



UNIVERSITY OF GOTHENBURG

# **Mobile Sales, a mobile CRM solution.**

**An analysis of the implementation problems**

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## **Abstract**

### ***Problem***

The users of today live and work in a ubiquitous environment (an environment surrounded by computers) and this implies that mobile technology is ever present. But there are unfortunately still problems with mobile systems. We have asked the question “*How can the usage of mobile technology be improved in a ubiquitous environment?*” in order to examine the areas of improvement that exists in ubiquitous environments.

### ***Purpose***

The purpose of our study is to find out how the usage of mobile technology can be improved. In doing so we will propose changes both on a workflow level and on a technical level, that will better support a mobile sales force.

### ***Method***

The research has been founded on a case study of Mölnlycke Health Care. In this study we have used methodological triangulation which, in this case, consists of semi-structured interviews, observations and a questionnaire. This helped us to understand the intended use of the system, the actual use of the system and the preferred use of the system.

### ***Conclusions***

There are several ways to improve the usage of mobile technology in a ubiquitous environment. This is done by adding more interaction points, remove bindings, have both technology push and need pull, avoid or simplify cross-media transitions, encourage private use of mobile devices, avoid similarities with other non related applications and when it comes to trust the most important factor is structural assurances.

### ***Keywords***

Ubiquitous computing, mobility, CRM, ERP.

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# 1 Introduction

*This chapter starts with research background to get the reader familiar with the subject we have chosen. After this, we discuss the problem and the purpose of the study, followed by delimitations.*

## 1.1 Background

In today's increasingly competitive business environment there is a need for companies to adjust to ever-changing conditions. It is therefore more and more important for companies to organize and work in efficient ways. The organisational structure needs to be supported by one IT-system for the entire organisation. Enterprise Resource Planning is a system that allows for the planning of an organisation's resources, spanning from raw materials to personnel and finally to the customers. This type of system involves the whole business process and the preferred way of structuring an organisation is to adjust its workflows to the ERP-system (Enterprise resource planning, 2008).

As one can imagine an ERP system is very costly to implement – not only is the IT infrastructure fundamentally changed, the entire organisational structure also needs to be altered. A typical ERP installation has a total cost of about \$15 million (O'Leary, 2000) and costs can be as high as two to three percent of revenues (Escalle, Cotteleer, & Austin, 1999). Installation takes between one and three years (21 months on average), with benefits starting to show after an average of 31 months (McAfee, 1999).

The ERP system divides into different modules based on the business function of the enterprise it should support. A few examples of these business functions could be Manufacturing, Supply Chain Management, Financials, Projects, Human Resources and Customer Relationship Management (Enterprise resource planning, 2008).

*From the outside, customers interacting with a company perceive the business as a single entity, despite often interacting with a variety of employees in different roles and departments. CRM is a combination of policies, processes, and strategies implemented by a company that unify its customer interaction and provides a mechanism for tracking customer information. (Customer relationship management, 2008)*

The focus of this study is on the module Customer Relationship Management also known as CRM.

### 1.1.1 Mölnlycke Health Care - our case study

We had the good fortune to study a sales tool application integrated into SAP's CRM module at a company called Mölnlycke Health Care (MHC).

MHC is one of the world's leading providers of single-use surgical and wound care products and services to the health care sector (About Us, 2004). Examples of these products are patient drapes, instrument drapes and surgical gowns, as well as caps and masks for operating personnel. MHC also markets wound care products for treatment of surgical wounds, chronic wounds and burns.

As of year 2004 there were approximately 4,000 employees, 3,300 of them work in production at the factories in Belgium, Finland, Mexico, Thailand and the Czech Republic.

In the year 1997, Mölnlycke Health Care was established as an independent company, through an acquisition and merger of the clinical divisions of SCA/Mölnlycke Group and Tamro Oy. Ever since the beginning, MHC's core business concept has been to manufacture and market single-use surgical and wound care products.

The headquarters was placed in Gothenburg and the company started its work towards becoming a world leader in the manufacturing, marketing and sales of single-use products for surgical interventions and wound care.

## **1.2 Problem discussion**

For MHC who has a travelling sales force, the need for mobile access to their CRM system is important. The sales personnel are many times offline without access to a stable connection where they can share and receive information about a specific client, a product or an order. A mobile system that can be used offline was an essential part of their initial requirements.

Mobile Sales Application (MSA) is an instrument that the sales personnel at MHC use to administer their customer information. SAP originally developed the tool to be used in conjunction with the CRM module. The sales personnel in Sweden have used MSA since 2002. Before that, they used a system called MOSS, this did however not have any connection to MHC's ERP system.

