computers ▪ Lack of time can be a deterrence		
St. George's	Purchasers ☺ ▪ Very keen, already in the NHS pilot project for e-business ▪ Thinks nurses would be unreceptive Nurses ☺☹ ▪ Receptive, as they are open-minded ▪ Lack of time can be a deterrence	▪ Heavy workload of Purchasing Department ▪ High transaction costs ▪ Scepticism in quality of information	▪ Work duplicates ▪ Long lead times ▪ Waste of human resources ▪ Less funds to buy medical products ▪ Double-check => waste of human resources

Source: Own

☺ Receptive
☹ Sceptical or reluctant
☺☹ Mixed reactions

After having investigated the German and British Acute care market in particular, the next step is be to analyse our findings.

7 EMPIRICAL ANALYSIS

In order to be able to answer the research questions, this chapter first summarises the different roles of the hospital staff and then we categorise all the key problems to determine which of the nine goals of supply management were not fulfilled. We continue by formulating the e-strategy and identifying the required resources and capabilities. Finally, we will conclude with describing how a scorecard of progress can be maintained.

7.1 Mapping of the roles of the hospital staff

Although different institutions have different set-ups of their purchasing departments and functions, we can identify and map the common roles or influences that are possessed by the key employees that are involved in the purchasing process. In most institutions, they include the nurses and buyers. However, the warehouse managers, financiers, and sometimes even the Medical Directors and General Managers, are also involved. In theory, the users also have to identify the buying alternatives. This is not always the case in hospitals, as the doctors and nurses are usually too busy to do this.

Table 5: Decision stages and roles in buying (adapted to hospitals)

	Users Doctors Nurses	**Influencers** Nurses Buyers Warehouse Managers	**Buyers** Managers Assistants	**Deciders** Buyers Head[67] of committee	**Gate-keepers** Buyers Warehouse Managers
Identification of need	➳	➳			
Establishing specifications and scheduling the purchase	➳	➳	➳	➳	

[67] This is only applicable in cases when there is a working committee, who is in charge of purchasing, mainly headed by the Medical Director

Identifying buying alternatives		➳	➳		➳
Evaluating buying alternatives	➳	➳	➳		
Selecting the suppliers	➳	➳	➳	➳	

Source: Own

7.2 Which goals were not fulfilled?

Among all the problems that have been mentioned at the British and German hospitals, we can summarise and categorise them versus the nine goals of supply management.

The hospitals are pleased with the current quality of Acute Care products by MHC and its continuous research and development (R&D) initiatives. As one of the hospitals puts it, its repeat purchase is a sign of satisfaction by itself. As such, we conclude that the hospitals face no severe problems in *improving the product or service quality* (Purchasing Goal #3, see Section 4.2.2) and, thus, is not mentioned below.

7.2.1 Obtaining an uninterrupted flow of materials

During the round table discussions, we have understood that all the hospitals studied, at different times and frequencies, have experienced an interrupted flow of materials because product deliveries were inaccurate or delayed. In fact, within the health care industry, only 84% of the deliveries are accurate and on time, in comparison to a high 99% in the automobile industry[68]. This indicates the poor industry performance or forecasting performance of hospitals and the vital need for improvement in health care.

[68] Alistair Douglas, Head of Procurement, St. George's Hospital, the UK, 18 October 2000.

Among MHC's key customers, many of them have had some experiences with the change of product specifications such as product size, packaging, or quantity without notice. The product quantity in a package is the most common change that has occurred. The consequence of such inaccurate deliveries could be eased, if only there was a prior notification.

When the deliveries are delayed, the hospitals are also in a dilemma, as there is a lack of timely notification from MHC to the customers about such back-orders. Therefore, they could not turn to other suppliers to obtain the urgent products in time for use in the Operating Theatres. On the same note, although there is only one hospital in London that cited a need for efficient and accurate information flow from suppliers as a key problem, two others in Germany and three in London cited that as a secondary challenge. From here, we can generalise that, although proactive and high quality information (such as the accurate date and time of deliveries) may not necessarily be the deciding factor in selecting suppliers, but they can definitely add value to the offerings.

7.2.2 Inventory management

In any hospital, there are two major limitations that intensified the importance of inventory management. Firstly, there is too little storage space in the hospital grounds and it is too cost-intensive to keep a large inventory to prevent stock-outs. Secondly, there is an acute shortage of health care professionals in Europe, who have no time to deal with inventory management. Therefore, from our research we concluded that inventory control is an essential challenge that needs to be addressed. Although there is only one hospital in UK that cited this as its key problem, there are three other British hospitals that agree that the inventory should be kept at a minimum and managed electronically with no, or little, human intervention. Meanwhile in Germany, two of the hospitals cited that their inventory controls are done manually as well, but do not consider that as a problem because they are currently taking measures to overcome this inefficiency.

7.2.3 Achieving lowest product cost

Hospitals need to find the most efficient supplier in the market and order in bulk to obtain the best price from that supplier. Lack of standardisation (see Section 7.2.4) and transparency (see Section 7.2.6) are the present barriers towards the lowest product cost possible.

7.2.4 Standardising the items bought

Two out of the five institutions in Germany complained about a lack of product standardisation, meaning different departments are buying from different brand suppliers for the same product group. In London, one hospital cited a similar problem and added that the poor internal infrastructure is the cause of the problem. As a result, lead time is lengthened and system cost is increased, as more human resources are needed to process the different purchases and there are no optimum economies of scale.

7.2.5 Reducing administrative costs

For most large institutions, e-business is seen as a solution to reduce its transaction costs, which are caused by every single order. In the UK, transaction costs alone can easily add up to £3-3,5 million per annum for one NHS trust. Ernst & Young believes that e-business could save more than USD3 billion per year altogether in the German health care industry. However, a critical prerequisite for conducting business electronically is a compatible and reliable IT-system. Unfortunately, two out of five hospitals in the UK cited the lack of infrastructure as the key problem in implementing e-business. However, in Germany the infrastructure does not seem to be a serious problem, as hospitals already have, or are willing to invest in, the IT-systems needed.

7.2.6 Finding or developing competent suppliers

<u>Lack of transparency</u>

Among the challenges that hospitals face in finding competent suppliers is the lack of transparency. At present, enormous efforts and time needs to be spent by purchasers to manually locate good suppliers.

The Internet is supposed to make the supplier search easier, but to date it still lacks the transparency that hospitals seek. One German and one British hospital claimed that the lack of transparency is a key problem, while another German hospital claimed it as a secondary problem. Those hospitals claim that the quality of the information posted by health care providers on the Internet is insufficient for them to make sound comparisons and decisions. They are also uncertain which Internet site, among the hundreds there are, provides complete and reliable information about Acute Care products in the market, which could facilitate buying decisions. Price transparency is of particular interest to the hospitals to increase their bargaining power and obtain better offers.

One German hospitals considers materials management as important, but claims that information management should not be overlooked either. Therefore, it would like suppliers to post value-added information on the Internet for purchasers to browse through and subsequently, gain higher bargaining power. For instance, one possible solution is to *auction* a tender instead of using the traditional way. This means that after a few suppliers have been short listed, an auction will be held over the Internet for those suppliers and the tender will be offered to the lowest bidder.

Lack of traceability

Another prominent problem that surfaces is the poor traceability of product orders and used products. This is a competence that hospitals believe the suppliers could develop. Two out of five hospitals in both the UK and Germany said that poor traceability might bring about some of these three problems. Firstly, cost control is very poor and waste is high because there is no control of the products used on patients. For instance, nurses would use a new mask every time the patient is transferred from one department to the other, when the fact is that the same mask could be kept on the patient throughout, to optimise the use of materials. Secondly, hospitals are not capable of sourcing elsewhere if there is a back-order because they do not know where the product is within the supply chain, thus resulting in a product shortage that might freeze some major operations.

Thirdly, traceability is also poor in the areas of used products when a hazard occurs, where there is a need to trace back a particular batch of infected product to prevent further usage in operating theatres.

Inefficient invoicing

Another challenge that suppliers could face lies in the invoicing process. In London, one hospital mentioned invoicing as an important area of improvement within the supply chain, while two other British hospitals and a German hospital regard it as a secondary problem. A large number of invoices are generated due to the frequent deliveries that are made to the hospitals each week to help the hospitals minimise its inventory. Besides the papers, human resources are also needed to file, process and pay each and every one of those invoices. However, one critical aspect to consider before implementing e-invoicing is the legal aspect. It remains uncertain if an electronic invoice is valid and recognised. Without paper copies, there might be disputes over proofs of payment. On top of that, the German law also insist on a six-year archive of all invoices, which would rule paperless invoicing redundant.

7.2.7 Developing cross-functional relationships

Participation and co-operation from both the administrators and clinicians are vital to ensure the success of e-procurement in hospitals. It is understandable that the administrators are often very receptive because e-business lightens their workloads and improves their efficiency. However, it is difficult to convince the clinicians because of the traditional and deep cultural roots in hospitals.

First of all, the clinicians are particularly reluctant to changes in general. For instance, if they are satisfied with the current product range that they have been using in the operating theatres for years, they will not consider using new products that require a change in habits and ways of doing things. Secondly, clinicians are also generally less exposed to the use of computers in their work and, thus, are very sceptical about its usage.

One argument is that the nurses do not know how to use the computers and, thus, it will take *more*, instead of less time to perform a task electronically. Another argument is that they have no time (and also are too vain sometimes) to learn how to use the computers.

The acute shortage of clinical professionals has worsened this problem. In fact, some nurses even argue that they *dare not* touch the computers as they seem too hi-tech and actually *love* to deal with the high piles of paper work. Last but not least, there also exist some very deep-rooted hierarchy in certain hospitals, where doctors and nurses still perceive themselves to play more important roles in saving lives and, thus, are more superior than the administrators. As a result, administrative tasks like costing and inventory management are often tossed between the clinicians and administrators. The clinicians argue that such tasks are not "part of their job", while the administrators are committed that such tasks are necessary to optimise the welfare of the patients and, thus, is very much part of their professional duties. Compromises are sometimes difficult to reach.

7.2.8 Improving competitive position

All in all, more efficient procurement is aimed at increasing the hospitals' competitive position. In this case, it is to be done with an e-business implementation.

7.3 How to formulate e-strategy?

Based on the Arthur D. Little e-business strategy option model, we have chosen a combination of the Swan and Phoenix strategy options for this thesis. The Swan is more applicable to MHC because we do not foresee the company changing very much within the short- to medium- term, transforming into a whole new business. This is also consistent with the statement by MHC's E-business Manager that there are no real revenues that are "lost" to the e-health businesses until now. So we believe that MHC should take the wait-and-see approach for the time being. This does not mean that MHC does absolutely nothing about its e-business activities though. On the contrary, it should start to prepare itself and its customers towards using Internet or other electronic media for business transactions.

But through Vamedis, we believe that it should take the Phoenix option, as the portal is a whole new venture and the business model has to be revolutionised.

As there is little difference in the steps between the Swan and Phoenix, we use the following steps, which we had modified accordingly:
Step 1: Develop the long-term vision of the company
Step 2: Identify a business model
Step 3: Identify solutions
Step 4: Identify resource and capability requirements
Step 5: Make recommendations
Step 6: Maintain a scorecard of progress

7.3.1 Developing the long-term vision

On the whole, MHC aims to set clear targets for its e-business efforts and ensure that its activities are profitable. MHC's mission for its e-business involvement is defined as[69]:

> MHC wants to use the new electronic media whenever feasible for the company to add value to its stakeholders, including customers, suppliers, etc.

7.3.2 Identifying a business model

Under this section, we try to identify MHC's business environment with an e-business implementation, with concepts of Relationship Marketing as a foundation. The key areas that must be observed are the customers, the products and services, as well as logistics. For each area, we describe the possible alternatives. Among those alternatives, recommendations would be presented in Section 9.1-9.3, page 127-130.

[69] MHC Corporate Strategy Document 2001-2003

The customers

MHC should continue to build long-term relationships with its key customers. At present, MHC is already embracing RM, but it should not hesitate to incorporate that concept into its e-business strategy too. The Internet is simply a *new means* of delivering the continued value-added services to them.

True enough, one of the benefits of e-business is the ability to reach the mass of customers across national boundaries. Therefore, with e-business, MHC's customers can be any health care institution, e.g. hospitals, clinics, etc. that would buy Acute Care products in a sterile operating environment[70]. This includes all of MHC's customers, which are categorised into the A, B, C and D groups. A and B are the most profitable (and usually largest) customers[71], while C-group has the potential to turn into A or B customers and lastly, the D-group generates less than 5% of its total contribution. However, e-business will also provide the richness, which allows customised customer care. But, it is not profitable for MHC to offer customised products/services to all its customers. Therefore, it has to select the key customers, either in terms of profitability, volume or other strategic values. MHC should also consider targeting its current or new customers.

The products and services

To decide what MHC's products and services will look like, it is crucial to first determine how much innovation it intends to do. There are four options available:

- To reach online users and provide customised in-depth product information
- To sell existing products and process orders online
- To provide new offerings that are unique to the Web
- To revolutionise business models and shift value creation, e.g. through portals

[70] They must be legally operating institutions with sound financial records.
[71] A and B customers generate 80% of the total contribution in the company.

