

**International Business**  
**Master Thesis No 2000:27**

# ***Electronic commerce***

## **Vapour or Value**

**- implications for industrial marketing  
in the health care industry -**

**Case Company: Getinge Industrier AB**

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## ABSTRACT

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Information technological changes have triggered the growth of electronic commerce technologies that provide companies with opportunities to redefine and/or refine existing business processes. “How will e-commerce change my business?” is a question that puzzles managers around the globe, across every industry.

The main problem of the thesis was to investigate how electronic commerce can complement industrial marketing activities of a multinational company supplying capital equipment to the health care industry. Our case company, Getinge, is an MNC that manufactures and markets infection control equipment to this industry.

We studied the problem from three perspectives: a macro-, micro and first and foremost a customer perspective. We found both drivers and impediments for introducing e-commerce into the marketing mix. The customer (hospitals) is the major impediment due to technical (IT status) and cultural (IT and Internet usage) reasons. Furthermore, product complexity, infrequent purchases and the nature of interactions and exchanges in the buyer-seller relationship are impediments. However, emerging industry actors (“dot-coms”) are providing hospital buyers and suppliers with electronic- procurement and marketing opportunities, which will drive the e-commerce development in the industry.

At present, we believe that electronic commerce, in terms of on-line selling of infection control equipment, is of limited value to Getinge and its customers. Realisation of on-line selling of consumables and less complex products, could although be possible in the near future. Nonetheless, the company could deploy e-commerce solutions for information exchanges in pre-sale and post-sale (marketing) activities. This can range from basic product-service information- and promotion to advanced on-line support.

**Keywords:** E-commerce, e-business, healthcare, capital equipment, industrial marketing, buyer-seller relationships, buying behaviour



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# 1. INTRODUCTION

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*“If you don’t see the Internet as an opportunity, it will be a threat”* (Tony Blair, UK Prime Minister)

## 1.1. Background

### 1.1.1. Thesis topic

#### 1.1.1.1. Industrial marketing and electronic commerce/business

Buying and selling in industrial product markets – between businesses and organisations – involves a complex network of exchanges, transactions and interactions between a vast array of the people involved in the selling and buying process. These episodic exchanges encompass for instance product and service exchanges, information exchanges, financial exchanges and social exchanges. A general assumption is that the relationships between sellers and buyers of industrial products (e.g. capital equipment) are long-term and largely affected by these exchanges.

They are subjected to uncertainties (mental distances) as both sellers and especially buyers are uncertain of what the outcome of these exchanges and interactions will be. Scholars stress the importance of personal contacts to reduce distances and uncertainties, solve problems and exchange information. Industrial companies’ (industrial) marketing have generally integrated a great deal of personal selling and personal contacts and other relationship activities, in order to build trust and reduce the uncertainties to create satisfied and loyal customers<sup>1</sup>.

A new electronic frontier – in general referred to as electronic commerce or electronic business – has created new opportunities for the above mentioned exchanges and interactions between businesses and organisations. Some form of electronic commerce has already touched most global marketplaces such as business-to-business, business-to-consumers, business-to-government and business-to-both suppliers and consumers. In its simplest appearance, e-commerce is merely an electronic business transaction utilising a network. One

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<sup>1</sup> IMP Group (1982)

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such network is the Internet, which many people refer to when mentally conceptualising e-commerce<sup>2</sup>.

Electronic commerce over the Internet is a global phenomenon given the vast spread of the Internet. 60% of all global companies have access to the Internet and an additional 20% are planning to gain access during 2001. Around 46% of all European companies with Internet access are already engaged in electronic business, by using e-commerce utilities and technologies in combination with the Internet. The majority of industries believe that adapting to e-commerce will be important for their particular industry<sup>3</sup>. Either to complement current business activities or to adopt a completely new way of doing business<sup>4</sup>.

Internet based e-commerce is attractive as it can facilitate and improve business activities in business communities comprising actors such as manufacturers, customers, suppliers, distributors, financial institutions, government agencies and transporting companies. The Internet serves as the provider and 'transport vehicle' for mutual exchange of all kinds of electronic information such as order management information, invoices, payment information, shipping information, material specifications, product and service catalogues, supply chain information and so on<sup>5</sup>.

The attractiveness of e-commerce lies in the great potentials to lower costs- and reduce inefficiencies in the supply chain activities. Consequently, this can save time and money allowing companies to allocate more resources to their core- and value-creating business activities. After all, creating value for customers and delivering it to them is essential for any business relationship to exist. The question is whether this value may be created and delivered electronically, deploying information technologies and the Internet.

Like many other companies, our case company wondered where e-commerce is taking their industry and whether the Internet is a possible and desirable marketing and sales channel for transactions and interactions with their customers.

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<sup>2</sup> Fellenstein & Wood (2000)

<sup>3</sup> Fellenstein & Wood (2000)

<sup>4</sup> Timmers (1999)

<sup>5</sup> Fellenstein & Wood (2000)

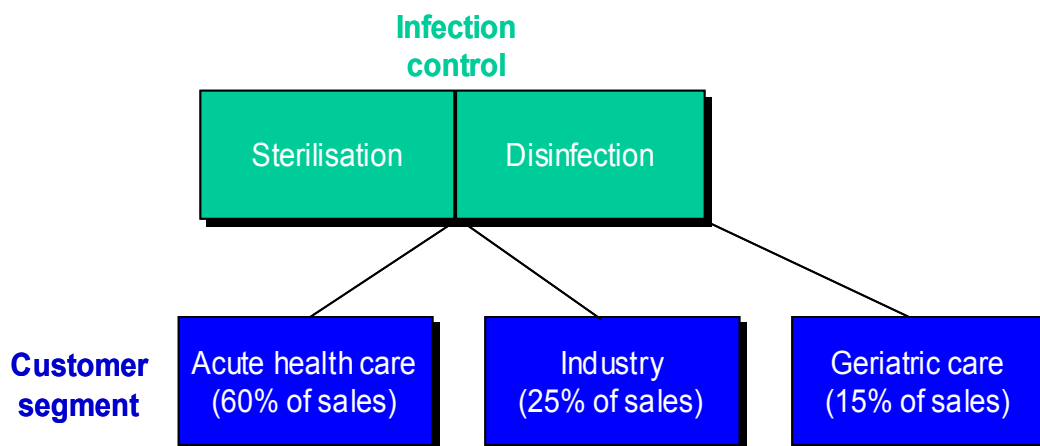
### 1.1.2. The case company - Getinge Industrier AB

Getinge Industrier is a medical-technical group providing complete solutions to its customers in the health care, geriatric care and industry sectors. 95% of the sales go through Getinge's own sales companies and 95% is sold overseas. In total, Getinge is present in over 100 countries, which makes it a multinational company (MNC).

The infection control products are marketed under the Getinge brand name and target three customer segments:

- *Industry*, comprising the pharmaceutical industry, the medical-technical industry, bio-technology and laboratories.
- *Geriatric care*, including hospitals, nursing homes and care of the disabled.
- *Health care*, consisting mainly of acute health care, is the largest customer segment accounting for 60% of the sales in the infection control business area. The major customers are hospitals that buy disinfection and sterilizing equipment for areas such as operating departments, hospital wards and central sterilization service departments (CSSD).

**Figure 1 Getinge's product and customer segments**



*Source: Getinge annual report (1999)*

In the infection control business area, Getinge sells mainly steam sterilizers (autoclaves) and disinfectors (mainly washer disinfectors and flusher disinfectors). This capital equipment is technically complex, costly for the

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customers to acquire and must meet strict requirements in terms of standards, performance requirements and safety requirements<sup>6</sup>.

Being able to offer maintenance and services (e.g. training staff in a sterilisation centre) is becoming an increasingly important part of sales in the health care sector. Servicing and spare parts continue to add up to a rising proportion of sales and the growth rate is over 10%.

Besides the core product and related spare parts and service, the company also supplies a control system, T-DOC, consisting of both hardware and software, to which the infection control equipment are connected in order to trace the disinfection and sterilization processes. As the requirements are getting stricter to document the infection control process, the T-DOC system is growing in importance. This system may also be remotely supported and controlled by support personnel, to assist users of the equipment and the T-DOC system. They have the complete process displayed on a computer screen where possible problems during the process may be traced.

Getinge, as well as many other multi-national companies, is of course eager to gain knowledge of where e-commerce is taking the health care industry, what the customers' values and beliefs are, what marketing opportunities that new on-line intermediaries offer and whether the Internet is a sustainable marketing- and sales channel. Thus, taking this into account, the company seeks answers to *if* and *how* the Internet may enhance or complement current marketing activities.

### ***1.1.3. Research background***

Research on industrial marketing has, as mentioned above, focused on supplier-buyer relationships in terms of the various exchanges taking place between the parties over time. In addition, researchers studying marketing of industrial products and equipment often emphasise the importance of having a thorough understanding of buying behaviour, upon which to predict buying decisions and develop suitable marketing strategies. Organisational buying behaviour is different from consumer buying behaviour as organisational buying is a complex process that involves several people in the buying decision process

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<sup>6</sup> Getinge Annual Report (1999)



and is affected by macro- and micro environmental factors and actors outside the organisation<sup>7</sup>.

One such macro-factor that affects buyers as well as sellers is the technological change in terms of information technology that have triggered the growth of e-commerce technologies. Business-to-business (B2B) e-commerce is expected to exceed \$3.4 trillion by 2003<sup>8</sup> resulting in a significant number of organisations that will rethink and redesign their core business activities and integrate e-commerce solutions in their 'new' business models. For instance, buyers may procure products electronically and sellers may market and sell products on-line.

It is not surprising that companies with digital products (e.g. software, music etc.) were among the first to fully exploit the opportunities of e-commerce. The reason being that the whole value chain can be "e-commercialised", that is the product can be marketed, sold, distributed, paid for and serviced electronically, over the Internet.

It is therefore not surprising that very few industrial companies supplying industrial products such as capital equipment, have introduced similar solutions. Industrial companies can gain other types of benefits from e-commerce, such as being able to support users of highly complex equipment on-line.

The development of information technologies and electronic commerce technologies has resulted in new actors and re-intermediations, in the microenvironment. Portals or on-line marketplaces ("dot-coms") have emerged or 're-intermediated' to act as electronic intermediaries to create value for both suppliers and buyers. These companies will affect both buyers and suppliers in the market as they offer new business opportunities for the parties that affect the current relationship. In the health care industry, the growth of these actors is significant.

The main focus of most companies is on the customers. Creating value and delivering it to customers has grown in importance along with the growth of Internet and Internet commerce. Creating value efficiently and effectively and

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<sup>7</sup> Webster & Wind (1972)

<sup>8</sup> Fellenstein & Wood (2000)

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sharing it with customers to gain mutual benefits, are the essential goals and values of any relationship. Interesting questions for companies are *if* and *how* these value creating business activities, wholly or partly, may be conducted electronically, using e-commerce technologies and the Internet.

For example, many companies are today looking into whether they should sell their products on-line and how to do it. In addition, close to the sale of the actual physical product are other value creating activities such as service, training and support. Therefore, companies are wondering if the quality of these value adding activities will improve, if costs may be lowered, and if customer satisfaction and customer-perceived value will increase by complementing these activities with e-business solutions.

Industries and companies now realise that developing electronic business solutions in the transactions, interactions and relationships with customers, may enhance their marketing activities, the value for the customers and consequently the quality of customer relationships.

We have found that little research has been conducted in the areas combining electronic commerce and industrial marketing of capital equipment, which is why we have developed the following problem statement:

#### 1.1.4. Problem statement

**How can electronic commerce complement industrial marketing activities of a multi-national company supplying capital equipment to the health care industry<sup>9</sup>?**

#### 1.1.5. Research problems and areas of investigation

- 1. How will factors in the macro-environment, in terms of information-technological changes and legal changes, affect buying and marketing behaviour?**

We have pre-identified two macro factors that we will study. Firstly, and for obvious reasons, technological changes in terms of *information technology and electronic commerce*. Secondly, legal changes such as emerging pan-European *standards* for infection control equipment.

- 2. How do key actors in the industry micro-environment conduct electronic commerce activities and how will they affect buying and marketing behaviour?**

We believe that the most important trends and actors to study are actors in the general health care industry environment such as hospitals and suppliers, emerging actors (Internet portals/dot-coms) and competitors in the immediate industry environment consisting of manufacturers and suppliers of infection control equipment.

- 3. What does the customer buying process look like and how will it change?**

The focus of the study is on the customer environment; the interactions and exchanges in the process, the various actors involved, their respective needs and wants, the factors contributing to the customers' perceived value and their view of future changes in the buying process.

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<sup>9</sup> We define the health care industry as hospitals, their suppliers and intermediaries.

To answer the main problem, we will take into consideration the three research questions, tie them together, analyse and suggest potential solutions on how to market infection control equipment in a new or changed business environment. Marketing, in our case, includes selling and after sales service activities.

#### ***1.1.6. Purpose***

The purpose of the thesis is threefold – descriptive, explanatory and to a certain extent prescriptive. By conducting a theoretical and empirical study, we aim to describe and explain the effects and the potentials of electronic commerce for marketers of equipment to the health care industry. The focus of the study is on the European health care industry, and on hospitals in Sweden and the United Kingdom. Moreover, the thesis will provide our case company with possible answers and solutions on how to respond to the challenges of electronic commerce, and how the company may use it to improve and reinforce its relationships with the customers. Finally, we aim to develop new theory combining electronic commerce with industrial marketing theory.

#### ***1.1.7. Delimitations***

- *Product segment delimitations:* The Getinge group is engaged in the two-business areas infection control and geriatrics. We will exclude geriatrics and focus our study on the infection control business area, in which the company sells infection control equipment (sterilizers and disinfectors).
- *Customer segment delimitations:* We will study the main customer segment, which is ‘acute health care’ where most customers are hospitals. Moreover, we are focusing on the company’s current customers in this segment.
- As we will focus on current customers, our main focus is forward facing, that is, we study the pre-sale, sale and after sale processes, in which electronic business solutions may be implemented. We will therefore exclude backward facing business activities (the case company’s relationships with its suppliers) in which electronic business solutions also may be implemented.
- *Geographical delimitations:* Getinge is present in over 100 countries. The countries that we are going to focus on in our study are Sweden and

the UK. Sweden is an appropriate market to study as it may serve as a test market for new marketing initiatives. UK is one of the company's largest markets.

- Our research is a case study and limited to one case company

## 2. THEORETICAL FRAMEWORK

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### 2.1. Industrial marketing

#### 2.1.1. *Supplier-buyer relationships (Interactions and exchanges)*

Theories on industrial marketing and purchasing in industrial product markets most often emphasise relationship theory comprising various exchange processes, transactions and interactions (Håkansson & Wootz, 1979; IMP Group, 1982; Cunningham & Homse, 1986; Han, Wilson & Dant, 1993; Ford, 1998; Tanner Jr., 1999). The interaction model developed by the IMP Group (1982, p. 8) implies that the marketing and purchasing of industrial products (e.g. a machine) can be seen as an interaction process between the supplier and the buyer. This interaction model focuses on the interactions and exchanges in buyer-seller relationships. It also touches upon the participants in the interaction process, the interaction process environment and the atmosphere that affect the interactions.

The authors' general assumption is that the relationships between seller and buyers of industrial products (e.g. capital equipment) are long term. They do, however, distinguish between short term "episodes" in a relationship (e.g. placing or delivery of order) and the longer-term aspects of a relationship, which are affected by these episodes. They divide the episodes into four elements of exchanges:

1. Product or service exchanges are the key exchanges between sellers and buyers and will have a significant impact on the relationship, depending on how the product or service is able to satisfy the needs and wants of the buyer. The IMP Group argues that this will depend on the ease of identifying these needs and for which the characteristics of this product and service are easy to specify.
2. Information exchanges relate to the *content* of the information, the *formality* of the information, the *width and depth* of the information and the *way* the information is transferred between the buyers and sellers. Content refers to what kind of information (e.g. technical or economic questions) is exchanged. The formality of the information exchange is to what degree formality or informality dominates the exchange. The width and depth refers to the information width (e.g. the number of questions

exchanged, such as technical, organisational, economic, etc.) and the information depth in the questions (e.g. a thorough technical specification). This information can be transferred *personally* or *impersonally*. The authors argue that impersonal means of transferring information suitable for basic technical and commercial data, and personal means (e.g. personal contacts) is more appropriate for transferring “soft data” such as information on how to use a product, the conditions regarding an agreement, or supportive and general information about the parties.

3. Financial exchanges concern the money exchanges and transfers. The amount of money involved in the exchange indicates the economic importance of the relationship.
4. Social exchanges occur to reduce uncertainties and distances between seller and buyers, which is important to maintain long-term, mutually beneficial relationships. Cunningham & Homse (1986), based on Ford (1984), highlight social distances, technological distances, cultural distances and geographical distances as important to consider and reduce to develop a sustained relationship. The IMP Group (1982, p. 10), do not mention any examples of social exchanges and practical ways to reduce uncertainties and distances, although they state that lack of information is a major source of uncertainty. The authors also argue that building trust is a way to reduce uncertainties, which is dependent on how well the execution of the abovementioned interactions and exchanges has been.

### **2.1.2. Personal contacts**

Cunningham & Homse (1986, p. 257) strongly stress the importance of personal contacts to reduce distances, uncertainties, solving problems and exchanging information. These reductions evolve as personal contacts change from a mere salesman-buyer contact to a “multi-functional network” of inter-organisational contacts. In a long-term relationship, the authors argue that several functions of the companies are involved in a relationship that is characterised by interdependence, experience, high resource commitment, adaptations and reciprocal information exchanges. This is likely as a ‘buyer’ is often only one person of many in the purchasing decision making unit/the

buying centre (Webster & Wind, 1972) and as selling industrial products not only includes a sales function but also a service and support function. Contact patterns between buyers and sellers thus evolve to include individuals that operate in different functional departments. The exchange and communication of information contain different messages (e.g. technical or commercial information, etc.) and the way to exchange the information depends on the content and the people involved (IMP Group, 1982).

According to the authors, the social- and information exchanges will, and should, also continue until the next product/service- and financial exchange takes place.

### ***2.1.3. Adaptation***

An important issue considered by Håkansson & Wootz, (1979, p. 31) and the IMP Group (1982, p. 10-11) concerns the adaptations that either a supplier or buyer may make in the exchange processes during the relationship. Adaptations may occur in the exchange of product or service, in information routines, in financial arrangements and in the social exchanges. This often occurs if the sellers and buyers see value in cost reductions or increased revenues. Manipulating with adaptation such as modifying products, services, delivery, pricing, information routines and the organisation itself are important parts of the sellers marketing strategy. The buyers will also adapt to own product and service requirements, price acceptance and information needs.

### ***2.1.4. After sales service and the service concept***

*Differentiation is the ability to provide unique and superior value to the buyer in terms of product quality, special features or after sales service” (Porter, 1980)*

As the quote implies, a relationship does not end after exchanging a product. The relationship continues after the purchase in service and after sales service process, which is an important feature in a company’s marketing. Furthermore, provided that this process is managed successfully and adapted to meet the demands of the customers, it is a good way to differentiate from competition.

Wilson, Boström & Lundin (1999, p. 386) identified, in a study of an international firm supplying capital equipment, six *post-sale/after sales service*



*activities*: installation, training/education, routine maintenance, emergency repair, parts supply and software services. Moreover, this company had developed technical brochures, operating instructions, videos, etc., translated into a number of languages for its international markets. These are a few practical examples of different after sales service activities.

#### **2.1.5. The extended marketing mix**

*“Marketing is the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods and services to create exchanges that satisfy individual and organisational objectives”.* (The American Marketing Association, 1985)

Marketing plans and strategies are often structured around the 4 Ps; product, price, place and promotion, also described as the strategic variables of the marketing mix (McCarthy, 1964). Each marketing tool or component does in itself consist of a mix. For instance a product mix (e.g. product line, size, function), a price mix (e.g. discounts, price options), a promotion mix (e.g. communication, advertising, personal selling, sales force, direct marketing) and a place/distribution mix (e.g. direct selling, intermediaries, location) and so on.

Every organisation also delivers some degree of service as part of the total offer (Mudie & Cottam, 1999, p. 3).

Special for services is that they are to a large extent intangible in that they often cannot be seen, tasted, felt, heard or smelled before, during and after they are bought. This means that the customer is uncertain about the service and is unable to perceive the value it will create (Mudie & Cottam, 1999, p. 6). Lovelock (1996) classifies services according to *whom* or *to what* they are targeted and the intangible and tangible nature of the service. “Tangible actions directed at goods and other physical possession” could include repair and maintenance of industrial equipment and “intangible actions directed at people’s minds could be education. Other *tangible elements* of a service package are the items that form part of the service process such as technology (e.g. computers) (Mudie & Cottam, 1999, p. 11). The authors highlight the importance of defining products or services of customer benefits rather than

### *Theoretical framework*

technical features. Communicating and proving these benefits will reduce the customers' uncertainty around the service.

According to Mudie & Cottam (p. 45-46, 109-110), an important part in the design of a service is the balancing act between *technology and people* and the *customer contact and service encounter*. A company must thus ask itself how technology will apply to the work of service employees as well as for the customer usage of the service. The authors divide the service encounter into:

- The remote encounter where customers interact with the service for instance through a machine such as a computer terminal or through mail and mail order. Machines, e.g. a computer interface must then be user friendly to satisfy the user of the service.
- The indirect personal encounter where customers interact with a service by telephone.
- The direct personal encounter face-to-face with the service personnel.

An obvious task for marketers of the service is to analyse which service exchanges (standardised or customised) are most suitable for the specific service encounters and whether these are according to the needs and wants of the customers.

## **2.2. Organizational buying behaviour**

Theorists studying the marketing of industrial equipment and equipment used by businesses and other organisations, have often emphasised the importance of having a thorough understanding of organisational (business or institutional) buying behaviour, upon which to predict buying decisions and develop suitable marketing strategies (Webster & Wind, 1972; Laczniak, 1979; Doyle, Woodside & Michell, 1979; Mattson & Sangari, 1993; Tanner Jr., 1999). These models on organisational buying behaviour intend to serve as a general framework for the implementation of empirical organisational buying research (Laczniak, 1979, p. 57).

*Institutional buying* and government markets, including hospitals, are characterised as non-profit seeking organisations with tight budgets. They typically require suppliers to submit bids, where an initial evaluation focus is on the lowest bidder. They normally buy on a negotiated contract basis.

According to Kotler (1997), government organisations tend to favour incumbent suppliers over foreign suppliers, especially in Europe. The European Community is trying to remove this bias. Due to government paperwork requirements, bids and proposals tend to become very lengthy and time-consuming to prepare. Many American firms tend to anticipate government needs and participate in the product specification phase, as part of their marketing efforts.

Webster & Wind (1972) developed perhaps the most comprehensive, full-scale model of organisational buying behaviour that provides a cohesive picture of factors inside and outside an organisation that will affect buying decisions. Laczniak (1979) used this model to conduct empirical research to describe and analyse how American hospitals purchase medical equipment. However, the study focused only one part of the model – the participants in the buying decision making unit or the “buying centre” – which provides little insight into other environmental factors affecting buying behaviour. Furthermore, albeit published in the *Journal of Industrial Marketing Management*, the stated implications for marketing of hospital equipment are scarce.

Webster & Wind (1972) argue that theory regarding buying behaviour have mainly been based on research on consumer behaviour. The authors distinguish between the organisational buying process and the consumer buying process, as organisational buying (industrial and institutional):

- is a complex process taking place in a context of a formal organisation influenced by budget and cost considerations
- involves several people in the buying decision process resulting in a complex set of interactions between individual people with different goals, values and decision criteria
- is affected macro- and micro environmental factors and institutions outside the organisation

Webster & Wind also emphasise that using this model as a base for analysing environmental factors affecting buying behaviour, would help the marketing strategist in analysing information about the market and in specifying the targets for marketing efforts and decisions. This is especially important if a company’s markets are multinational (p. 14). Moreover, a model would help to

identify the information needed and preferred by buying decision makers and the criteria that they value and use to make these decisions. As this is a general model with consequent limitations and weaknesses, as admitted by the authors themselves, the marketing implications of the model are however somewhat vague and implicit. The Webster & Wind model (hereinafter referred to as the WWM model) is illustrated in the appendix and explained below.

### ***2.2.1. Explanation of the WWM model***

#### *2.2.1.1. The buying environment (environmental influences)*

Albeit difficult to identify and measure, environmental factors provide both constraints and opportunities. The environment includes both environmental factors such as technological, economic, political, legal, physical and cultural factors, as well as a number of institutions such as suppliers, customers, competitors, professional groups and governments. The authors states that these institutions will vary between countries, which is critical knowledge for planning multinational marketing strategies.

Thus, environmental factors determine the availability of goods and services, the business conditions, information to the buyers about available suppliers (marketing communications) and goals and values. The impact of technological change, according to Webster & Wind, must be considered as the basis for strategic decisions regarding product policy and promotions.

#### *2.2.1.2. The buying organisation (organisational influences)*

The organisational climate is described as the physical, technological, economic and cultural climate within the buying organisation comprising organisational technology relevant for purchasing, organisational structure (the buying center and the purchasing function), organisational goals and tasks (buying tasks), and the organisational actors (members of the buying center). Technology defines both what is bought and how it is bought:

*“...technology defines the management and information systems that are involved in the buying decision process, such as computers... (Webster & Wind, 1972, p. 17)*

The buying decision process or the buying tasks are divided into:

1. The identification of a need
2. The establishment of specifications
3. The identification of alternatives
4. The evaluation of alternatives
5. The selection of supplier

The authors mean that marketing strategies should be adjusted according to the various members participating in these buying tasks, to the different decision criteria and to the fact that different information sources may become more or less relevant, in order to influence the members in an appropriate way.