By replacing the old system, MHC had the opportunity to implement new work processes that comes with the CRM module. The new work process will make their work more effective, by utilizing the best practice incorporated in the system. The module is a part of SAP's ERP system called R/3. Another of the key drivers for Mölnlycke Health Care to choose MSA was the ability to use it offline, without direct connection to the CRM system.

There are many examples – from previous related work – of problems with mobile systems (Andersson & Lindgren, 2005). They noticed the problem with the limited theoretical understanding on *how IT architectures can be designed to support core business activities* (Andersson & Lindgren, 2005). They noticed the need for multiple interaction media when the users were working with the system, which is one key aspect in mobile systems. **We therefore wanted to see how the sales personnel actually worked with the mobile system** – MSA in this case.

Previous research has also shown the difference between the expected plan of use and the real way of using a mobile support system (Benbunan-Fich & Benbunan, 2007). It is supposed to be a support system for the personnel but instead it turned out to be a documentation device (Luff & Heath, 1998). Since this problem is well known we thought that it would be interesting to find out **how MSA intended use differed from the real use**.

The IT department at Mölnlycke Health Care had received complaints about MSA, they therefore wanted to take a closer look at **how the users used the application**, and find out about any input the users might have. We also want to deliver a solution that would remove the discrepancies between intended use and real use.

### **1.2.1 Problem statement**

There are many issues to consider when working with CRM. There are a few areas where the processes of CRM meet the customer. One of these points of contact is when the sales person is in contact with the customer in some way. Our aim was therefore to find out whether or not this application is a support tool for the sales personnel that are the users of MSA. Consequently our question for this thesis is:

*How can the usage of mobile technology be improved in a ubiquitous environment?*

We will explain the term “ubiquitous environment/computing” in section 2.3.1.

In this setting, we will specifically look into:

- How the sales personnel interact with the customers.
- How the sales personnel should use Mobile Sales.
- How they actually use Mobile Sales.
- How they would like to use Mobile Sales.

### **1.2.2 Purpose**

The purpose of our study is to find out how the usage of mobile technology can be improved. In doing so we will propose changes both on a workflow level and on a technical level, that will better support the sales force.

### **1.2.3 Delimitation**

Customer relationship management is a large area to cover. For a company to be successful in CRM you have to work with it in every department of your company. We have however concentrated our work on the processes that the sales personnel work with.

We will focus on the part of the CRM process that has to do with MSA and its usage.

Our research is also solely based on MHC’s sales force in Sweden.

Our empirical research was conducted in 2004.

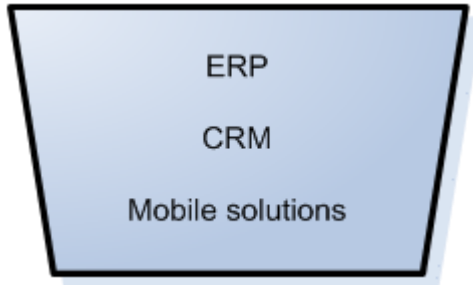
## **1.3 Disposition**

In order to understand the impact of the empirical findings, we need to examine what has been said before in the relevant area of research. This is done in the chapter “Related work”. We start that chapter by explaining what ERP is all about. How it all started, the properties of ERP, its pros and cons, and how it effects an organization.

We then narrow it down, by focusing on explaining an ERP module by the name of Customer Relationship Management. This is necessary since the use of the MSA tool is closely linked to just that module of the ERP infrastructure. The CRM module is – as the name suggests – a part of ERP that assists the company in its customer contacts. It can – for example – consist of customer databases, tools for marketing and product information (Customer relationship management, 2008).

Furthermore, we find it relevant to present some of the research performed on mobility. We look at the different types of mobility so that we can define what characteristics MHC sales personnel have in its mobile work. The part about the different types of mobility also helps us to understand exactly how mobile the sales force is.

After this, we examine some of the difficulties that mobile work can create in the use and design of mobile applications and devices. This knowledge will help us when creating our suggestion of how the mobile technology should support the sales force, since we need to be aware of some of the pitfalls that mobile technology can create.



**Figure 1 – Going from a general ERP level to a more specific mobile solution (created by us).**

After the section on “Related work”, we come to the section dealing with the “Method”. That chapter is followed by “Research setting and technology review”. In this chapter, we describe the system from a more objective point of view, how it works on a technical level. The first part explains what the driving forces behind the decision to implement MSA were (4.1 and 4.2); The second part consists both of an overview and a detailed explanation of the features and functions of MSA, presented in a top-down approach (4.5, 4.6, 4.7, 4.8, 4.3, and 4.4); The third part will explain how the users are intended to use MSA (4.9).