In all cases, the current product range would probably not differ; MHC's Acute Care products would still consist of drapes, gowns, caps, masks, gloves, equipment drapes and procedure trays. However, procedure trays would have even more "selling points" coupled with e-business. Besides the fact that trays help reduce waste, it is also easier to implement bar-coding and automatic inventory control with trays, as the nurse only needs to scan *one* bar-code on the tray instead of say *ten* bar-codes on every drape and gown for one surgical intervention. The quality of services should be improved, although how much improvement would depend on the level of innovation.

So, if MHC chooses the first alternative, the additional value it can provide to its customers through the Internet or other electronic media is the high quality product information. Such information is a resource that can help customers improve its internal efficiency, such as making better buying decisions, optimising product usage and keeping themselves updated with the latest developments.

By pursuing the second alternative and selling and processing orders online, it would simply mean that customers would be able to shorten the lead-time and save administrative or transaction costs, as the purchase process is automated. In this case, the services offered should ideally include electronic invoicing and payments as well.

If it aims to provide new products or services that are only possible through the Web, then it could offer an e-learning package, for instance, to educate the users on ways to use MHC products through a visual and interactive site. Another example would be to provide management tools, such as inventory and cost management, for designated customers. It could also allow its customers to track down or return its orders.

MHC could also choose to revolutionise its business model and create new values via a portal. For example, it could consider creating an online auction. This allows customers to name their prices for certain products, then the system would offer their bids to the multiple suppliers within a certain period of time. If the bid is not accepted, a new bid may be entered.

This enables suppliers to sell certain products below the normal prices, without compromising the advertised prices or suffering image erosion.

Logistics

There are two options available with logistics: MHC can either deliver the products themselves, i.e. through the local sales offices/warehouses or outsource to a competent logistics partner. The pros and cons of each are presented in Table 7, page 108.

7.3.3 Identifying solutions

In this section, we outline the structure of the e-business organisation, again with the concepts of Relationship Marketing in mind. We then suggest possible ways of overcoming the problems that have been mentioned by the hospitals by using e-business. It is noted that there are certain problems that can be solved with e-business, while some others still depend on the conventional ways of doing business. After that, a gap analysis will be done indicating the resources and capabilities are required to provide the solutions mentioned, and if MHC has the resources and capabilities to implement the solution.

Obtaining uninterrupted flow of materials

To ensure an uninterrupted flow of Acute Care products to the hospitals, MHC must try to overcome the problem of inaccurate or delayed deliveries. When there is a change in the product specifications such as product size, packaging, or quantity, MHC has to be proactive and inform the customers of such changes. When there is a back-order, MHC also needs to inform its customers in advance and provide an alternative/substitute product. In cases when MHC does not have the substitute, timely notice would give the hospitals ample time to find a substitute elsewhere. Naturally, this would mean that there has to be an efficient flow of information within MHC to begin with. Whenever there is a complication at the production site (for example insufficient raw materials, machine breakdown, high number of faulty products, or any other factors resulting in a delay) the salespeople should be informed, so that they can communicate that to their customers, either by e-mail or phone. If MHC were

proven to be a reliable supplier, the hospitals would have no hesitance to buy from MHC again after that incident.

Inventory management

Integrating MHC's ERP[72]-system with the ERP-system of the hospitals is a prerequisite for all following actions. To achieve a successful integration, it is crucial to prepare the hospitals internally for instance by uniting all major business practices within a single family of software modules. These modules again run on server networks. To make all this work, the hospitals have to have computers in all separate departments, which are connected to more powerful computers that feed them data. This is *the* precondition, for instance, for inventory management. The information flow, paper flow and the product flow will be coordinated via the ERP-system.

With help of the ERP-system integration, MHC should help hospitals to manage its inventory. Stocks should be recorded automatically (every time a new product has arrived or used) and kept at a minimum to save space and money. To do this, bar-coding is the very basic solution.

To implement this idea, it is necessary to have a scanner in every storage room in the hospital. The most suitable scanner would be similar to the ones used in supermarkets, where the product just needs to be swept over the surface and the bar-code will be acknowledged immediately. These scanners are also fixed to the location, thus preventing the scanner from 'disappearing'.

Each scanner will be connected to a computer. Particularly at the initial phase of implementation, it is almost certain that some nurses will forget to scan the products that they took out of stock. Therefore, it must be made possible and convenient for others to correct these mistakes immediately on the computer when they are realised.

It is essential to have an isolated computer system to monitor the stock-up and product usage. Hospitals are still very strict about patient confidentiality and

[72] Enterprise Resource Planning (see Appendix 5)

will not allow any supplier to set up a computer system that is fully integrated, thus giving access to patient records.

Therefore, although there are some requests from hospitals to have a total solution from inventory control to automatic replenishment and even costing (linking the products used onto the correct patients), this idea will remain wishful thinking on the grounds of patient confidentiality. Besides, different hospitals have different computer systems. It would be impossible to agree on one common platform and upgrade all the suppliers' IT systems to match the hospitals, or vice versa.

The hospital computers are linked to a central server (which can be located in the purchasing department of the hospital if the hospital wants to have a centralised purchasing organisation). This server can be connected via a direct Internet line with MHC's e-server in Sweden. If this is the case, MHC would receive orders automatically when a particular stock count falls to a certain level. Meanwhile, information updates about products, prices, etc. that are sent by MHC will appear immediately on the computers in the hospitals.

However, a direct Internet line is extremely costly. We have learnt that hospitals are very cost-sensitive organisations and large investments that are not directly linked to improving the quality of health care are often deferred. On the same note, the industry would not be willing to pay for such a hefty investment either. Therefore, the alternative to the direct Internet line would be the ordinary modem.

Using a modem, the only difference is that the changes in inventory are only registered when it is online. Every time a product is taken out of the inventory, it is registered in the database. When a certain amount of the same product has been used up, a message will be sent to the purchasing department to replenish the product. The purchaser receives the message when he is online and then places the orders accordingly. This solution is made for those purchasers who would like to control and administer the buying process itself.

Instead, an alternative for some purchasers who would like to automate the buying process is for the suppliers to stock up for the hospital automatically when the stock count falls below a predetermined level. So, whenever the purchaser goes online, a message will be sent automatically to the supplier containing the order without his intervention.
Some technical aspects have to be taken into consideration though:

- Which software should be chosen for the scanners?
- Which scanners would be most suitable?
- Which computers are the most appropriate ones for this plan?
- How is it possible to support this system for every hospital?
- How can MHC help the hospitals define their e-strategy?

It is noted that with bar-coding and automatic inventory control, it will also be easier for MHC to track down the product trail when a hazard occurs (for example infected products).

Achieving lowest product cost

Encouraging hospitals to make MHC its 'system supplier' is also a solution for achieving the lowest product cost. Naturally, when a customer buys in bulk, it would obtain product discounts, as the supplier benefits from the economies of scale.

Standardising the items bought

MHC should start promoting itself as a "total solution provider". In order to support the product standardisation in hospitals, MHC should demonstrate that it is a "one-stop shop" that offers a broad spectrum of products and capable of becoming the "system-supplier" that the hospitals are asking for. In fact, this is also a good "entry point" for MHC to promote the continuum of care[73] and sell its Wound Management products to these hospitals as well.

[73] A product that is used for a wound on a patient in Acute Care will be prescribed for the same wound on that same patient in Home Care. Hence, there is a strong connection between Acute Care and Home Care; presence in Acute Care is a prerequisite for growth in Home Care. One can also say that the investments in sales and marketing in Acute Care pay off in Home Care.

Standardisation can be achieved not merely by becoming the "system supplier" but, also, by providing the opportunity to standardise their product catalogues based on the hospitals' order history.

This means that the hospital can categorise MHC's products in line with the categories the hospitals define themselves, based on the regular products that they often buy, by best value or non-best value designation, by category of product or even at the individual product level. It is essential for the hospitals to be able to define their own product categories instead of being told by MHC, as they would know their own requirements best.

Reducing administrative costs

By implementing an Internet solution, MHC not only saves costs in their own business but also helps the hospital to save. It is easier to bundle orders, either by department or by product group, which cuts down the paperwork, as less order confirmations and invoices have to be sent and handled.

From MHC's point of view, there is not much the company can do about the lack of infrastructure in the hospitals. It is up to the hospital themselves to make capital investments in the equipment and commit the hospital staff to use computers in order to increase the overall efficiency of its procurement process. The only area where MHC can contribute is the promotion and education on e-business opportunities. Just like the conversion process from reusable Acute Care products to single-use, the hospitals need to be exposed to the benefits prior to the actual deployment. MHC can conduct lectures, seminars and group discussions to inform the purchasers, nurses, and other staff who are involved in purchasing, about the integrated, convenient and cost-effective e-business solutions that are available. It is important to emphasise that e-business is not just another hype, but can, in reality, contribute to make their professional lives much easier and more comfortable. For instance, if the hospital is considering implementing the bar-coding system and having all inventories tracked electronically, it is vital to explain to the nurses of the direct benefits to them and the downsides of *not* doing so. Besides the user groups, MHC also needs to

communicate the benefits to the top management of those hospitals, as they are the ones with the final say on investing in an e-business implementation.

At the start-up phase, where the main task is to convince the hospitals to participate, one of the key issues to address is how e-business can accomplish different improvements for different parties. We believe that the following parties can experience the subsequent enhancements:

Table 6: E-procurement benefits to different hospital functions

Purchasers	▪ Cheaper: ➢ Lower product & transaction costs ➢ Lower inventory costs ▪ Less workload: ➢ No work duplicates ➢ Orders made by clinicians themselves ➢ Less paper work ▪ More focus: more time and effort spent on negotiating contracts ▪ Shorter lead time ▪ More transparency: ➢ Better understanding of internal workflow ➢ Higher quality of supply information & better selection of suppliers
Nurses	▪ More transparency: ➢ Better understanding of internal workflow ➢ Higher quality of medical information – medical breakthroughs, products usage, supplier offerings, etc.
Warehouse Managers	▪ Cheaper: lower inventory ▪ Less workload: automatic replenishment ▪ Less paper work
Financiers	▪ Less workload: less frequent invoicing ▪ Less paper work ▪ More manageable Account Payables
Board of Directors	▪ All of the above

Source: Own

Being a competent supplier

Under this goal, there are three outstanding issues that need to be addressed: lack of transparency, lack of traceability, and inefficient invoicing. MHC can contribute in the following ways:

Lack of transparency

By putting high quality and valuable information on the web, MHC is increasing its transparency for the perusal of hospitals. This information has to be accurate, reliable, applicable and easily accessible for the hospital staff. Among the hospitals' interests is product information including prices, product quality, other services provided by the company, other products in the market, medical information and developments, etc.

Besides, there should be a high level of transparency on the way to make a transaction over the Internet too. This is particularly important, as e-business in the health care industry is still very much in the infancy stage and Internet exposure is rather limited. Therefore, there should be a user-friendly step-by-step explanation on how to use website. Every step, from the login, to the check of an order, to the payment, has to be so simple that everybody, even the most computer illiterate person is able to follow the instructions. Pictures and complementary text will be of great help to make it more understandable and navigable.

To find the ideal solution, MHC should look out for a competent partner in the field of e-business. Companies with experience in this domain, for instance cardinal.com, can show how the whole Web page should be build up and how the Web ordering should be handled (see www.alligiance.net).

Lack of traceability

In order to see where in the supply chain the product currently is located, if it is delayed, out of stock or if it'll be delivered in time, a so-called 'tracking system' is needed. This tracking system already exists. Cardinal, the owner of Allegiance offers, for instance, this kind of service. The EKG Niederrhein in Germany will have the opportunity to track its orders as well, provided by the company fiege.med. Other companies offering this feature are, for instance,

UPS and Fedex. MHC should either develop its own tracking solution or team up with one of the above-mentioned companies.

Whether MHC should try to establish its own tracking system or leave the implementation to already experienced companies in this subject is not easy to answer. Below is a brief analysis of the pros and cons of both situations.

Table 7: Criteria for deciding on whether or not to outsource

	Own initiative	**Find a competent partner**
Pros	▪ Can influence the whole development from scratch - the result will be exactly the way MHC want it to be	▪ Deep knowledge in tracking ▪ Specialised in logistics - its their core capability ▪ Customised solutions to MHC's needs and demands ▪ More economic with economies of scale
Cons	▪ Logistics is not MHC's core capability ▪ Prone to making mistakes ▪ More expensive	▪ The solutions may be more general as they already exist and are not created only for MHC

Source: Own

Looking at the table, finding a competent partner seems to be the better alternative for MHC.

Inefficient invoicing

Meanwhile, to overcome the invoicing process that is inefficient and generating a large amount of papers, a future aim is, of course, to implement electronic invoicing, so that payments can be made electronically and no paper records are needed. However, this cannot be done until the legal requirements for archives are clarified and lifted.

On the other hand, there is something else that MHC could do to make the invoicing more effective: payments could be made through an account in a bank.