#### *2.2.1.3. The buying centre (interpersonal influences)*

The buying centre consists of all individuals who have authority or responsibility for purchase decisions, including their roles in the decision process. These individuals may include:

- Buyers are those having the formal authority to arrange the final purchase and contracting with suppliers
- Users are individuals that will use the purchased products and services and will most certainly have some influence in the decision.
- Influencers are those in the buying organisation that are in the position to modify a purchase decision, by providing information and criteria for the evaluation of alternative buying actions
- The deciders are individuals in a position to choose among alternative buying actions because of professional or financial control (Leczniak, 1979, p. 59).
- Gatekeepers are individuals that control the flow of vital information about a product considered for a purchase.

It is important to note that several individuals may have the same role and that one individual may have several roles. From a marketer or salesman's point of view, the authors argue that it is important to determine what the members expect in terms of information, behaviour, personal contacts and other exchanges.

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Furthermore, Webster & Wind (p. 19) argue that the members' buying decision and criteria are affected by *task-* and *non-task variables*. Task related motives and consequent task-related interactions refer to the specific buying problem to be solved (e.g. right quality, right price, right delivery time, right suppliers). This may differ between the members of the buying center. Non-task related motives and consequent non-task related interactions are related to risk-reduction. The individuals' perception of risk refers to the uncertainty of value of various outcomes when buying a product or service. According to the authors, lack of information is the major source of uncertainty, which implies that providing the right information to the right members is of utmost importance to reduce the uncertainty of members in the buying center.

#### **2.2.2. Marketing implications**

More recent research on the buying centre shows that the buying process is a multi-person process and that there is often a complex, and over time changing structure of the buying centre (Ghingold & Wilson, 1998). A study by Woodside, Liukko & Vuori (1999) argues that buying capital equipment involves persons across several authority levels with different needs and values. Ghingold & Wilson (1998, p. 96) suggest that one marketing implication is that person-specific communications must be tailored to each member of the buying center. Communicating generic messages is of limited use since the individual members perceive the purchase situation and the purchase criteria differently. They state that:

*“Effective business marketing often hinges on identifying key buying center members, determining their concerns and needs, and then crafting solutions for individual buying center members that meet their needs, fulfil buying requirements and minimize perceived risk...// Proactive marketing is clearly required. The earlier the marketer is able to approximate buying center composition and buying process status, the greater the opportunity to reach participants, influencers and decision makers before product specifications or other drivers of vendor choice are firmly established. If this opportunity is missed, so too may be*

*the marketer's chances for success.* (Ghingold & Wilson, 1998, p. 103)

The authors suggest an approach that they name “dynamic marketing” (p. 104). Dynamic marketing means adapting marketing activities to changes in buying center membership and structure. The approach is highly individualistic in its communications strategies, and process-oriented. Nonetheless, it places significant responsibilities on sales team members, field service/engineering, customer service/order processing, marketers in general, and anyone with customer contact opportunities. They stress that the advantages from this approach are that as customers gain confidence in the supplier's enhanced understanding of, and responsiveness to, the customer's needs, which creates high-perceived switching costs to vendors who do not know the buying firm as well. This will result in enhanced customer commitment, long-term relationships and customer loyalty.

## **2.3. Relationship management**

### ***2.3.1. The concept of value***

#### *2.3.1.1. Perceived value*

Marketing is facing a new paradigm, relationship marketing (Grönroos, 1994). The idea is to create customer loyalty so that a stable, mutually profitable and long-term relationship is enhanced. Value is considered to be an important constituent of relationship marketing and the ability of a company to provide superior value to its customers is regarded as one of the most successful competitive strategies (Ravald & Grönroos, 1996, p. 19). If there were no value involved for the parties involved in a relationship or a transaction, there would probably not be any incentives to engage in relationships or business transactions. For any practitioner or companies that want to succeed, gain and sustain a competitive advantage, they must design and align its business functions- and activities to create value - for itself, its customers and other stakeholders.

Customer-perceived value is in some literature (Ravald & Grönroos, 1996, p. 21; Lapierre, 2000) mentioned as the ratio between the customer-perceived benefits and customer-perceived sacrifice (see figure below). The perceived

benefits are some combination of physical attributes, service attributes and technical support available in relation to the particular use of the product, as well as the purchase price and other indicators of perceived quality. The perceived sacrifice includes all the costs the buyer faces when making a purchase: purchase price, acquisition costs, transportation, installation, order handling, repairs and maintenance, risk of failure or poor performance.

## **Figure 2 Customer perceived value**

$$\text{Customer-perceived value} = \frac{\text{Perceived benefits}}{\text{Perceived sacrifice}}$$

*Source: Ravalid & Grönroos (1996)*

This is useful as it gives a company two options to improve perceived value. Either by reducing the customer-perceived sacrifice or increasing/improving the perceived benefits for instance by continuously providing more benefits (e.g. adding services in the offer).

The latter may be costly and possibly an inappropriate approach in order to establish and maintain stable long-term relationships with the customers. If the company decides to provide value in terms of a reduction of the customer's perceived sacrifice, so that the relationship costs are minimised and customer performance improved, the chances of becoming successful are more evident.

Customer sacrifice in terms of costs may include indirect and psychological supplier relationship costs. Indirect costs arise from for example delayed delivery. Psychological costs are the cognitive effort, the need to worry about whether a supplier will fulfil its promises. If a company emphasises quality and service rather than the lowest possible price, the company should seek to reduce the customer-perceived sacrifice by focusing on other components than purchase price reductions. Rather, the minimisation of indirect and psychological costs should be the focus. If value is delivered continuously for example by a stable delivery and service, it is likely that these costs will be lowered which will lead to mutual benefits.



### 2.3.1.2. Value criteria and value drivers

To be a useful concept for companies, they need to understand how to create and deliver value to customers. It is therefore essential to determine the needs and wants of customers in terms of value criteria and what processes or activities are creating, delivering or driving this value (Walters & Lancaster, 1999). Walters & Lancaster (1999) suggested the following model:

**Figure 3 Customer value criteria and value drivers**

Customer value criteria and performance	Customer value drivers
High levels of customer satisfaction derived from offering:	
<ul style="list-style-type: none"> <li>❖ Security               <ul style="list-style-type: none"> <li>- brand strength</li> <li>- service/warranty</li> </ul> </li> <li>❖ Performance               <ul style="list-style-type: none"> <li>- choice, quality etc.</li> <li>- cost/effectiveness</li> </ul> </li> <li>❖ Aesthetics               <ul style="list-style-type: none"> <li>- style/design</li> <li>- conformity</li> </ul> </li> <li>❖ Convenience               <ul style="list-style-type: none"> <li>- location</li> <li>- time</li> </ul> </li> <li>❖ Economy               <ul style="list-style-type: none"> <li>- relative price levels (with competition)</li> <li>- relevant price/relevant value drivers</li> </ul> </li> <li>❖ Reliability               <ul style="list-style-type: none"> <li>- consistency of attributes</li> <li>- continuity of benefits and costs</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>❖ Corporate/Product brand characteristics</li> <li>❖ Research, design and development</li> <li>❖ Customer services</li> <li>❖ Customer response effectiveness</li> <li>❖ Manufacturing and logistics facilities: matched with customer value criteria/cost and volume objectives               <ul style="list-style-type: none"> <li>- product quality</li> <li>- choice</li> <li>- order management</li> <li>- inventory availability</li> <li>- delivery frequency and reliability</li> <li>- Supply chain management: relationships and transactions</li> </ul> </li> <li>❖ Margins management</li> <li>❖ Systems: relevance and management</li> </ul>

*Source: Walters & Lancaster (1999, p. 700)*

Customers consider these criteria to be the reasons behind a purchase as they enhance the value of the customers' outputs. Security, convenience, performance, economy, aesthetics and reliability are some of them that add value to a product and service and for which customers are willing to pay. The combination of these value criteria must be reflected in the company's product and service offers – the physical product range, high quality, delivery, installation, maintenance and financial solutions - tailored to the specific customers.

Hence, the value criteria form the basis for the identification and management of the response or action (e.g. value creation) to these criteria – the value

drivers. Service performance for example, as it is both a customer value criterion and value driver, could be conceptualised as comprising both a technical (“what” is delivered) and a functional quality (“how” the service is delivered during the service encounter) (Patterson & Spreng, 1997, p. 419; Grönroos, 1984). Thus, the customer value criteria require the management of customer value drivers such as customer response and support. Moreover, it is important to realise that value criteria and value drivers differ between individual customers and markets (Ravald & Grönroos, 1996).

### ***2.3.2. Customisation vs. standardisation***

Gordon (1998, p. 176) argues that customisation is often confused with personalisation. Rather, customisation is the process of the company or the customer or both, to develop a product, service or communications that reflect the value of customer needs and wants. Companies face three options of customisation (p. 225):

1. Standardised product, standardised service, customised communication
2. Standardised product, customised service, customised communication
3. Customised product, customised service, customised communication

As the degree of customisation increases, so does the cost of providing these options. Customised communications means tailoring messages to various customers and investment in technology should enable this customisation of the communication process (Gordon, 1998).

Firms managing a high level of inflexible capital assets may not easily be able to customise products, but can instead add value to the product by customising service and communication. The differentiation advantage will not be created by technology itself, but rather by “the commitment to the use of innovative, customer-specific processes and then aligning the organization and its people to deploy the technology” (Gordon, 1998, p. 228). Gordon (1998) argues that although customising all three options is costly, this solution creates the best customer value at all stages of value creation, resulting in the closest customer relationships possible.

### **2.3.3. Differentiation**

To distinguish the company's offer from that of competitors, Kotler (1997, p. 282), there is a need to design "a set of meaningful differences" with regard to the product, the services, the personnel, the channel (place) and the image. The opportunity of which differentiation factors to choose depends largely on the type of industry.

*Product differentiation* can be achieved on variables such as *features* that are supplementing the basic function of a product. A company must however decide whether to offer feature customisation to customers at a higher cost or to standardise the offer at a lower cost. Other variables of differentiation include *reliability*, *repairability* (ease of repair), *durability*, and *performance* quality.

*Services differentiation* is related to ease-of-ordering, delivery, installation, customer training, customer consulting, maintenance and repair and warranty contracts that are better than competitors'.

*Personnel differentiation* concerns the competence, credibility, reliability, responsiveness and communication of the company staff.

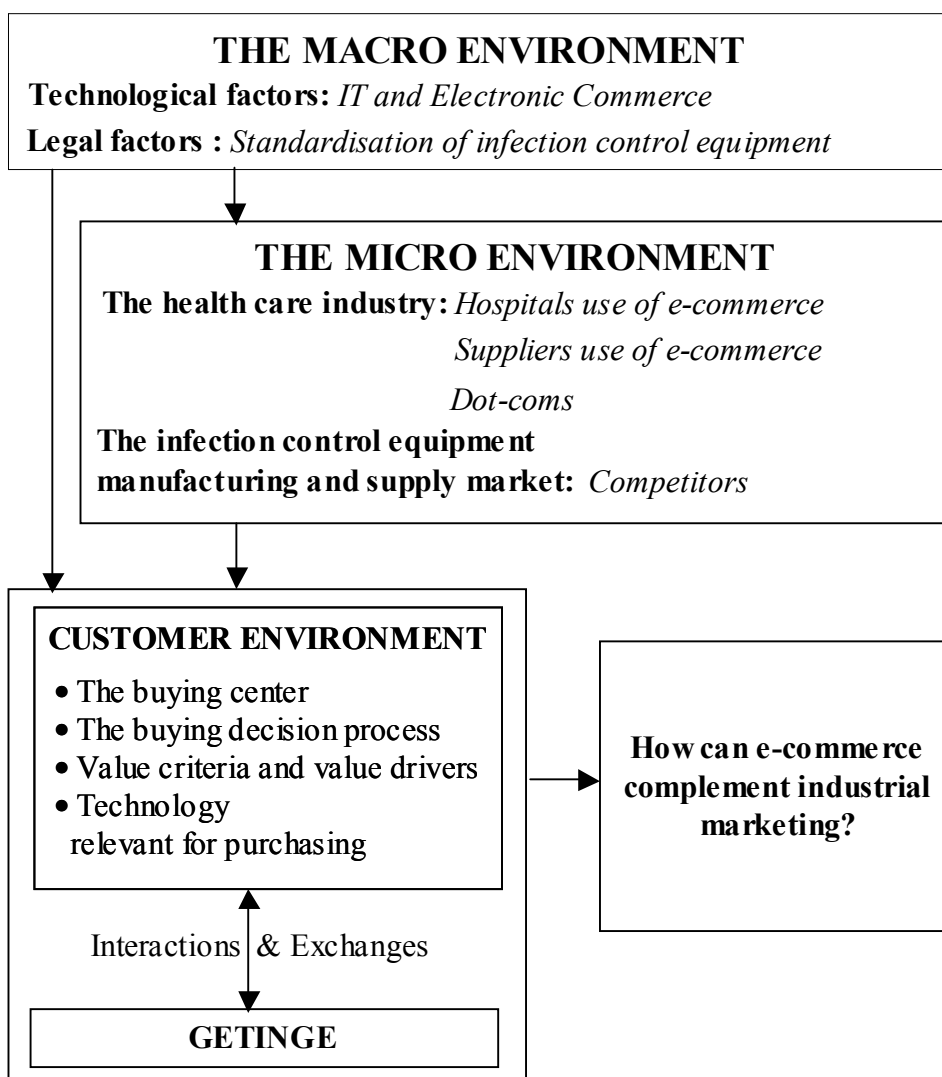
*Channel differentiation* refers to the ways a company chooses to sell (distributes) its products. For example, adding the Internet as an on-line sales channel to complement existing marketing- and sales channels, is a way to differentiate from competitors.

*Image differentiation* refers to distinguishing a brand identity and communicating it to create a favourable image as perceived by the customers.

## 2.4. Research model

The model illustrated below will form the general framework for our study of factors and actors in the macro-, micro and customer environments. Besides analysing customer buying behaviour/decisions, this refinement of the Webster & Wind model also incorporates the seller, whose marketing decisions directly or indirectly – now or in the future – will be affected by these pre-determined factors and actors.

Figure 4 Research model



(Own modified model)

## 3. METHODOLOGY

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### 3.1. Research design

#### 3.1.1. *Qualitative research*

The general assumption behind using a qualitative research approach is that the researcher aims to develop an understanding of situations taking part in a specific context or setting and the interactions within that setting. Characteristics of qualitative research are the goals of the study (understanding, description, discovery, meaning), the design of the study (flexible and evolving), the sample (small, non-random and serving the purpose), the data collection (researchers' interviews and documents) and the findings that tend to be holistic and richly descriptive (Merriam, 1998, p. 9).

In order to answer the main problem, the main aim of our empirical study was to develop a cohesive understanding and meaning of the situations and interactions in the context of organisational buying behaviour and buyer-seller exchanges and interactions. As we were interested to understand “this phenomenon of interest” (Merriam, 1998, p. 6) from our respondents' various perspectives, a qualitative research design seemed to serve our research purpose the best. Also, some of the pre-determined interview questions were to serve as a base for discussion, rather than getting short answers, to get the in-depth understanding we desired. As a consequence, the sample would have to have a limited size (e.g. number of hospitals, number of countries) but a wide array of people in the specific context in order to develop a cohesive, yet in-depth understanding of factors and actors affecting organisational buying behaviour. As Merriam (1998, p. 6) argues, qualitative research, as opposed to quantitative research, “can reveal how all the parts work together to form a whole”.

#### 3.1.2. *Case study*

Yin (1994, p. 14) states five different research strategies; experiment, survey, archival analysis, history and case study. Which strategy to choose depends on, for instance, the type of the research question, the need for control over behavioural events and the degree of focus on contemporary versus historical events.

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A case study, unlike survey or experimental research, does not have any specific methods for collecting or analysing data. This means that any and all methods of data collection can be used, although conducting interviews is the most frequently used method. Case studies are used to gain in-depth understanding of the situation and meaning for those involved. They are useful as they pay attention to a context rather than specific variables when the aim is to discover rather than to confirm. It is however somewhat lucid whether one should define a case study as the *end product* or the *unit of study* (Merriam, 1998, p. 27). Wolcott (1992) argues that a case study is the end product – the output – of field-oriented research rather than method. Moreover, a case study is appropriate if the researcher aims to answer research problems that are stated as “how” questions.

### **3.1.3. Case study design**

Yin (1994) distinguishes between single-case and multiple-case designs and between single (holistic) and multiple (embedded) units of analysis. The two distinctions refer to the number of cases that are studied and the number of units that are studied within the studied case.

As our problem statement is stated as a “how” question, which is “how electronic commerce can complement industrial marketing activities” of our case company, a case study seemed the most appropriate. The analysis and answer to that question will thus be part of the end product and part of the unit of study. To reach the end product, however, we also need to look into other units in our field research. These units may be seen as sub-units embedded in a larger unit, an entity. This entity refers to the factors and actors that will affect organisational buying behaviour *and* seller marketing behaviour. These units will also be part of our description and analysis to shape the end product of our research. They are the sub-units of our empirical study: Thus, we need to study important aspects of the macro-environment, the micro-environment and the customer environment (buying organisation/hospitals) that are interrelated and make up a cohesive whole, a large unit.

It is unclear whether this is a single case study or multiple case study having sub-cases and sub-units embedded in a larger unit. A preferred term to define our study would be a single case study but with embedded units of analysis. As Merriam (1998, p. 41) highlights, a case study is an investigation of complex

units that consist of “multiple variables of potential importance in understanding the phenomenon”. Thus, our research is a case study as “it is an investigation to retain the holistic and meaningful characteristics of real-life events” (Yin, 1994, p. 3). It could also be defined as an evaluative case study as it involves description, explanation and judgement (Merriam, 1998, p. 39). The emphasis of our field research is nonetheless the customer environment, the hospital buying process of infection control equipment. Thus, we have used multiple sources of evidence and each unit of study has called for different data collection approaches.

Although there are issues and shortcomings of generalizability, reliability and validity and researcher/interviewer bias that may limit a case study, it does nonetheless provide insight and understanding. It also allows the researcher to penetrate deeply into a complex problem. Furthermore, as the case study is in a real-life context, the results can be applied more effectively.

## **3.2. Scientific approach**

### ***3.2.1. Abductive qualitative research***

With qualitative induction, a specific empirical phenomenon is described or explained by listing it under an already existing category or rule, for example an existing theory. A deductive approach on the other hand, is used by researchers to find empirical information to test (verify or falsify) pre-formulated statements (e.g. hypotheses). We chose an abductive approach that combines new and developing empirical findings with previous theoretical and conceptual knowledge. Thus, our study is a hybrid of previous theoretical concepts and new empirical findings.

### ***3.2.2. Exploratory study***

Our case study aims to explore, describe or explain a phenomenon. In the beginning of the research process, exploratory research helped us to identify, define and structure the problem. As we had somewhat limited knowledge within the area of information technology and electronic commerce, as well as organisational buying, we initiated an exploratory approach to gather data on the topics. Therefore, to lead us in the right direction, we conducted interviews with Getinge and another company (Chross Research) that had been engaged in qualitative research at hospitals. To gain an initial understanding of electronic

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commerce we interviewed an IT consultant, Cell Networks, as well as the Danish company Lunatronic, which is partly owned by Getinge.

Initially, information material and interviews with our case company implied the direction to what theories were appropriate to use and what empirical units to study.

### **3.2.3. Descriptive study**

Our purpose is also to describe the factors affecting organisational buying behaviour and consequent seller marketing behaviour. Our study of the factors in the macro environment, trends and actors in the industry and customer environment and the empirical findings within, is mainly descriptive.

### **3.2.4. Explanatory study**

We used the existing knowledge and theories and the empirical findings to explain the cause-and-effect relationship between different factors and actors. Thus we try explaining how the studied units make up a whole entity of interrelated factors and actors affecting buying behaviour and seller marketing behaviour. This corresponds to the analysis of our findings where we analyse the three studies and aim to answer our main problem.

## **3.3. Data collection**

As mentioned in Merriam (1998, p.137), collecting data in case study research most often involves several strategies of gathering information such as interviewing and analysing documents. Using multiple sources of information is therefore useful if the researcher doubts that a single source of information will provide a complete and comprehensive understanding. Hence, to validate and cross-check findings, we needed both interviews and document information.

*Primary data* is collected for the purpose of a specific study where interviews are used as the main tool for data collection, whereas *secondary data* has no particular connection to the case study in question.

To gather primary data, we conducted personal in-depth interviews. The list of interviews and the interview guides for customers and dot-coms, are found in the appendix.



We collected secondary data and information from articles, books, on-line sources, and also interviews, especially in the beginning of the study and for the development of our theoretical framework. The extent to which these different sources were used varied, however, depending on the different units of study.

### ***3.3.1. Macro-environment study – technological and legal factors***

#### *3.3.1.1. Information-technological changes – electronic commerce*

To get an understanding of technological factors in the field of electronic commerce, we mainly gathered information from books, articles and on-line sources that were related to the topic.

#### *3.3.1.2. Legal changes – standardisation*

We used personal interviews with people at Getinge headquarters and the UK subsidiary, to get information concerning legal changes in the field of European standardisation of infection control equipment production. We also used some document information (report and articles).

### ***3.3.2. Microenvironment study – industry actors***

We studied the use of electronic commerce by actors in the general health care industry environment by collecting data from newspaper articles, on-line sources and consultancy reports.

#### *3.3.2.1. Dot-coms*

We conducted personal interviews with three new Internet actors in the healthcare industry that focus on providing electronic commerce solutions for hospital buyers and suppliers. We chose to call these companies “dot-coms”.

In Sweden we interviewed a company called Medinsite.com, located in Stockholm, a company providing electronic tendering solutions. In the UK we interviewed SureStock in Oxford and Medexonline.com in London. The interviews were semi-structured and were to serve as a discussion on the developments of electronic commerce for hospital buyers and suppliers. The number of people participating in the interviews varied between one and four people and the interviews varied between one and two hours in length.

**3.3.2.2. Competitors in the immediate industry environment**

To find out if and how other suppliers of infection control equipment (competitors to the case company) are engaged in any electronic business activities, we studied the Web sites of two large competitors on the European market in each product segment; sterilizers and disinfectors. Thus, we studied four competitors.

**3.3.3. Customer environment study – buying centre factors and actors**

The main aim of our empirical research was to gain an in-depth understanding of the hospital buying process with regard to procurement of infection control equipment. In addition, we wanted to get the respondents' various opinions and observe trends about using the Internet in the buying process. We chose to personally interview a broad spectrum of people involved in the buying process; purchasing managers, users of the equipment (operation room nurse and sterile services department managers) and service engineers.

In Sweden we conducted interviews at two hospitals in Gothenburg; Sahlgrenska University Hospital and Lundby Hospital. At Sahlgrenska, we interviewed a user of the equipment (an operation ward manager/operation room nurse), one service engineer, and one person responsible for the administration and budget allocation. As the hospital has no purchasing department they use the purchasing organisation Westma, from which people also participate in the buying process. At Westma, we interviewed a purchaser and a "process owner".

At Lundby, a private hospital, we interviewed a ward/SSD manager (user of the equipment), and two people from the administration; the financial officer and the managing director assistant. Given the small size of the hospital, the number of people participating in the buying process was limited.

All the interviews followed a semi-structured interview guide and the same respondents also filled in a more specific standardised questionnaire, in order to support the findings from the interviews. The length of the interviews varied between one and two hours.

In the United Kingdom, we interviewed two hospitals, Addenbrooke's in Cambridge and Hope Hospital in Manchester. At Addenbrooke's, we interviewed the purchasing manager for the hospital, one CSSD manager and

one authorized person (AP) that is involved in sourcing the market for potential suppliers and writing the demand specification for the equipment. At Hope Hospital, we interviewed one CSSD manager and a service engineer, as one interview was cancelled at the last minute.

#### ***3.3.4. Purposeful sampling***

In order to answer our main problem, we chose a purposeful sampling method as we wanted to gain insight, understand and discover (Merriam, 1998, p. 61) the buying-selling process and its potential future development. We created a list of factors and actors essential to our study.

Getinge and its UK subsidiary (Sterilizing Equipment Company – SEC), selected what hospitals to study in Sweden and the United Kingdom respectively. The initial aim was to interview two hospitals in each country, one public and one private, that are current customers of the case company. We wanted to look at current customers to study the current relationship and buying process. In the UK, it was not possible to arrange an interview with a private hospital, as the major customers are public hospitals. Therefore we interviewed two public hospitals in the UK. We also wanted a broad spectrum of all the essential people taking part of the buying process to get a holistic understanding of the factors and actors that affect the current and future buying process.

We chose what new on-line actors, “dot-coms”, to study in the health care industry as they would give us a more in-depth understanding of electronic commerce and how they will affect future hospital buying behaviour and seller marketing behaviour. The reason we chose the ones we did, is that they provide a good picture of what electronic buying and selling opportunities these new on-line intermediaries offer.

#### ***3.3.5. Interview guide and questionnaire design***

For hospital customers, we developed a standardised interview guide together with our case company. The design of the interview guide was semi-structured (see appendix) and the questions were to serve as a base for discussion. In addition, to enhance the findings of the interviews, we developed a standardised questionnaire for the respondents, with similar but more structured and specific questions.

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To interview the on-line marketplaces (“dot-coms”), we developed a semi-structured interview guide (see appendix). The aim was to discuss the developments of electronic commerce for hospitals and hospital suppliers and the companies’ electronic business solutions for these parties.

### **3.3.6. Data presentation and analysis**

We organise, present and analyse the data in the following way:

**Table 1 Method for presentation of data**

<b>Study (report chapters)</b>	<b>Data presentation</b>
Macro environment	General
Micro environment	General and country specific
Customer environment	Country and customer specific
Analysis, managerial implications and conclusions	General (products, customers and markets)

*(Own table)*

To present the customer study in a descriptive manner, the data was also categorised by topics related to theories on buying behaviour. The studies of the two public hospitals in the UK are put together, as they are very similar compared with the two hospitals in Sweden.