In the chapter “User site investigation” we will describe how the sales personnel perform their daily tasks and go about their business. We will look at the discrepancies of intended and unintended use. The view of what the workflow really looks like is based on observations, interviews and a questionnaire.

In the “Discussion” chapter, the empirical findings will be summarized and discussed in relation to established theories from previous research as well as make recommendations for the future. The question for this thesis will be answered in this chapter.



## 2 Related work

We will in this part of the study present what other researchers has said before in the related area of research. The theories presented will form the basis for the analysis of our empirical findings.

### 2.1 Enterprise Resource Planning

There is no single definition of ERP (Klaus, Rosemann, & Gable, 2000). Instead, the definition of ERP is in the eyes of the beholder, depending for example on the context. Perhaps the three words Enterprise Resource Planning are not very appropriate for describing the properties of the IT system. First, the system often extends beyond the boundaries of the enterprise; it is more than managing resources; and finally, the focus is not necessarily on planning. Davenport argues; “The ERP name reflects the manufacturing roots of these systems – It's a modification of "MRP" (manufacturing resource planning) – but in my view these systems have so transcended their origins that the somewhat clumsy ERP name is no longer appropriate.” (Davenport, 2000)

*Enterprise systems (ES) are large-scale organizational systems built around packaged enterprise system software. Enterprise system software (ESS)*

- *is a set of packaged application software modules with an integrated architecture, which can be used by organizations as their primary engine for integrating data, processes and information technology, in real time, across internal and external value chains;*
- *contains deep knowledge of business practices accumulated from vendor implementations in a wide range of client organizations;*
- *is a generic 'semi-finished' product with tables and parameters that user organizations and their implementation partners must configure, customize and integrate with other computerbased information systems to meet their business needs.* (Shang & Seddon, 2002)

Perhaps “Enterprise systems” would be a more suitable name, but in this essay we will use the term Enterprise Resource Planning, since this is better known.

In the e-book “Enterprise Resource Planning: Global Opportunities and Challenges” (Hossain, Rashid, & Patrick, 2002) we found a suitable definition for the ERP software. According to this, enterprise resource planning systems are software systems for business management, made up of modules supporting different functional areas such as planning, manufacturing, sales, marketing, distribution, accounting, financial, human resource management, project management, inventory management, service and maintenance, transportation and e-business. These modules are all connected to the same central database, for several reasons. First, the different business functions across the enterprise have to be able to share information; and second, to also make the shared information consistent. The legacy systems used before ERP systems are usually too incompatible to make them as integrated as an ERP system.

*ERP systems enable efficient and error-free workflow management and accounting processes including in-depth auditing. These systems feature a single database to eliminate redundancy and multiple entry errors, and they provide in-depth reporting functionality. Finally, because of their role as the core transaction system, ERP systems provide information for effective decision-making on all organizational levels.* (Murphy & Simon, 2002)

ERP can be described as a software product, but it is of course more than that. It is more importantly part of an objective – during implementation – to identify the different processes of the enterprise in question, and to both support and encourage the possibility to share data between the enterprise departments. Doing so in order to evaluate the current ways of doing things, and possibly (probably) make some structural changes for the better. (Klaus, Rosemann, & Gable, 2000)



**Figure 2 – Modules of ERP system (nvish, 2003)**

*Generic software packages, such as ERP systems, cover the fullest range of organisational activities and processes and are adopted with the aim of achieving substantial cost savings as well as improved access to “tried and tested” solutions, new releases, and an opportunity to update procedures and align them with perceived “best practice”.* (Pollock & Cornford, 2004)

The ERP infrastructure plays an important part in supporting the business of the enterprise. It is a tool for supporting the different processes involved in conducting business (Klaus, Rosemann, & Gable, 2000).

It is important to realize that implementing an ERP system is not just a technical “upgrade” project; the main focus has to be the business aspect. This means redesigning processes, organizational structures, and strategies, which in turn prolongs the project span. It is easy to find lot of examples of projects where this was not taken into consideration, and the result was far from excellent (Klaus, Rosemann, & Gable, 2000).

*There is often a gulf between the system and the specific contexts, practices and requirements of particular user organisations. Among the many issues ERP systems raise, of particular concern to practitioners is the choice between conducting expensive “customisation” work on standard solutions or undergoing unwanted organisational change in adapting their practices to models of work and organisational process embedded in the software.* (Pollock & Cornford, 2004)

### 2.1.1 Business processes

*Successful implementation of an ES does involve probably the greatest technological change most organizations have ever undergone, not to mention the largest employing client/server technologies. Even more difficult and important, however, are the major changes in business that come with an ES project. (Davenport, 2000)*

Davenport argues that the arrival of ERP systems have replaced the ongoing need for the reengineering of business processes. And that there is a compromise between the two goals of getting a system in place that supports or enables the company's strategy, and getting a system with basic technical functionality in place quickly (Davenport, 2000).