Similar to a credit card system, hospitals will make the payments when the product deliveries are made (based upon the delivery orders and thus no invoices are needed) and MHC will get the money in its account in a maximum of three days. The only difference is, instead of swiping through one's card, an authorisation code is used. Naturally, the budget holders in the hospitals would need to have access to computers and access the bank's website to make the transaction. However, none of these computers need to be integrated, so there is no need for any major investments or training. The only requirement is for MHC to open an account with a selected bank (preferably an international bank for ease of operations across borders) and the hospitals could deposit in a certain amount of money for the year's expenditure on Acute Care products. With such an agreement, hospitals could reduce the amount of invoices received and MHC would get its payments sooner. Of course, the bank would also issue monthly statements and advice to both the hospitals and MHC for review and safekeeping[74].

Developing cross-functional relationships

To develop cross-functional relationships, we first need to consider the hospital culture. There is not much the industry can do about the hospital culture, which is generally old-fashioned, and thus very reluctant towards administrational changes in general and e-business in particular. What MHC can probably work on is strengthening the relationships with the purchasers, doctors and nurses. More frequent visits and product demonstrations should be made to convince the hospitals that MHC is the desired supplier in providing high quality products at competitive prices while concurrently delivering superior customer satisfaction. Such strong relationships are the pre-conditions for e-business.

At present, MHC's salespeople have very close contacts with its customers, but these relationships should be maintained and possibly improved in the future.

[74] Anna Millard, Cash Management Group Executive, Handelsbanken, 25 November 2000

Personal contact is still essential for the people at the hospitals. It is important to note that an e-business implementation in the short- to medium-term is not a *substitute* for the personal contacts that exist.

On the contrary, it is a *complement*. Whenever a salesperson is unavailable or when there is an urgent need, information is available with just a click of the mouse. Indeed, as we have gathered from the round table discussions, purchasers and nurses still favour seeing the salespeople once in a while and having face-to-face meetings to negotiate and discuss business. Particularly in those traditional hospitals that are not too keen about e-business, these meetings give the salespeople the opportunities to introduce the e-business concepts subtly and gradually.

However, this is a long and psychological process. It is not possible to change habits and ideas from one day to another. Nevertheless, if MHC can *prove* to the Board of Directors that e-business is the most cost-effective solution to health care procurement in the future, chances are higher that the top management will pressure the hospital staff to embrace e-business and indirectly moulding the culture to be more receptive towards computerization and modernisation.

As MHC is a multinational corporation that operates on a European level, it is crucial to keep in mind the language barrier. In Europe, there are many countries that are very nationalistic and would refuse to do business in any other language than its national language. Even in an advanced country like Germany, we can safely say that none of the hospitals would be content with an English website, although English proficiency is rather high, especially among the younger generations. In fact, there are strong doubts that any German hospital would even *bother* visiting an English site. Naturally, MHC should have a level of consistency in its websites to indicate its global presence and strategies, but local adaptations are equally, if not more, important. Under certain circumstances, signs and logos can be used to overcome the language barrier, e.g. single-use or expiry date.

Improving competitive position

As many business experts would agree, the customers are the kings today. Therefore, the customers must be at the centre of the business processes. Whatever is done at the company is ultimately aimed at increasing customer satisfaction. Hence, MHC's e-business strategy should be organised around the customers it has chosen to serve, while all technologies and processes help MHC advance its customer relationships and others within the chain of relationships.

MHC must also realise that customers today no longer judge a product per se. Related services are equally as important for the customers in determining a superior supplier. Therefore, to create a competitive edge, it is imperative for MHC to deliver superior services.

First and foremost, MHC must capitalise on their already existing customer database (also known as customer data warehouse). With having an in-depth knowledge about its customers, MHC can proceed to commit to mass customisation, i.e. provide customised products and services to all its key customers. (It is also important to prioritise its most profitable customers). Naturally, it would be ideal if MHC could afford to implement customisation to the extreme, where customer choice is unlimited. However, this is impractical as prices will soar beyond the reach of customers. Therefore, a huge opportunity to advance the mass customisation is in the area of services. The services that can be offered include, real time feedback, rich product information, supply costs reports, as well as service and productivity performance.

All the data stored in the database must be easily extracted whenever the front-line personnel (Customer Service representatives or salespeople) need them to provide real time customer care. This means that the customer knowledge and, to a certain extent, decision-making power, should be decentralised to the point of relationship contact, where the context is more evident to the personnel. Supported by technology, they are better able to address the customer's immediate concern and offer more valuable and timely advice or solutions.

Considering Acute Care products are rather technical and yet do not evolve continually like mobile phones and software, it is beneficial for MHC to provide detailed product information on the network, to complement the printed and oral media. For the purchasers, such detailed information online could save them tremendous time and efforts, while simultaneously increasing the desired transparency. Meanwhile, for the clinicians who are seldom in contact with computers for professional purposes, the most relevant subject that they would be interested in would be the product information. Therefore, by posting accurate, updated and rich product information on the Internet/EDI, it would encourage them to begin using computers. Naturally, it is also important to have the information customised to the needs of the users. Information overload would only put them off. Hence, using passwords may be the solution for users to log into a customised web page, which provides the product information that the user usually uses.

To emphasise the cost-saving efforts, MHC should offer some additional features on its web page that could help the hospital staff (mainly administrators) to manage cost, productivity, etc. One example is to '*Identify Supply Costs'*. Here, they may view and print out the report containing the hospital's supply cost from MHC for the last quarter or year-to-date. These reports contain all the data the hospitals need to analyse their total supply costs by product line, department or manufacturer. They can also help to determine the usage by product line, the cost and vendor consolidation opportunities and assist in viewing the purchase volumes to ensure the hospital is meeting any goals or thresholds they have set. However, in this case, the automatic inventory control is a prerequisite; otherwise, a manual inventory count will need to be done to determine the amount used for the particular period, which is not feasible.

Other than the services, another vital aspect that could help MHC create a competitive advantage is branding. But it is critical to note that promoting brand-as-experience is far better suited to e-business than brand-as-belief. Take the corporate brand name MHC (with product brand names Klinidrape) for example.

If MHC attempts to promote Klinidrape as *belief*, it would convey the product attributes through branding, such as the low infection risk, comfort and warranted price premium. As the brand is a matter of belief, it is fundamentally a *navigator* message. This means that any objective navigator could provide this message, so the brand-as-belief in fact competes with the navigator. If a credible navigator repeatedly demonstrates that specific Klinidrape product does not have low infection risk, or comfort, and so forth, it would undermine Klinidrape's brand name. Also, if people came to respect Klinidrape *because* of the navigator's endorsement, then the brand is redundant. On the contrary, Klinidrape as *experience* is the whole set of visual and emotional connotations that the product carries including the design of the product, the feel of the materials and the logo; for instance, the experience of being at the forefront of all technological and scientific developments. This means that a Klinidrape user would feel assured that the company is constantly improving and using high technology to provide high quality products and services. Consistent with that, MHC's e-business involvement would also help project a savvy image. This experience can only be obtained from Klinidrape and no other, creating a much more sustainable brand name and thus competitive advantage.

7.3.4 Identifying resource and capability requirements

In order to provide the solutions above, some resources and capabilities need to be present or developed.

Table 8: Resource and capability requirements

Solutions	Resources needed		Capabilities needed	
1. Provide proactive, timely and accurate information to customers – product changes, delays & contract terms and conditions – customised to local needs	▪ Human – communication & interactive abilities *Helpful, speedy & pleasant front-line personnel (Customer Service representatives & salespeople) who supports teamwork and efficient information flow*	(✓)	▪ People *Provide professional information & services*	✓
			▪ Technology *Provide complete & updated customer information*	✓

	(internal & external) ▪ Technology *Complete and updated customer database*	× ×	▪ Knowledge & insight *Understand what information its key customers need* ▪ Process *Provide real time feedback with available data & decentralised decision-making structure*	× ✓
2. Provide detailed information, especially regarding products, on the company web site	▪ Technology *User-friendly web site with up-to-date and detailed information*	(✓)	▪ Technology *Allow customers to learn about product online (e-learning)*	(✓)
3. Allow online ordering	▪ Finance *MSEK5-10*[75] ▪ Technology *Ordering software*	× ×	▪ Technology *Allow customers to buy online*	×
4. Provide management tools, e.g. supply cost control	▪ Finance *Inclusive in MSEK5-10* ▪ Technology *Automated inventory count & supply and performance software*	× ×	▪ Technology *Allow customers to view and print out management reports for better decision-making*	×

[75] Rough estimation from Lars Ericsson, salesperson from Intentia Consulting, inlcusive of the Movex software and consulting expenses

5. Brand management – brand-as-experience	▪ Reputation *Strong brand equity vs. competitors* ▪ Culture *Corporate culture that emphasises high quality products & services* ▪ Human – specialised skills & knowledge *Marketing & branding expertise*	✓ ✓ ✓	▪ People *Position MHC as a premium health care company* ▪ Process *Project a reputable image and brand name*	✓ ✓
6. Set up an automatic inventory control system	▪ Finance *Inclusive in MSEK5-10* ▪ Technology *Computers, scanners & software*	× ×	▪ Technology *Keep track of stock levels, automatic replenishment & cost management*	×
7. Set up a tracking system	▪ Finance *Inclusive in MSEK5-10* ▪ Technology *Tracking software* ▪ Human – specialised skills & knowledge *Competent logistics partner*	× × ×	▪ Technology *Determine product/order location in the supply chain*	×
8. Use a "credit card" system	▪ Human – specialised skills & knowledge *Competent banking partner*	×		

9. Talks/lectures on e-business opportunities	▪ Human – specialised skills & knowledge *Competent employees with sound IT knowledge*	×	▪ People *Provide exposure and knowledge about e-business opportunities* ▪ Knowledge & insight *Understand the different IT needs and potentials of each customer*	× ×

Source: Own

✓ MHC has the resource/capability
(✓) MHC is currently developing the resource/capability
× MHC does not have the resource/capability

7.3.5 Maintaining a scorecard of progress

As volatile as the e-health market is, defining an e-strategy and implementing it is insufficient. It is imperative to set both internal and external milestones to monitor its e-business developments. Among the internal scorecards are increased sales and profits, payback period, number of customer complaints and hits on company web page. Meanwhile, the external scorecards can be increased shareholders' value and market share changes, to name a few.Besides the internal and external scorecards, it is also advisable to track the developments of the new and current businesses. To monitor progress of the current business, the company needs to create a tracking mechanism that accurately reads what is happening in the environment. Is the current business under threat? When did the deterioration start? How will the company learn from its e-experiences? A second mechanism is to monitor the performance of the new e-business ventures and start-ups. For e.g., is the health of the new

venture, even before they produce positive cash flows and returns, and who will do it, how and how often.

After having analysed our findings, we will now conclude from these and try to look deeper into different aspects by presenting our general conclusions.

8 CONCLUSIONS

This chapter is aimed at presenting our general findings. First we look at what impact geographical location, private or public status, and the size of the hospital have on our results. We will continue with a separation between internal and external problems in hospitals and, finally, conclude with our theoretical implications.

8.1 Solutions to Research Problem 1, 2 and 3

8.1.1 Research Problem 1

We noticed that the decision-makers differ from institution to institution. In section 7.1, page 91 we mapped the role of the hospital staff and answered the first research problem, which the main decision-makers in the hospitals are.

8.1.2 Research Problem 2

Research problem two (*In the customers' opinions, how can e-business help to solve the main problems that exist in the purchasing process in the Acute Care segment in Europe?)* takes up the main problems that exist in the purchasing process in Europe.

Internal problems:

- The lack of technological infrastructure in the hospitals
- The lack of product standardisation
- Culture

External problems:

- Poor traceability
- Manual inventory control
- Lack of transparency
- High transaction costs
- Inefficient invoicing
- Need of more efficient information flow from suppliers

Internal problems

From the three internal problems, we realise that the first two are tangible problems. They are more easily comprehensible and can be solved in a short-term with a physical action (e.g. new rule in the hospital that strictly forbids purchasing any other product/brand name than those selected) or investment (e.g. new computers and IT system in the hospital). However, the cultural problem is more of an intangible nature. There is no definite right or wrong when it comes to cultural values; it simply is the way of doing things in that organisation. Culture also revolves around people and has been nurtured over a long period of time and, thus, is extremely difficult to change. We believe the culture is the key factor that will hamper the usage of computers and e-business in hospitals. We shall take the three problems above as an illustration of this. Even if there is an adequate amount of computers in the hospital and product standardisation is promoted, if the hospital staff refuse to change their ways of working, the benefits will remain minimal. Therefore, it is extremely important to expose the hospital staff to the use of computers and other electronic media, and educate them of the benefits. As we discovered from our research, teaching hospitals are more receptive, mainly because of their exposure and education. Also due to this, the younger generation, particularly the nurses, will show more amenability towards e-business.

A hospital culture is different from the cultures in other public or private institutions. It is a traditionally grown institution that is rather resistant to administrative changes and has a traditional hierarchy.