After studying the macro-, micro- and customer environments, we make a general analysis integrating countries and customers.

### **3.3.7. Quality of the research**

#### *3.3.7.1. Validity*

Internal validity measures how well the findings in an empirical study relate to reality. It is also a measure of whether the researcher has investigated what was supposed to be measured. Obviously, our study is subject to our own perceptions and interpretations of reality. The internal validity of our study is however enhanced as we used multiple sources for gathering research data and asked the respondents to confirm the data and interpretations. We seemed to get

fairly consistent answers and discussions from the respondents, which is a sign of fair internal validity.

External validity refers to whether or not a study's findings can be generalised beyond the immediate case study. Case studies are only useful as a source for analytical generalisations. Thus, it is possible to make theoretical generalisations based on a case study (Yin, 1994). We have tried to analytically generalise our findings and theory development, taking into consideration theory, empirical data and data analysis.

Construct validity depends on whether the researcher uses the correct operational measures and objective judgement when collecting data. To ensure the construct validity of this study, we have used multiple sources of evidence. In addition, a supervisor has reviewed the draft of the study.

The findings and conclusions in a case study are more likely to be accurate and convincing if several sources of information are used. *Triangulation* is the process of combining findings from different sources to reach a conclusion. We use data triangulation by combining findings from different sources to analyse and reach a conclusion.

#### 3.3.7.2. *Reliability*

Reliability concerns the extent to which the findings and conclusions can be replicated by another researcher following the same procedures as in our study. The goal of reliability is to minimize the errors and biases in the study. The reliability of our research has been enhanced by careful documentation of our findings by using a dictaphone recording the personal interviews. Moreover, we developed a database covering all aspects and steps in our case study. After each meeting and interview, protocols and transcriptions were conducted to ensure that the material was safely stored and easily retrieved.

#### 3.3.7.3. *Sources of error*

There is risk that our questions were misunderstood or that we misinterpreted the discussions and answers. The interviews in Sweden were conducted in Swedish to avoid this error. The interviews in the UK were conducted in English, where the risk of misinterpretation was higher as English is not our mother tongue. Moreover, the questionnaire we developed may also have been a source of misunderstanding. To avoid this, we carefully explained the

### *Methodology*

questions and the alternatives. In the UK, only two people filled in the questionnaires and we therefore excluded the result in the presentation of our empirical data. In addition, one respondent cancelled an interview at the last minute.

As researchers, our interpretation and understanding of the infection control equipment industry in general and the hospital buying process in particular, may also be a source of error.

## 4. MACRO ENVIRONMENT STUDY – TECHNOLOGICAL AND LEGAL FACTORS

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### 4.1. Technological factors

#### 4.1.1. *Electronic commerce and electronic business*

Rapid changes in the development of information- and communications technologies – such as the Internet and other network technologies – have consequently forced or encouraged society, and the organisations within, to adapt to the new technology. This technological change has driven the growth of electronic commerce technologies- and activities, as they allow companies to experiment with new products, services and processes to conduct business activities more efficiently and more effectively.

The Internet and electronic commerce are concepts that in recent years have become the focus of businesses and media worldwide. Turban *et al*<sup>10</sup> define the concept as "the process of buying and selling or exchanging of products, services and information via computer networks including the Internet". Kalakota & Winston<sup>11</sup> argue that electronic commerce involves four perspectives:

The *communications perspective* where electronic commerce is the delivery of information, products/services, or payments over telephone lines, computer networks, or other electronic means

The *business process perspective* where electronic commerce is the application of technology to automate business transactions and work flow.

The *service perspective* where electronic commerce is a tool that considers the need and wants of organisations, consumers and management to decrease service costs while improving the quality of products and speed of service delivery.

The *online perspective* where electronic commerce provides the capability of buying and selling products and information on the Internet and other online services.

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<sup>10</sup> Turban et al (2000)

<sup>11</sup> Kalakota & Winston (1997)

As the interpretation of the term electronic commerce is sometimes limited to the actual buying/selling transaction (commerce), the term *e-business* has emerged to also include servicing of customers, collaborating with business partners and conducting electronic transactions within an organisation<sup>12</sup>. Arthur D. Little (ADL), the management- and technology consultant has given more general definition of e-business:

*“E-business is the creation of new, and the redesign of existing value chains and business processes through the application of information technology”*<sup>13</sup>

ADL also argues that e-business is not by definition the Web or the Internet. E-business applications are realised through EDI, extranets, wireless networks, as well as over the Internet. Thus, companies today are using the Internet, intranets and extranets in an integrated manner to conduct various electronic business activities. (In this thesis, we use e-commerce and e-business as the same concept).

#### **4.1.2. Internet technology**

As mentioned above, companies' electronic commerce/business comprises different factors, processes and applications that are realised in various networks. The Internet is a public and global communication network providing connectivity to anyone over a local area network (LAN) or Internet Service Providers (ISP). This network, connected and routed over gateways, is open to all and therefore there is a lack of control over the information and security. Over the past five years, the World Wide Web has come to dominate the Internet traffic and the greatest majority of electronic commerce applications are Web based where Web browsers (client) and Web servers (server) interact with each other like in any other client-server application<sup>14</sup>.

#### **4.1.3. Intranet technology**

An intranet is a corporate LAN or Wide Area Network (WAN) that uses Internet technology (TCP/IP protocol) that links different clients, servers, databases and application programs. This network is secured behind firewalls

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<sup>12</sup> Turban et al. (2000)

<sup>13</sup> Arthur D Little (2000a, p. 2)

<sup>14</sup> Deise et al. (2000)



and is a private network in that it has limited access to only authorized parties. Companies use an intranet to improve and enhance communication and collaboration with employees, customers, suppliers and other business partners. The intranet allows access through the Internet and it does not require any additional implementation of for example a leased network<sup>15</sup>.

#### ***4.1.4. Extranet technology***

The extended intranet, or the extranet, also uses Internet technology (TCP/IP) to link different intranets in different locations. As extranet transmissions are conducted over the Internet towards for instance suppliers, customers and distributors, they may lack privacy and security. To ensure security for electronic business activities, it is necessary to create tunnels of secured data flows. Tunnelling technology combined with the Internet is called a virtually private network (VPN). Thus, extranets provide secured connectivity between a corporation's intranets and the Intranets of suppliers, financial services, business partners and customers. It is though up to the different parties to decide what information to have access to and what is not suitable to share.

Hence, extranets are virtual private networks that physically exist within the global Internet but are linked to other private networks (intranets). Extranets extend secured communication links to a geographically dispersed set of locations (e.g. country-to-country) and a remote set of access points (e.g. customers and sales agents). Both intranets and extranets are to be designed to transport complex technologies from desktop machines onto networks and servers where IT professionals can centrally manage technology and applications<sup>16</sup>.

Extranets may be seen as both collaborative and competitive technologies to electronic data interchange (EDI), enabling technologies for electronic commerce and supply chain management. The goal of managing an extranet is to reduce costs in complex processes and large, costly, computing frameworks. Compared with EDI standards, an extranet has some advantages. Firstly, extranets allows real time communication as opposed to batch processing. Secondly, an extranet is interactive and allows browsing which could lead to an increase in the number of orders. Thirdly, an extranet is accessed through the

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<sup>15</sup> Fellenstein & Wood (2000)

<sup>16</sup> Vlosky, Fontenot & Blalock (2000)

Internet instead of leased or private lines. Lastly, extranets cost 20-40% less to operate than the traditional EDI technologies. However, EDI is mostly used in financial exchanges, record keeping, ordering and more. Extranets with its user friendliness, although it allows the same functionality, emphasise human-to-human communications. EDI, however, still remains a key technology for electronic commerce<sup>17</sup>.

#### ***4.1.5. Business-to-business/organisation electronic commerce***

Electronic commerce technologies and applications may allow companies to reduce costs in a more cost efficient and effective management of their supply chain. The supply chain can be divided into three parts that comprise all the activities that are concerned with the flow of and transformation of goods from the raw material all the way to the end-user (customer): The *upstream activities* involve the raw material and service inputs from a company's suppliers. The *internal activities* involve the manufacturing of products and the *downstream activities* include the distribution and sale of the products to customers.

Companies have hitherto managed the upstream and downstream activities with paper transactions (orders, invoices and so on) and human involvement. As supply chain management includes the "coordination of order generation, order taking, and order fulfilment/distribution of products, information and services"<sup>18</sup>, one should study the companies from the selling company (marketing management perspective) and the buying company (procurement management perspective)<sup>19</sup>.

##### ***4.1.5.1. Electronic marketing management***

The electronic commerce/business technology platform can be used to sell products and services to customers over the Internet, called seller-oriented marketing or a supplier-oriented marketplace, as customers (buyers) visit the company's Web site to search for product information or other information in the company's electronic catalogue, perhaps with the intent to buy or to gain knowledge and obtain information. Moreover, the seller may also be able to offer after sales service and support and training/education from its Web site after a purchase to enhance its offer and to satisfy its customers. A supplier-

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<sup>17</sup> Timmers (1999)

<sup>18</sup> Kalakota & Winston (1997)

<sup>19</sup> Turban et al (2000)

oriented marketplace may be sustained if the seller has a superb reputation in the market and large group of loyal customers. The advantages may lie in reduced operating and administrative costs, enhanced technical support and customer service, and reduced technical support costs<sup>20</sup>.

Information technological developments have allowed the development of on-line catalogues<sup>21</sup> to present products and services to the users and buyers. For customers, *electronic catalogues* (web or CD-ROM) are sources of information on products and services, for the seller it is a way to advertise and promote its products. Software technology and intelligent agents provide the customers with search options, in order to find the information about desired items. Electronic catalogues differ in design and capabilities concerning the *presentation of the product and service information*, the *level of customisation* and the *extent of integration* with various business processes.

Whereas static catalogues present written descriptions and static pictures of products and services, dynamic catalogues present this information with motion pictures or animation and sound. Companies can also choose to present the same catalogue to all customers or customise the content and display for various customer segments or individuals. As mentioned, technology also allows the catalogue integration with order taking and fulfilment, electronic payments, inventory and accounting systems and with suppliers' or customers' extranets. The advantages of on-line catalogues are the easiness to update information, the ability to integrate with the buying process and the simplicity of searching for a wide range of product and service information. It does, however, require that customers have access to computers and the Internet, which means that paper catalogues will be used to reach all customers. A disadvantage is also the difficulty of developing an electronic catalogue and the large initial costs related to it.

#### 4.1.5.2. *Procurement management*

Electronic procurement or "e-procurement"<sup>22</sup> (the buyer's perspective) is a web based (i.e. Internet/Intranet/Extranet) procurement process. The entire process,

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<sup>20</sup> Turban et al. (2000)

<sup>21</sup> Turban et al (2000, p.142-143)

<sup>22</sup> Arthur D Little (2000b)

or parts of it, may become web-based. There are four levels of application for e-procurement:

The first level of procurement management is the mere *collection of information* on products and supplier's price information etc., from supplier's electronic catalogues; the Internet is here used as a buyer driven pull system.

The second level is the interaction channels initiated by sellers or buyers, where the interaction is within the ordering, order tracking and paying over the Web. A *sell-side procurement solution* is when the seller develops a procurement solution for the buyers in terms of for example electronic catalogues and order forms. This is appropriate for products with complex pricing or configuration requirements specific to each seller. A *buy-side procurement solution* is when the buyers are driving the solution and having the control over the catalogue content as they request the seller to update its catalogue to facilitate the procurement process of the buyers. A customer-or buyer oriented marketplace<sup>23</sup> is when a buyer or buyers announce request for proposals (RFP) and invite potential suppliers to bid for competitive purchasing.

The third level is the actual integration of the supply chains of the buyer and seller, thus integrating procurement with back-end legacy systems.

The fourth level is the creation of new business models and new electronic intermediaries. Auctions, exchanges and grouped buying are growing in importance, where buyers and sellers meet and a third party solution enables them to exchange products and information. This is an intermediary-oriented marketplace.

#### *4.1.5.3. On-line communities*

The idea behind communities is that it brings together buyers, sellers and intermediaries and other individuals, around a certain area of interest. Many communities are organised according to professional business interests (e.g.) where, for example engineers in a specific industry may interact, obtain relevant product information and eventually place orders or other transactions. Thus, communities offer an opportunity to create value by offering marketers the possibility of business transactions and the communication of messages with and to people interested in the particular product, industry or service.

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<sup>23</sup> Turban et al (2000)

Communities normally have chat room functions, where vendors may sponsor a chat or host a chat session.

#### *4.1.5.4. E-mail*

E-mail, being a direct marketing channel, is a cost-effective way to advertise over the Internet to reach a wide variety of targeted audiences. A list of e-mail addresses, supported by customer database information is an efficient and effective tool as you target a group of buyers who you know in advance. However, it still depends on the recipients' computer and e-mail/Internet access and the willingness to use it if the effects are to become positive.

#### *4.1.5.5. Push technology*

Searching for information on a web site and downloading information is an example of how a customer pulls the information to himself/herself. Push technology, however, allows direct delivery of customised information to an individual's desktop. So, instead of customers searching for information, they submit their preferences concerning the information they want, how often they want it and the information is then sent automatically to the customer<sup>24</sup>.

#### *4.1.5.6. On-line customer service and support*

The technologies that allow other e-business activities to be executed also allow customer service to be conducted by electronic means. The aim of customer service is to enhance customer satisfaction, which is that customers perceive that a product and service has met their expectations. During the purchasing process, the customers may need help at various stages. Customers have questions both prior to the purchase and after the purchase on how to maintain and operate a product. New technologies and e-business applications have made possible an improved and more automated service for customers. This is of course also possible for purchases that have been conducted off-line, where the customer may get instructions and expert advice on-line on how to use a product and/or how to maintain it<sup>25</sup>.

A company may provide customer service throughout the product life cycle<sup>26</sup>, which can be provided electronically due to new technologies. There are

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<sup>24</sup> Turban et al (2000, p. 137)

<sup>25</sup> Timmers (1999)

<sup>26</sup> McKeown & Watson (1998)

several **functions** and tools for on-line customer services that assist the customers *prior to purchase* (catalogue, pictures, video presentations, articles, reviews, textual descriptions, CD-ROMs, and downloadable demonstration files), all of which may be provided electronically. Customer service also means making it easy for the customer to acquire the product or service (specifications, on-line order entry, payment, negotiations and delivery). A good service for the customer also means supporting the customer on an on-going basis after having acquired the product (on-line technical and remote support, customer education, frequently asked questions and answers and newsletters).

There is also new technology and **tools** that support these functions of customer service. *Personalized web pages* to satisfy the needs of various customers, can be used to record historical purchases and preferences and to target individual customers to enhance their satisfaction. *Frequently asked questions* (FAQs) are used if the customers have a standard behaviour of asking similar questions and queries about products and services. If they do not, it will require an e-mail to answer the questions. Answering inquiries by *e-mail* is fast and inexpensive. E-mail can also be used to disseminate product information to various customers. *Electronic interactive media* provide the marketer with new potentials. E-mail and the Web are Internet-based media. A CD-ROM medium allows the execution of multimedia- video and promotions. CD-ROMs are also used to connect to the Internet, hence, a CD may contain a product catalogue that can be updated by having a link to the company's web site.

## **4.2. Legal change**

### **4.2.1. Standardisation**

The creation of the common European market has driven the developments of creating harmonised standards for products on a pan-European level. Consequently, this has driven an intensive phase of standardisation applying to both sterilisation and disinfection equipment.

As a result, there has been a significant increase in requirements and standards for the equipment. The standard applies to the whole product - the whole sterilization plant. The standard also explains how the process is to be carried out and what specifications for temperature differences are allowed.

Since June 1998, a European standard is mandatory. In the autumn of 1999 the pressure vessel standard was expected to come into effect. Then the biggest component, the pressure vessel itself, was to be standardized. Before the standard becomes valid, each national pressure vessel authority must continue to grant its approval.

In the sterilization equipment market the most prevalent technological trend is the two standards that have recently been introduced by the EU, the EN285 (which dictates design features) and the EN 554 (which stipulates that a sterilizer should be tested at the customers site), which are expected to make the market more competitive and provide impetus for growth. The Medical Devices Directive is expected to increase this impetus further<sup>27</sup>.

Standardization is also taking place for disinfection equipment. Before the end of 1998, the EU was expected to publish common standards for the washer/flusher disinfector market throughout Europe. These norms, that relate to the products' technical content and microbiological performance, are however not expected to come into force until 2001/2002<sup>28</sup>.

Nonetheless, peoples' views on standards are different. In the UK, the National Health Service (stated in the Hospital Technical Memorandum) recommended a national standard technical specification for sterilizers, C14, which fell behind and eventually got out-dated. The European standards, for example the EN 285, are interpreted differently. According to one respondent:

*“Some people’s view of the EN 285 standard is different than others. All these standards are not specific; there are too many grey areas. They are open to different interpretations. That’s the problem. A recommended standard still has loopholes, they’ll argue for how they are interpreting the standards, for what kind of (packing of) doors they want for example. As you have this situation, you never standardise, this is something that manufacturers have discussed during the years, it would be so much easier if these guys could, from a production engineering*

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<sup>27</sup> Personal interview with John Hanson, Getinge (2000)

<sup>28</sup> Frost & Sullivan (1998)

*Macro environment study*

*point-of-view, produce a standard piece of kit. But then the manufacturer would only sell to certain parts of the market. It's a crazy situation but that's where we are<sup>29</sup>.*

The effects of these different interpretations of standards are that the technical demand specifications written by individual buyers of sterilizing equipment are not standardised, which is the system in the UK, according to one respondent. The EU legislation has grey areas and that is where national legislation and hospital standard requirements fill the gaps.

There is also a trend towards developing a standard world sterilizer. As for now, given the situation with different interpretations and arguments for European and national standards, the actual realisation of common standards seems long-term.

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<sup>29</sup> Personal interview at Addenbrooke's Hospital (2000)



## **5. MICRO ENVIRONMENT STUDY- INDUSTRY ACTORS**

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*The data for the study of industry actors have been collected from personal interviews (Medinsite.com, SureStock and MedexOnline), from a study of Getinge's competitors' web sites, and other sources such as newspaper articles, the Internet and consultancy reports.*

It is important for Getinge to observe trends in the general industry environment as these actors directly or indirectly will drive the development and use of e-commerce in the industry in general and hospital procurement in particular. Thus, current trends in the general health care industry environment may have an impact on Getinge's immediate industry environment in the future. In the general industry environment we have found the most important actors to be:

- Hospitals
- Suppliers
- "Dot-coms" (electronic intermediaries)

In Getinge's immediate industry environment, we will study the web sites of some of the company's closest competitors.

### **5.1. The general health care industry environment**

*"At first glance, healthcare looks one of the least likely sectors to undergo a radical reshaping as a result of B2B e-commerce."<sup>30</sup>*

Business to business (B2B) e-commerce is exploding across all industries. According to AMR Research 70% of buyers and sellers will participate in e-marketplaces by 2002, up from 25% today<sup>31</sup>. The health care industry has been slow in adapting its business processes and models to exploit electronic commerce, especially when compared with other industries, and is expected to do so in coming years. According to Forrester Research, the value of healthcare business conducted over the Internet could leap from practically nothing to \$370 billion over the next five years. About \$124 billion of this will be trade

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<sup>30</sup> Firm (2000)

<sup>31</sup> <http://www.zdnet.com/e-commerce/stories/main/0,10475,2636807,00.html>

between healthcare providers and their suppliers<sup>32</sup>. The industry has the potential to achieve substantial savings and efficiency improvements by adapting to e-commerce opportunities in sales and procurement. The reasons why this is possible include:

- **Vast size:** The European market valued at \$700 billion.
- **Fragmented market:** In Europe a total of 12,000 hospitals are dealing with 5,500 suppliers<sup>33</sup>. The average hospital deals with between 2,000 and 5,000 suppliers resulting in substantial costs maintaining relationships and order handling. A UK estimate argues that it costs £ 100 to process each order.
- **The industry is “high information content”:** Health is one of the most information intensive businesses<sup>34</sup> resulting in substantial information exchanges (patient records, knowledge, etc.). The Internet has great potential for improving and facilitating information flows in the system.

There are several reasons why the industry in general and the European health care industry in particular, have been slow in adapting to e-commerce:

Firstly, the industry is highly regulated concerning standards and procedures. Secondly, investments in IT are kept down as governments try to control exploding costs in the health care sector. Nonetheless, estimates show that much value can be sought by exploiting e-commerce. A study by PriceWaterhouseCoopers estimates savings from 6-12.5%<sup>35</sup>.

### ***5.1.1. Are hospitals generally using e-commerce today?***

It varies greatly how far hospitals have adapted to e-commerce, both within countries and especially between countries. The United States has been keener and faster to exploit the opportunities of electronic commerce. The specific market conditions (more private hospitals and more competition among hospitals) and the fact that the US is far ahead of Europe in the e-commerce development in general, contribute to this. Hospitals have begun probing the possibilities of electronic business, and the first initiatives have been towards the customers (patients) or to improve internal inefficiencies. The United States

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<sup>32</sup> Firm (2000)

<sup>33</sup> Clark (2000)

<sup>34</sup> Harvey (2000)

<sup>35</sup> Firm (2000)

is probably a few years ahead of the European countries so a great deal can be learned from US experience and trends. A recent survey of American hospitals, implemented by ARiA Marketing Inc, states that 95% of health care organizations are considering Web-based implementation<sup>36</sup>. The following categorizes what most managers consider most valuable:

**Table 2 Health care organizations' implementation of e-commerce**

Activity	% of health care organizations
Medical content for consumers	52%
Medical content for providers	33%
Supplies ordering	24%
Clinical data repository	20%
EMRs (electronic medical records)	15%

Source: Jankowitz (2000)

As the table shows, almost 25 % of health care organizations are considering web based electronic procurement of supplies.

Hence, the health care industry is lagging behind other industries a few years concerning the use of information technology and the Internet. Getinge recently bought a 25% stake in a Danish company called Lunatronic. The company makes and installs software (T-DOC) that enables the tracking of all goods in the sterilization circle. Their experience shows that the IT “situation” at hospitals in Europe varies and that hospitals are far behind most other industries with regard to the implementation, use and access to IT and the Internet. They argue that perhaps as little as 5% of hospital sterilizing services departments have Internet access but that the exact numbers may vary between countries<sup>37</sup>. The reason for this could be that hospitals are very much focused on “patient care” and not so much on running the hospital as efficiently as

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<sup>36</sup> Jankowitz (2000)

<sup>37</sup> Personal interview with Lunatronic, Copenhagen (2000)

possible. A minimum amount of resources is therefore channelled to IT investments.

#### *5.1.1.1. Sweden*

Sweden is, along with the other Scandinavian countries, the most mature for Internet usage and business-to-business (B2B) e-commerce<sup>38</sup>. Findings from our interviews with hospitals and a purchasing organisation show that Internet access is generally good but that Internet usage is poor. Most hospitals mostly use an intranet in their work but hardly ever the Internet. High turnover products (consumables) are bought electronically, either via a bar code system from hospital stock depots or via suppliers web sites. Nonetheless, Landstinget and its purchasing organisations are investigating and interested in using electronic tendering.

#### *5.1.1.2. United Kingdom*

The National Health Service (NHS) and NHS Purchasing and Supply Agency (PASA) are forcing hospitals to implement IT and electronic procurement solutions to lower costs and improve supply chain inefficiencies. By the end of this year all trusts (hospitals) must introduce electronic purchasing. To date, the results have been moderate as highlighted by the following quote:

*“The closest that procurement comes to high technology in most hospitals is the fax machine or the phone, when they are used to send or call in orders to suppliers.”<sup>39</sup>*

To reach the set goal of 3% savings in product price reductions, hospitals are required to develop an e-procurement strategy and set efficiency targets that must be backed with performance indicators. Other savings are expected with regard to more efficient administrative handling of orders (time-, staff- and money reductions).

Use of technology in purchasing also varies widely between hospitals, with over twenty purchase-ordering systems in use across the service and low levels of Internet access or use of EDI. Local autonomy, combined with the complexity of EU and public procurement regulations, and the small amount of

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<sup>38</sup> PriceWaterhouseCoopers (2000)

<sup>39</sup> Ward (2000)

money available for developing e-systems, will make introducing e-business into the NHS a real challenge. The e-strategy will cover both e-tendering - providing the ability to invite, receive and evaluate offers from supplier - and e-trading - a combination of e-communications, information provision and sharing, together with e-commerce between trading partners. Current EU procurement rules are hindering the development of e-tendering, with the process for OJEC tenders (for goods and services worth more than £93,000)<sup>40</sup>.

A central purchasing unit exists but it is not very active in adapting to and pushing technological developments. Therefore, hospitals are going separate ways in experimenting with e-commerce. Some hospitals have begun to use Internet portals to access supplier's electronic catalogues and handle ordering on-line<sup>41</sup>.

Pressure from both the government and institutions (NHS) will facilitate and accelerate the speed of which hospitals will start to make use of e-commerce. A recent survey conducted by Medix found that 80% of British doctors would welcome some form of on-line procurement exchanges for their practices<sup>42</sup>.

### ***5.1.2. Have suppliers to hospitals embraced e-commerce?***

It varies greatly how far suppliers adapted to the developments of e-business and on-line selling. The companies that have come the furthest in this development are those selling consumables. The reason is that most cost savings can be gained in that sector.