What is a process? Davenport defines it as "A process is thus a specific ordering of work activities across time and place, with a beginning, an end, and clearly defined inputs and outputs: a structure for action" in his book Process Innovation. The implementation of ERP can be seen as an attempt to turn the process into practice. The more of the processes supported by the ERP you try to implement, the more resources the implementation are going to consume. Implementing an ERP system does not automatically make the organization more process oriented, but it supports the possibility to do so. It is also important for management to understand that this will fundamentally change the ways this organization do business. In addition, to allow this change to take the time it needs to get the desired results from it. Because of the size of the impact, this change is accountable for; the decision to go ahead with the implementation of an ERP-system has to come from the top (Davenport, 1993).

### 2.1.2 Pros of ERP systems

The table below illustrates the benefits gained by implementing an ERP system.

<b>What benefit</b>	<b>How</b>
Reliable information access	Common DBMS, consistent and accurate data, improved reports.
Avoid data and operations redundancy	Modules access same data from the central database, avoids multiple data input and update operations.
Delivery and cycle time reduction	Minimizes retrieving and reporting delays.
Cost reduction	Time savings, improved control by enterprise-wide analysis of organizational decisions.
Easy adaptability	Changes in business processes easy to adapt and restructure.
Improved scalability	Structured and modular design with "add-ons".
Improved maintenance	Vendor-supported long-term contract as part of the system procurement.
Global outreach	Extended modules such as CRM and SCM.
E-Commerce, e-business	Internet commerce, collaborative culture.

(Hossain, Rashid, & Patrick, 2002).

### 2.1.3 Cons of ERP systems

The table below illustrates the problems needed to overcome in order to implement an ERP system successfully.

<b>Disadvantage</b>	<b>How to overcome</b>
Time-consuming	Minimize sensitive issues, internal politics and raise general consensus.
Expensive	Cost may vary from thousands of dollars to millions. Business process reengineering cost may be extremely high.
Conformity of the modules	The architecture and components of the selected system should conform to the business processes, culture and strategic goals of the organization.
Vendor dependence	Single vendor vs. multi-vendor consideration, options for "best of breeds," long-term committed support.
Features and complexity	ERP system may have too many features and modules so the user needs to consider carefully and implement the needful only.
Scalability and global outreach	Look for vendor investment in R&D, long-term commitment to product and services, consider Internet-enabled systems.
Extended ERP capability	Consider middle-ware "add-on" facilities and extended modules such as CRM and SCM.

(Hossain, Rashid, & Patrick, 2002).

*ERP systems are thus becoming increasingly more complex, aspiring to provide support for business functions that were previously offered by third party vendors. Extended ERP software includes such applications as supply chain optimisation, customer relationship management and decision support systems. (Stefanou, 2002)*

The reason for "Extended ERP capability" being among the problems of ERP implementations, are the fact that it adds to the complexity of such an endeavour (Stefanou, 2002).