Rigidities

The tendency to avoid risks and to prefer stable situations is rather high in hospitals. Rules and habits have been implemented for ages and most people are not really willing to change them. For example, the doctors see it is as a necessity to work with particular gloves in order to work effectively and do not want to change the procedure. The same accounts for routines. Nurses insist in having no time for integrating computer work in their every day work flow, as the current workload is already very burdensome.

Hierarchy

The hierarchy among the doctors, nurses and administrators is strong and deeply rooted. The doctors particularly, do not like the idea of giving away and sharing their power, no matter which topic it concerns and which country we look at; we find the same situation in Sweden, Germany and the United Kingdom. Generally, we can conclude that the power distance in hospitals is high.

However, although we do believe that the power distance is high in all three mentioned countries, it is higher in some countries than in the others. This can be traced back to a significant component of culture, namely the language. The English and Swedish language both have only one form of address: all persons are addressed with the pronoun 'you'. Not so in many other languages. In the German language for instance, there are two forms - the personal and the formal address (For example in German: 'Du' for personal and 'Sie' for formal addressing a person).[76]

What can be done concerning the high power distance? As we found out, the internal information flow in hospitals needs to be improved. This includes both the upward and downward communication flows.

In the hospitals, the downward communication flow should come from the doctors to the nurses and from the administrators to the doctors/nurses. As the participation and collaboration of the nurses are especially important to ensure the success of an e-business initiative, it is critical for them to understand the reasons for their assignment. For instance, if the clinicians are aware of the importance of saving costs and how e-business can help achieve that savings, it will give them more motivation to co-operate, thus bringing the hospital a step closer to achieving its financial goals.

[76] Jeannet & Hennessey, 1998, p.73

In fact, the downward communication that traditionally relied mostly on printed media (such as handbooks, manuals, newspapers, bulletin-board items and information displays) and oral communication can, nowadays, be distributed online. The Intranet or Internet is a fast and flexible complement to the print media. The keyword here is a "complement", as we discovered that the printed and oral media would still play a major role for downward communication. The clinicians in particular, are still in favour of receiving pamphlets, memos and other informational statement in paper format. Face-to-face contacts are also highly appreciated.

By improving the upward communication the hospital can benefit from the employees in that sense that they can give their personal opinions about ideas, attitudes and performance and, of course, more technical feedback information about performance, which can be a vital factor for control of any hospital.

External problems

The six external problems are relatively easier to solve with the help of e-business because suppliers could actually do something to improve the situation, sometimes even without any direct contributions from the hospitals. Among them, we noticed some different emphase in Germany and London. It seems to us as though Germany would place more importance in obtaining a higher level of transparency, whereas the UK is more concerned with improving the efficiency of the purchasing process on the whole, such as the inventory management, invoicing and information flow from suppliers. In fact, the Germans also seem more concerned about the portal ownership, and whether or not it is "neutral" or non-profit. The British people tend to focus simply on the net gain of the transactions via the portal – as long as there is reasonable gain, they are indifferent whether the portal is set up by the suppliers and are profit-oriented. From our research, we also noticed that the hospitals were not too particular about the high transaction costs and the savings that can be made with e-business, although secondary data has placed quite a lot of emphasis on this issue, particularly in Germany.

8.1.3 Research Problem 3

Research problem three (*What is required of Mölnlycke Health Care to provide the e-business solutions?)* deals with the requirements, MHC has to fulfil to be able to provide the e-business solution. For this, it is necessary that MHC continuously develops its resources and capabilities (see Table 8, page 113-117).

MHC has to find the compromise between the inevitable development of the e-business and the traditional culture of the hospitals. Without considering both, MHC will not be able to implement their e-business strategy successfully.

8.2 Concluding Thoughts

8.2.1 Geographical similarities

From the results obtained in Germany and the UK (and to a limited extent even Sweden), we came to the conclusion that the problems that hospitals face in implementing e-business are rather similar across the countries. In this case, geography is not quite relevant. Most of the problems that exist in one country are also experienced by the other, although the perception of their importance and urgency may differ. For instance, only one British hospital considers the inefficient information flow from suppliers as a key problem. In this case, two other German hospitals face similar problems with the information flow too, but regard it merely as a secondary challenge.

8.2.2 Private vs. public hospitals

Another interesting observation is the perception of e-business in the public versus private hospitals. It seems to us that, generally, the private organisations are more profit-driven and naturally are keener on harvesting the benefits of e-business, as a dollar saved is a dollar earned. This is true for both Germany and the UK. However, the public hospitals in the UK demonstrated a more receptive perception than expected[77]. The reasons for this may be multiple:

[77] We had expected the traditional and public hospital (especially the nurses) to be disapprove of any e-business initiatives

- some of the hospitals are also teaching hospitals and, therefore, are more open-minded
- the government places great emphasis on improving the quality of health care provided by NHS and e-business is one solution it has been promoting
- more players are entering the British e-business scene and approaching and educating the hospitals of the real benefits of e-business, and/or
- people in the hospitals (mainly the purchasers) have gained tremendously from e-business through their personal experiences, such as private online-banking and ordering consumer goods over the Internet, and would like to capitalise on similar opportunities but at a corporate level.

8.2.3 Large vs. small hospitals

It is also noted that large health care institutions are more likely to engage in some form of e-business activities in the coming years. The reasons for such enthusiasm may be the larger savings that can be made, the existing and compatible technological infrastructure, the available financial means or human resources, etc. On the other hand, smaller organisations tend to take the "wait-and-see strategy", as they perceive the risks and uncertainties in e-business are too high at present. They would like their larger counterparts to take the risks and test the waters first. They want them to try out the options available in the e-health market, so that they could learn from their mistakes. They also hope to see how the larger hospitals pursue e-business and hopefully they can simply follow and engage in the "sure-to-succeed" business models.

8.3 Theoretical implications

It is also interesting to determine whether the theories that have been used in our research are applicable to other research topics. To do this, we will be looking at only the main theories used, namely the e-business strategy options by Arthur D. Little (2000), the nine goals of supply management by Leenders & Fearon (1997), the organisational buying behaviour by Webster & Wind (1972), and Relationship Marketing by Gordon (1998).

The e-business strategy options model (theory 3) is highly applicable to researches on e-business strategy in any industry and at any level (corporate, business or tactical).

The six steps that are recommended are indeed similar to any other strategy development theories; develope a long-term vision, identify the business model, decide on the structure and resource requirements, plan and implement, align and motivate and, finally, maintain a scorecard of progress. The distinction of the theory is the different emphasis placed on different aspects (e.g. the scenario analysis or the actual implementation) of all the strategy options (i.e. the Eagle, Phoenix or Swan). However, one should be cautious as the criteria for choosing the options could influence the type of approach taken by the company. For instance, if one were to use the deterioration of its current business to decide when it should move, it will indirectly be taking the reactive approach. This means, that e-business will only be adopted if and when sales have plummeted and the current business is under jeopardy. However, if one were to use the opportunity size as a measure, then the approach would be more proactive. This means that although the current business is doing well, e-business is adopted anyway to capitalise on the new stream of revenues.

The nine goals of supply management theory, which constructed theory 5, turned out to be the most important and widely-used in our thesis. It is also very basic and, thus, can be used for other research that is related to supply management. It is a good introduction to the roles and importance of supply management.

The organisational buying behaviour theory (theory 6) is also applicable to many organisations, private and public. The larger the organisation, the more complex the decision-making process is, and the more useful this theory is to recognise the right persons responsible for certain tasks.

Lastly, the Relationship Marketing theory (theory 8) is applicable to companies that have a high fixed initial costs and, therefore, customer loyalty is crucial. It is also relevant to industries where the costs of attaining a new customer are much higher than keeping an old one. The products/services must also have high potentials to create more values added to customers where price is not the sole deciding factor. Groceries, for instance, are not suitable for RM.

It is also important to consider the customer amenability towards building relationships; for example, a car buyer would be keener on building a relationship with the dealer compared to a soap buyer with the shop-owner.

Based on our more general conclusions we will now try to give more particular recommendations to Mölnlycke Health Care.

9 RECOMMENDATIONS

In this last chapter some short- and medium term recommendations will be indicated for Mölnlycke Health Care. We will finally end this Masters' Thesis with our suggestions for future research.

It is inevitable that e-business is the way to go in the future. The key question here is how *far* in the future are we referring to and, thus, how advanced should the company's e-business activities be. Setting up a home page alone is already a step into e-business and can be done by almost any company in any industry. On the other extreme, the company can offer a full-fledged e-business solution – from information provision on the home page to online ordering to a complete integration with its customers' computer systems.

With a traditional industry like health care, the *real* amenability of customers towards e-business and the time period, it will take before the customers indeed use the Internet and other electronic media substantially for business transactions, remain uncertain. Despite this, we firmly believe that MHC should take a proactive approach towards e-business. It should promote itself as one of the forefront companies in e-business. It should demonstrate to its customers that they are ready to sell online when the customers want to. This means that it should invest in e-business *before* its current business deteriorates. Its participation in Vamedis, the pan-European health care portal is an excellent start among many of its e-business initiatives.

We have attempted to briefly define the e-business model for MHC to specify the target customers, target markets, products and services and logistics.

9.1 The customers

MHC should use e-business as a complement to improve or sustain its long-term relationships with its key customers. As it is more effective and much cheaper to convince its current customers to use e-business for procurement than for acquiring new customers, MHC should first concentrate on the former group. Its target customers should be its A and B-group customers at present, which are its most profitable (and also usually largest) customers.

In their cases, e-business will be a good compliment to the personal treatment that they have been receiving, such as the sales force. Customisation and personalisation are key features of customer care.

9.2 The products and services

What customers seek today is not merely high quality products by themselves, but more of a "total solution". The demands for the services associated with the products have increased significantly. Customers expect more and better services to facilitate their purchases, making them easier, faster and cheaper. With e-business, MHC could provide such convenience, speed and savings. Therefore, MHC should try to provide customised in-depth product information, sell product and process orders online, offer unique offerings via the Web and revolutionise models and shift value creation. MHC could achieve the first (information) by itself but it is advisable to carry out the rest via Vamedis.

The current product range would remain the same; for Acute Care products, they include single-use drapes, gowns, caps, masks, equipment drapes and procedure trays. Services though, can be improved in many ways with e-business (see Section 7.2, pp. 92)

9.3 Logistics

As mentioned in Table 7 (page 108) it is more appropriate for MHC to outsource its logistics activities to a logistics company, while it focuses on its core competencies, that is R&D and marketing.

Proceeding to our recommendations, MHC has two options; it can either pursue e-business with its own resources and capabilities, or to go through Vamedis. By itself, we suggest that its e-business initiatives should be more of a "preparatory" nature – to "prepare" itself and its customers to buy and sell online. In order to carry out those actions, minimum investments are needed. The most critical resources and capabilities that the company needs to attain or develop are the management, IT and communication skills of its employees.[78]

[78] For further details on the resource and capability requirements for the solutions, see Table 8, page 113-117.

It is noted that some of these recommendations are not exactly e-solutions, such as the face-to-face talks/lectures on e-business opportunities. However, such conventional methods can be very effective in the "transition phase" to convince the hospital staff to start using computers and other electronic media at work.

However, MHC could carry out more of the solutions that we suggest via Vamedis, as stated in Table 9 below (with the exception of the branding strategy). This is mainly because the resources and capabilities that are needed for such improvements are too substantial for MHC to borne by itself. From the customers' point of view, it is also more attractive to buy from a portal that offers a "one-stop shop" concept with multiple suppliers; it is extremely difficult to lure customers to visit and buy from an exclusive company web site.

Table 9: Final recommendations

RECOMMENDATIONS	**RATIONALE**
MHC and Vamedis:	
Provide proactive, timely and accurate information to customers (e.g. product changes, delays & contract terms and conditions) that are customised to local needs	▪ To provide value-added information quickly to customers ▪ To keep customers informed about the changes in agreement and suggest alternatives or allow them to make the necessary adjustments ▪ To increase transparency
Provide customised information, especially regarding products, on the company web site	▪ To expose and encourage the hospital staff to using computers for search of product information ▪ To increase transparency
Using a "credit card" system	▪ To reduce paper work and related processes ▪ To decrease Account Receivables
Talks/lectures on e-business opportunities	▪ To expose and educate the hospital staff on e-business

	opportunities subtly ▪ To allow real time interaction and Q&A sessions to clarify any queries
Strengthen brand equity – brand-as-experience[79]	▪ To enhance its competitive advantage ▪ To increase switching cost
Via Vamedis only:	
Sell online	▪ To reduce lead time ▪ To reduce work duplicates
Set up an automatic inventory control system using bar-codes	▪ To reduce lead time ▪ To help minimise inventory ▪ To reduce work duplicates ▪ To use human resources more effectively ▪ To simplify the process of tracking infected products
Provide management tools, e.g. supply cost control	▪ To help the time-pressured hospital management to perform such analysis for better decision-making ▪ To enhance its competitive advantage
Set up a tracking system	▪ To provide customers with opportunities to source elsewhere for urgent products in case of back-order
Important:	
Top management support	▪ To show commitment to its customers and implement the recommendations above to collectively gain from e-business

Source: Own

[79] The branding strategy is suitable for MHC but not for a portal like Vamedis

9.4 Future Research

- *Benchmarking* could be a future research area. Which are the most important players, how do they develop, and which position do portals have in the industry?