Suppliers are also partnering and starting up on-line ventures. Five of the medical industry's largest suppliers - Baxter, Abbott Laboratories, GE Medical Systems, Johnson & Johnson and Medtronic - have set up their own marketplace, Global Healthcare Exchange. Price negotiations is so far taking place in the normal way, that is offline, but the site will allow ordering and order tracking. The marketplace has attracted the attention of European anti-trust authorities, and it faces opposition from purchasers, who fear their negotiating power will be limited<sup>43</sup>.

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<sup>40</sup> Medexonline.com (2000)

<sup>41</sup> Personal interview Addenbrooke's Hospital (2000)

<sup>42</sup> Harvey (2000)

<sup>43</sup> Firm (2000)

A European example of a similar creation is Vamedis, which consists of a group of seven European hospital suppliers (further described in the dot-com chapter).

### **5.1.3. Dot-coms**

With the advent of the Internet, a plethora of so called dot-com start-ups are trying to spot business opportunities in the health care industry. New information technological solutions are deployed to create value for both health care providers (e.g. hospitals) and health care suppliers. Entrepreneurs and venture capital companies have identified the health care industry as an immense market opportunity. The health care dot-coms or “portals” appeared in the US a few years ago where third party independent firms set up a company facilitating the transaction of goods and services in healthcare through their channels. Thus, these companies have re-intermediated and become “new” intermediaries between hospital buyers and hospital suppliers.

The US has seen the greatest growth of dot-coms in the health care industry (estimated number of health care dot-coms are 100) and Europe has been slower in the development. An American health care dot-com, WebMD, was established four years ago with the vision of revolutionising US healthcare. The company experienced that it is a harder task than first thought<sup>44</sup>. This shows that hospitals, even in the US, are slow to adapt to new information technology or are not willing to let third party dot-coms take care of their business transactions.

#### *5.1.3.1. Europe – How many and what do they offer?*

A study by PriceWaterhouseCoopers reveals that forty e-business companies have launched Internet sites related to electronic procurement of medical supplies and/or medical equipment in the major European markets. Many of these are local players but some also have cross-boarder ambitions<sup>45</sup>. The sheer number of companies is already causing problems, and consolidation is expected<sup>46</sup>. The main problem for hospitals is the uncertainty of which partner to select. Most of these companies offer basic services such as providing

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<sup>44</sup> Liu (2000)

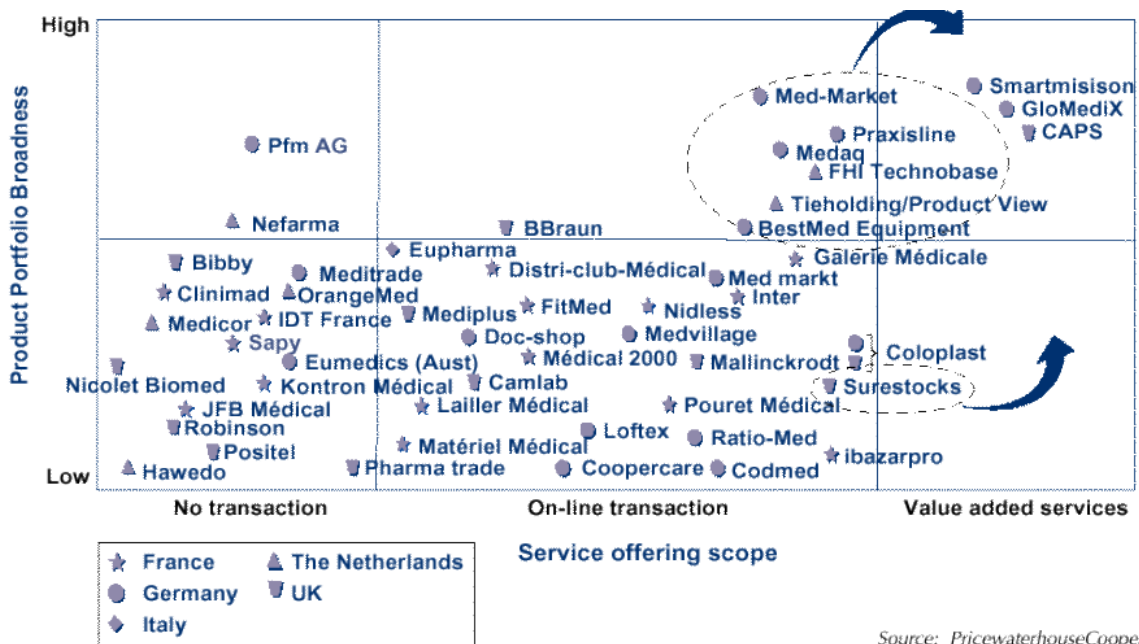
<sup>45</sup> PriceWaterhouseCoopers (2000)

<sup>46</sup> Personal interview, MedexOnline (2000)

product information through on-line catalogues but an increasing number of companies are offering the possibility to order on-line

The picture below illustrates the major players on the market, their width of product offering and the added value service they provide.

**Figure 5 European health care dot-com matrix**



Source: PriceWaterhouseCoopers (2000)

As the health care industry is not yet very developed concerning IT, the service that dot-coms are currently offering is rather simple to use (electronic catalogues, on-line ordering). Although hospitals order on-line, most other activities (invoicing, payment etc.) are still conducted in a traditional paper-based way. Eventually, the services will develop into more advanced offerings; integration of systems, e-invoicing, e-tendering and so on. This means that before and after placing an order, the whole process becomes electronic<sup>47</sup>.

The dot-coms are established by three different parties, or in collaboration among the parties:

- third party independent portals
- seller/supplier- controlled dot-coms

<sup>47</sup> Personal interview, Medexonline (2000)

### *Micro environment study*

- buyer-controlled dot-coms, or so called private auctions or exchanges where buyers (often with profound bargaining power) form their own dot-coms with the aim of lower price of goods and services.

Third party independent companies have established most dot-coms. Moreover, manufacturers and suppliers of healthcare equipment have started partnerships and formed Internet exchanges. The ambition of Global Healthcare Exchange, a US based exchange, is that “the network would be open to all suppliers, with the expectations that it would become a global exchange in future years as suppliers from Europe and Asia come on board<sup>48</sup>”. As a consequence, when these new companies establish themselves on the European market, American firms will/could gain a stronger position in the European health care market.

Another similar but smaller marketplace is Vamedis. Seven European producers and suppliers of health care products and equipment have formed an open health care portal. The companies include 3M Medica, B. Braun, Coloplast, Hartmann, Krauth medical, Lohmann & Rauscher, and Mölnylcke Health Care. The company is however independent from its founding companies, and the participants are also planning to sell directly from their own e-commerce sites. The portal focuses both on transactions and on the provision of broadly diversified content. It will be open for business activities in Germany by mid 2001 and plans to be a pan-European electronic business exchange in two years. The healthcare portal is open to all professionals active in healthcare and to other partners as well<sup>49</sup>.

The major business models of dot-coms can be distinguished as follows:

- *Content providers*: On health, industry news etc.
- *Community builders*: Communities of interest (of for example CSSD managers or infection control)
- *Directory portals*: Electronic listings of vendors (“Yellow pages”):
- *RFP specialists*: Focusing on electronic tendering processes

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<sup>48</sup> [http://www.thestandard.com/article/article\\_print/0,1153,13496,00.html](http://www.thestandard.com/article/article_print/0,1153,13496,00.html)

<sup>49</sup> [www.krauth.de/Factsheet\\_e.pdf](http://www.krauth.de/Factsheet_e.pdf).



- *Market-operators*: Providing various services, from facilitating on-line ordering to full supplier-customer e-business integration

The companies will pursue one or a combination of these models. Internet companies are now pushing towards signing up both suppliers and buyers to establish their services<sup>50</sup>.

#### *5.1.3.2. Dot-coms in Sweden*

Compared with other markets, few dot-coms seem to focus on the Swedish health care market. There are though a few companies that have started to offer on-line services with different business models. Some firms target the tender process while others focus on establishing e-commerce platforms allowing on-line ordering and order tracking. We interviewed Medinsite.com located in Stockholm.

#### Medinsite.com

The goal of Medinsite is to make pan European tendering easier and more efficient. The company specialises in the on-line tender process (e-tendering). Thus, buyers and suppliers of health care products and services may use the company's web site for on-line, electronic tenders.

Medinsite offers a tender platform that facilitates writing and responding to request-for-proposals and the proposal evaluation. Besides the electronic format, the company also has a translation service that will facilitate this process on a European level. The company argues that, the immediate, short-term value is that both sellers and buyers save time, as the tender process (RFP, bid, evaluation) today requires a great amount of resources (paper, time) from both the buying organisation and the sales organisation of suppliers. The long-term value of this service will be that suppliers can organise themselves in a more global/European way. That is, suppliers may not need to have their European affiliates to deal with all the surrounding tender administration. They may have a sales force in every country but they could be connected to one European head office. Also, suppliers may not need to have stocks in every country but rather a central European stock unit.

Currently, Medinsite focuses on consumables and accessories, which is a market estimated to have an annual value of 15 billion euro<sup>51</sup>. They target

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<sup>50</sup> Personal interviews, Surestock, Medexonline, Medinsite (2000)

### *Micro environment study*

suppliers, purchasing organisations and both public and private hospitals. As procurement and demand specifications for consumables are similar, the company has been able to develop a standardised, electronic tender template on the company's web site.

The company believes that it may eventually be possible to sell capital equipment (e.g. sterilizers) on-line. The current difficulty concerning capital equipment is that demands and technical specifications vary considerably from one purchase to the next. Eventually, a standardised template may be developed for those products.

Orders are not placed via Medinsite.com, but directly from purchasers to the suppliers in a traditional way. The only part of the service that cannot yet be completely electronic is the signing of agreements and contracts. Still, papers need to be signed, as laws do not yet view electronic signatures as legally binding.

Neither the suppliers nor the buyers need to make any special investments in IT to use the service. The company is currently operating in Sweden and Germany as they are more advanced than other countries concerning IT infrastructure and Internet usage. Germany was also selected because of the vast size of the market.

Medinsite's electronic procurement/tender solution has been well received by Swedish purchasing organisations, as they believe that there is a need for more cost-efficient tendering. According to the company, Swedish purchasing organisations are both willing and ready to start using this on-line service.

The firm is planning on expanding both the product concept and market reach. Furthermore, the company will provide an "aggregated demand" service, where smaller buyers can aggregate their demand to obtain better prices. In 2001 the firm will expand to other countries in Europe.

#### *5.1.3.3. Dot-coms in the United Kingdom*

Since the UK is expected to generate the greatest B2B revenues in Europe, numerous health care dot-coms have started operations<sup>52</sup>. One hospital respondent that we interviewed claimed that sixteen dot-coms had approached

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<sup>51</sup> <http://www.oresaventures.com/pr0824sve.html>

<sup>52</sup> PriceWaterhouseCoopers (2000)

the hospital to offer their services<sup>53</sup>. Some of major players on are SureStock, MedexOnline, Smartmission and Glomedix. We interviewed SureStock and MedexOnline.

### SureStock

Surestock is a private/public partnership between Unipart and TBA (The Buying Agency). The company offers electronic procurement across all hospital supplies, logistics, IT systems (Surecat & SECROS) & trust management support. The goal is to bring better value for money to NHS hospitals.

The unique approach of SureStock is that they literally take over the purchasing functions of hospitals. SureCat, an on-line product catalogue is accessible on the NHS Intranet and the Internet. SECROS is the IT system that allows on-line ordering and requisitioning. This implies that privatisation of the purchasing function will bring more advanced supply chain measures and different approaches in procurement. The business model is also interesting as the major part of the revenues is result based. The company and the client split the savings that SureStock is able to achieve. According to SureStock, the company installs an internal ordering system on the NHS intranet in January 2001.

### MedExOnline.com

Currently, MedexOnline only provides on-line ordering and the system is not yet integrated with the back-office systems of hospital buyers and suppliers. On-line ordering is currently the main service of most dot-coms. Nonetheless, an important element of the strategy is to provide content. Medexonline has an editorial team that updates the site daily with industry news. Another element of the strategy is “community building”. Different communities of interests will be opened where companies can sponsor the community and hence enhance the brand image or increase brand awareness. The company will also offer suppliers a “private site”, on which on-line selling is enabled. This site will have the design and features of the selling company’s web site.

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<sup>53</sup> Personal Interview Addenbrooke’s Hospital (2000)

As other dot-coms, MedexOnline is making efforts to increase trading through its web site. Therefore, MedexOnline offers, free of charge, to digitalize suppliers' product offering/catalogue into an on-line catalogue and upload it on the company's server. Customers can then search for available products within each product category. The information will be stored in a way that enables the "searcher" to find the information needed through product names, item numbers, different languages etc.

## **5.2. The infection control equipment manufacturing and supply industry**

### **5.2.1. The competitors**

To gain more insight into the immediate competitors' exploration of electronic business, we have studied the web sites of some of Getinge's largest competitors in Europe (or in other local markets). In steam sterilization we look at two companies who are the second and third largest competitors after Getinge in terms of European market share. The German company MMM ([www.mmmgroup.com](http://www.mmmgroup.com)) has a European market share of 26% and the Spanish company Matachana has 18% market share<sup>54</sup>. In the disinfection equipment segment we studied Mièle (market leader in Europe with 22% market share<sup>55</sup>) and Ken, which is a competitor of Getinge on the Swedish market. In order to make a fair comparison between the Web sites, we studied the English version of the competitors' web sites.

Almost all the web pages of Getinge's major competitors do not offer any greater functionality in terms of the e-commerce technologies presented in the previous chapter. The majority of the web sites and web pages are mainly static "information boards" containing static product pictures. All Web sites offer product information that nonetheless is neither very detailed nor technically specified.

The Danish competitor, Ken, offers a login for the customers and consequently the company may customise information for every customer that logs onto the website. The company also provides customers with the opportunity to

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<sup>54</sup> Frost & Sullivan (1998)

<sup>55</sup> Frost & Sullivan (1998)

download detailed product information in a PDF format. Moreover, they have product manuals that can be accessed after password authorization.

MMM (mmmgroup.com) offers on-line ordering of consumables and components for sterilizers, such as printers, biological indicators and so on. The company offers its customers order volume discounts. In addition, the company has a section with frequently asked questions. The message and overall intent of the web site is oriented towards the customers.

On only one site (ken.dk) could customers download more specific product information sheets. Concerning other content (e.g. news, FAQs) very little information could be accessed.

It is obvious from the study of the European competitors that they are not using e-commerce/business technologies extensively in their business practices nor have they developed an e-commerce strategy. The Web sites serve mainly as sources of information (product-service information/description). The most information-rich Web site seems to be that of Ken. The actual commerce part (selling over the Internet) is limited to one company (MMM) and the less capital-intensive consumables. Thus, none of the studied competitors sells sterilizers or disinfectors over the Internet.

It is however not possible to say what kind of underlying network infrastructure exists, that is to what extent the competitors use intranet- and extranet technologies. A table that contains the comparison can be found below.

**Table 3 Competitors web-site study**

	Sterilizers		Disinfectors	
	MMM www.mmmgroup.com	Matachana www.Matachana.com	Miele www.miele.de	Ken www.ken.dk
Login	NO	NO	NO	YES, to reach KEN's customer section
Product info	YES, but not extensive	YES, but very little	YES, but very little	YES
News	YES, but not extensive	YES, but only a few paragraphs	YES	NO
Value added information <sup>56</sup>	NO	NO	NO	NO
FAQ	YES	NO	NO	NO
Download brochures	NO	NO	NO	YES
Selling of consumables	YES	NO	NO	NO
Selling of infection control equipment	NO	NO	NO	NO
Request for information	YES	YES	YES	YES
E-mailed Newsletters	NO	NO	NO	YES
Training	NO	NO	NO	NO
Support	NO	NO	NO	NO

*(Own table)*

<sup>56</sup> Information that goes beyond being a mere description of products and services.

## 6. CUSTOMER ENVIRONMENT STUDY – BUYING CENTRE FACTORS AND ACTORS

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*We studied two geographical markets, Sweden and the United Kingdom (England). In the selected countries we interviewed two hospitals. Within the hospitals, we interviewed a broad range of people taking part in the buying process.*

First we identify the buying centre consisting of people that participate in the buying process to find out what their tasks in the process are. The buying process is described at three levels.

- Pre-purchase phase (from need recognition to the placement of order)
- Purchase phase (the administrative process of placing orders, payment, etc.)
- Post-purchase phase (receiving after sales service, training etc.)

We have looked at these phases from a buyer perspective. From a seller (Getinge) perspective, the similar phases are the pre-sale, sale and post-sale phases.

Finally we describe the value criteria and value drivers of different actors when selecting which equipment to buy. Under “technology relevant for purchasing”, we mention the use and access of IT- and the Internet.

### **6.1. Sweden**

In Sweden we interviewed Sahlgrenska University Hospital and Lundby Hospital, both located in Gothenburg. Sahlgrenska is a public hospital whereas Lundby is a private hospital.

#### ***6.1.1. Public hospital – Sahlgrenska University Hospital***

Sahlgrenska University Hospital is large organization with a total of 18,000 employees.

##### *6.1.1.1. The buying centre*

Through in-depth interviews with a wide range of people we have identified the persons or divisions participating in the buying centre. The persons and divisions that are involved are:

### *Customer environment study*

- The Central planning division
- The head(s) of the department buying equipment
- Other hospital departments (hygiene, the med-tech department etc)
- Users of equipment
- The technician (service engineer)
- Purchasing organization (Westma)

The *Central planning division* at the hospital is often involved in the need recognition phase (recognizing a need to buy *new* equipment), as hospitals have investment plans for extensive time periods. One task is to allocate the budget. The division does not play a major role in other functions in the buying process.

The *head(s) of the department* that needs to procure the equipment is involved in the process. If the head of a division is not knowledgeable on the necessary functions that the equipment has to perform he/she may give their subordinates the responsibility to participate in the buying process. The head of department is involved in the following steps: Need recognition, need specification and selection of suppliers.

*Other hospital departments* also participate in the process or in parts of the process. These departments bring into the group expert advice on various fields. An example is the hygiene department. These departments participate in specifying a demand specification and take part in selecting which vendor to do business with.

The *user of equipment* is most often a very important person throughout the whole process, as that person has the prior experience from working with the equipment. The user is obviously one of the people that identifies the need to buy new/replace old equipment and a key person specifying which needs the equipment has to fulfil. Furthermore, the user is involved in the more specific demand specifications, which are to be sent to alternative equipment suppliers/vendors as a request for proposal. The user also participates in suggesting products as well as setting the criteria (functionality, service, etc.)



by which the incoming offers will be evaluated, and contributes to the final decision of which supplier to buy from.

The *technician* (service engineer) at the hospital seems to play an important role in the buying process. Since the technician and the user have to “live” with the selected equipment for the coming years, they greatly influence the buying process and the final decision. Since the technician maintains the equipment, he makes a judgement when it is time to replace old equipment (need recognition phase). The technician is much involved in writing the demand specification, setting evaluation criteria, evaluating the tenders, giving recommendations on which supplier to select and in the end is the member of the team that decides what supplier to select.

As the hospital has no purchasing department of its own, the *purchasing organization* Westma is a very important participant in the whole buying process. The organization handles the co-ordination of the procurement project, which involves gathering the necessary information, forming a reference group with the needed expertise and so on. Westma also takes care of all the documentation and administrative functions of the process (writing demand specifications, sending out the request for proposals, receiving offers). The organization then takes part in setting evaluation criteria, the actual evaluation of tenders and product/supplier selection.

The following picture summarizes which functions each actor of the buying centre is involved in:

**Figure 6 Actors and tasks in the buying process**

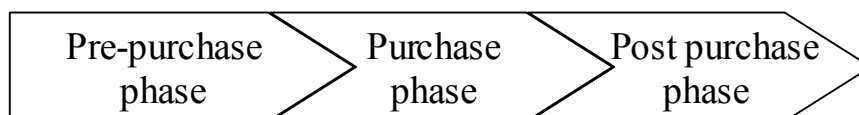
	Need recognition	Need specification	Demand specification	Reference group	Co-ordination	Information gathering	Setting value criteria	Publishing/receive tenders	Product suggestions	Evaluate tenders	Select supplier	Place the order		
Central planning division	✓												None	Influence on final purchasing decision
Heads of SSDs	✓	✓		✓									Some	
Other departments		✓		✓									Some	
User (nurses etc)	✓	✓	✓	✓		✓		✓	✓	✓			High	
Technicians	✓		✓	✓		✓		✓	✓	✓			Very high	
Purchasing organization			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	High	

(Own figure)

6.1.1.2. The buying process

We categorize the actual buying process according to the following structure.

**Figure 7 Phases in the purchasing process**



(Own figure)

Pre-purchase phase

When a need has been recognised in a particular department the initial steps of the process differ. If the investment amount is small (e.g. one or two sterilizers/disinfectors), the department may directly approach preferred suppliers. If the investment exceeds a specific amount, a tender procedure is applied. Hence, it differs between replacement purchases and investment purchases. Almost every purchase of equipment goes through Westma, who has the co-ordination role in the buying process.

The first task is to write a need specification where the user specifies which function the equipment must perform and fulfil. The purchasing organization

(Westma) then sets up a reference group, a buying centre, which will work together during the buying process. The size of the group varies but the most common number for larger purchases is around ten people. The group communicates mainly by e-mail and telephone, and meets for in-depth discussions. This kind of teamwork seems to be strongly engraved into the buying process and is not likely to change in the near future. Westma tries to aggregate demand from the whole region (Västra Götaland) and if many hospitals are involved in the purchase the reference group grows in size (two technicians etc.). This may of course be somewhat problematic as differences of opinions may arise because of different preferences and needs.

The hospital technician, with input from Westma and the user, then writes the more detailed technical *demand specification* (DS). If a long time has passed since the last equipment purchase, the purchasing organisation needs to source the market (market research) to be updated on available products and suppliers. Most often, they obtain the information from fairs or by telephone, where they ask for informational material that is sometimes used in the demand specification.

One respondent argues that the DS does not look much different from one purchase to the other, although demands for equipment sizes and volume capacity may differ. Therefore, writing the DS is not very time consuming as they have a more or less standardised template in the PC. The DS document includes a detailed demand description of technical data, necessary capacity, functions, cost of running the equipment, service, etc. The DS is divided into compulsory demands (“skallkrav”) and alternative demands (“börkrav”). Depending on these demands, the number of incoming offers varies considerably.

The group also decides the evaluation criteria by which they will judge the incoming proposals. That involves deciding whether the importance of functionality or closeness to service is evaluated as more important than price, and so on. According to Westma this weighting procedure is new to them. Equipment is sometimes tested and the input from the people (users) that tested the equipment is important.

Westma then sends out a request for proposal (RFP), which is mainly published in four ways.

### *Customer environment study*

- Westma's website
- An official journal (Anbudsjournalen)
- Official Journal of the European Community (OJEC)
- Directly to vendors

If the total value of the purchase exceeds 200,000 ECU then it is defined as "open tender" which must be implemented according the EU laws and published in the OJEC.

Westma, which receives the incoming proposals, re-distributes them to the reference group members. This is generally a large document containing a great amount of information. After individual evaluation, the reference group meets for a group evaluation of the proposals. This phase in the buying process is considered to be the most time consuming. When the proposals have been opened, communication between members of the buying centre and the different vendors sending in proposals, is not allowed. If some individuals, or the group, need clarifications, they will contact the companies for more detailed information. Respondents argued that Getinge's proposals are very clear and professional, which actually saves time. This is especially true for disinfection equipment.

The final decision on what vendor to select is a group decision and it is therefore difficult to evaluate who has the greatest power. It is though clear that the people that work mostly with the equipment (user and technicians) greatly influence the decision. Also, the smaller the order the more power the users have to recommend which equipment to buy. If these two members of the buying centre present enough evidence and arguments (to buy from a particular product/vendor) their opinion can weigh strongly in the purchasing decision. Due to EU norms the hygiene-technical department has a lot to say in the buying process on what range of equipment do buy.

It is Westma's job to balance the needs, wants and requirements of different members of the reference group. If vendors have the same evaluation score (after the weighting procedure) the group has to choose one, objectively and not subjectively. The purchasing organization put great emphasis on "objective assessment" of the proposals. Favouring nationalities should for instance not

occur. Past experience with a supplier's equipment and services, matters though in the overall assessment.

#### The purchase phase

When the reference group has made a decision, Westma writes a contract and sends the order to the selected vendor. Westma has an "order template" on the PC, where they "cut and paste" to build up the final document. Westma then administers the process by checking up on delivery, seeing to it that the product is in accordance with the agreed terms etc. The only function the hospital takes care of is paying for the goods. Getinge sends a paper invoice either to the department where the equipment was bought or to a central administrative level, depending on the invoice amount. Westma sends the order documentation and the agreement to the hospital. At Sahlgrenska there are ten divisions, all of which have their own administrative unit. A total of thirty people are handling invoices full time.

Westma tries to concentrate the procurement of sterilizers for the region to one purchase each year. Thus, purchases of infection control equipment are rather infrequent. In some cases Westma makes a framework/general agreements with suppliers. This is often the case with washer/flusher disinfectors. The whole buying process has changed during the last 2-3 years, mainly with the advent of the PC. Nonetheless, there is still a great amount of paper documents involved in the process.

#### Post purchase phase

After delivery, the post-purchase (post-sale) activities take place:

- installation
- validation
- training (users and technicians)
- service

We gathered little information about the actual installation and validation of the equipment. The Thorax department complained about the installation of the last autoclave that was bought, and about late response time from Getinge's to correct the problem. Respondents thought that the validation service was a little too expensive.

The respondents are in general satisfied with Getinge's post-sales activities. That particularly accounts for the rapid servicing of the equipment. The services and warranties are included in a service agreement between Getinge and the hospital. The hospital service technician is satisfied with the interactions with Getinge. However, one respondent, a user, argued that regular and contractual service operations on the equipment had been late or skipped, unless they were followed up. If a sterilizer stops working, the whole department is set on hold. Getinge is in frequent contact with Sahlgrenska, especially with the technicians. Both sales representatives and technical service people visit on a regular basis. Hence, interactions and exchanges of views and information after the purchase are very "people" based.