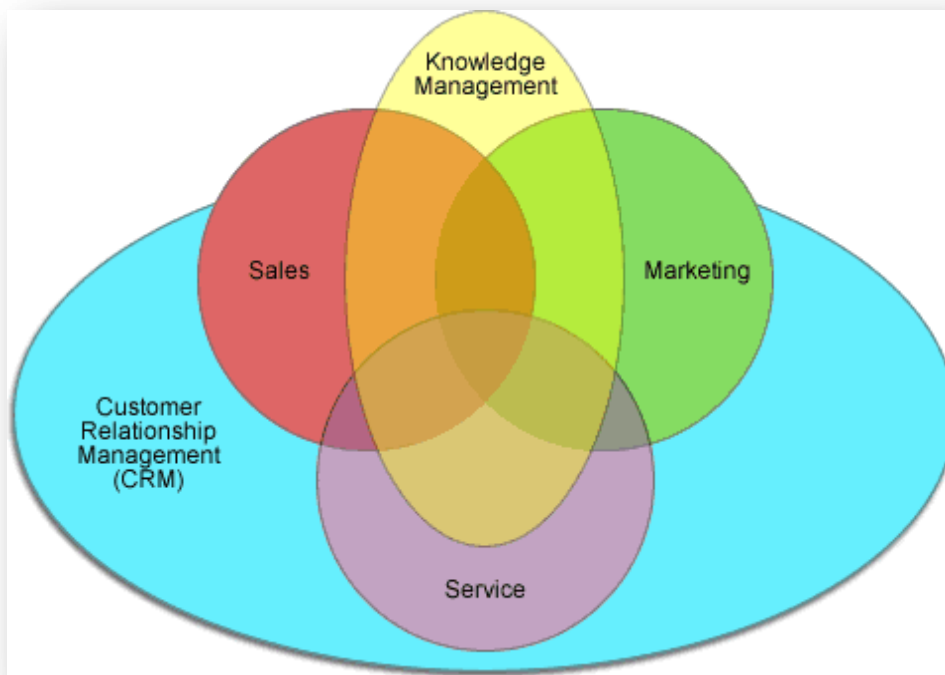
## 2.2 Customer relationship management

Since we are examining MSA and since it is a part of SAP's CRM module we need to have an understanding of what CRM is. We also need to know how it is supposed to work and what benefits a company can draw from it. In the following chapter we will define CRM, look upon the advantages with it and examine some pitfalls that a company can end up in when dealing with CRM.

### 2.2.1 Defining CRM

One of the reasons for a company to use a CRM solution is that the focus has changed from acquisition of new customers to the retention of old customers and the maximisation of the value from the lifetime of the customer (Langerak & Verhoef, 2003).

It's impossible to state precisely what customer relationship management (CRM) means to everyone (Harris, 2009) the reason for this statement is that the term has been used for every part of business that has been even remotely in contact with the customer. We understand this difficulty but we think that there are at least a couple of definitions worth mentioning.



**Figure 3 – CRM plays an important role for many parts of an organisation. As you see above it is integrated in sales, marketing, service, and knowledge management (Squidoo, 2009).**

Customer relationship management is a comprehensive approach for creating, maintaining and expanding customer relationships (Anderson & Kerr, 2002). The word “comprehensive” means that CRM needs to be in every part of the organisation. If CRM is delegated to only one department, the relationships with the customer will suffer. The biggest profits are earned if CRM strategies are aligned over all departments (Deck, 2004).

*From the outside, customers interacting with a company perceive the business as a single entity, despite often interacting with a number of employees in different roles and departments. CRM is a combination of policies, processes, and strategies implemented by an organization*

*to unify its customer interactions and provide a means to track customer information*  
(Customer relationship management, 2008).

This definition implies that CRM is a system that is supporting the customer relationships. Such a definition can create problem if the system is used without knowledge on how the system should support the processes in the company. Stewart Deck addresses this when he explains that CRM is "... a strategy used to learn more about customers' needs and behaviours in order to develop stronger relationships with them." He also claims that there are many technological components in CRM but if you concentrate on the technology instead of the strategy, you are in trouble (Deck, 2004).

All these writers agree upon the importance of an effective CRM system for a company. This is quite easy to understand since the customers are very important to all companies and a good CRM strategy and CRM system makes the work with the customer more effective. This effectiveness is reached by that the company knows every bit of important information about the customer via the CRM system. Moreover, this information makes it easier – e.g. for the sales personnel – to conduct their work in a more effective way.

### **2.2.2 Pitfalls of CRM**

With these great advantages it is strange that it is only 30 to 70 percent of CRM projects that are successful. There can be several reasons to this. One of these is that managers are unaware of that CRM does not always have a positive effect upon customer performance. It is not guaranteed that CRM results in significant changes in the purchasing pattern of customers in fast-moving consumer markets. The disappointing results can also be blamed upon the reason that many managers have trouble in embedding CRM in their strategy and organisation. It is not difficult to see that a risk with this can be that the CRM tool becomes merely a reporting tool (Langerak & Verhoef, 2003).

Nevertheless, to ensure that the use of the CRM tool does not become one of the failed CRM projects, some important issues should be considered (Langerak & Verhoef, 2003).

1. When you implement CRM strategically it should be in line with the chosen business strategy. You should even let the strategy play an important role when you are deciding what type of CRM application that you should choose. This can of course be rather difficult to do if a company already has an ERP-solution since the options are reduced.
2. According to some managers the human factor is the single most important determinant of CRM performance. This implies that CRM is bound to change the culture of the organisation.
3. Companies often think that the CRM software is the key to success in applying CRM. But even since a large part of the budget is allocated to software, managers should not fall in the trap and only focusing on it. Especially in customer intimate CRM, software facilitates customer relationship development.

## **2.3 Mobility**

As with most sales organisations there has to be some sort of mobility support for the sales personnel working in the field. This is possible because of the paradigm shift in computing, from the use mainframe to personal computers and now ubiquitous computing (ubicmp). In the following text, we are going to explain ubicmp. We are also going to describe some of the problems you can face when you are dealing with mobility.