- *Follow-up research*: The development and changes during the next years, including research about what has happened in the markets and if we were right with our perceptions of the future development.

- *The role of the local sales offices:* How does their role change after the e-business implementation?

- *Increase web page hit-rates*: How can MHC attract more customers to visit its web page?

- *Organisational culture*: Evaluating the organizational culture in hospitals and how that affects the decision-making process.

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1.	Claus Holmen	E-commerce Manager, MHC Gbg	22 Aug (5-6pm)
2.	Anders Karlsson	Chalmers University	7 Sept (4-6pm)
3.	Per-Olof Olsson	Business Manager, Sweden	15 Sept (9-10am)
4.	Ola Henfridsson	Viktoria Institute	18 Sept (9-10am)
5.	Ann-Margreth Hellberg	Market Researcher, MHC Gbg	21 Sept (1-2pm)
6.	Phil Cooper	Managing Director UK & Ireland	25 Sept (2-3pm)
7.	Anna-Karin Friberg	CSC Representative	26 Sept (3-4pm)
8.	Ulf Nilsson	Account Manager, Västra Götaland	29 Sept (9-10am)
9.	Heléne Österman	Sales Assistant	29 Sept (3-4pm)
10.	Lars Krysell	Warehouse Manager, Sisjön, Gbg	2 Oct (9-11am)
11.	Reino Harmsund	Warehouse Manager, Lund	3 Oct (11-12am)
12.	Gunnel Karlsson	Warehouse Manager, Jönköping	6 Oct (12-1pm)
13.	Ingrid Hollsten	Purchaser in Norrbotten	6 Oct (2-3pm)
14.	Claus Holmen	E-commerce Manager, MHC Gbg	17 Nov (1-2pm)
15.	Anna Millard	Cash Mgmt Group Exec. Handelsbanken	25 Nov (3-3.30pm)

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Round Table Discussions - UK

Hospital	*Date*	*Name*	*Position*	*Time*
St. Peter's Hospital	16-okt	Ms. Alyson Brett	Procurement Manager	10-11.30 am
		Ms. Rosemary Carey	Clinical Manager, Theatre	
		Mr. Peter Green	Purchasing Manager Theatre	
Frimley Park Hospital	16-okt	Mr. Tony Glover	Senior Operating Department Practitioner	2.30-3.30 pm
		Mr. Wayne Burgin (absent)	Theatre Supplies Coordinator	
Private Clinic in London	17-okt	Mr. X	Purchasing Manager	10.30-11.30 am
		Mr. Y	Supplies Manager	
		Mr. Z	Purchasing Assistant	
Private Clinic in London	17-okt	Mr. X	Purchasing Manager	11.30-12.15 am
Follow-up Discussion		Mr. A	Nurse Education Manager (Nurse)	

St. Anthony's Hospital	17-okt	Ms. Julie Wale	Purchasing Manager	2-3
		Ms. Carolyn Haga	Theatre Manager	
St. George's Healthcare Trust	18-okt	Mrs. Barbara Kleban-Stanczak	Sterile Services Manager	10.
		Mr. Kevin Harbottle	Deputy Finance Director	
		Mr. Alistair L. Douglas	Head of Procurement	

In all discussions Ms. Fiona Wallace (MHC's Regional Business Manager) participated, not o
representative of MHC but also with her 10 years of experience working as a nurse.

Round Table Discussions - Germany

Hospital	*Date*	*Name*	*Position*
Zentralkrankenhaus Sankt-Jürgen-Strasse	24-okt	Mrs. Anja David	Sachgebietsleiterin, stellv.Abteilungsleiterin
		Mrs. Sigrid Vetter	Sachbearbeiterin
		Mr. Klaus Kohnke	MHC Regional Key Account Manager
EKG Niederrhein	25-okt	Mr. Wolfgang Appelstiel	Klinikeinkauf Niederrhein-Westfalen GbR
		Mr. Manfred Jung	MHC Germany
		Mr. Wolfgang Mai	MHC Germany
Sana-Kliniken München	26-okt	Mr. Christoph v. Wrisberg	Purchasing Manager
		Mr. Christian Weinert	Purchaser
		Mrs. Ortrud Schön	MHC Regional Business Mana

Uniklinikum Kiel	31-okt	Mrs. Angelica Kuerschner	Head Nurse
		Mr. Michael Kahlert	MHC Regional Key Account Manager
Städtische Krankenhaus Kiel	01-nov	Dr. Riedel	Purchasing Manager ('Apothek
		Mrs. Barbara Schmuesch	Head Nurse
		Mrs. X	Head Nurse

APPENDIX 1 - SWEDEN

Five Minicases

Lundadepån/Lund Minicase

The warehouse in Lund, in the south of Sweden, is one of the three warehouses that are currently using EDI when ordering from MHC. Lundadepån is already a step ahead when it comes to an e-business implementation. They initiated a computer training/education for more than 2000 of the warehouse customers. As a result of this event, the level of awareness of e-business potentials and benefits among the customers has increased. They will, however, not organise this event again as they think that the responsibility is now on the side of the suppliers to prepare people for the coming changes.

The Warehouse Manager, Mr. Harmsund, believes that the positions of the warehouses are not necessarily threatened by the increasing electronisation of the procurement process. Due to the complicated logistics, which are controlled by the warehouses, he believes that the warehouses will not become redundant. They will, however, have to adjust to the changes and play a different role in the industry.

In his opinion, the warehouses simplify the complicated logistics and are able to decrease prices by about 15-20% due to the large volumes that they order. At the same time, warehouses have a positive effect on the environment and as they can bundle the orders, they reduce the number of deliveries to the hospitals.

Warehouse in Sisjön/Göteborg Minicase

The Sisjön warehouse in Göteborg serves most of the public hospitals in the Västragötaland region. Among them, about 200 of its customers place their orders via EDI (about half of the total value of orders received), while the rest use fax, phone and ordinary mail. In fact, the Sisjön warehouse would like to have a computerised solution that would fax the orders straight to the suppliers.

At present, the information is already available in a database, but ample time and human resources are needed to print out the orders and fax them to suppliers.

The Warehouse Manager, Mr. Lars Krysell is generally receptive towards the idea of automation in his warehouse. He is in favour of the reduced workload for his staff with the use of EDI. However, he is not pleased at all with the idea of automatic replenishment system, where suppliers would stock up whenever the safety stock level is deemed too low. He believes that it would only result in total chaos at the warehouse, since all its suppliers would want to decide how much stock is "enough" and deliveries would be out of control as these suppliers would deliver as and when they like without informing the warehouse beforehand. His reluctance can be explained that his job and function will be made redundant if the automatic replenishment system is put in place.

Ryhöv warehouse/Jönköping Minicase

Ryhov in Jönköping is the third warehouse in Sweden already using EDI. They have also initiated a computer introduction for their customers, but instead of organising one single event and inviting the customers to attend it, they went out to the customers and gave a more personal introduction. When the presentation was completed, the representative of the warehouse left an information-leaflet with explanatory pictures at the customer and the customer even had the possibility to request another visit if the need should arise.

The Warehouse Manager, Mrs. Karlsson's, perceives e-business as predominantly positive, although, at the moment, there is no possibility to introduce the 'whole' e-solution, such as electronic invoicing, due to security concerns. Mrs. Karlsson also voiced some concerns about the position of the warehouse in the health care procurement process. She does not appreciate the idea of hospitals placing all their orders directly via the Internet, as this could make the warehouses redundant.

Warehouse in Jämtland Minicase

The warehouse in Jämtland seems to be in a transition phase. With regards to the contacts with the suppliers it appears to be rather traditional, as it still has no Internet/EDI connections whatsoever.

However, the orders are already placed with the help of a fax-modem which bundles the orders that were registered during the day and sends them once a day to the supplier. Sometimes, however, the orders are still made via phone or ordinary mail. They want to wait until the electronic invoicing is officially permitted before establishing an Internet-connection. Nevertheless, they have already started to observe Internet-solutions that are available in the market, as they are aware of the time- and cost- saving benefits.

Meanwhile, between the warehouse and the hospitals, they have already implemented an Intranet, which contains a product catalogue with product specifications for all products that the customers can choose and order from. Nonetheless, not all customers use this opportunity; some are still ordering via fax or phone.

Warehouse for Norbotten/Luleå Minicase

This warehouse is one of the masses that does not use EDI at all; neither with MHC or another supplier, nor with their own customers (i.e. the hospitals). The Internet is mostly used to search for general and product information. The Warehouse Manager, Mrs. Hollsten sees some positive aspects in e-business, for instance sending e-mail instead of a letter. But she has not considered implementing e-business yet. Their solutions to simplify the present organisation do not involve the Internet to a large extent. For instance, one of her suggestions is simply for suppliers to issue one invoice per half a year to cut down the paperwork. In fact, Mrs. Hollsten is rather sceptical about ordering via the Internet. Presently, it is legally unfeasible to make a contract through fax, as a hand-written and original signature is needed to verify the purchase. As long as this law is officially valid, there is no chance to change the way of purchase.

APPENDIX 2 - EXCERPTS

Excerpt 1

"Internally, the hospitals have problems with a lack of transparency. The responsible persons for the purchase often do not know which products are needed at which department, for which specific occasion, in which quality. This results in uncoordinated purchases of separate departments."

SmartMission, E-health Service Partner, Germany
September 2000

Excerpt 2

MHC and its customers do not have real-time and accurate information flow. As one warehouse manager stated, "One of the problems we have is when MHC changes the product specifications (e.g. product features or packaging) without informing us and sometimes the notice is too late"

Warehouse Manager in Sweden
September 2000

Excerpt 3

"Hospitals in Europe are aware of some of the potentials of moving into e-business, but unfortunately, most of the hospitals expect e-business solutions to be 'neutral' or non-profit to the suppliers themselves. The problems for the hospitals are two-fold: firstly, nothing is really 'neutral' and, secondly, the hospitals in a particular country or region (with their different infrastructures and ways of working) face difficulties in agreeing upon a common IT platform."

Claus Holmen, E-business Manager
Mölnlycke Health Care AB
October 2000

APPENDIX 3 - GERMANY

General information[80]

Germany is Western Europe's richest and most populous nation. The total population is estimated to be 83 million with a population growth rate of 0.3%. The population is dominated by people 15-64 years old (68% - male 28,638,814; female 27,693,630) and the life expectancy at birth is constantly rising (*total population:* 77.44 years; *male:* 74.3 years; *female:* 80.75 years).

Some more statistical information about Germany (2000 est.):
Birth rate: 9.35 births/1,000 population
Death rate: 10.49 deaths/1,000 population
Infant mortality rate: 4.77 deaths/1,000 live births
Total fertility rate: 1.38 children born/woman

EKG Niederrhein

Institution background

EKG Niederrhein is a purchasing community that consists of 34 hospitals all together, of which 23 are acute hospitals. The 'Klinikeinkauf Niederrhein-Westfalen e.G[81].' is located in central western part of Germany with its headquarter in Gladbeck.

Perception of e-business

At the moment, just two of the hospitals are using an Internet solution. They are placing their orders via a web shop, where they insert the demands into pre-fixed order-windows, which are checked and released by the purchaser.

[80] www.cia.gov, 10 September 2000 (2000 est.)
[81] Clinical purchasing group Niderrhein-Westfalen

From March onwards though, all selected hospitals will send their orders, online to the ZED, as mentioned above .[82]

In most cases, the hardware is already present. There is as an internal communication system in the hospitals, just the Internet connections are missing. It is important to establish these in all departments that have the privilege to order online. This will be one of the next things to do. Furthermore, an instruction/training period for all the people who will get in touch with the system is planned for January 2001.

Herr Appelstiel is aware of the changes that are going on in the health care industry and the necessity to build up-to-date technological infrastructure. The question is no longer if this should be implemented, but *how*. With 'Fiege Med' as a logistics associate, he believes that they have found a competent partner to prepare them for e-business in the future.

'Fiege Med' offers features, such as traceability, which makes it possible to find out where the product is in the supply chain or where it has been used. It is even possible to see where the product has been and where it comes from.

But this is not the final solution in Mr. Appelstiel's eyes. What he is looking for is a single portal where all the main suppliers and users are present. Everybody should pay a monthly fee in order to be able to use the portal, as he is convinced that people will only value things for which they need to pay. In addition to the fee, the costs should be allocated based on the number of transactions and not in regard to the value or total amount of money that is traded through the portal.

Concerning the e-procurement system, the EKG has rather clear requests. They demand an integrated network with the suppliers, which make it possible to order both centralised and decentralised.

[82] Zentrum für Einkauf und Dienstleistungen im Gesundheitswesen GmbH (center for purchase and service in the health care market)

Additionally, they want to be able to see if the order is on stock. The solution should be capable of establishing hospital internal approval-procedures and, among several other demands, the whole network solution has to be easy to use. The EKG has designed a whole list of claims, not only for e-procurement, but also, more specifically, for the way the catalogue should be planned, how the costs could be reduced and when the whole plan should be implemented.