The technical department finds it very important to have access to service within twenty-four hours. When problems with equipment arise, the user may try to solve minor problems. The user has access to a manual but finds it difficult to use (it is easier and quicker to call Getinge service people straight away). The user, depending on the problem, contacts either a Getinge service technician or an internal service technician. The technical department handles smaller/easier repairs (e.g. change of spare parts) but call service personnel from Getinge for more complex problems.

Concerning education and training, one part is user training, which is carried out during a few days to teach users how to use and handle the equipment and manage the sterilization process. The second part is for the service engineer/technician that needs more in-depth training on maintaining and repairing equipment. The technician was satisfied as Getinge actively invites them to seminars and training sessions, lasting between 2-4 days.

The user expressed some complaints regarding the training, mainly because Getinge wanted to gather all the necessary personnel to participate in one training seminar. As people needed to attend to their ordinary tasks, everyone could not attend during the seminar. Consequently, some users did not receive the education. Also, the education service was considered very expensive:

*"They charge a very high price for this service, which I think is bad. It should be obvious that when you buy such an expensive*

*machine, the training should be free, as much education as you want until you know the machine”.*

The idea of on-line training, to learn how to use the system and equipment, was received very well. On-line training and support could work in some cases, for example minor problems with software etc. No computers are right now by or near the sterilizers although the respondent argued that it could be arranged.

#### 6.1.1.3. Value criteria and value drivers

Realizing which value criteria people use to evaluate competing proposals is very essential. The different members of the buying centre all evaluate proposal with different sets of criteria. Here are some examples:

#### **Table 4 Value criteria of users and technicians**

The user	<ul style="list-style-type: none"><li>• reliability</li><li>• functionality</li><li>• ease-of-use</li></ul>
The technician	<ul style="list-style-type: none"><li>• “simple mechanics” which are easy to repair</li><li>• access to service</li><li>• access to spare parts</li><li>• installation considerations</li></ul>

*(Own table)*

The most often mentioned criteria were functionality and the easiness to use and maintaining the equipment ("handhavande"). The costs, service & support are also very important. Getinge has a good position in the market. This is partly due to reputation, both equipment and service-wise and the fact that they are well established on the market makes it harder for the user to switch suppliers. Another reason is that the customers find no other alternatives, for

instance because of the long geographical distance of foreign suppliers which limit the access to fast service and increases repair time and service costs.

#### *6.1.1.4. Technology relevant for purchasing*

The IT status at Sahlgrenska and Westma seems good. Every respondent has access to a PC and the Internet. The computers are nonetheless mainly used for internal communication through the hospital Intranet. Computer literacy concerning Internet usage is not very high as the respondents are not used to using it. All the respondents were very positive about the idea of using the Internet more in their tasks, for instance to access and receive information about product news, information on upcoming events, updates etc. No respondent had ever visited Getinge's web site, or could not remember if they had. Computers are used for all registration of patients, times, operation procedures and so on, so most of the personnel are computer literate. The Intranet is used mainly for educational purposes and communication.

Electronic means are used to procure consumables. Each item has a barcode and by using a handheld scanner the personnel can scan the items that are low in stock and send the order to Westma (organisation in Sisjön). From there the order is either shipped from Westma's own stock or forwarded to a supplier, which it has an agreement with. This system saves a lot of time for the hospital since it is a one-stop shop for all the different kinds of consumable needed to run the department.

The technical department has good access to the Internet but does not use it much. E-mail is used to communicate with suppliers (Getinge) and sometimes drawings and spare part lists are exchanged via e-mail. The department is positive towards using the Internet more. For instance, the respondent would like to access price lists for spare parts, news about software for autoclaves, and schedules. Spare parts are now sourced through an electronic bar-code system. The storage department receives the orders, prints and sends order lists to the suppliers.

Purchasers at Westma use computers frequently in their work, but the procurement process is still largely paper based. The Internet/intranet is mainly used for communication, with members of the reference group and other internal communication. Sometimes, the Internet is used to search for product



information and more frequently to announce and upload tender (RFP) documents on their web site. Most often, only parts of the documents are put on the web site.

The government has now started a project where the objective is to look into electronic public procurement. The first interim report is out<sup>57</sup>. The first findings show that the main savings can be accomplished with consumables or goods that are standard items with frequent buying patterns and low customisation. Most of Getinge's products do not fall into that category. Nonetheless, Westma is already looking into how electronic means can help to streamline the buying process. The main conclusion, up till now, is to put the whole procurement process on-line. It is most likely that independent third party "dot-coms" will provide this service since individual vendors could not provide this service, as it would not be a neutral tender process. Still the actual order will be placed directly with the selected vendor. Another year will though pass before this can become reality. The report argues that legal issues will hinder a complete electronic procurement process, which today contains documents that need to be signed and sent in a paper format. The benefits of this effort would be a less paper-based process with better communication possibilities between buyers and suppliers and between members of the buying centre, that will eventually save time and money.

### ***6.1.2. Private hospital - Lundby Hospital***

Lundy is a private hospital in Gothenburg and employs 200 people. What distinguishes between public procurement and private procurement is that it is simpler (less formal and fewer people involved) and more flexible.

#### *6.1.2.1. The buying centre*

Compared with Sahlgrenska, Lundby has only 2-4 people involved in the purchasing process. Only 200 people work at Lundby (compared with 18,000 at Sahlgrenska) and therefore the amount being spent on infection control equipment is much lower. The structure of the buying centre therefore varies, depending on the type of products being procured. The administrative

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<sup>57</sup> Arbetsgruppen för elektronisk offentlig upphandling (2000)

department consists of six people, which means that responsibilities concerning procurement are decentralised.

The *head of the department*, that is buying equipment plays a major role in the process and takes part of most of the tasks in the process. Most of the time that person (a user) discovers the need to buy equipment, searches for alternatives and selects which vendor to buy from. Since the hospital has no direct purchasing department, the user “becomes a purchaser”. In the hospital there is one person dealing partly with purchasing questions. The user has the strongest influence on what vendor to choose but he needs a consent form the financial officer and the managing director.

The *financial officer* is mainly involved in searching for available funds and gives the formal consent to buy equipment. The head of the economic department is also somewhat involved in the selection of suppliers.

The *service/maintenance department* is asked for advice on the technical matters.

#### *6.1.2.2. The buying process*

##### Pre-purchase phase

It is most often the head of the department that identifies the need to buy new- or to replace old equipment. The need may also be pointed out by a Getinge service technician, if the equipment is ailing.

The user searches for alternative suppliers and products. It is not likely that Lundby will have a special purchasing department in the near future because of the small size. For larger purchasing projects (e.g. opening a new hospital department), advice on what must be purchased is received both internally and externally (consultants, vendors etc). Often the information search phase involves determining what kind of equipment the hospital already has and if there exists a service agreement with that vendor. Lundby seems to favour equipment from vendors that they have prior experience with. If the necessary product knowledge is not available in-house the hospital sometimes consults with Westma to access expertise on available vendors and products. In some cases the Internet (e.g. [www.hsiinfo.se](http://www.hsiinfo.se), Röda Sidorna) is used as a directory (list) of alternative vendors and products.

When alternative vendors have been identified, the user requests information by telephone, to receive information on available equipment models and price information. A (paper) document (request for quotations/proposals) is sent to the suppliers after receiving the informational material such as brochures. The user contacts the maintenance technicians and asks for their views on the various products and models.

The demand specification can be written by various parties, such as an external consultant or the selected vendor in co-operation with the hospital and the consultants.

The final decision on whom to buy from is then taken mainly by the head of the department and the financial officer. The hospital has long-term agreements with vendors that supply day-to-day goods but this does not apply for capital goods. Often the conclusion is to stick to the existing supplier, as the hospital often has a binding service agreement with that supplier.

#### The purchase phase

The hospital sends a document to Getinge with a product specification and a purchase document as an order and receives an order confirmation and a paper invoice.

#### Post purchase phase

When the internal technicians at Lundby cannot handle problems with equipment, they contact Getinge service people. Responsive service people are considered important. Some problems with equipment are solved over the telephone. Accessing help via telephone is the preferred means of communication. The hospital does not pay for receiving help that way. The user prefers personal contacts, either on the phone or in person, as it is easier to have things explained that way. Training follows the same procedure as at Sahlgrenska.

#### *6.1.2.3. Value criteria and value drivers*

Important value criteria when selecting a vendor are the equipment's functionality and the possibility to use it for the particular area/tasks that the equipment is bought for. Numbers two and three are the price and the access to service. Getinge is considered to offer good service. When the hospital has a problem with the equipment, Getinge responds quickly.

In addition, they recognise the brand as an important decision making criterion. The user is satisfied with the equipment that is reliable and durable. Also, another important factor is that the hospital already has a service contract with Getinge.

#### *6.1.2.4. Technology relevant for purchasing*

All members of the buying centre have access to computers, and the computer skills seem fairly good. The employees use the Internet somewhat, but rather the intranet to communicate internally. Human and personal contact is still the preferred means of communication, although the users can imagine accessing information on-line for the initial assessment of alternatives; for instance product information, product pictures and prices.

Lundby uses the Internet to purchase consumables (e.g. gloves). The hospital has an agreement with a supplier in Örebro where orders are completely handled via the Internet and these orders are placed by the various clinics within the hospital.

One respondent said that it is perhaps possible to order/buy capital equipment on-line, but as there is such a long time (several years) between the purchases of for instance sterilizers, personal/human contacts to get information on what has happened within the field of infection control equipment is essential.

#### **6.1.3. The questionnaire results from Sweden**

After each interview with participants in the buying centre we asked them to fill out a questionnaire. No scientific conclusions can be drawn from this questionnaire, as only six people answered it. The results serve mainly as a back-up (cross-check) for the interview findings.

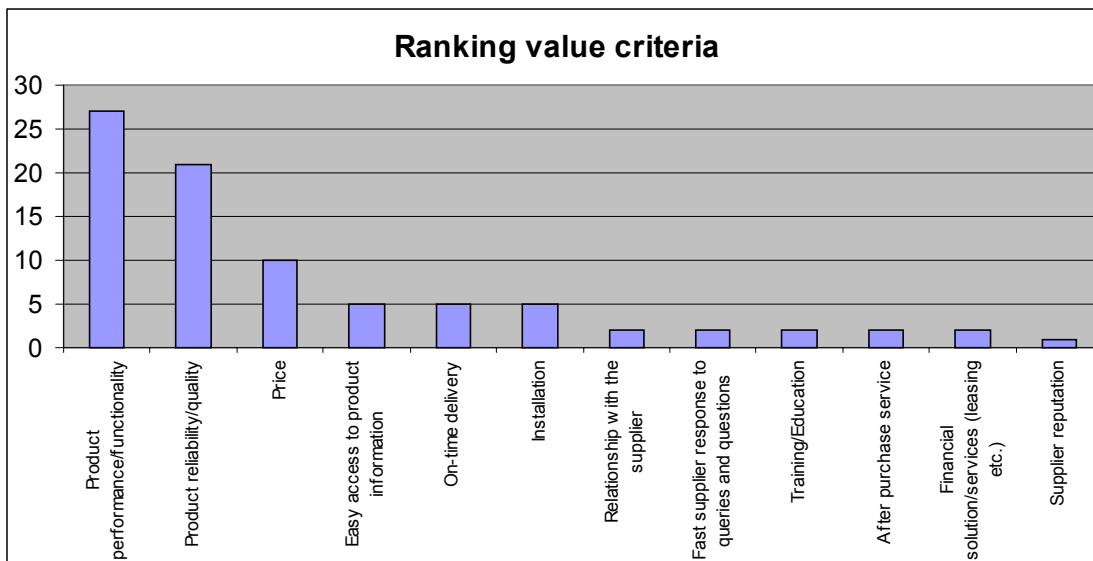
##### *6.1.3.1. Value criteria*

Respondents were asked to rank the criteria from one to five in degree of importance. Three criteria were clearly the most important ones:

- Product performance/functionality
- Product reliability/quality
- Price

The result is illustrated below.

**Figure 8 Value criteria of the buying centre**



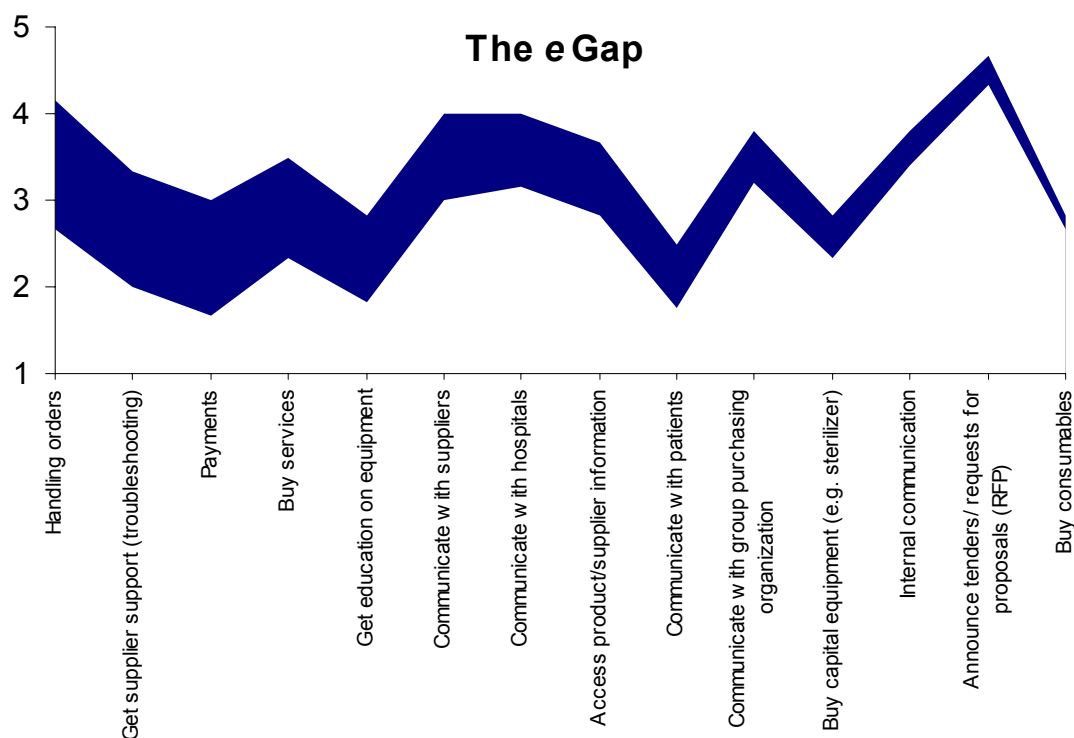
*(Own figure)*

The value criteria of the members of the buying centre did not vary greatly, meaning that all have a similar perception on what factors to look at when evaluating a proposal.

### 6.1.3.2. *The e-gap*

This question involved investigating which activities the respondents used the Internet for today and for which they would be willing to use it in the future. The picture below shows the results.

Figure 9 The e-gap



(Own figure)

The black area shows the gap between current and wanted future situation. In all cases people wanted to use the Internet more in the future. Currently the Internet is mostly used for internal communication and announcing tenders (RFP). It is apparent that it is for information access and communication that people want to use the Internet in the future. This involves communication between hospitals, suppliers and purchasing organisations. The interesting part is where the biggest gap is between current and future status. These factors are:

- Handling orders
- Get supplier support (troubleshooting)
- Payments
- Buy services
- Get education on equipment

This can be explained partly by the fact that they are uncertain about how these activities would work in practice that they prefer the way current activities are handled.

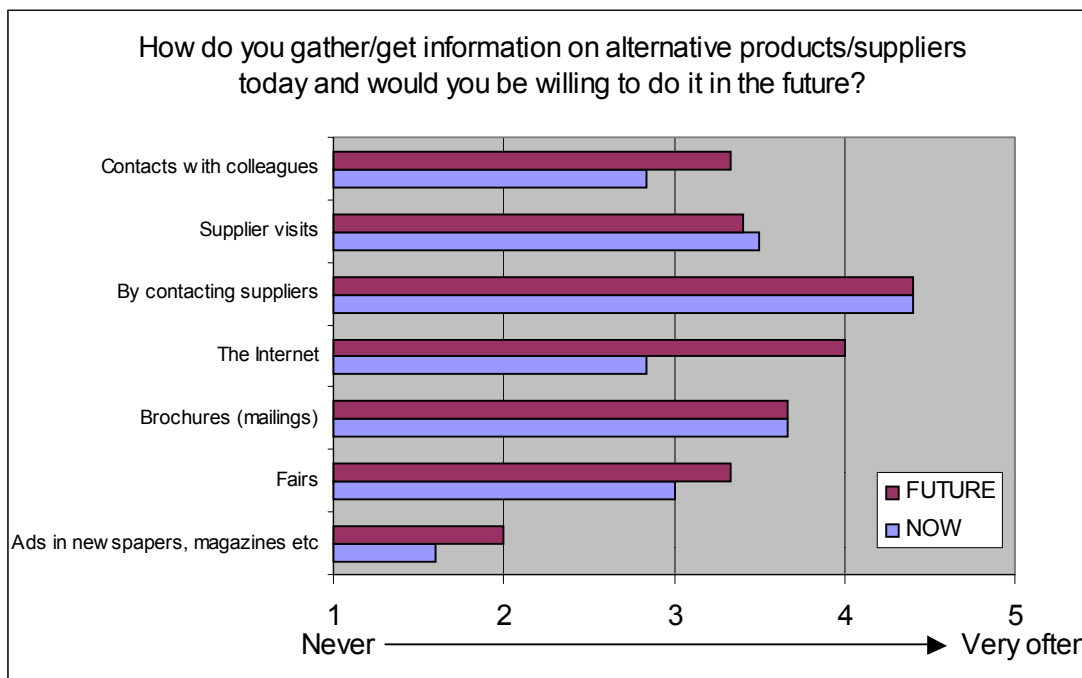
6.1.3.3. *How to collect information*

Another question was how the respondents gather/get information on alternative products/suppliers today and how they would be willing to do it in the future?

The main conclusion is that the respondents are willing to use the Internet to gather information on supplier/product alternatives in the future. To a lesser extent they want to use:

- Contacts with colleagues
- Fairs
- Ads in newspapers, magazines etc

**Figure 10 How information is/will be gathered**



*(Own figure)*

**6.2. United Kingdom**

The UK is the second largest market in Europe for infection control equipment with 13.5% of the total market<sup>58</sup>.

<sup>58</sup> Frost & Sullivan (1998)

### **6.2.1. Public hospitals**

We interviewed two public hospitals, Addenbrooke's Hospital in Cambridge and Hope Hospital in Manchester. As these two hospitals have a very similar buying centre and buying process, we will be putting them together in the study.

#### *6.2.1.1. The buying centre*

The persons and divisions that are involved are:

- The purchasing department
- The head(s) of the department buying equipment (CSSD manager)
- The technician (service engineer)
- An authorized person (AP)

Both hospitals have their own *purchasing department*. Some purchasing departments have links to the National Health Service and the NHS Purchasing and Supply Agency (PASA), which is a part of the Department of Health. Only few products are purchased on that level such as utilities, gas, electricity and telephone. The government has pulled away from "national contracts" into letting individual hospitals (or group of hospitals) deal with purchasing. The local purchasing units have the competence to reach even better deals than the central unit.

How much the purchasing department is involved in the process seems to vary. The department looks at different offers from a commercial point of view and points out the pros and cons of the offers. In some cases the order goes to purchasing department and they handle the paperwork after that.

*The head(s) of the department* (users) buying equipment, most often a CSSD manager, is the most important person in the buying process. The CSSD manager has many different roles/tasks in the process. The tasks include identifying a need, writing a demand specification, gathering information on possible vendors, evaluating the tenders and selecting which supplier to buy from. The user has great influence on the selection of vendors. The CSSD manager browses the market and investigates which vendors are available. This is mainly done through personal contacts, either through the phone or personal (face to face) contacts. The NHS hospitals in the UK have formed a network.



The CSSD managers, for instance, have a nationwide organisation where about 70% of all the managers participate. Through this network the users of infection control equipment exchange their experiences with different vendors, equipment etc.

The *technician or the engineers* at the hospital play a role in the process by giving advice on the technical issues, confirming that the equipment meet standards and evaluating the equipment from a maintenance point of view. The engineering department is involved in collecting information on possible vendors and writing the demand specification. They also have a say in which equipment to buy, but the weight of their input varies between hospitals.

*Authorized persons* (APs) are most often external bodies employed by the hospitals as consultants. Some APs are however employed by hospitals. In some cases the AP is very involved in the whole process from writing the demand specification (DS) to participating in the decision making process. In cases where the AP writes the DS, he can have a great impact on which supplier will be selected. How specific and demanding the DS is, differs between APs since they may have different views on what to include in it.

One of the key roles of the AP is to see to it that the equipment meets specified standards. The AP also acts as an audit body that is to ensure that the CSSD is operated in accordance with standards. The APs also oversees the testing and validation of equipment and training of personnel (of both users and technicians/service engineers).

The influence of APs on the buying decision varies from one hospital to the other. In the case where the AP is employed by the hospital, they greatly influence the decision on which product/supplier to choose. In this case, the relationship between the AP and the other members of the buying centre is closer. On the other hand, there are APs that strictly advise on whether the equipment meets standards but do not influence which vendor to select.

#### *6.2.1.2. The buying process*

##### Pre- purchase phase

The need to buy new equipment is most frequently recognised by the user, normally a CSSD manager. In some cases the need to buy new equipment can

be initiated by an AP, if the old equipment does not comply with safety standards.

A purchasing team (buying centre) is brought together consisting of a CSSD manager, an engineer from the technical department, a representative from the in-house purchasing department and an authorized person (AP)

The extent to which each member of the buying centre participates in the procurement process, varies between hospitals, depending on the role of the authorized person. In some cases the AP is much involved (recognizing need, finding vendors, DS, etc.) but in others they are only consulted in the process.

Before going out to tender, the members of the buying centre source the market for available products, models, what standards they comply with, whether suppliers meet performance criteria, sizes, capacity, and so on. However, there seems to be little active information search prior to the tender being published. The AP is often knowledgeable about the market (possible vendors, products, trends etc.). The respondent uses magazines, periodicals, meetings, talks with sales representatives, to keep up-to-date with the latest development.

If the team's objective is to buy one or two autoclaves (approximately 1 million SEK) they select three to four manufacturers to which they send requests for proposals. If the purchase amount is above, the open tender must be published in the Official Journal of the European Community (OJEC). First, a so-called pin-notice, without detailed specifications, is placed in the OJEC. Manufacturers respond by expressing their interest and by informing what they have to offer. The buying centre selects approximately four suppliers that meet the set criteria and it becomes a closed tender. The first criterion that the vendors must meet is to offer equipment that meets their needs and standards. At this stage the network of CSSD managers plays an important role. Most CSSD managers are members of the Institute of Sterile Services Managers and the members can verify what suppliers or products are reliable and which are not. Also, hospitals check the quality of the last installation job of a particular vendor.

The members of the buying centre then write a demand specification. In most cases the AP handles it but sometimes the hospital writes it. At a minimum, the AP must be consulted due to regulations. The fundamental demands come from

the CSSD manger or a user where they state what kind of functions the equipment must able to perform. There is no standardized approach on how to write the DS but it often contains three layers of required standards:

- European legislation (vague and ambiguous)
- British legislation (more specific)
- Own additions (could also be a demand form the users, funding etc)

Because of this situation of various standards, equipment often needs to be customized for each hospital.

Vendors send in their proposals, which are paper documents that contain price information, indicative drawings, manufacturer information, photographs and so on. The members of the buying centre evaluate each proposal. The different members of the buying centre then have different tasks in the evaluation process. The engineers look at the technical correctness and check if the equipment meets the specification. The AP's job is to verify that everything concerning the required specifications is included and that everything has been priced. The CSSD managers look more at performance satisfaction, the functionality and so on. So in the end, there should be a consensus to what will provide the best value for money and which supplier to select. One user argued that she had the greatest influence on which equipment to select.

#### The purchase phase

After choosing a supplier, an officially typed order is placed. No tasks of the process, from placing an order to payment, are electronically processed.

#### Post purchase phase

As in Sweden, the first step of the post-purchase (post-sale) activities is installation, which the equipment manufacturer takes care of. After that, independent persons control the equipment to ensure they perform according to standards (compliant with the hospital technical memorandum). This process is overseen and validated by an authorized person.

Training of people that will use- and service the equipment is overseen by the AP. The CSSD manager designates certain people of her staff that are to operate the machine, and they go through a training exercise with the AP

and/or the supplier. In a separate exercise the people that will maintain the equipment (mostly routine servicing e.g. filter change) receive training. To be able to train users, the AP attends training sessions with manufacturers. He also determines whether the user and service personnel are able operate the machines. In addition to the training from the AP, the technicians have to go to an approved training course that is run by the NHS. According to one respondent, little training is received directly from the vendor that supplies the equipment. However, in a demand specification that we studied, manufacturers were asked to train users of the equipment. The hospital also receives instruction manuals. The first twelve months, equipment is under a service contract and warranties.

As the warranty expires, the hospital has the option of signing an agreement with the current equipment manufacturer (SEC) or other specialised companies. In most cases the vendor does not service the machines. The hospital also signs up a validation company, which has to be approved by the NHS, to run regular mandatory checks on the equipment.