### **2.3.1 Ubiquitous Computing**

We have gone from a situation where users outnumbered computers many times, to the opposite situation. Now “users” are exposed to computers in almost every corner of their lives. Not only are there more computers per user, the way to interact with the computer have changed. It has improved to a more intuitive way to interact for the most part. This vision is called ubiquitous computing. Ubicmp is more than just mobile PDA and such, it is the computing hidden from the users perception (Weiser, 1993).

Ubicmp is one of many similar visions making up the coherent paradigm called “everyware”. However everyware also goes beyond ubicmp and takes it further. One difference is that in ubicmp the user is still the initiating part. Where the system is the initiating part in everyware (Greenfield, 2006).

One of the main conclusions when it comes to general infrastructure challenges in ubicmp environments is the need for a variety of the interaction point exposed to the users. The multiple interaction points are a necessity for the information flow to bridge the mobile and stationary divide (Andersson & Lindgren, 2005).

### **2.3.2 Previous research findings regarding mobility and mobile systems**

We all know that there is a big difference between mobile and office work. Besides the obvious differences, there can also be a more subtle difference. In the article “Dealing with mobility: Understanding access anytime, anywhere” the authors talk about the uncertainty that a person can feel when they do mobile work. The difference lies in that if you work in an office you have greater familiarity and certainty about the surroundings and the resources. You know where the printer, telephone, co-workers and the other resources are. However, if you are a mobile worker there can be problems since you spend your time in so many different places e.g. customer meetings, hotel rooms, trains, airplanes, busses or cars. Since the mobile worker is not familiar with these environments, he can experience uncertainty if the technology does not remove all the bindings between the office space and the mobile workers information and communication resources (Perry, O'hara, Sellen, Brown, & Harper, 2001).

One way to remove these bindings can be to live by the rule “access anytime, anywhere” since this can simulate an office and the access to documents and support by the co-workers. But there can be a danger in using these simplistic assumptions since these does not capture the nature of mobile work. Instead of looking upon the concepts of access anytime, anywhere as the salvations of mobile work one can argue that each of these terms has different implications for the way we think about mobile work (Perry, O'hara, Sellen, Brown, & Harper, 2001).

An example that illustrates this problem with mobility was an issue at a building site. A mobile device was supposed to replace a sheet of paper used to record the time spent on



certain work tasks. The system was supposed to be a help for the supervisors when they encountered problems and to assist them in discussions with their co-workers. However, unfortunately the system failed in its intended purpose since it became a data documentation device instead of a communication tool. The paper was easy to view for the participants in a discussion and it was easy to show to the co-workers on the construction site. However, the size, shape and screen size of the mobile device made it difficult to use in a discussion. The outcome was that the device made it difficult to perform mobile work instead of supporting it. The system made the information accessible anytime anywhere but it did not capture the essence of the mobile work in the situation at the building site (Luff & Heath, 1998).

Another problem that could have arisen in the situation above is discussed in the article “Understanding mobile contexts” (Tamminen, Oulasvirta, Toiskallio, & Kankainen, 2004). Here is an ethno methodologically inspired study of adults in Helsinki performed. They studied how these persons used mobile technology and how the technology influenced their daily life. One of their findings was that there was almost never a situation when their participants just “walked” or “waited”. During most of this time, they were engaged in multiple activities simultaneously. The connection to the previous problem at the building site is that the mobile device requires more attention to work than what the papers demand. This could be a problem with the design of mobile systems. If you do not take into consideration the situation that the user is in, the mobile system can become a failure.

One interesting thing is that “incoming information on one medium tends to stay on that medium, e.g. paper to paper, email to email and phone to phone”. It is not often cross-media transitions occur since such transitions cost both time and effort. The designers should make these cross-media transitions easy to perform or to design the system to avoid the transitions altogether (Brodie, 2003).

A lot of extra effort has to be put in by the mobile user before the actual mobile work can begin. The mobile workers of today often search for flat surfaces to work on such as tables in restaurants or bars in airports. This makes it difficult for the users to work anywhere. This puts some pressure on the designers to understand the context that the technology is supposed to be used in (Brodie, 2003).

### **2.3.3 Adoption**

When it comes to making the user favourable toward new mobile services, there are a few things to consider. The most interesting are user’s satisfaction, need, behaviour, and trust.

User satisfaction is also important to consider. Research has shown that depending on the mobile user’s social context (individual as employee, professional, private user, and as member of society) the user satisfaction of the mobile device will vary. I.e. when comparing the two cases in the study, the conclusion is that in the case where management actively encouraged private use of the mobile device, the user satisfaction is increased (Scheepers, Scheepers, & Ngwenyama, 2006).