Procurement process

The way the purchasing is handled in the EKG Niederrhein is undergoing a period of change. At the moment, it is still routine that most of the hospitals order via fax or phone. The nurses have to fill out pre-printed forms where they can cross out the quantity of standard products. These forms are sent through the internal mail to the purchaser, who creates the order and faxes or phones that to the supplier. For MHC, it is sent to its Customer Service Centre in Waremme, Belgium.

From March 2001 onwards, they plan to have orders sent directly from the hospitals online to a central warehouse in Ahlen/Westfalen, which will be called ZED (Zentrum für Einkauf und Dienstleistungen im Gesundheitswesen GmbH). They will start with seven hospitals. They presume that in the next five years the clinical purchasing of all the hospitals in the purchasing community will be outsourced by the hospitals and brought strategically together in the ZED, where the ordered products will come together, and later, on further delivered to the hospitals (cross docking).

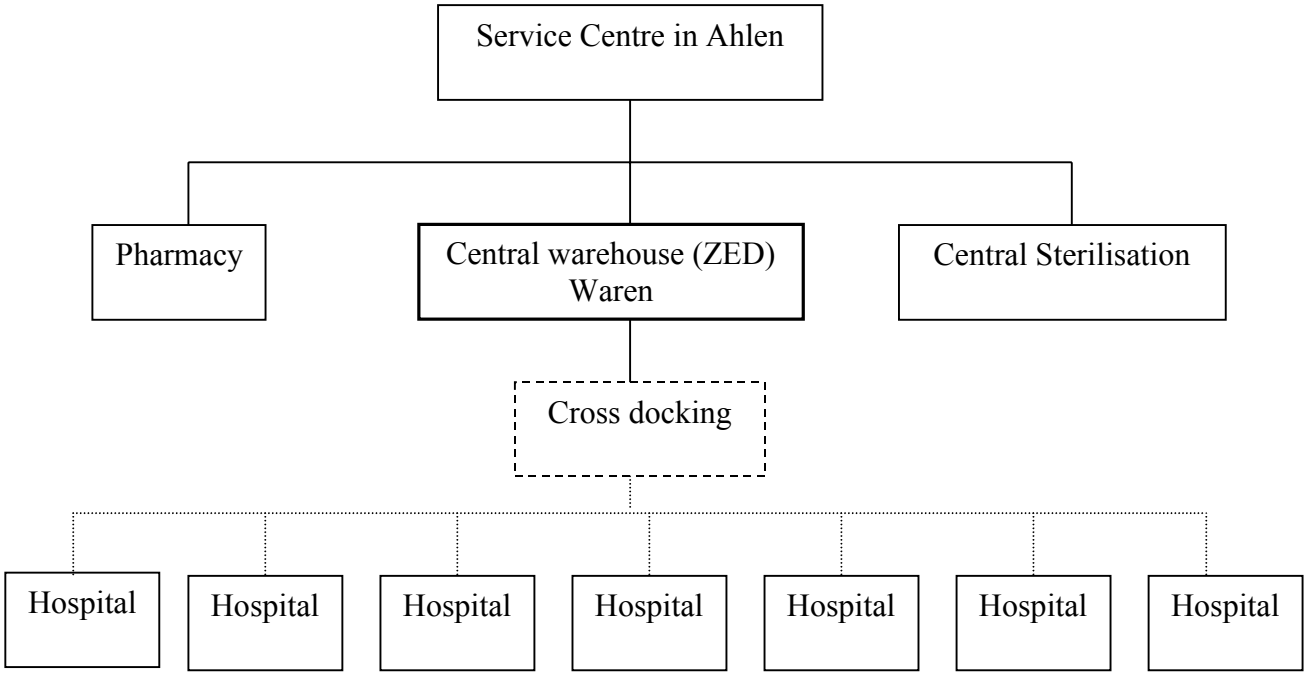
This will be realised strategically with the help of the logistic company 'Fiege Deutschland GmbH & Co.KG' (Fiege), which is based in Greven. Fiege consists of four main parts:

- 'Fiege Log', which deals with stationary logistics,
- 'Fiege Net', responsible for distribution networks,
- 'Fiege E-CM', dealing with electronic chain management, and
- 'Fiege Engineering', which is responsible for logistics consulting, facility management and fleet management of raw materials.

In this co-operation, 'Fiege Med', which is part of 'Fiege E-CM', will be accountable for the virtual logistics, e-commerce solutions, supply chain management systems and the IT systems and services concerning the ZED.

Fiege will be accountable for the logistics, as Mr. Appelstiel deems that suppliers should not take care of the distribution themselves.

The suppliers should stick to their core competencies and leave the distribution to others that have established their core competencies in this area. Furthermore, he does not like the thought of exchanging confidential information through a network that has been set up by, or in the name of a supplier. He believes that someone who builds up a network can easily get access to it again and take advantage of it by gathering confidential information, such as patient records. This applies both to the supplier himself and a potential IT-company that implements the network in the name of the supplier. As long as the network is not handled by a neutral company, but in the name of a supplier, Mr. Appelstiel sees this as a threat.



Source: Mr. Appelstiel

The 'Klinikeinkauf Niederrhein-Westfalen e.G.' will still be responsible for the decision-making on which products to buy, the selection and the enforcement of the acceptance of the tender, the choice of the suppliers, and the establishment of the contracts. These contracts are not tenders; they are directly negotiated contracts with the suppliers.

In order to decide which products should be chosen for contracts, the EKG has build special groups that are called 'Arbeitskreise' (working-groups) in which responsible professional persons from different departments of the hospitals come together with representatives of the industry to discuss the products. If they come to a conclusion, another group, the so-called 'Arbeitsausschuesse' (working-committees) consisting of people in the administration that are in charge of making purchasing decisions, comes together. In this body, it is necessary to reach 75 percent approval of the participants. If the 75 percent are reached, the decision is obligatory for all the hospitals in the purchasing community.

Zentralkrankenhaus Sankt – Jürgen - Strasse, Bremen

Institution background

The 'Zentralkrankenhaus Sankt-Jürgen-Strasse' (ZKH St-Jürgen-Strasse) is a public hospital, located in Bremen, in the northwestern part of Germany. Until recently it has been a customer to a competitor of MHC and only about three months ago MHC managed to 'win' the ZKH St-Jürgen-Strasse back as a large customer. An obligation for this contract was the assurance that MHC would be able to find an e-business solution by 2001. Now, approximately DM 1 million of their total turnover of DM 320 million is in connection with MHC.

The ZKH St-Jürgen-Strasse is a 'maximum care hospital', including 19 medical departments and 6 institutes. They have space for 40.000 stationary patients and 60.000 ambulant patients per year and employ about 400 doctors and 1.400 nurses.

Perception of e-business

The ZKH St-Jürgen-Strasse currently employs the 'wait-and-see' position. They are perfectly aware of the fact that the health care industry is changing and e-business has its many advantages and is the way to proceed in the future. However, they are uncertain about the impact of these changes on the hospital and how exactly they should react. They are not in a hurry to define their e-strategy and develop their e-business thoughts, as they prefer to wait and see what the other hospitals are going to do, which solutions they will find, and how these solutions will work out. The only aspect that they are certain of is that a suitable solution has to offer a SAP/R3 connection.

The hospital itself does not have the necessary equipment yet to participate actively in an e-business solution. At present, they are undergoing an implementation of an internal network (SAP/R3), which will connect the different departments in the hospital. This Intranet is aimed to be up and running by the end of the year 2000. Nevertheless, when an ideal e-business solution is found, the ZKH St-Jürgen-Strasse will be very receptive towards its implementation, such as automatic replenishment system, online ordering, e-invoicing, etc. There are no security concerns with regards to transferring confidential data through the Internet.

Procurement process

The decision on which products to buy is made by a 'procurement commission', which consists of different representatives of the different departments. In this commission, the product features are discussed and compared until they come to an arrangement. This settlement is communicated to the purchasing department, which sets up the frame-contracts with the suppliers. The ZKH St-Jürgen-Strasse has no ongoing tenders and is just operating with the already mentioned frame-contracts.

When the contract is set up, the hospital always keeps a security stock in the store, from which the ordered products are distributed to the departments. The hospital has started to use a so-called 'module-supply'. This 'module-supply' is based on the fact that there are two baskets in the stock and as soon as the first on is empty, it will be taken to the central warehouse of the hospital, filled up

and brought back to the stock of the department. At the time of the discussion the noticing of the empty basket was still done by a person, but from the 1st of November, 2000 the ZKH St-Jürgen-Strasse is intending to use a scanner to recognise the empty basket electronically.

At the moment, orders within the hospital are still made on paper. The nurses have to fill out pre-printed forms, which are sent via the internal post to the purchasing department, which is the only department that has the permission to contact the suppliers, and who forward the orders via a fax-modem to the suppliers.

The implementation of SAP/R3 will open up new possibilities, as the nurses will be able to key in the orders directly into the PC and do not need to do it manually anymore. This is already partially realised and aims to connect all departments and get rid of the paper work by the end of the year 2000.

The ZKH St-Jürgen-Strasse is not interested in an EDI-solution as they consider it as an interlude and prefer to wait for the final solution, which is, in their eyes, the opportunity to order via a portal. When this portal is implemented, the hospital wants to do all business through it, including the invoicing.

The final objective is to offer frame-contracts in form of catalogues on the Net. This means that the nurse would be able to order directly from the supplier from the computers at his/her department, which are linked to the supplier's ERP system. The purchasing department will only have strategic tasks, such as, the set up of the frame-contracts with the suppliers and the updating of the catalogues on the Intranet.

Städtisches Krankenhaus der Landeshauptstadt Kiel

Institution background

The 'Städtische Krankenhaus Kiel' (Städt. KH) was established in 1864 by the 'community of the voluntary friends of the poor'[83] to take care of poor and sick people. Today, it has about 651 beds and is owned by the city of Kiel. It is situated in the city centre of Kiel, the capital city of Schleswig-Holstein in the very north of Germany.

At present, the Städt. KH is not a customer of MHC. This is not because they do not like MHC's products, but rather that they are already satisfied with their present products and see no benefits in changing suppliers.

Perception of e-business

At present, there is no specific person responsible for the e-business development at the Städt. KH. They are starting to think about the topic, both in the administration (which has been recently replaced by a new administration from the 1st of November, 2000) and in the pharmacy, but have not defined a strategy yet. All they have done until now, according to Ph.Dir.Dr.rer.nat. H. Riedel (Dr. Riedel), the pharmacist of the Städt. KH, is search for information about the possibilities the Internet can offer, mainly on special congresses.

The Städt. KH is still in the process of establishing an internal network and the hardware has just been installed. The different departments and theatres will be successively equipped with computers and the nurses will be educated and trained to use them. This process is aimed to be completed by the end 2000 or the beginning of 2001.

Dr. Riedel and Mrs. Schmüsch do not see any problems in making the nurses work with computers. In fact, working with computers is already part of the theatre nurses' daily job, as they have to insert the surgery-data into the computer after every surgery.

[83] 'Gesellschaft freiwilliger Armenfreunde'

However, although the Internet does not play a particular role in the procurement process of the Städt. KH now, Dr. Riedel imagines that it will in the long run.

Procurement process

The decision-making process is very traditional in this hospital. It is rather centralised, as all ordering goes via the pharmacy, and the administration does not tell them what to do or what to order. The pharmacy has the total 'ordering-power' and 'ordering-competence'. Dr. Riedel, gathers his information about the products with help of the sales-representatives from the different suppliers who visit him. At the same time, the doctors and nurses tell Dr Riedel which products they prefer. Dr Riedel structures these demands according to the information he obtains from the sales-representatives.

Within the hospital departments, there are two main ways of ordering. First, the nurses note the products down into a 'pharmacy-book', which is brought down to the pharmacy for Dr. Riedel to sort out the notes. This is a rather chaotic way of forwarding the orders because some orders are noted twice, as they do not check if somebody else has already written it down in an earlier work-shift. This way is also rather inefficient, as some of the handwriting is barely legible or the information provided is completely wrong. Alternatively, orders can be placed by using pre-printed fax-orders. With this method, the nurses just have to tick the products they need and fax the pre-print to Dr Riedel. In both cases, Dr Riedel needs to look through the requests, sort them, and fax the final orders to the suppliers.

The purchases are normally made based upon a pre-determined frame-contract. Tenders are rather rare, and individual agreements are more common. Such individual agreements are reached after a face-to-face discussion and, in some cases, need not necessarily be written down. This way of handling the contacts with the suppliers has the advantage that agreements can be changed easily and quickly, if the situation demands such a drastic act.

At the moment, the actual order is forwarded to the suppliers by fax or phone. So far, the Städt. KH does not use any EDI or Internet based solution.

Uniklinikum Kiel

Institution Background

The Uniklinikum Kiel (Uniklinik) is a university hospital, centrally located in the capital city of Schleswig-Holstein in the very north of Germany.