#### *6.2.1.3. Value criteria and value drivers*

Two respondents mentioned “value for money”. Obviously, that is hard to quantify. Infection control equipment (especially sterilizers) is “built to order” in the sense that demand specifications vary greatly from one hospital to the next. Hence, an important value criterion is that the manufacturer can produce a machine that meets the demand specification. The tender price is always initial focus of an evaluation. Although price is important, the vendor with the lowest price is not always the one that will be selected.

Prior performance is also important and the better the reputation a company has regarding on-time delivery, equipment security, reliability and service, the likelier the hospital will select the vendor. The hospitals look both at switching costs and operational costs. One respondent argued that as the hospital had invested in Getinge/SECs IT system that runs the sterilisation equipment, the likelier they would repurchase from the supplier with equipment compatible with the IT system (high switching costs). Also, a hospital is likely to stick with the same equipment if any of them needs to be replaced (operational costs).

The NHS has stressed that hospitals should select suppliers that are innovative and that will “take us [NHS] into the future”.

*6.2.1.4. Technology relevant for purchasing*

The IT status varies between the two hospitals we interviewed. According to one respondent, most university hospitals and big- and medium sized trusts have good IT infrastructure. Most hospitals have Internet access but currently the access is limited to the heads of departments. Most public hospitals have access to the NHS intranet. It is the task of the NHS to get every trust to the same IT level. Bringing all NHS trusts up to a desired e-commerce level will take 5-8 years, according to one respondent.

Addenbrooke’s has a good IT structure and Internet access. All members of staff within the purchasing department have access to the Internet and a high proportion of the staff within the hospital itself as well. The next step is to provide Internet access at a nurse level. Hope Hospital, on the other hand is not as well equipped where only a few people have access to the Internet, but the hospital relies on the intranet to communicate internally (e-mail).

Many hospitals have in place a bar code system to order consumables. Some are well equipped with computers and have already started to look into how they can benefit from e-commerce. This is the case at Addenbrooke’s where the hospital has found a “dot-com” partner to work with (smartmission.com). The system, which allows different departments to buy consumables on-line, will be fully integrated with the financial systems (back office integration) of the hospital. This is a pilot project but the hospital plans extend this solution to other product categories such as consumables used in the CSSD. The hospital still has to use traditional methods (formulating a demand specification etc.) when sourcing capital equipment.

The ultimate goal of the hospital is to use one portal where hospital staff can access all the necessary information and products. Thus, initiatives from each supplier to sell through their own website is not welcomed. Another advantage of the system is that it has the potential to stop maverick buying (opportunity buying) since items will be tied to the selected suppliers. In addition, the hospital plans to use electronic tendering. That has the potential of creating

*Customer environment study*

price-transparency within the NSH hospitals as every trust has access to information on what prices have been offered to other trusts.

## 7. ANALYSIS

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### 7.1. Macro factors affecting buying and marketing behaviour and buyer-seller relationships

#### 7.1.1. *The effects of IT and electronic commerce technologies*

As information technological changes such as electronic commerce has an impact on society as a whole and on the behaviour of actors within, we define it as a macro factor. Electronic commerce technologies could therefore directly affect hospital buying behaviour and seller marketing behaviour as they provide direct opportunities to make adaptations to current interactions and exchanges in the relationship in general and in the buying/selling process in particular.

Simply, hospitals may use the technology to search for product/service information, procure equipment electronically and Getinge may use the technology to provide detailed product/service information, sell and market infection control equipment and enhance the after sales service activities. In addition, the information technology allows the access and provision of a large pool of knowledge of infection control, of customers and so on. Either way, it would change the nature of current interactions and exchanges in the relationship and of the buying/selling process. It is therefore valuable to analyse whether electronic commerce technologies directly will change the buyer-seller behaviour by taking into consideration:

- The nature of current interactions and exchanges between Getinge and its hospital customers and the possibility/suitability of making adaptations to the exchanges by using e-business technologies
- The nature of the current buying-selling process
- The processes that drive the relationship value
- The readiness and willingness of hospitals regarding access to the technology and the willingness to use it in the future.

These considerations will be put together in the analysis.

### ***7.1.2. Current Getinge-customer relationship (interaction- and exchange process)***

#### *7.1.2.1. Product and service exchanges*

Given the durability (10-15 years) of infection control equipment in general and sterilization autoclaves in particular, the company and the customers engage in a long-term relationship. After the purchase/sales transaction has been completed, the relationship also encompasses after sales service in terms of delivery, installation, training, maintenance and repair. In addition, customers buy spare parts for the equipment. Service is included in negotiated contracts, warranties and agreements. The product and the after sales service are more or less inseparable. The hospitals buy both the product and the service (e.g. installation and training), due to the complexities of installing and repairing the equipment and uncertainties of running the machines without training.

Thus, the product and service are the key exchanges that contribute the most to the performance of both Getinge as a supplier and the hospital sterilization services centre (and consequently the surgery/operation departments who need sterile equipment to operate). The product and the service are the major components with which Getinge and its subsidiaries satisfy the basic needs of their customers: disinfected and sterilised goods and equipment. The product and service components are also the factors that drive the relationship value the most.

By law, hospitals are also required to document the disinfection and sterilization process. As part of the solution, Getinge also supplies an IT-system for the sterilization plant that controls and facilitates the documentation of the sterilization process. Thus, the IT-system satisfies the need for documentation.

The market penetration of the T-DOC installation is not yet very high. Hospitals in the UK are now required by the NHS to develop a solution for implementing a traceability system by the end of the year. It seems important for Getinge to focus marketing efforts on selling and installing the T-DOC system to hospitals because, as one respondent mentioned, it is more likely that the hospital will buy equipment from the same company that supplies the IT-system controlling the sterilization process. This ties the company and the customers together and the hospital switching cost becomes higher. In addition,



as support personnel may remotely support the whole process, the relationship becomes closer and even more integrated.

Hospitals procuring infection control equipment in both Sweden and the UK involve a number of people in the buying process with different tasks, values and need requirements. These people make up the buying centre.

What is important is that there may be different product needs and wants. A user tends to value the ease of using the equipment, the reliability, capability and performance of the equipment and access to service on demand. They value the functional characteristics rather than the price. A technical engineer values the repairability of the machine and access to spare parts and service. The purchasing organisation needs to negotiate a commercially sound contract, where the price is important. However, as it is supposed to be a collective decision on what product and supplier to buy from, one cannot exclude one specific evaluation criteria, although they are weighted differently. Thus, to succeed, the company's product and service solution must take into consideration and satisfy all the value criteria of the buying centre individuals.

Hence, to satisfy the needs of all people in the buying centre, product and service exchanges involve several people from both the Getinge organisation and the hospital buying centre. This means that interactions and exchanges occur between several actors with various functions. The company therefore needs to know the needs, wants and values of all the members in order to be able to satisfy them.

The complexity of the product and after sales service components requires a very people based interaction between Getinge and the hospital customers. This is due to both hospital and user requirements. For instance, hospitals sometimes want to test the equipment, Getinge needs to install, validate, train users, maintain, and support the equipment which are processes that require people. Moreover, if a machine breaks down, users need service people from Getinge to repair the equipment. Therefore, the people we have interviewed value and need the personal interaction with people. That is why they perceive limited possibilities and/or value of exchanging these products and services over the Internet. Thus, they seem to prefer human and personal interaction.

## *Analysis*

### *7.1.2.2. Information exchanges*

In the company's relationship with the hospitals, the information exchanges between the two parties intensify when the need to buy new, or replace old, infection control equipment is recognised in the hospital. As there is a long time between the purchases of this equipment, the customers need updated information on available products and services. Therefore, hospitals 'source' the market for information on potential products and suppliers. In the UK, an authorized person sources the market by looking at written material or by the on-going personal contacts or phone calls with sales representatives. As company representatives and people in the buying centre have on going personal contacts, there is a limited need to use the Internet to search for information. In Sweden, the purchasing organisation Westma source or "research" the market or as in the other hospital, a user sources the market. It is however important to note that most respondents in the UK and Sweden want to use the Internet more in the future to search for information on products and services. This would for example facilitate the work of writing a demand specification for people involved, increase the knowledge of products and services and lower the search costs. Thus, the information may be transferred more impersonally in the future.

Developing an electronic catalogue (customised or standardised) to promote products and to help hospital buying centre members to obtain detailed information on products and services is possible using Internet and e-business technologies. To use the on-line catalogue, the people must have access to the Internet. Internet access in the hospitals in Sweden seems to be good, whereas Internet access in the UK seems limited to a few people. In addition, computer and Internet usage should come naturally, which it does not at the moment. Today, given the poor access to the Internet in the UK hospitals and the low degree of Internet usage in the Swedish hospitals, it is not likely, however, that hospital buyers in a near future will use the Internet in the buying process.

### *The content and formality of the information*

The information exchanges in the buying and selling process are formal and complex during a tender in both countries. The information contains mostly technical and commercial data, facility- and engineering drawings, product specifications and so on. Given the complexity of the products and

requirements on safety, performance, standards, documents tend to become rather large. Hence, there is a rather formal content and exchange of information.

*The width and depth of the information*

The information in the exchanged tender documents is both wide and deep. The information is wide in that it includes information on technical, practical and commercial issues. It is deep as the required technical specification for the equipment is both complex and thorough.

Electronic tendering, which will be possible in Sweden and the UK in a near future, depend heavily on the ability to standardise such information, that both buyers and suppliers need to tender efficiently. That is possible for consumables where requirements and technical information are similar and not as wide or deep as in the case of capital equipment such as sterilizers. Thus, the complexity of the information exchanges concerning infection control equipment will make it difficult to change traditional tender behaviour to electronic tendering. However, increased standardisation of equipment may allow electronic tendering in the future.

From an informational and promotional point of view, the benefit of a web site is that e-business and Internet technologies may present both wide and in-depth information on products and services, customised to each customer. In addition, on line catalogues for instance, may be both static and dynamic which may include both static product pictures as well as video demonstrations of the equipment. Such information exchanges would be possible prior to a tender.

*The way of transferring the information*

The written tender documents are transferred *impersonally* by ordinary mail and not electronically. It is still required by law to exchange this type of information this way, although legal authorities discuss electronic tendering. Training, education and instructions to users of the equipment is “soft” information that is exchanged *personally* as people from the company must have representatives present on the hospital site to train, explain and instruct users how to handle the equipment. The personal interaction is, as in the UK case required, and in general preferred, which will make it harder to implement on-line customer service and training for instance.

## *Analysis*

Prior to the tender, when hospitals source the market for products and suppliers, they do not see the Internet as a natural source of information, which is why they prefer getting this information by personal means (personal contacts) or written material. They do wish to use the Internet for this purpose more in the future. Currently, most respondents never use the Internet in the buying process and see no real value or possibility of doing it to buy complex machines. In addition, adapting to developments in information exchange routines will probably take time. A key marketing task would be to influence the customers to adapt to changes in information exchanges. This will only happen if this is perceived as valuable in that it facilitates the customer's work.

### *7.1.2.3. Financial exchanges*

The cost of acquiring one or several sterilization autoclaves or disinfectors is substantial, which implies the economic importance of the relationship between the Getinge and the hospitals. Significant money transactions are subject to uncertainty, which was expressed by one respondent about using the Internet for such transactions. Moreover, given the durability/lifetime of the equipment, the purchasing frequency of infection control equipment is low, which implies that there are no major savings related to order and invoice handling.

### *7.1.2.4. Distances and uncertainties*

There exist obvious cultural distances between Getinge and its customers. Getinge is a private, profit-seeking company whereas customers in Europe are mainly public hospitals that perhaps do not share the same commercial values. Hospitals are to provide the best health care possible to society and the ultimate aim is not to show profit, although they work with tight budgets. The opportunities of adapting to e-commerce are to lower price of products and the cost of administration to increase profits. This may explain why other industries (mainly private) are far ahead of hospitals in implementing IT and e-commerce solutions.

Furthermore, using computers and the Internet does not come as naturally for the people in hospitals, which tend to belong to the "older generation". According to one respondent, it will take a "generation shift" before hospital people will see the benefit of the Internet and a more electronic relationship with suppliers. They are obviously uncertain of how to use the technology as

well as of what value it will bring into the buying process of infection control equipment.

As mentioned, the complexity of the product requires people based interaction, especially in the after sales service (post purchase) phase. It is difficult to see whether e-commerce technologies can change these interactions. One option would be to use the web site for on-line support that would give fast access to support for minor equipment problems. Another possibility is to have on-line education/instruction on how to use the equipment or the system.

### ***7.1.3. Customer perceived value***

#### *7.1.3.1. Perceived benefits*

The key benefits are a combination of core product- and after sales service characteristics; price, functionality, performance, reliability, quality, ease-of-use, ease-of-maintenance, installation, user training, repair and warranties, access to technical support and fast service response.

#### *7.1.3.2. Perceived costs*

The main costs are related to the costs of acquiring the equipment, the costs of running the equipment, the cost of services and indirect and psychological costs. The total price of the product/service offer is often the initial focus of an evaluation. The cost of running the equipment concerns the electricity and water consumption and the time and effort to run the machine. The indirect costs concern delayed product/service delivery or equipment downtime/break downs. The psychological costs refer to the uncertainties and worries of delayed delivery and equipment breakdowns.

Obviously, it is not possible to sell the equipment unless the buying centre perceived benefits outweigh the perceived costs. A close relationship characterised by trust tends to reduce the uncertainties regarding benefits and costs. If customers do not perceive a higher value for Getinge's product and service offerings, compared with competitors' offerings, then repeat purchase is less likely and a continued relationship is less likely. An important evaluation criteria when selecting a supplier of infection control equipment, is fast access to service/maintenance personnel when a machine breaks down. Fast access in Sweden means within 24 hours. This implies that the supplier probably must be

### *Analysis*

present in a country in order to respond quickly. That is why hospitals tend to favour local suppliers.

It is of utmost importance to know the factors related to customer perceived value and adapt to them (if necessary and beneficial) either by influencing and/or increasing the customer benefits or reducing the customer perceived costs.

If all members of the buying centre perceive more benefits than costs, the more likely the result will be

- total customer satisfaction increases
- reduced uncertainties and enhanced trust
- reinforced customer loyalty
- higher probability of repeat purchase
- deepened, long-term relationship

#### *7.1.3.3. Can e-business technologies be deployed to improve customer perceived value?*

Can e-commerce technologies and functions contribute to improving customer perceived value by implementing the technology in current value creating processes? **Given our interpretations of the opinions of most respondents, the analysis of the current interactions and information exchanges and current Internet access and usage, e-business technologies seem hard to implement at this moment and will be of limited value.** Personal interactions rather than impersonal interactions are currently preferred in the relationship and in pre- and post purchase/sales activities.

However, if, and when this changes, e-business technologies should complement rather than replace existing activities and interactions to improve customer perceived value. A customer focused web site with electronic catalogues is a marketing tool that can promote the product and service benefits so that the customer *perceived* benefits increase and *perceived* costs decrease. For instance, Getinge can promote 100% on time delivery, reliable equipment with little downtime, low running costs, ease-of-maintenance, ease-of-use and responsive service and support personnel. Moreover, the company can show

(e.g. a video demonstration) product functionality and ensure that it will meet the demands of the customer.

An on-line catalogue also allows people in the buying centre access to detailed product and service information and commercial information, which may decrease *actual* search costs and time needed to write a demand specification. If possible, the electronic catalogue could also be connected to an on-line order form, which would increase the ease-of-ordering and reduce administrative costs.

Adding ancillary services such as remote on-line technical support may guide and allow users or hospital service engineers to solve minor problems/repairs themselves, which could reduce downtime costs and service costs and improve customer satisfaction. This would also make it easier to maintain and repair the equipment. This may also be seen as a service benefit that increases the actual value. In Sweden, the respondents saw possibilities of using on-line support in the future.

On-line education and training/instructions could complement or replace existing training activities to increase or enhance customer education satisfaction. On-line education could include the area of infection control in general to show that the company is very knowledgeable in the field, and sharing this knowledge with customers will signal commitment and reliability, which will build trust. Hence, this may strengthen the reputation of the company.

#### ***7.1.4. The effects of equipment standardisation***

The standardisation of infection control equipment, as driven by the European Community may affect both hospital buying decisions and behaviour as well as selling and marketing behaviour. In the short term, complete standardisation seems impossible as the hospitals apply and require that equipment meet both European standards and national standards. This is obvious in the UK. As it is now, the UK subsidiary customises product features (especially autoclaves) to meet the needs and standard requirements of hospital buyers. However, if infection control equipment becomes completely standardised in the future, there are three major implications regarding buying behaviour and marketing behaviour:

## *Analysis*

- Standardised equipment may lower price and reduce buyer product options. Possible effect: Hospitals buy the lowest priced products
- Standardised equipment may leave less room for product differentiation. Possible effect: Getinge must find other means of differentiation
- Standardisation of equipment may drive the growth of e-commerce. Standardisation of equipment may create similarities in hospital buying behaviour, which would make it easier to standardise demand specifications and orders. Possible effect: It will be easier to tender electronically, order electronically and sell equipment electronically

*Standardised equipment will lower price and reduce buyer product options.*

This depends on how standardised the equipment will be. If all the product features and product offerings look exactly similar and have the same functions and performance, hospital buyers may evaluate offers solely on the lowest price. This could decrease customer loyalty and increase the price sensitivity of hospital buyers. This could also increase international and pan European competition as uncertainties of what products are on the market disappear. However, as after sales service and access to fast service are important evaluation criteria by hospitals, local market presence will still be needed.

*Standardised equipment will leave less room for product differentiation.*

*Product differentiation* can be achieved on variables such as *features* that are supplementing the basic function of the equipment. Getinge must however decide whether to offer feature customisation to customers at a higher cost or standardise the offer at a lower cost. Other variables of differentiation include *reliability*, *repairability* (ease of repair), *durability*, and *performance* quality. If these variables are similar there will be less room for product differentiation.

However, as a supplement to the equipment, the T-DOC (IT) system is one way to differentiate. In the UK, traceability and documentation will be mandatory. The system that is also remotely supported makes it easier for hospitals to control and document the whole sterilization process. Moreover, it may be more likely that hospitals will buy the equipment from the same company that provides the IT system.

There are also other ways to differentiate:



- Services differentiation is related to ease-of-ordering, delivery, installation, customer training, customer consulting or maintenance and repair and warranty contracts that are more valuable than competitors. Service quality is already an important value criterion for hospital buyers and a key prerequisite to sell equipment. The question is whether some of these variables may be improved or complemented by implementing e-business technologies. If used by hospital buyers, detailed on-line catalogues (or even an on-line order form) would for instance facilitate writing a demand specification or the ordering of equipment. Getinge could also, with all its knowledge of infection control, become consultants to its hospital customers, in terms of giving advice on facility planning and the sterilization process.
- Personnel differentiation concerns the competence, credibility, reliability, responsiveness and communication of the company staff. By increasing the customer knowledge of sales- and service representatives, they can be more responsive to customers needs and wants which may lead to increased customer satisfaction.
- Channel differentiation refers to the ways a company chooses to sell (distribute) its products. For example, adding the Internet as an on-line sales channel to complement existing sales channels is a way to differentiate from competitors. This may be possible, but, given the hospitals high uncertainties regarding the value of electronic procurement and the low access to, and usage of the Internet, this is not likely to be an important sales channel in the future.
- Image differentiation refers to distinguishing a brand identity and communicating it to create a favourable image as perceived by the customers.

*The standardisation of equipment may drive the growth of e-commerce*

Standardisation of equipment may create similarities in hospital buying behaviour, which would make it easier to standardise demand specifications and orders. This would possibly make it easier to tender electronically, order electronically and sell equipment electronically. The trend towards electronic procurement of the hospitals we interviewed will mostly concern consumables.

The buying patterns of consumables look fairly similar with low customisation and standard offers. In addition, the buying frequency is much higher for consumables than for capital equipment such as sterilizers and disinfectors.

## **7.2. Industry actors affecting buying and marketing behaviour and buyer-seller relationships**

Electronic commerce does not seem to have, or will have in the near future, a direct effect on hospital buying behaviour or Getinge's selling and marketing behaviour of infection control equipment. Product complexities and the (preferred) people-based interactions will probably prevail for a while.

The major drivers that currently affect, and will indirectly affect buying and selling behaviour between hospital and suppliers, are found in the industry environment. They are driving the development of electronic commerce in the health care industry in general and between hospital buyers and suppliers in particular. It is therefore important to analyse the trends and type of actors in the industry environment regarding the use of electronic commerce, which may indirectly affect both hospital buying behaviour and the Getinge's selling and marketing behaviour in the future.

In the United Kingdom, following the recommendation of a Cabinet Office review of NHS procurement, all hospitals must introduce an electronic procurement solution by the end of this year. The purchasing organisation Westma in Sweden is investigating the possibilities of electronic tendering and the private Swedish hospital currently orders hospital consumables over the Internet. The key word is consumables. Those are products with high purchasing frequency, low customisation, low product- and after sales service complexity and demand low personal interaction between suppliers and the hospital.

Suppliers of medical supplies (consumables) are making hospitals realise the benefits of accessing product information and ordering on-line. As hospitals deal with a large number of suppliers, suppliers have teamed up to create e-business exchanges that aggregate supply of several suppliers. These make it easier for hospital buyers and make the buying process more efficient as search costs and transaction costs decrease.

Third party “dot-coms” are also in the process of making hospitals and suppliers change their buying- selling and marketing behaviour. They deploy new information technological solutions to create value for both health care providers and health care suppliers. The companies provide hospital buyers and suppliers with e-business solutions for procurement, information exchanges and marketing opportunities. Different hospitals and trusts are cooperating with different dot-coms and there is a great number of them on the European healthcare market. The current focus, as mentioned, is on on-line ordering of consumables. Dot-coms provide, and will provide a number of solutions that are affecting and will affect buying and selling behaviour. The main solutions are:

- electronic tendering platforms (e-tendering on web sites)
- commerce platforms (on-line ordering and selling)
- community platforms (on-line communities of interests that can be hosted and sponsored by suppliers)

When legal impediments disappear, electronic tendering platforms will allow the tender process to be completely electronic. Medinsite provides an independent web site for cost-efficient tender based sourcing of medical supplies according to the legal requirements for public tenders. The cost-efficiency is accomplished through a more direct contact between buyers and suppliers within Europe and through a standardized and significantly simplified tender process. Medinsite’s services will most likely increase Pan-European competition as virtually any supplier anywhere can respond to a local tender, because the tender is translated. Both tender requests and tender responses are translated; therefore everyone can participate in the tender process, irrespective of their geographical location and language preference. Medinsite will offer additional services such as distribution of product information, link to suppliers’ home page, advertisements etc.

Other European dot-coms will provide similar solutions. As this is firstly focused on consumables due to the possibility to standardise an electronic tender format, this will not have an immediate impact or provide immediate opportunities for electronic tendering between Getinge and its hospital customers.

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However, dot-coms will drive Internet usage of hospital buyers (especially purchasing organisations), which may have an indirect affect with regards to procurement of infection control equipment. Eventually, if infection control equipment becomes standardised, the same standardised e-tendering process may be implemented between Getinge and hospital buyers. If such standardized pan European tendering will be reality, competition will increase and pressure prices and Getinge's hospital customers may become more focused on price as price transparency increases.

Dot-coms also provide promotion opportunities for suppliers that may submit product information and place advertisements on their web sites. This allows the possibility to increase brand- and product awareness. In the process of signing up suppliers, one dot-com offers – free-of-charge –to digitalize suppliers' product catalogues and upload the electronic catalogue on the web site. As the current focus is on exchanging information and products that are medical supplies and consumables, the hospital audience buying infection control equipment that visit the web site for product information, hardly exists. This implies that it currently seems less valuable to promote the company and the products on the dot-coms' web sites. In the future, however, the audience visiting these dot-coms will be larger.

Besides commerce platforms (on-line ordering and selling), dot-coms also offer on-line communities. These center around an area of interest (e.g. profession) where buyers may interact to discuss issues, ask for product advice and so on. Dot-coms allow suppliers to host and sponsor these communities, for example by placing the logotype on the community page, which may be exposed to a targeted audience. Eventually, a community for CSSD managers or for sterilization may be developed, where Getinge could host the community to increase brand awareness or enhance the brand image.

This is a new way of bringing suppliers and buyers together. For buyers a new way of searching for information and for sellers a new way to promote the brand name, provide information, generate sales leads and eventually complete sales transactions. For Getinge, this could be a future solution on how to complement existing marketing activities. The current target audience is slow to adapt to the possibilities of the Internet, which implies that this has to be a long-term solution.

Actors in Getinge's immediate industry environment – competitors manufacturing and supplying infection control equipment and services to hospitals – are currently not driving hospital customers to buy infection control equipment over the Internet. That is, they are not exploiting their web sites as marketing, sales and after sales channels to affect hospital buying- and post buying behaviour of infection control equipment. One competitor does nonetheless provide on-line ordering of sterilization consumables and accessories.

Most competitors use the web sites for promotional purposes by providing product and service information that customers may download or request. Some information is more detailed than other. One competitor allows authorized customers (password) access instruction manuals for the equipment. In general, they do not experiment with e-business technologies or functions.

### **7.3. Drivers and impediments of e-commerce**

*“For a while the story was that if you were not one of the first on the Internet, you were doomed, but now we know that's not true<sup>59</sup>”*

From the above analysis we can draw the conclusion that all the hype surrounding e-commerce is of moderate short-term importance or value for Getinge and its customers. Newspaper and magazine articles have predicted that companies who do not embrace e-commerce will have a hard time surviving competition, if surviving at all. It is apparent that some industry actors benefit from creating hypes like that. Those include consultancies (mainly new Internet consultancies), new dot-com intermediaries and sellers of various hardware and software. In this thesis we have tried to filter out the hype from the real value that can be gained. Experience has shown that the recently created dot-com companies are having a hard time competing with established companies for a number of reasons. “Bricks-and-mortar” companies have strong distribution networks and established relationships with customers, suppliers and partners. Thus, in the long run, the e-business winners are likely to be established enterprises that find a way to integrate the Internet into existing business processes, not those that rely on the Internet alone.