The more knowledgeable the organisation is and the more informed decision can be made when it comes to technology, the more likely they are to adopt new technology. It takes both technology push and need pull to get a successful technology adoption. I.e. the technology is being pushed out by the provider but it is also important that the business have the need for the pushed technology in order to adopt it (Lee & Shim, 2007).

Research has shown that users tend to use a system the way they have previously learned to use a similar system. E.g. in the study of Microediciones – mobile application designed to be read as a newspaper – the user instead tried to use it as they were browsing the internet. This is an important factor to consider when dealing with mobile systems (Benbunan-Fich & Benbunan, 2007).

Another important aspect is the user trust since it is always an important issue to consider with people, the same goes when it comes to mobile services. In order to get people to use the system it is important to get the user feel initial trust toward the system. The trust can be built on lots of different factors. The most important is structural assurances followed by perceived benefits of the service and personal propensity to trust. The reputation of the company behind a system does not affect initial trust (Kim, Shin, & Lee, 2009).

### 3 Method

*In this chapter we will describe the methodological approach we used when conducting this study.*

#### 3.1 Qualitative and quantitative research

There is quantitative and qualitative research. These can be defined as follows.

- Quantitative research can be defined as an investigation in which the researcher attempts to understand some larger reality by isolating and measuring components of that reality without regard to their contextual setting. This view of the world is more or less an objective standpoint. The underlying belief in this view or paradigm is that there exists a more or less objective reality separated from man. Here the research separates the individual from the surrounding environment in order to explain how the objective reality appears (Backman, 1998).
- Qualitative research as an investigation; is when the researcher attempts to understand some larger reality by examining it in a holistic way or by examining components of that reality within their contextual setting. The reality is an individual, social, and cultural construction. In this paradigm the interest is more aimed at the individual, you ask the individual how he or she interprets and shapes his or her reality (Backman, 1998).

##### 3.1.1 Induction and deduction

There are two main ways of coming to a conclusion, induction and deduction. Induction is based on empirical data and deduction is based on logical reasoning.

When taking empirical data and from that deriving general conclusions it is called induction. The premise for induction is for this reason the ability to quantify. The researcher work with an open mind and through empirical data they will reach a conclusion. Here is an example of induction (Thurén, 1991):

*Premise: All the people throughout the history of the world have died.*

*Conclusion: Thereby is all of humankind including me mortal.*

Deduction is on the other hand when you come to a logical conclusion that is valid if it is in a logical context. I.e. the researcher tests already existing theories. However, it does not have to be true in the sense that is in accordance with the reality. Here is an example of deduction (Thurén, 1991):

*Premise: All of humankind is mortal.*

*Premise: I am a man.*

*Conclusion: Thereby, I am mortal.*

The difference between the induction and the deduction in these two examples is that in the case of induction there is a theoretical possibility that the reasoning can be overthrown by empirical data (Thurén, 1991).

Qualitative research usually starts with the gathering of empirical data, followed by (often at the same time) the phrasing of the hypothesis or theories. This hypothesis generative process

is inductive in its nature. Quantitative research on the other hand, which tests the already present hypothesis, is more deductive in its nature (Backman, 1998).

### **3.1.2 Case Study**

According to Paul M. Brewerton there are three different classes of design to choose from when you are designing a study. These three are: case study, correlational study and experimental study. A case study deals comprehensively with a single organizational sample or issue. It includes a description of an ongoing event (e. g. organizational change) in relation to a certain outcome of interest (e. g. strategies of coping) over a fixed time in the 'here-and-now' (Brewerton & Millward, 2001).

Three of the advantages with a case study are:

- It allows for a deeper investigation of a certain situation than other designs would;
- The information it acquires can be great and informative and it can give new angles or raise issues that otherwise might never have been noticed;
- The group of people being studied is usually well defined and closed, which increase the level of detail available for the researcher (Brewerton & Millward, 2001).

However, what about the downsides of case study? Brewerton mentions that problems sometimes occur with the interpretation. "There is no guaranteed method for determining the impact of an event that has not been systematically controlled, or where there is an absence of baseline information against which impacts can be compared." However, this difficulty can be overcome if one compares the results to some absolute standard of success (i.e. compare the results to some, in advance decided, criterion of success). Other problems can be one of the following (Brewerton & Millward, 2001):

- Focusing on detail, making it hard to 'see the forest for the trees';
- Getting too committed that impartiality is lost;
- The information collected can be hard and slow to analyse;
- The design in the local setting is hard to generalize;
- The group of people being studied may feel that they are under surveillance.