Unfortunately, the person in the administration we were supposed to talk to fell ill that day, so we were only able to discuss the topic with a theatre head nurse, who did not have the in-depth knowledge about administrative decisions as the other person would have had.

Perception of e-business

Concerning the perception of e-business at the Uniklinik Kiel from the nursing point of view, the idea about e-business is still rather limited. Although they are open-minded, they have not started to think more seriously about the topic. The hospital offers internal computer education; however, the departments are rather poorly equipped with computers. Not everybody has the opportunity to use a computer whenever he or she wants to.

The possibility to search for information is still limited and Mrs Kürschner has her doubts whether it would be suitable to offer the opportunity for everybody to search for information on the Internet, or if this would just unable the people to surf without any limit on not-work-related pages. Besides that, she doubts that the nurses will have the time during day shifts to use the computers, as the schedules are really tight.

Procurement process

At the moment, everything is still done manually in the Uniklinik. Everyday someone checks the stocks and writes down what is missing. The needed products are noted on a sheet of paper and sent over via the internal mail to the purchasing department, which faxes or phones the actual order to the suppliers.

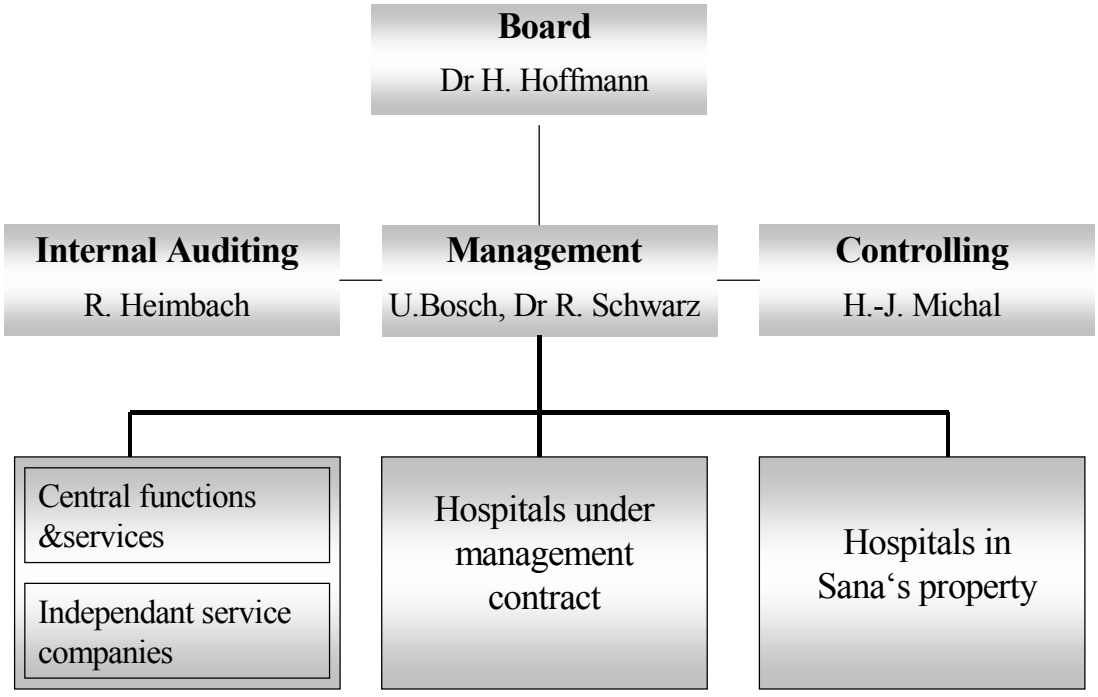
They have already started to implement a new system that is a bit more automated. Instead of writing down which products have to be ordered, the nurse, who checked the stocks, is given a list, containing the bar-codes of all products in the hospital and a scanner to scan them. With this, the physical writing is no longer necessary. This list would be printed out in the purchasing department, and sent back to Mrs. Kürschner for her to double-check in case of errors. After having checked the list, Mrs. Kürschner sends it back again to the purchasing department, who makes the actual order.

Mrs. Kürschner is positive towards the idea of an automatic replenishment system. By implementing this system, the daily check of what is in stock and what is missing would be unnecessary, and time and human resources would be saved.

Sana Hospital Management Group

Institution background

Sana Hospital Management Group (Sana) was founded in 1976 and belongs to a private insurance company with 36 mainly German owners. The core function of Sana is to manage hospitals and provide high quality medical care with a profit orientation. It is also a member of the European Foundation of Quality Management (EFQM).



Source: Sana Kliniken-Gesellschaft mbH, corporate information

There are two types of hospitals that are under Sana's management: firstly, there are Sana-owned hospitals, and secondly, there are management hospitals that are managed by Sana for a specific period of time, e.g. 4-6 years. Sana is responsible for the entire hospital, including the doctors and nurses. All in all, Sana has 51 hospitals[84] under its management throughout Germany, with a total of 25.000 Acute beds. This makes Sana the largest private Acute Care company in Germany, with strong presence in the Northern and Southern regions. It has yet to establish itself in East Germany, although expansion strategies are already seriously under consideration by the top management. However, Sana has no intentions of expanding abroad at this point of time.

Perception of e-business

Generally, the perceptions of the purchasers of e-business are rather positive. Particularly with portals, as they are convinced that an efficient and effective implementation would increase speed and reduce costs significantly. However, the outlook of health care portals is still very vague at the moment, thus Sana is in no rush to make a sound commitment. Despite the many advantages of being a first mover, in this case, Sana is willing to wait for the best e-business solution in the market that fits its organisation.

Procurement Process

Sana has a Central Purchasing Department based in Munich, which is responsible for purchasing all goods for all the 51 hospitals. Mr. Christoph v. Wrisberg is the Head of Purchasing at Sana. In regards to Acute Care products, MHC is quite a small supplier to Sana.

At present, Sana has no e-procurement experience. There is an internal system that allows information sharing and product cataloguing, but not any trading over the Internet yet. The majority of the Material Management System at Sana is inter-linked, but only 20-30% of the users are connected to this system.

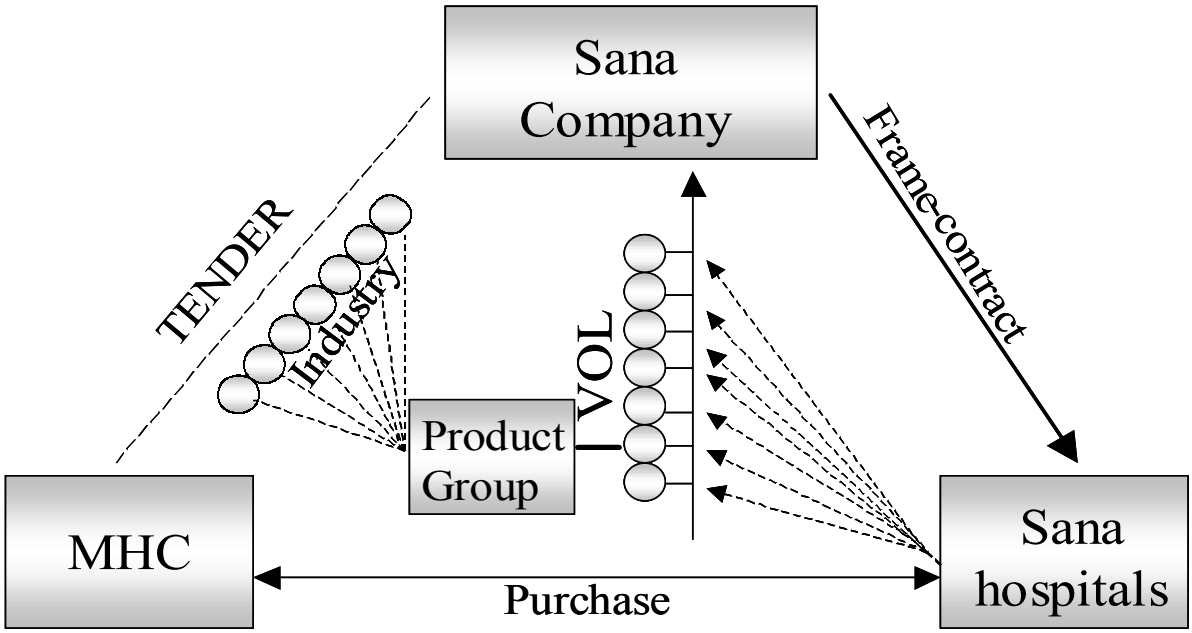
The way contracts are made is rather complicated. The purchases are mainly based on tender contracts, which are discussed between the Sana Company and the industry.

[84] Including the Associated Hospitals (partners only in purchasing), this number would be 75.

The industry gives its product samples to product groups, which consist of members of the VOL[85]-commission. These seven VOL-commissions again involve chosen representatives of 60 of the Sana hospitals, generally staff who are dealing with the product in discussion. They are responsible for defining the product specifications, conducting market researches and, also, testing the products. Mainly, they decide on three important factors, namely quality of the products, service level and price, which products are selected for the tender. The short listed suppliers that are recommended by the group of specialists would then be handed in to the Central Purchasing at the Sana company, who has the final say in decision-making. Based on the discussed tenders, the Sana company formulates frame-contracts for the Sana hospitals, which are mainly valid for 2-3 years.

On the basis of these frame-contracts, the hospitals can do their ordering directly from the supplier, without further involvement of the Sana company.

This process is critical to abide by the regulations set by VOL for all institutions that are run by the state or government, such as hospitals, to ensure the highest quality of products obtained at the best price.



Source: Christoph von Wrisberg, Sana

[85] 'Verdingungsordnung fuer Lieferung und Leistung' (Rules for delivery and service)

It is important to note that the individual hospitals have a decentralised buying behaviour; i.e., they would make their own purchases and keep their inventories independently, although they are bound by the contracts signed by Sana. Therefore, the description of the procurement process, perception of e-business, and the problems in purchasing are only pertaining to Sana's Central Purchasing Department and not to the hospitals themselves.

APPENDIX 4- THE UNITED KINGDOM

General information about the UK[86]

The UK is one of the world's great trading powers and financial centers, and its essentially capitalistic economy ranks among the four largest in Western Europe. The UK has a population of 59 million inhabitants, with a population growth rate of 0,25%. 65% of the population is in the range of 15-64 years of age, with an equal number of inhabitants of both genders. Life expectancy at birth is also rising in the UK to an average age of 77 years (male: 75 years and female: 80 years).

Birth rate: 12.01 births/1,000 population
Death rate: 10.72 deaths/1,000 population
Infant mortality rate: 5.87 deaths/1,000 live births
Total fertility rate: 1.7 children born/woman

St. Peter's Hospital

Institution background

St. Peter's Hospital is situated in Chertsey, Surrey, thirty miles south-west of Central London. This hospital is part of the Ashford and St. Peter's Hospital NHS Trust that had been formed following the merger of Ashford Hospital and St. Peter's Hospital effective 1 April, 1998. St. Peter's has 400 acute beds and mainly serves the population from Woking, Weybridge, Chertsey, Staines, and Walton on Thames. It provides medical and surgical services; as well as, maternity services, A&E, ITU and Orthopaedics.

Procurement process

The purchasing department in St. Peter's is headed by its Procurement Manager, Alyson Brett, who is in charge of the buying process of supplies throughout the hospital.

[86] www.tradeport.org, 1998, 15 October 2000

The Acute Care products that the hospital is currently using are all single-use products. Purchases from MHC include drapes and procedure trays. Sales in 1999 were recorded at £80.000 per annum.

As St. Peter's is such a large customer to MHC in terms of volume, thet MHC's Business Manager in London, Fiona Wallace, presents an index report to the Procurement Manager on a monthly basis. This index report indicates the total amount spent on different product groups and different procedures, as well as the trends of expenditure.

Within St. Peter's, there exists an internal network that is supported by NHSnet. Hospital staff is free to use this intranet for sending and receiving e-mails, but product catalogues and other medical information are yet to be posted on the intranet. Naturally, the system does not allow any trading over the network either.

The purchasers use a procurement system that is linked to the central storage of the hospital. However, the various departments in the hospitals, such as theatre, pharmacy, etc. are not connected. In order to place an order, the respective department would need to complete a Purchase Order form and send it to the purchasing department via fax or internal mail. The purchasers would then key-in the requested orders into the system, and at the same time, send the order to MHC's Customer Service Centre in Waremme via fax, telephone or ordinary mail. To keep track of the inventory level at the central storage, there is personnel who is responsible for checking the inventories manually everyday and placing an order whenever the inventory of any product group drops below a pre-determined level.

For any orders above £100.000, it is compulsory to obtain three written quotations from three different suppliers before an order can be made. If the order exceeds £1.000.000, then a tender must be offered.

Perception of e-business

St. Peter's is very amenable toward the use of computers in general, and e-business in particular. Even the nurses, the group that is expected to show great reluctance to take up administrative tasks and especially using the networks, are extremely positive in this case.