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<sup>59</sup> Leaders of a new pack by Jeff Moad. eWEEK. November 13, 2000.

The value of e-commerce for established companies although differs greatly. The following table shows the identified drivers and impediments (internal in the relationship and external in the environment) of using e-commerce as a complement to current marketing activities.

**Table 5 E-commerce drivers and impediments**

	<b>Drivers</b>	<b>Impediments</b>
External	<ul style="list-style-type: none"> <li>• Dot-coms</li> <li>• Standardization</li> <li>• Other suppliers</li> <li>• Governments</li> </ul>	<ul style="list-style-type: none"> <li>• Hospitals in general                             <ul style="list-style-type: none"> <li>○ Culture</li> <li>○ IT and Internet access/usage</li> </ul> </li> <li>• Legal requirements</li> <li>• Competitors</li> </ul>
Internal	<ul style="list-style-type: none"> <li>• Much information has to be exchanged</li> <li>• Training/education needs</li> <li>• Service/Support needs</li> <li>• Willingness to use the Internet for information in the future</li> </ul>	<ul style="list-style-type: none"> <li>• Nature of the product (capital equipment)                             <ul style="list-style-type: none"> <li>○ complexity of product and service exchanges</li> <li>○ low purchasing frequency</li> </ul> </li> <li>• Complex and un-standardized RFP</li> <li>• Tender purchases</li> <li>• Personal contacts are important and preferred in exchanges and interactions</li> </ul>

(Own table)

### 7.3.1. Drivers

#### 7.3.1.1. External

We believe the major drivers of introducing e-commerce into the health care industry and hospitals are *dot-coms*. They provide the technical expertise and the essential investments concerning e-business software and hardware. In this way start-up costs of building the solution can be spread across a number of hospitals and thus decrease the overall cost of introduction. Trade through these new intermediaries is nonetheless not yet substantial.

Another driver is *governments*, who are in most cases the buyers of health care services and anxious to lower costs of procurement. Initiatives, both on national

and supra-national level, are underway. On a European level a few projects have started, such as<sup>60</sup>:

- European E-Commerce for Hospital Procurement (ECHOP)
- Electronic Commerce within the Medical Device Industry (EMEDEC)

The fact that many *suppliers to the health care industry* have started supplying their goods and services on-line is also driving the development. This means that hospitals have started looking at e-commerce as a viable option to procure products. These suppliers currently sell consumables on-line. *Standardisation* of infection control equipment may however lead to this equipment being able to be exchanged on-line in the future. Standardisation is therefore defined as a driver.

#### 7.3.1.2. *Internal*

A vast amount of information has to be exchanged between Getinge and its customers. This includes product information, specifications, training, support, service etc. The Internet is an ideal medium for information exchanges, which means that e-commerce is of great value. The willingness of the hospitals to use the Internet in the future for informational purposes, is also a (minor) driver.

### 7.3.2. *Impediments*

#### 7.3.2.1. *External*

The major external impediments are the customer segment or *hospitals* in general. The problem is not, or will be, concerning the access to IT and the Internet but rather in the company culture where it can be hard to change people's attitudes and work processes. This is partly due to the lack of knowledge concerning using the new technology.

Legal factors and requirements are currently hindering the e-commerce development, as some of the business processes cannot be conducted completely by electronic means. For instance, tender documents still need to be signed and sent with pen and paper.

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<sup>60</sup> <http://www.cenorm.be/iss/Workshop/worksheets/worksheets.html>

### *Analysis*

Looking at Getinge's closest European *competitors* who do not sell infection control equipment over the Internet, we can conclude that Getinge is not falling behind competition concerning the development of e-commerce solutions.

#### *7.3.2.2. Internal*

The nature of the product that Getinge is selling is a major impediment for utilizing e-commerce. The equipment requires substantial investments and the products are very durable. This means that purchases are infrequent and made through ad hoc tenders. Also, because of the complexity of the product, no standard request for proposal or demand specification exists. In addition, product- and service complexities require human interaction and personal contacts, which are also preferred for these purposes. This implies that limited value can be gained from implementing e-commerce solutions.



## **8. CONCLUSIONS AND IMPLICATIONS**

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### **8.1. General conclusion**

#### **8.1.1. Problem statement**

**How can electronic commerce complement industrial marketing activities of a multi-national company supplying capital equipment to the health care industry?**

“How will e-commerce change my business?” is a question that puzzles managers around the globe, across every industry. It is an unchallenged fact that e-commerce has the potential to revolutionize the way companies conduct business activities. In some industries, the revolution (evolution) has already occurred. However, all companies cannot expect to gain equal value from e-commerce as they have different characteristics (industry, product/service offerings).

To gain an in-depth understanding of the main problem we defined in the thesis, we choose to analyse it on three levels: the macro level, micro level and the customer level (supplier-buyer relationship level). At each level, we identified drivers and impediments for using e-commerce. The objective was to identify where and how e-commerce can bring value to the business relationship.

On a macro level, we found that standardization has the potential to accelerate the exploitation of e-commerce between buyers and sellers of infection control equipment. Un-standardized and complex products cannot easily be sold online since a great deal of human interaction is required to exchange products and services. A possible effect of standardisation is that prices will be put under pressure as the competing products become more similar. The implication is that Getinge has to seek other ways to differentiate from its competitors. The Internet and e-commerce are technologies and tools that should be deployed to differentiate services and communication.

On the micro level we found that the customer (hospitals) have not to any greater extent implemented e-commerce solutions, but we identified signs in that direction. The owners of the hospitals (governments) are pushing e-

### *Conclusions and implications*

commerce into hospital procurement procedures, which imply that it will be easier for suppliers to introduce new methods of doing business. The health care industry is nonetheless a slow moving industry where innovations are introduced progressively. Recently formed electronic intermediaries (dot-coms) are penetrating the market, pushing new e-business solutions and new thinking into the health care industry. They have the knowledge, technology and the tools to help hospitals achieve set goals, which are mainly focused on lowering procurement costs. Dot-coms are therefore major drivers of change in the industry. Suppliers of medical supplies (consumables) have to a limited degree started to implement e-commerce solutions for hospital buyers. However, Getinge's closest competitors on the European market have not yet introduced similar solutions to explore the possibilities of e-commerce.

The most important evidence in reaching our conclusion emerged in the study of the supplier-customer relationship. There we found the major impediments for developing e-commerce solutions. We found that the human contact is an essential part of marketing and servicing of capital equipment in the business-to-business market. Most of the hospitals included in the study have the basic tools (PC and Internet access), or are heading in that direction, to engage in electronic business activities. We have nonetheless learned that the general IT status in the UK is poor.

Some of the respondents were willing to use the new medium to communicate with Getinge. The major concern is whether hospital employees have the capability or are willing to use the Internet. Using the Internet is not their "natural" way of communication, searching for information and so on. Hence, a "generation shift" may be needed for e-commerce to take full effect in the hospital environment. The purchasing process is also a major impediment where un-standardized and complex request for proposals (RFP)/demand specifications are exchanged. This (tender) process shows no evidence of major change in the near future.

We have divided the sales- and service process into three steps: pre-sale, sale and post sale. E-commerce has mainly been used as a business tool in the "sale phase" where it has helped bringing together sellers and buyers and automated sales/purchase transaction processes (e.g. order handling). Due to infrequent

purchases, product complexity and decision-making complexity, not much value can be gained by selling capital equipment on-line. This accounts only for the products included in this thesis (sterilizers and disinfectors). Other departments or products within Getinge may be more suitable for on-line trading. For example, consumables can gradually be sold on-line.

Thus, most value can be gained in the pre-sale and post sale phases. In the pre-sale phase, customers showed interest in being able to access product information on line. On-line presence, both through Getinge's own website (electronic catalogues) and through other web sites (on-line magazines, "yellow pages", dot-coms etc.) can be viewed as a promotional tool and brand building activity.

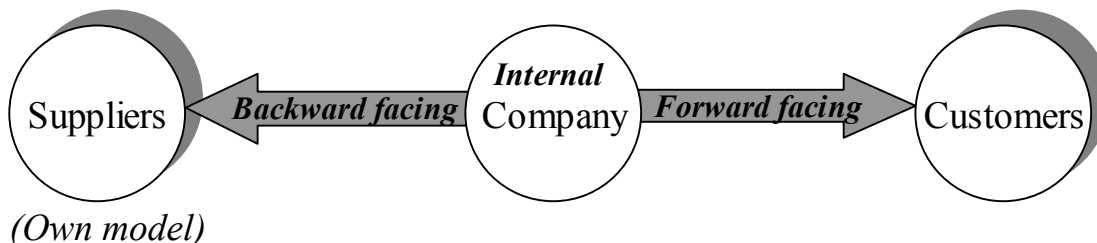
The most significant value can be gained in the post-sale phase (e.g. after sales service). The customers view service as an important value criterion. Well-delivered service also builds up trust between the business partners. Extending the service to the Internet (e.g. on-line support) could be a solution.

We believe that e-commerce, as a tool for selling infection control equipment, is of limited value for Getinge in the short term. Nonetheless, the importance of the Internet in the selling process will likely increase in the future. Getinge should rather use the Internet as a complementary channel to enhance the delivery of the services, and as an informational/promotional tool to communicate with current and potential customers. By doing so, the company can sustain its competitive advantage mainly through increased customer satisfaction, but also through lowering costs in the long run.

## 8.2. Managerial implications

In general there are three different types of e-commerce as the following picture shows.

**Figure 11 Types of e-commerce initiatives**



This thesis emphasises forward facing (towards customers) e-business initiatives. The other two areas where companies can deploy e-commerce solutions are in backward facing processes (towards suppliers) and for internal processes.

### 8.2.1. E-commerce tactics

To analyse where and how Getinge can use and benefit from e-commerce in its marketing it is useful to look at the major steps of the actual buying process. Internal and external processes should always be designed from an outside-in approach by asking the customers what they really value and want<sup>61</sup>. Therefore we need to look at the processes that have a high-perceived value for the customers. We will look at each major step of the buying process taking into consideration the internal and external drivers/impediments.

**The tactics that we identify under each phase will be further explained and developed under “implementation”.**

#### 8.2.1.1. The pre-need recognition phase

In this phase the customer is not in direct need of buying sterilizing or disinfection equipment. Looking at the health care industry at large it is very fragmented considering the large number of suppliers. The infection control equipment industry is on the other hand fairly concentrated. As a consequence, most buyers of sterilizing equipment know most of the possible vendors that

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<sup>61</sup> Seybold (1998, p. 35)

can satisfy their needs. Therefore, traditional mass marketing where the objective is to be seen among numerous other brands is not suitable. However, it is of utmost importance to keep members of the buying centre both updated on market developments and on the products being offered. Hence, e-commerce should be used as a tool for promotion and information dissemination. The study results showed that people in the buying centre want to keep updated on the on-going development of infection control in general and the products and services in particular.

*Tactics:* E-information dissemination  
E-content and e-community

#### *8.2.1.2. Information search*

As most purchases of capital equipment are made through tenders, limited information search is conducted. However, customers like being able to access rich and detailed information on products and some want to access price-lists, spare parts lists, and engineering drawings of the equipment on the web site.

*Tactics:* E-information dissemination

#### *8.2.1.3. Defining the specification, the tender process, evaluation and decision*

Most of Getinge's sales are realized through public tenders on national or pan-European level. The process of writing a demand specification (DS) is currently very "people" based and rather complex since many actors, both within and outside the hospital, participate in and affect the process. The process can be very time-consuming so much value could be gained by applying an e-commerce solution to make the process more effective. Already, electronic tendering is underway in Sweden and the UK, but will mainly concern procurement of consumables, for which the demand specifications are simple and standardized. Currently there are no dot-coms offering this kind of service for capital/infection control equipment, but it will possibly be part of their services in the future. The standardisation of infection control equipment could probably drive this development.

The evaluation process (deciding which supplier of infection control equipment to choose) is one of the most time consuming tasks in the purchasing process. The reason is that although the incoming tender proposals are fairly

### *Conclusions and implications*

standardized, it can be difficult to compare, besides mandatory information is often lacking or is insufficient. Hence, reducing the amount spent can create customer value.

*Tactics:* E-information dissemination

E-tendering

#### *8.2.1.4. Place order, invoicing and payment*

Most e-commerce solutions today involve placing the order on-line, aggregating them and sending them to suppliers. For consumables, there is great value to be sought as they are purchased frequently and the transaction cost (invoicing, administration, paying etc) is often more costly than the product being bought. In the case of capital equipment not much value can be gained from solely placing orders on-line, due to infrequent purchases.

Hospitals, both in England and Sweden, are actively looking for ways to lower costs by using e-commerce. The real value for sellers of capital equipment and their customers will not be realized until integration is reached between the seller, the intermediaries and the buyers.

However, 5% of Getinge's turnover is consumables. It is in that field value can be sought.

*Tactics:* E-selling

#### *8.2.1.5. Training*

Educating and training the customer on a regular basis, is seen as an important factor contributing to value. Training is expensive, both for the seller and the supplier. E-commerce can bring real value to both parties. It is clear that far from all employees (users and technicians) are able or ready to use a computer and the Internet to receive training. However, as in every organization there are people that are both able and willing to do this. The number of people interested in this will increase as younger and more IT savvy individuals replace the "older" generation of personnel.

*Tactics:* E-training

8.2.1.6. *After sale service and support*

After sales service is one of the most important value criteria for hospitals when purchasing decisions are made. Therefore, prior positive experience with vendors will be important in an evaluation of a supplier’s proposals. As with training, hospital personnel vary a lot concerning computer literacy. But all respondents in the interviews use computers in their jobs and the percentage of computer literate people will increase with time.

*Tactics:* E-support

The following table gives an overview of each stage in the buying/selling process. In addition, it includes our judgement on customer perceived value of the different activities and whether an e-commerce solution could contribute with added value. Also, we judge how willing and able the customers we interviewed are to use electronic means for these activities.

**Table 6 The buying process and value implications for e-commerce**

<i>Phase/Activity</i>		<b>Contribution to value</b>	<b>E-commerce contribution</b>	<b>Willing</b>	<b>Able</b>
<b>Pre need phase</b>		Medium	Medium	Yes	Yes
<b>Pre sale phase</b>	Information search	Medium	High	Yes	Yes
	Define spec & publish tender	Medium	High	Somewhat	No
	Evaluation and decision	Medium	Medium	Somewhat	No
<b>Sales phase</b>	Place order, Invoicing and Payment	Medium	Medium, has the potential in future	No	No
<b>Post sale phase</b>	Training	High	High	Yes	Somewhat
	Support	High	High	Yes	Somewhat

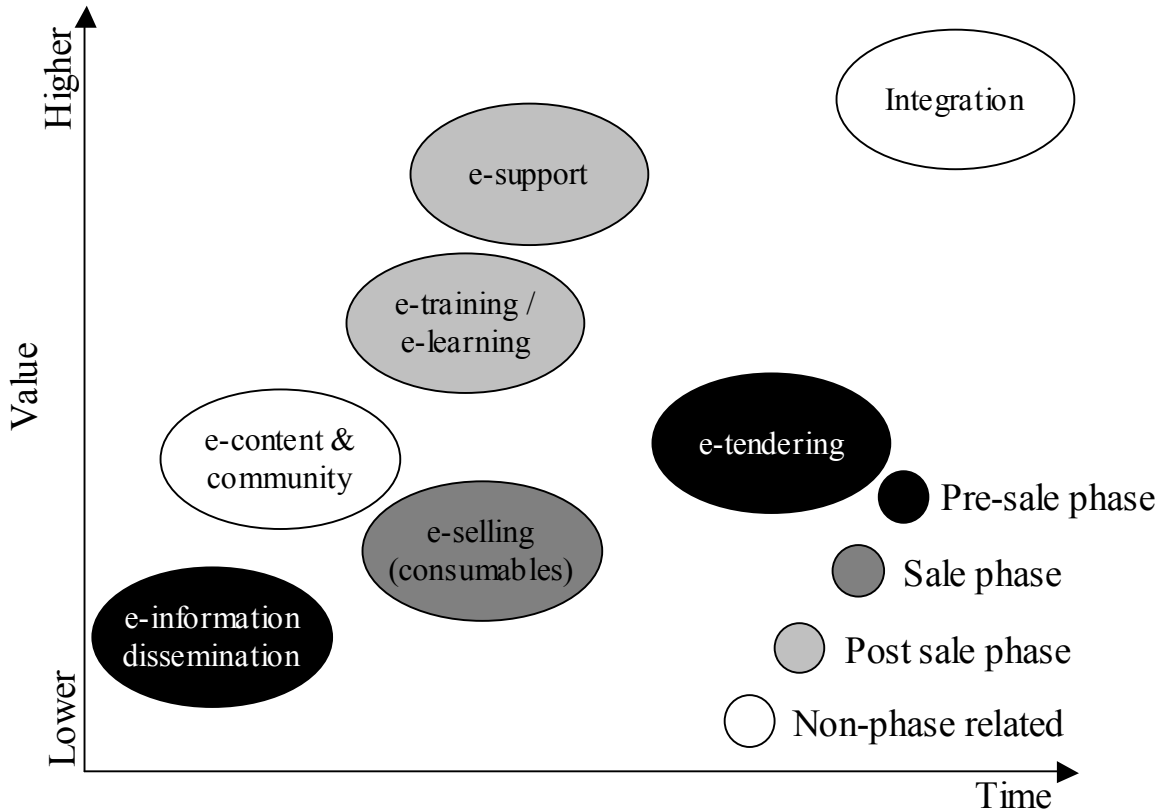
*(Own table)*

### 8.2.2. Implementation

As mentioned earlier, we believe that most value is to be gained outside the actual sales phase (order). Most e-commerce solutions are today focused around lowering transaction/administration costs related to the actual sales/order transaction. To enhance customer satisfaction, most of the valuable opportunities can be identified in customer service, both before and after the sale. Since both macro (standardization) and industry factors are putting pressure on prices, Getinge must use other means to differentiate and sustain its competitive advantage. This, we feel, can be accomplished by further enhancing and deepening the relationship with customers and thus increase loyalty.

We will further develop the identified “e-tactics” in this part. Some of the e-business tactics are more valuable than others and they have different time perspectives. Some could be implemented now but other aspects are more likely to be valuable in the future. We have drawn up the following graph to show the possible development of the e-commerce development of Getinge:

**Figure 12 Tactical map for the implementation of e-commerce**



(Own model)



#### *8.2.2.1. E-Information dissemination*

The initial step in implementing e-business solutions to complement existing marketing and sales activities should be to provide customers with valuable product- and service information (e.g. electronic catalogue). The company should include wide and deep product and service information on the website, to satisfy all the information needs of the buying centre actors. Getinge could for instance provide information that facilitates the “writing” of a demand specification. An electronic catalogue may provide this information. To access information, the company could enable customers to register on the site and in that way the site content can be customized. A search engine will facilitate web site manoeuvring. To extend the promotion reach, Getinge could also register on the most appropriate/popular dot-coms in each country.

Getinge could also use e-mail marketing to customers in order to promote the web site and attract users. Moreover, e-mail is ideal to reach members of the buying centre with customised information.

#### *8.2.2.2. E-content & community*

The core product is getting homogenized in the industry, so differentiation must be sought by other means. Supplying customers with rich customized content on CSSD management, microbiology and other matters allow customers to keep themselves updated and educated. There are several ways to supply content. Partnering is getting more and more essential in the new economy where specialization becomes increasingly important. Thus, partnering with content providers (dot-coms, magazines etc.) can accelerate the development towards Getinge becoming not only a provider of products, but also a source of valuable knowledge and rich content.

Creating a community for industry actors (customers, suppliers etc) could also be important where Getinge could provide on-line discussion groups or forums. There, industry actors can interact, exchange views and experiences. In that way the brand awareness may increase and the brand image be reinforced.

#### *8.2.2.3. E-learning & E-training*

Developing on-line training for both users and technicians could complement existing training activities. Implementing an e-learning solution can serve many purposes, such as:

### *Conclusions and implications*

- improve internal learning (e.g. for sales reps), and thus the ability of the staff to serve customers better
- improve external learning (customers), will improve the customers own ability to run the equipment and hence increase customer satisfaction
- lower cost of training (both internally and externally)
- being a source of revenue

Training is clearly one of the more important value criteria for users of equipment and hospital technicians. Giving courses is a substantial cost factor and often lessons have to be repeated for hospital staff so that all the relevant staff receives training. New people that are hired will also need training. Therefore, we suggest building up e-learning capabilities for some products as a pilot project. Some parts of the training program can be free for loyal customers but more extensive lessons can be sold to customers ad hoc.

To implement this, Getinge should seek external advice, both regarding the technology and pedagogic matters. To be valuable to customers, it would be wise to include them in the e-learning development process to get their views on how training is best communicated to accomplish the desired effects.

#### *8.2.2.4. E-selling*

Hospitals are clearly moving towards procuring consumables on-line. No substantial IT investments are needed to implement basic on-line procurement at hospitals. Only a PC and access to the Internet is needed and the dot-coms provide the needed server/software infrastructure. Therefore, Getinge could implement on-line sales of all sorts of CSSD consumables and accessories (e.g. paper rolls for printers, wraps, pouches, etc.) Developing an e-selling solution from scratch is very expensive and probably not profitable for the turnover of consumables at Getinge. Therefore, two other solutions are also possible:

1. Use the services of dot-com intermediaries
2. Buy/rent a solution from an application service provider (APS)

Which solution is most feasible is difficult to state at this point. It is likely that hospitals will use the service of dot-coms to assemble all the procurement needs through one portal. This is beneficial since hospitals may access all the necessary supplies through one Web site. In that case selling through a dot-com

would be a better choice. This implies that Getinge should monitor the e-commerce development in hospitals concerning from which dot-coms they are willing to procure consumables.

The other solution (ASP) is different in the way that although Getinge buys/or rents the e-commerce solution from an outside vendor (often the same dot-coms that are providing their services to hospitals) the web site could have the design and the features of Getinge's web site and would be accessed through Getinge's own web site.

#### *8.2.2.5. E-support*

Developing a database that is accessible either through the Internet or an extranet for delivering an after sales support service, could be of great value for customers. This database could include technical drawings, frequently asked questions, troubleshooting etc. Also, spare parts could be accessed on-line (both to view prices and to order on-line). An extranet solution (which is accessed only by authorized customers) can also prevent sensitive information from being available for competitors or others. When companies allow their customers to access personalised information (purchasing history, etc.) the relationship could be enhanced, as this signals customer commitment and builds trust.

E-support allows users and/or service technicians to solve minor equipment problems themselves (self service). This may reduce equipment downtime costs and service costs. The result could increase customer satisfaction and deepen relationships with customers.

As with e-learning, Getinge will need external advice to implement this solution. However, bringing support on-line is a gradual process where content is systematically added to the web page. The first step can simply be to assess what problems the customers most frequent run into and eventually supply the instructions and answers (FAQ) on-line. Initially, customers will probably not use the service extensively (instead of calling support), rather this will be a gradual development. This will also lower support costs for Getinge as customers can solve problems themselves.

With T-doc penetrating the market Getinge also has the ability to remotely monitor the equipment and be proactive rather than reactive concerning

### *Conclusions and implications*

problems. This will also deepen the relationship with customers as both monetary and psychological switching costs are increased.

#### *8.2.2.6. E-tendering*

Public hospital procurement of infection control equipment is mostly done through tenders. In the future, neutral e-tendering marketplaces (e.g. medinsite.com) for public procurement will create the value for hospital buyers, which Getinge cannot influence. Therefore the only tactics the company can follow is to closely monitor the developments of electronic tendering for infection control equipment.

#### *8.2.2.7. Integration*

The ultimate benefits of electronic commerce are realised when there is a complete integration of all the members of the supply chain, hence when all systems (ERP, support systems etc.) can communicate with each other and exchange information. The following example explains an integrated supply chain:

When a customer needs spare parts for equipment he will type in (or scan) the part needed and the order is sent electronically to the vendor. When it reaches the vendor the order is routed to the stock-keeping unit. The customer knows that this particular part is available as he receives an on-line verification on stock availability. The stock-keeping unit “clicks” on the order to verify that it has been processed and the order instantly becomes an invoice at the financial division and an e-invoice is sent to the buyers. The buyer verifies that the order has been received so that his financial division can authorize payment. The product is then paid (through a third party e-bank) and the system automatically updates the legacy systems (bookkeeping) of both buyers and vendors. This could be possible in the long-term.

### **8.2.3. Future challenges**

We have identified a few future challenges that the company has to monitor closely.

#### *8.2.3.1. Other products-markets*

In this thesis we have merely focused on two products and on two markets out of the many products and markets of the overall group. Also, we have been

focusing on forward facing processes (towards the customer) but have not include backward and internal e-commerce possibilities. Thus, the company still has a lot of ground to research.

*8.2.3.2. M-commerce*

Mobile commerce (m-commerce) is now developing. This will bring new challenges to companies to provide innovative solutions utilizing mobile media for information- dissemination and exchanges. This could for instance mean that a vendor could provide a customer with a hand-held device (which is connected to the Internet) where he can gain access to service information, order consumables etc. This could also be a useful tool for employees that are “on the road” (sales reps and service personnel) to gain access to customer information, product information etc. and can thus be able to serve the customer even better.

*8.2.3.3. Dynamic-fast moving*

The e-commerce “landscape” is highly dynamic. The relevance and applicability of this thesis will reduce drastically with time. Thus, constant monitoring of the environment, the customer, drivers and impediments is important. After all, Internet e-commerce is still in its infancy where market actors are in search of the right business models.

### **8.3. Theoretical implications**

Electronic commerce in business-to-business (B2B) and business-to-government (B2G) markets is growing across all markets including the healthcare industry, as shown in our study. Current books about e-commerce seem to adopt a very standardised approach to analyse the development and value of e-commerce and suggest that companies across industries can gain equal value from e-commerce. Thus, we soon realized that relevant theories for studying the problem were not available.

Therefore, we studied established theories. Industrial marketing, buyer-seller relationships (interactions and exchanges) and organisational buying behaviour are relevant as marketing of capital equipment to the healthcare industry touches upon-, and are related to each of them. Moreover, the theories provided the foundation for empirical research and a base for analysis. From this, we developed a research model to help gain a holistic approach to analyse and solve the problem.

The research model proved to be valuable to develop solutions and answers to our problem. Therefore, we believe that theories on industrial marketing and organisational buying behaviour, serve as a useful foundation to gain an understanding on buyer-seller interactions and exchanges, as well as internal customer processes. From this understanding, companies can develop solutions and ideas about how e-commerce can complement marketing activities.

Our study shows that several people participate in what seems to be a complex buying-selling process of capital equipment. Pre-purchase, purchase and post-purchase activities, include several people with various types of tasks, functions and interactions depending on the different stages in the buying-selling process. It also shows that the type of product (complex) requires people-based interactions and personal means for exchanging products, services and information.

The study also shows that the buying-selling process and the relationship is, and will be, affected by the environment:

- Information technology and electronic commerce technologies (macro-environment) provide the opportunity to make adaptations to the buying-

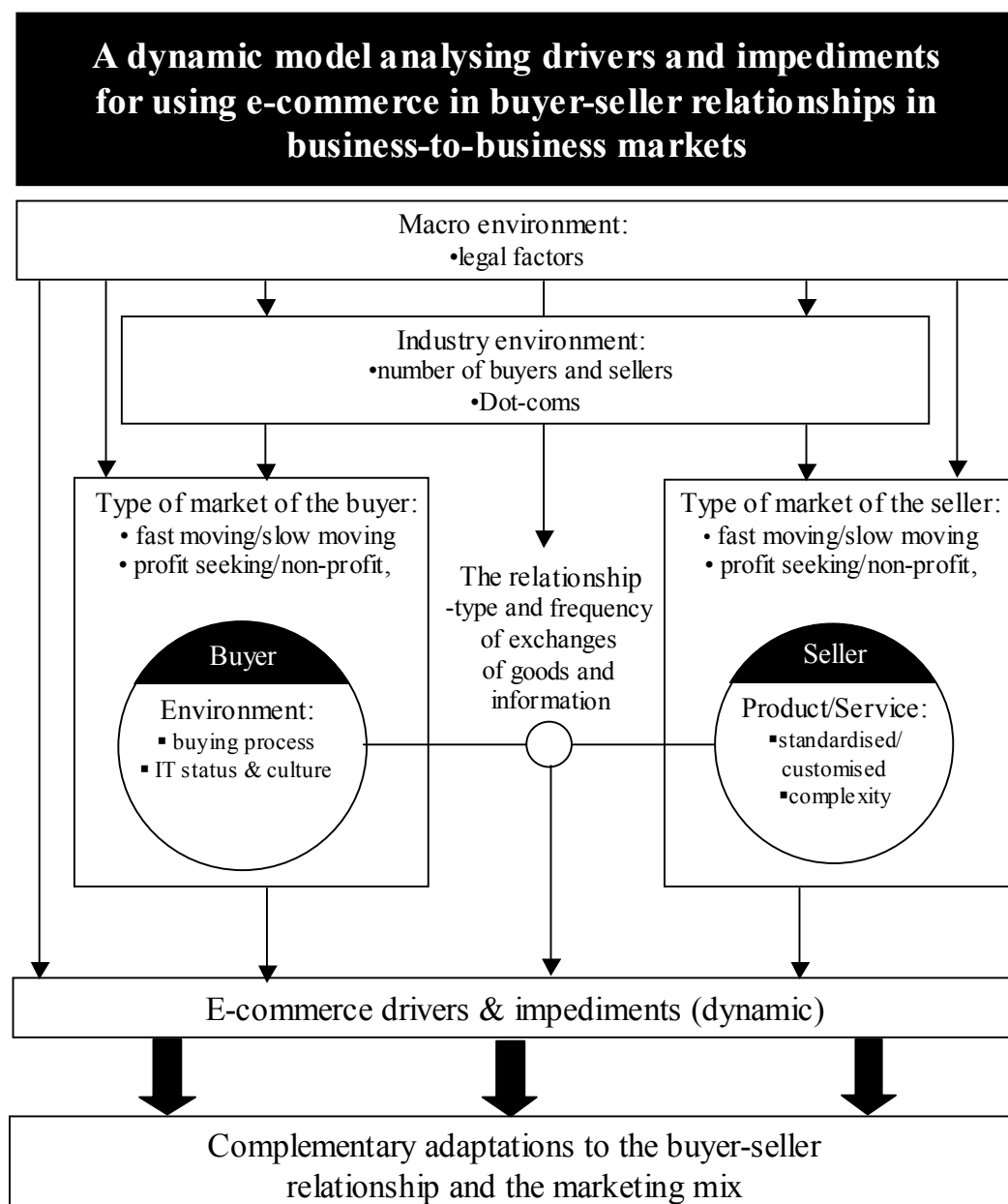
selling process in general and to the interaction and exchange process in particular.

- Industry actors will affect buying and marketing behaviour and buyer-seller relationships, as they keep developing new e-business solutions for suppliers and buyers in the healthcare industry.

### 8.3.1. Explanation of the developed model

From what we have learned in this study, we have developed the research model further.

Figure 13 Developed model



(Own model)

### *Conclusions and implications*

The development and suitability of e-commerce depend largely on the drivers and impediments for applying it to current business processes, either as a completely new way of doing business, or as a complementary solution. The drivers and impediments imply how valuable, and thus to what extent it is appropriate to adopt e-commerce solutions in current business activities and buyer-seller relationships. They also indicate trends that may drive this development in the future.

Obviously, drivers and impediments differ between markets and contexts, and are changing over time; thus, they are not static but *dynamic*. These drivers and impediments arise from the macro - and industry environment but more importantly from the supplier-buyer relationship. The main theoretical conclusion of the study is that e-commerce offers different opportunities for exchanging products, services and information in different product/service markets.

#### **8.3.2. Macro environment**

Currently, the major macro impediment for e-commerce to take full effect is legal factors. Various laws and regulations both on a global, regional and local level, make it difficult to reach the full potential of e-commerce. The extent to which legal factors hinder the development differs between countries, industries and products. For instance, electronic tendering and electronic signatures of contracts are not in accordance with current legal requirements.

#### **8.3.3. Industry environment**

The numbers of buyers and sellers in a particular industry has an impact on the attractiveness of introducing e-business solutions between buyers and sellers. If there is a large numbers of buyers and sellers (industry fragmentation), the Internet is a channel to bring sellers and buyers together to decrease search costs and transaction costs. On the other hand, if there are few buyers and sellers (industry concentration), the Internet does not provide the same benefits, as most buyers know about most suppliers and vice versa.

Brick-and-mortar companies are not the only companies that drive the e-commerce development in an industry. Rather, new Internet companies (dot-coms) provide new e-business solutions to create value for both suppliers and buyers. These companies drive the particular industry to adapt to the e-



commerce development as they provide the knowledge, technology and applications that provide new electronic opportunities for exchanging products, services and information. The availability of these services will determine how fast a particular industry starts to adopt e-business solutions.

#### ***8.3.4. Type of market of the seller and buyer***

Fast moving markets (e.g. PC market) are quicker to develop new business models such as e-business, compared with slow moving industries (e.g. health care). This is mainly due to the competitive nature of the fast-moving market. In addition, as e-commerce is expected to have substantial effects on companies' profits, profit-seeking actors in the market, are quicker to e-commercialise than actors that are non-profit. For instance, government hospitals are to provide the best health care possible to society and the ultimate aim is not to show profit, although they work with tight budgets. The opportunities of e-commerce are to lower price of products and the cost of administration to increase profits. This may explain why other industries (mainly private) are far ahead of hospitals in implementing IT and e-commerce solutions.

#### ***8.3.5. The seller***

The nature of the product and service are either drivers or impediments. Capital equipment per se, are not as appropriate for e-commerce compared with standardised products such as books, which are generally easily marketed and sold over the Internet.

#### ***8.3.6. The seller-buyer relationship***

The nature of the product is then reflected in the type and frequency of the exchanges and interactions between buyers and sellers. For instance, capital equipment:

- are complex products that often require complex after sales servicing activities where personal (human) interactions are needed or required by the customer.
- are complex products with functions that customers require to see and test in reality, before they are bought. Thus, "electronic promotion" is

### *Conclusions and implications*

more difficult for this type of product and cannot replace existing product promotion.

- are costly and require several actors to take part in the buying process to define and write thorough technical specifications, legal requirements, and commercial terms.
- are durable equipment with low purchase frequency leaving less opportunity to realise savings in handling and administrating orders.

E-commerce is therefore more appropriate for both buyers and sellers exchanging products and services that are:

- less complex in nature
- exchanged frequently
- more easily promoted, sold and bought electronically

That is why buyers and suppliers of less complex products such as consumables and other medical supplies, have adopted e-commerce solutions to promote, sell and procure electronically.

However, although it appears difficult and less valuable to sell and buy capital equipment by electronic means, e-business technologies provide good opportunities for complementary service extensions, and for making adaptations to communication and information routines.

Electronic catalogues are good promotional and informational tools to inform both current customers and to reach potential customers. They can present capital equipment and services either statically or dynamically and the content may be customised to each customer or standardised for all customers. Eventually, a catalogue may be connected to other business processes such as placing of orders.

#### **8.3.7. The buyer**

A complex buying process involving several people is an impediment for e-commerce. Purchasing complex products such as capital equipment requires several people in the buying decision-making unit resulting in a group decision. This process, or parts of it, is not easily complemented with electronic means.

Perhaps the most evident driver or impediment is the buyers' IT status and culture. This implies that the buyer:

- must meet minimum IT requirements (PC and Internet access)
- must be interested, willing and capable of using the IT in its business activities.
- must have a company culture that supports and welcomes the new e-business technologies into the organisation

### ***8.3.8. E-commerce drivers and impediments***

The assessment of the analysis above should indicate the dynamic e-commerce drivers and impediments (vary between contexts and changing over time). They will imply the opportunities for a company to make adaptations to the interaction and exchange processes in the customer relationships, and the opportunities to complement the industrial marketing mix with e-commerce/e-business solutions.

#### ***Complementary adaptations to the buyer-seller relationship and the marketing mix***

We believe that e-commerce will not change or complement, to any greater extent, industrial marketing of companies supplying capital equipment to the health care industry in the short-term, especially with regard to selling the equipment over the internet/extranet. Nonetheless, e-business technologies could gradually be deployed and incorporated into the marketing mix and in the interaction and exchange processes with customers. Thus, in a long-term perspective, e-commerce will play an increasing role in marketing of capital equipment to the health care industry.

##### ***8.3.8.1. Product-Service mix***

The core products are, and will be, the key exchanges and the foundation of the supplier-buyer relationship. Depending on the complexity of the capital equipment, after sales service activities are also key exchanges as they are parts of the product-service offer. Being complex, service elements require people interventions- and interactions to explain and solve problems and exchange information (e.g. how to use a product).

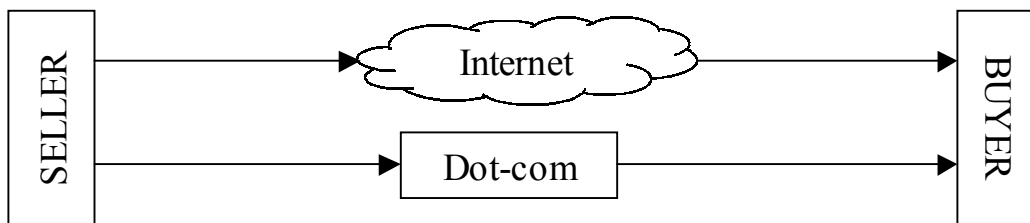
### *Conclusions and implications*

Nonetheless, e-business has the potential to extend the current service exchanges as Internet technologies provide the opportunities and tools to enhance the service delivery in terms of on-line support- and education. Not only are these service extensions potential sources of revenue, but also potential ways to enhance customer satisfaction.

#### *8.3.8.2. Place mix*

The overall offer consists of both *products* and *services*. Distinction has to be made between the two, as the opportunity of using the Internet as a sales channel depends on the type of product and service. On-line selling of products and services may in the long-term complement existing distribution channels:

**Figure 14 Complementary channels**



*(Own model)*

As channel options increase, so does the complexity of managing them.

The buying process of capital equipment is currently very paper-based with complex technical requirements and standards, and involves several actors. In this category, e-commerce will not challenge traditional channels as most of the products are sold through tenders, which are of un-standardized nature. It is although likely that the buying process, or parts of it, will be managed on-line in the future. As the usage of the Internet increases, it will be easier for hospitals to aggregate demand, both at a national and even international level. That will put pressure on prices.

Consumables and accessories are on the other hand more easily sold on-line, so companies need to monitor how and through what channels the customers intend to buy. The two likeliest situations are through third party dot-coms, as hospitals may prefer to access all product items through one site.

E-commerce will however have profound impact on the distribution channels for services as the Internet surely gives a global distributing channel of many

kinds of services. Using the new medium, companies can reach two goals at same time, lowering the costs of service delivery and increase its competitive position through raising customer satisfaction levels. We do not believe that the distribution of on-line services will replace the current service activities, rather it should be seen as a complementary activity. The human aspect, building up relationships and trust through personal contacts is still, and will be, a very important function of industrial marketing.

#### *8.3.8.3. Promotion and communication mix*

Promoting capital equipment is still a very people-based process and it is unlikely to change in the near future. Complex equipment is not easily promoted electronically although e-business technologies (electronic catalogues, etc.) will facilitate the presentation of equipment functions and capabilities. Companies can promote equipment, products and services both through own web sites and through electronic dot-com intermediaries.

Direct marketing (one-on-one) will also grow in importance as e-commerce technologies provide the tools to make it feasible to customize marketing messages and product-service information to each individual in the buying centre.

Traditional promotion (personal selling and contact, trade shows, ads etc.) should still be the major part of the marketing efforts. Trade shows allow companies to present the equipment functions in action. On-line promotion can serve as additional tool to fill the gaps.

The major source of uncertainties in a buyer-seller relationship is lack of information. Certainly, e-business technologies provide the functions and the tools to make complementary adaptations to information-and communication routines between the buyer and the seller. Theory states that information and social exchanges should be continuous between product-service- and financial exchanges. The Internet is a good medium for continuous information and communication exchanges, whereas social exchanges in terms of personal (human) contacts may be less suitable in this medium. Social exchanges will still be important to build trust and loyalty in business-to-business relationships.

#### 8.3.8.4. Price

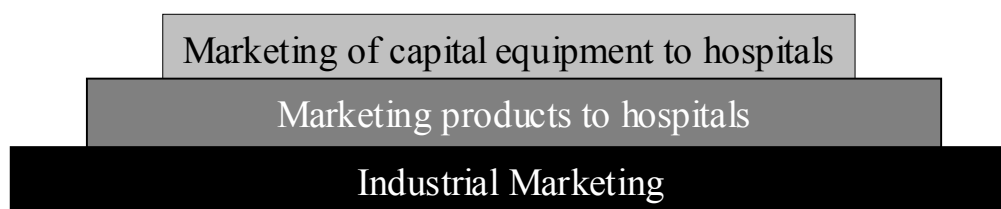
E-commerce may put prices of capital equipment under pressure due to price transparency, as access to product and supplier information increases. Electronic tendering, for instance, has the potential to aggregate demand and supply for capital equipment and force prices down.

When companies increasingly will deliver services on-line, they can have a great price-flexibility concerning how the company charges for those services. For instance, unlimited on-line access to a knowledge base and on-line support can be included in the overall offer and hence increase the attractiveness and competitiveness of the offer. The other solution is to sell ad hoc access to these services.

#### 8.3.9. Generalisation?

We have found that that extent to which we may generalize the study and its findings has three levels.

**Figure 15 Levels of generalization**



*(Own model)*

The thesis has focused on how e-commerce can complement the industrial marketing activities of a MNC supplying capital equipment to the health care industry. Capital equipment has been defined by one US university hospital as “any single asset which has an acquisition cost of \$5,000 (approximately 50,000 SEK) or more, and a useful life of more than one year<sup>62</sup>”. Therefore, it is quite apparent the capital equipment ranges from relatively simple equipment (e.g. rotators, pumps etc.) up to immensely expensive and complex equipment such as CT scanners. It is therefore unlikely that the overall findings in this thesis can be directly applicable for the various types of suppliers. Nonetheless, concerning products on the middle- and upper price range we believe that most

<sup>62</sup> <http://www.uwsa.edu/fadmin/fppp/fppp33.htm>

products have the same basic characteristics as sterilizers and disinfectors (complex, high involvement products).

However, some parts of the study are directly applicable for both marketing of capital equipment to hospitals and for general marketing of products to hospitals. We studied the problem from three levels, and the degree to which it is possible to generalize to other products (within the capital equipment definition) or product categories, varies between the different levels:

**Table 7 Level of generalization**

<b>Study</b>	<b>Generalization</b>
Macro	Generalization is possible with regard to available IT and e-commerce technologies/solutions for companies.  Limited possibility of generalization for standardization forces that are specific to sterilization and disinfection equipment.
Micro	High possibility of generalization. We studied the development of e-commerce in hospitals in general and how ready and willing they are to use e-commerce solutions. We also examined how dot-coms are affecting the industry environment.
Customer	Some possibilities of generalization. It obvious that the purchasing processes for different equipment and hospitals look different. However, the analysis of the exchanges between the supplier and buyer are likely to show resemblance within the industry.

*(Own table)*

As for the methodology, the theory and the research model we developed, generalization is possible. Thus, the methodology we used is not only possible to use in the health care market but also in other business-to-business/ industrial marketing situations.

As a result, many firms within the health care industry in general could make use of the findings and more importantly the method of analysing and answering the problem.

#### **8.4. Suggestions for future research**

In this thesis we have focused on the external environment and the supplier-buyer relationship in order to answer the problem. However internal factors are likely to have an impact on how successful a company will be to introduce e-commerce into its business processes.

Firstly, the internal configuration concerning appropriate alignment of the organizational structure and internal processes will have an impact on how successful an e-commerce solution will be. Secondly, company/corporate culture and values are likely to have an effect on how successfully the introduction of e-commerce into the company is. Often, business processes are deeply rooted into the company culture and are often hard to change or modify. All these factors need further research to back up the findings of the external environment.

In the particular industry we studied, we believe that e-commerce should mainly be used for information, promotion and service delivery. Thus, further research is needed into the effectiveness of on-line promotions (listing products and services in on-line catalogues, banner ads etc.) in the business-to-business environment. Concerning the delivery of services, a great deal of research has been conducted on multimedia (CD-ROM mainly) delivery of education. This research should be extended to the Internet to determine the possibility and value of on-line education.

***Electronic commerce, vapour or value? In our case, currently a little bit of both. In the long-term, value for sure!***



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### **9.4. Internet Sources**

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[www.oresaventures.com/pr0824sve.html](http://www.oresaventures.com/pr0824sve.html)

[www.cenorm.be/iiss/Workshop/worksheets/worksheets.html](http://www.cenorm.be/iiss/Workshop/worksheets/worksheets.html)

[www.uwsa.edu/fadmin/fppp/fppp33.htm](http://www.uwsa.edu/fadmin/fppp/fppp33.htm)

[www.krauth.de/Factsheet\\_e.pdf](http://www.krauth.de/Factsheet_e.pdf)

### **9.5. Other publications**

Frost & Sullivan (1998), European Hospital Infection Control, Equipment Markets

Getinge Annual Report (1999)

Arbetsgruppen för elektronisk offentlig upphandling (2000), . "Elektronisk offentlig upphandling", Rapport 1

## 10. APPENDIX

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### 10.1. Interview guide - customers

#### Identify the buying centre

- What people are involved in the buying process from need recognition to service/maintenance?
- Which people are the most influential?
- Who takes the final decisions?

#### Identify the buying process (from pre-purchase, purchase and post purchase)

- What does the buying process look like?
- How do the different participants in the buying centre interact in the buying process?
- Means of communication (phone, fax, e-mail, Internet, meetings etc)?
- Which are tasks of each individual in the buying process?
- What is your task in the buying process?
- What are the most time/resource consuming processes in the buying process?
- Needs & wants?

#### Value criteria;

- Which attributes in the offer (products/services) contribute most to your purchasing decision?
- What is Getinge good at? (strengths)
- In which areas/processes could Getinge improve? (weaknesses)

**E-commerce “willingness and ability”**

- Do you use the Internet in your work, and if so how and why?
- Does your organization use the Internet, and if so how and why?
- Do you use the Internet to buy supplies for the hospital?
- Do you think that you will use the Internet more in your future relation with your suppliers?
- Is the organization equipped to do business on the Internet?
- Have you visited Getinge’s web site
- How could Getinge improve its web site/Internet activities?
- Would you use the Internet for the activities in the buying process if it were available?

**Relationships**

- How would you describe the relationship with Getinge?
- What form of interaction exists (product info, product specification, troubleshooting, service etc)?
- How frequently to you/the hospital buy from Getinge?

**Concluding questions.**

- Do you think that the importance of group purchasing will grow?
- Many Internet portals (e.g. e-purchasing) are emerging in America and Europe. Do you think this trend will change the way hospitals buy equipment in the future?
- Do you buy anything from portals or do you use them for any other purposes?
- How do you see the buying centre change in the future and why?
- General IT infrastructure (administrative level and user service level)

## **10.2. Interview guide – Dot-coms**

### **Products/services and business model**

- How will your concept work in practice?
- What are your products/services?
- How do you plan to develop your products and services?
- What value will you bring into the health care sector?
  - suppliers
  - buyers
- What tasks (presale, sale and post-sale) do you think are valuable to put on-line?
- Which of these tasks do you think hospitals are ready to conduct on-line now or in the immediate future?
- What will be your source of revenues?
- What kind of information will be on your site?
- Will the suppliers be able to advertise products on your site?
- If your service becomes successful will the buyers and the sellers need to invest in IT or e-commerce solutions in any way?
- Do you think that sterilizers and disinfectors and other capital equipment are too complex pieces of equipment to sell/service on-line?
- When will this concept be reality? (In the various countries?)
- Can you see any value in producers themselves putting up Internet sale sites?

### **Markets, competitors and customers**

- How would you define your customers?
- Who in the hospitals will you target, who will use the service?
- Who are you competitors (Sweden, UK, etc)?

## *Appendix*

- Do you think that a lot of dot-coms will invade this market segment? Will there be a lot of dot-com players like you?
- How do you plan to expand geographically?
- Is it important to open up physical offices in the countries which you will do business in or is it enough to have a “global site”/”pan-European site” concept?

### **The purchasing process**

- How do you see the “purchasing process” of equipment?
- Who will place the order?
- Legal matters (on-line contracting, electronic proposals, electronic signatures?)
- Demand specification? On-line?
- How will your interactions with suppliers and buyers look?
- Do public hospitals procure goods differently than private hospitals?
- Are buyers/sellers going to use one dot-com or several?

### **General questions**

- How ready do you think the health care sector is to start using the Internet to do business?
- What kind of products do you think hospitals will exchange electronically?
- Are sellers of equipment for the hospitals sector using e-commerce today?



## 10.3. List of interviews

### 10.3.1. Sweden

<b>Company</b>	<b>Respondent</b>	<b>Position</b>	<b>Date</b>
<i>Getinge</i>	John Hansson	Group-marketing manager	27. September and 6. October 2000.
<i>Chross Research</i>	Cristian Jonzén	Consultant	4. October 2000.
<i>Westma</i>	Britt-Marie Ödling	Purchaser	10. October 2000.
	Hans Claesson	Purchasing process owner	13. October 2000.
<i>Sahlgrenska University Hospital</i>	Erik Andersson	Service technician	12. October 2000.
	Barbro Carlström	Ward manager/OR nurse	13. October 2000.
	Jan Hallén	Administration	20 October 2000.
<i>Lundby Hospital</i>	Anita Carlsson	Ward/ OR manager	11. October 2000.
	Lena Nöjd	MD assistant	20. October 2000.
	Peter Lysell	CFO	13. November 2000.
<i>Cell Network</i>	Karen Geiselhart	Business development	12. October 2000.
	Carl-Johan Mattsson	Business development	12. October 2000.
<i>Medinsite.com</i>	Stefan Winberg	Co-founder	27. October 2000.

**10.3.2. UK**

<i>SureStock, Oxford</i>	Ken Bickers	Sales and marketing manager	6. October 2000.
<i>Addenbrooke's Hospital, Cambridge</i>	Helena Fuller	Head of procurement	7. October 2000.
	Leslie Thorne	Head of CSSD	7. October 2000.
	Erik Coulson	Authorized person	7. October 2000.
<i>MedExOnline.com, London</i>	Tash Whitmey	Director of customer service	7. October 2000.
	Colin Williams	Research manager	7. October 2000.
	Roy PJ Dunn	Customer service manager	7. October 2000.
	Paul Stratton	Healthcare Business Development	7. October 2000.
	Philip Kennedy	Director of Marketing	7. October 2000.
<i>Hope Hospital, Manchester</i>	Ishbell Ingram	Head of CSSD	9. October 2000.
	Roger Robinson	Technical Manager	9. October 2000.

**10.3.3. Denmark**

Lunatronic, Copenhagen	Thomas Dan Hougaard		18. September 2000
	Karsten Saunte	Director of R&D	18. September 2000.

### 10.4. Webster and Wind model