As Mrs. Rosemary Carey, the Clinical Manager, puts it, they would be very pleased to help manage the inventory, make orders, gather information and communicate over the network, if the infrastructure is available. At present, the hospital still has a shortage of computers in the hospital and, therefore, this makes it difficult for the nurses to have access to the network. In addition, the purchasers are not too concerned whether or not the portals are "neutral" or non-profit to the suppliers, as long as the value added from the portals exceeds the costs incurred by the hospital.

Frimley Park Hospital

Institution background

Frimley Park is also one of the NHS Trusts, situated in the Surrey area, on the outskirts of London City.

Procurement process

This hospital uses a mix of single-use and textile Acute Care products. From MHC, its purchases include drapes, gowns, caps and masks with an annual turnover of approximately £80.000 in 1999. Three-year contracts are usually signed for the purchase of these products.

Overall, the internal system pertaining to procurement in Frimley Park is virtually non-existent. Almost all the orders are made manually. There is an acute shortage of computers for the use of hospital staff. Information gathering and procurement efforts are centred on a few responsible persons, but these persons do not have access to the Internet nor any procurement software to work with. As part of the NHSnet, Frimley Park is supposed to be linked to the procurement system and have free access to the Internet, but unfortunately, this is not the case.

Currently, requisitions are made by filling up Purchase Order forms with the description of the product, account code, cost centre and supplier. For any order exceeding £1.000, hospital staff from the respective department is required to fill up the E101 form with similar particulars on the Purchase Order form, and three additional signatures. The first two are authorisations from the Department Head and the Procurement Manager, while the third comes from the Chief Executive Officer or the Finance Director.

For any order exceeding £20.000, it is compulsory to request for three quotations from three different competitors. For high-volume products, like the single-use Acute Care products, standing orders or call-off orders are used. Today, Frimley Park has call-off contracts with 45 suppliers, adding the total up to £0,75 million.

Perception of e-business

All in all, Frimley Park seeks a well-integrated system that provides timely and accurate information for decision-making. The hospital is said to be able to link its system to the NHSnet by the end of October and, thus, have access to a total value-added package that covers the procurement process, bar-coding, logistics, payments, etc. However, it is realised that the rate of change within the hospital will be extremely slow, as it is a public and very traditional institution. Besides, the current system is functioning, although not very efficiently.

Therefore, the Senior Operating Department Practitioner, Tony Glover[87], is more focused on e-business and is trying to develop an efficient system externally with its suppliers. He aspires to cut down the time spent on management issues (such as inventory control and costing) and allow the clinicians to concentrate on their core functions in the Operating Theatres. He is also very receptive towards trading over a portal, as he believes that such marketplaces will be able to drive the prices down and give room for more developments in that field.

[87] Mr. Glover is not a purchaser, but is responsible for looking for suppliers, bundling the orders and evaluating the products used in his department. He sometimes negotiates contracts with salespeople too.

Private Clinic

Institution background

This clinic that we researched is among one of the most prestigious private clinics in London, with about 800 surgeons, who expect to receive the highest quality of inputs and are expected to deliver the highest quality of medical care. As it has been requested by the participants of our discussion to remain anonymous, we shall hereby refer to this clinic merely as "the clinic". Being a private clinic, its patients are not restricted to a particular area like the Trusts, but they originate mainly from London. This clinic is most popular for its neuro-surgery among others things.

Procurement process

The Purchasing and Supplies Department at this clinic is led by a Purchasing Manager and a Supplies Manager, and supported by a Purchasing Assistant. The hospital uses only single-use Acute Care products. The products that are purchased from MHC include drapes, gowns, caps, masks and procedure trays, which added up to £103.000 in 1999. MHC also provides this clinic with an index report, but a less frequent and less detailed one in comparison with St. Peter's Hospital.

At present, the purchasing process within this clinic is still conducted manually. To find a supplier, the Purchasing Assistant needs to browse through a thick catalogue with the names of suppliers and call them up one by one to gather more information about the product specifications, including prices, delivery time, terms and conditions of purchase, etc. Very often, it can take days just to find the right supplier who can provide the clinic with the desired product. The delivery dates can seldom be confirmed, as these suppliers are very dependent on the availability of raw materials and efficiency of the production sites. Meanwhile, the inventory check is done manually on a daily basis.

When making a decision to buy a certain Acute Care product, the purchasers sincerely respect the opinions of the nurses and clinicians. It is true that the purchasers have no right to dictate the nurses and clinicians on their choice of

Acute Care products. However, a very important question is whether the purchase has a high value for the money.

Purchasers would constantly be looking for products that are of similar quality level but at a lower price. Therefore, the buying process in this clinic could be described more as a team effort, consisting of the user groups and the purchasers.

Perception of e-business

This clinic started using EDI not too long ago with two of its major distributors of medical products. To date, they are very pleased with the use of EDI, as it is said to reduce paper work and lead time, thus increasing procurement efficiency on the whole. This EDI initiative indicates the purchasers' strong amenability towards e-business.

However, the main issue that the managers are concerned about is the *source* of the information over the Internet. There is such an information overload, making it extremely difficult for users to filter and obtain the correct information. Particularly within the health care industry, there is very little guidance that is provided to users about *what* can be obtained via Internet and *where* relevant information can be found.

It should also be noted that such strong support for e-business comes only from the middle management team, such as the purchasers. The top management is very conservative and would demand visible and trustworthy evidence of the benefits (which is, unfortunately, not yet available in the health care market) before proceeding with a full-fledged e-business project. Meanwhile, nurses and clinicians are reluctant to use the computers or any sort of electronic media (such as bar-code scanners) because "it is not part of their jobs".

St. Anthony's Hospital

Institution background

St. Anthony's Hospital is a private hospital, which is run by charity with St. Raphael's Hospice right next to it. As it is a private institution, its patients are not limited to a particular geographical area like the Trusts, but are more dispersed. It provides a wider range of medical services, among which orthopaedics and ophthalmics are highly recognised.

Procurement Process

Mrs. Julie Wale, the Purchasing Manager, heads the Purchasing Department in St. Anthony's. This hospital buys its drapes, gowns, equipment drapes and tray wraps from MHC on a contract. The tender system is not used here. The annual turnover is approximately £100.000 in 1999.

Within this hospital, the technological infrastructure available is rather limited. There is only a very basic and isolated computer system that is functioning at present. Every department has a few (and definitely insufficient) computers for professional use and there is no internal e-mail or any other linkages between departments. Information that is posted on the computer system is also very limited; thus, most documents are in paper formats including product catalogues, requisition forms, in-house inventory and invoices to name a few.

Currently, all product requisitions in this hospital are conducted manually. To place an order, the users need to fill in a requisition form with the desired product specifications including prices, and send it manually to the Purchasing Department. The purchasers would then key-in the requisition details into the computer system and fax a Purchase Order to a particular supplier.

Making a decision in purchasing Acute Care products is a team effort between the user group and the purchaser in this hospital. For any new product where a new contract needs to be signed, a product committee would be set up. The clinical choice is often respected in determining the quality of the products needed and a preference of supplier can be expressed. However, the purchaser would then step in to source products with the same quality, but at lower prices.

Perception of e-business

The Purchasing Manager perceives e-business as an important tool to move forward, especially after hearing about the many e-business developments going on at this moment in the global health care market. In fact, the top management has assigned her to design the hospital's e-business strategy, as well.

Generally however, she is rather sceptical about the *implementation* of e-business and the *real* benefits that would result from this development to a relatively small hospital like St. Anthony's. Theoretically, she is well aware of the possible reductions in transaction costs, increased efficiency in procurement processes and, thus, human resource management, cut down of paper work, etc. But, as there are no large players in the industry that have already implemented their e-business strategies and have solid evidence of the benefits boasted, she is more likely to take the wait-and-see approach in this matter. She would constantly observe and study all e-business progress in the industry and judge how they would fit into her organisation. Considering the poor infrastructure that the hospital has at present, one of her responsibilities is also to evaluate the new and advanced IT systems in the market and select one that would enhance both its internal capacities as well as its external potentials in e-business. She will probably not make a quantum leap towards e-business until significant success has been recorded, upon which she could benchmark.

St. George's Hospital

Institution background

St. George's Hospital is one the country's largest NHS Trusts and also has an undergraduate teaching hospital. The Trust provides a comprehensive range of services to its local community in South West London and is a major provider of most specialised services for the majority of referring clinicians in South West London, Surrey and the northern part of West Sussex.

Procurement process

The Purchasing Department in this hospital is managed by its Head of Procurement, Alistair Douglas. Its current contract with MHC includes products such as drapes and tray wraps, with an annual turnover of approximately £150.000 in 1999.

The procurement process in St. George's begins with a meeting of a committee called the Medical Surgical Supplies Equipment (MSSE). This committee consists of the Medical Director, General Manager, Head of Procurement and a co-operative team of clinicians (depending on the products discussed).

MSSE was set up to select one key supplier per product and allow all departments within the hospital to try and evaluate products from the same supplier. This is aimed to overcome the frequent problem where different departments would try and evaluate products from different suppliers, thus bringing about inconsistent and incomparable results. In consequence, they would be able to save costs, have better control of its finances, reduce the number of vendors[88] and also reduce wastage[89] in the hospital.

Within the MSSE, all quotations and bids must meet the specifications outlined by the clinicians. Based on that, the decision is made by selecting the supplier that offers the lowest price, irrespective of clinical preferences. If there is a dispute over clinical preferences versus best price available, the Medical Director has the final say on the matter.

All orders must be placed by filling in a requisition form and approved by the budget holder in the department. The budget holder may be a Head Nurse, Assistant or other key personnel, depending on the department. After approval, it would then be sent to the Procurement Department, which processes the order electronically using the Purchase Order Processing (POP), which generates Purchase Orders, the general ledgers, invoices, etc.

[88] St. George's aim to reduce its number of vendors from 3500 to 350.

[89] St. George's is encouraging its staff to follow the "patient stream", which means that the patient would use the same product throughout the duration in the hospital. So, if a mask is put on a patient when he enters the ambulance, the same mask should be used when he is transferred to the operating theatre and later to the Intensive Care Unit, to reduce the amount of wastage.

At present, St. George's has contracts signed through the hospital trust itself, or through the NHS Purchasing and Supplies Agency.

Perception of e-business

St. George's is among the most "advanced" of the hospitals that we have researched in the UK in terms of e-business developments. Its e-business responsibilities mainly fall onto the shoulder of its Finance Director.

In addition, he is assisted by a team consisting of the Deputy Finance Director, the Head of Procurement, the IT Manager, the Finance Systems Manager, and the Accountant. In accordance with the Government's vision to make the UK one of the most developed nations in terms of e-business, every hospital is directed to have their e-business strategies and a pilot project in place by February 2001. At present, St. George's is using NHSnet merely to generate management reports on issues such as savings, latest product lines and benchmarking. It is their intention to trade over the network soon, but the connections between NHS and suppliers must be established prior to that.

St. George's has been selected as one of the six hospital trusts in the NHS pilot scheme to implement e-procurement, among other e-business initiatives. Its nomination was due to the size of the hospital and its e-business developments to date. However, it remains unclear *in which direction* and *how* the health care industry should proceed with e-business. Now, the hospital is still waiting for the NHS Purchasing and Supplies Agency to select five or six suppliers for this pilot scheme, under the supervision of Eric Jackson, the Associate Director responsible for this whole scheme. The health care scenario in the UK in the next years will highly depend on the development of this pilot scheme.

APPENDIX 5 - ABBREVIATIONS

XML: XML is the *'Extensible Markup Language'* (extensible because it is not a fixed format like HTML). XML is not a single, predefined markup language: it's a metalanguage—a language for describing other languages—which lets you design your own markup. (A predefined markup language like HTML defines a way to describe information in one specific class of documents: XML lets you define your own customized markup languages for different classes of document.) It can do this because it's written in SGML, the international standard metalanguage for markup.[90]

EDI: *Electronic Data Interchange*: EDI is described as the interchange of structured data according to agreed message standards between computer systems through electronic means. Structured data equates with an unambiguous method of presenting the data content of a document, be it an invoice, order or any other document type. The method of ensuring the correct interpretation of the information by the computer system is defined by the standard. Electronic exchange of information in the context of pure EDI effectively means without human intervention.[91]

EP: *Electronic procurement*

ERP: *Enterprise Resource Planning*: ERP is an industry term for the broad set of activities supported by multi-module application software that helps a manufacturer or other business manage the important parts of its business, including product planning, parts purchasing, maintaining inventories, interacting with suppliers, providing customer service, and tracking orders. ERP can also include application modules for the finance and human resources aspects of a business. Typically, an ERP system uses, or is integrated with, a relational database system. The deployment of an ERP system can involve considerable business process analysis, employee retraining, and new work procedures.[92]

ZED: *Zentrum* für *Einkauf* und *Dienstleistungen* im Gesundheitswesen GmbH (Center for Purchase and Service in the Health Care Market)

[90] http://faq.oreillynet.com/XML/TFAQ1.shtm, 29.11.2000
[91] http://www.edi.wales.org/feature4.htm#ABC, 29.11.2000
[92] http://whatis.techtarget.com/WhatIs_Definition_Page/0,4152,213946,00.html, 08.12.2000