Some of the risks with case studies are also addressed in another article (Smith, 1990). Among other things, Smith says, "case studies need not to be viewed as solely exploratory or tentative exercises in research. Their validity when correctly understood, depends ... on how they are used and their logic of their analysis." Smith also speaks about the same problem that Brewerton raises; it can be difficult for the researchers to maintain their objectivity. We believe that we can overcome this obstacle by keeping in mind that the problem exists and act accordingly.

## **3.2 Performing a qualitative case study**

Since we started without a finished hypothesis, our approach is inductive. We used a qualitative case study for our research approach. The study at MHC was a one case study. Nevertheless, case studies do not have to be confined to just one case (Backman, 1998).

### **3.2.1 Methodological triangulation**

We decided to use triangulation in this study, which is the application and combination of several research methodologies in the study of the same phenomenon.

There are four basic type of triangulation (Denzin, 1970):

- a. data triangulation, involving time, space, and persons
- b. investigator triangulation, which consist of the use of multiple, rather than single observers;
- c. theory triangulation, which consists of using more than one theoretical scheme in the interpretation of the phenomenon;
- d. methodological triangulation, which involves using more than one method and may consist of within-method or between-method strategies.

We used the last of these types. We used three different methods for data gathering purposes, i.e. interviews, observations and a questionnaire. We regard our research to be the qualitative end of the scale, even though questionnaires can be regarded as a quantitative research method.

By combining three different ways of gathering data – interviews, observations, and a questionnaire – we hope to get a fair picture. We chose to have interviews to be able to dig deeper into the opinions and knowledge of the interviewees. I also help us keep the discussion alive and going forward. We chose to complement the material from the interviews by doing a series of observations. The observations help us identify the steps in the work process that didn't come up during the interviews. Also to verify the information that appeared during the interviews. We chose to use a questionnaire to reach a larger group of respondents, and to be able to quantify the gathered data set. We also conducted the questionnaire with the ambition to offer anonymity to the respondents, in that sense that they do not have the researcher looking over their shoulder.

### **3.2.1.1 Interviews**

We conducted our interviews in a semi-structured fashion, thus we had a few predetermined questions. We wanted to keep the questions within the predetermined theme, but at the same time dynamic enough to allow the interview to be a normal conversation. A good interview question should both contribute to building knowledge on the matter at hand, as well as being dynamic enough to create a connection between the interviewer and the interviewee (Kvale, 1997).

The questions were designed to give us a clearer picture in different areas. We wanted to find out how the system was intended to be used, how the system is being used, and how the system can be improved. These topics made up the three main categories of questions we used.

During the spring of 2004 we conducted six in-depth interviews. Three were product specialists – MHC's sales personnel – and was interviewed about the usage of MSA. We will refer to them as Lisa, Sara, and Joan later in the study to hide their true identity. One was an account manager who also was a user of MSA. The last two we interviewed more from a technical point of view, since they were administrating and supporting MSA. The four people with MSA experience have been using MSA from the very beginning and for that reason have been using MSA during the start-up period. The three product specialists we interviewed worked in Göteborg, Örebro, and Stockholm respectively. We met with them on their home ground, and had the opportunity to come along on their costumer meetings. They meet with their customers in order to inform them of how to use the products of Mölnlycke Health Care, as well as inform about new products.

We recorded four of the interviews electronically on a minidisc. During the other interviews, we took notes. Each interview took about one hour. The objective of our interviews was to get an understanding of how the sales personnel work and how they use MSA.

### **3.2.1.2 Observations**

Observation has been characterized as “the fundamental base of all research methods” in the social and behavioural sciences (Alder & Adler, 1994) and as “the mainstay of the ethnographic enterprise” (Werner & Schoepfle, 1987).

Objectivity remains central to the self- image of most practitioners of the social and behavioural sciences. Objective rigor has most often been associated with qualitative research methods, and so important has been the harmonization of empathy and detachment that even those dedicated to qualitative methods have devoted considerable effort to organizing their observational data in the most nearly objective form for analysis (Altheide & Johnson, 1998).

To get a more solid understanding of the behaviours and relations between people, you should instead of interviewing them, observe them in their environment (Altheide & Johnson, 1998).

We wanted not to interfere during our observation, i.e. being passive observers. We observed the product specialists in different situations, while taking notes of things we witnessed. Even though we wanted not to interfere during the observations, it was a good opportunity to let the product specialist explain some tasks in more detail. This explanation would not have been possible if we did not ask any questions during the observations. However, to a high extent as possible we wanted not to ask any questions.

### **3.2.1.3 Questionnaire**

There are mainly two objectives when designing a questionnaire. First, to maximize the response rate, i.e. the percentage of completed questionnaire received from the participants. Second objective is to receive as accurate and relevant information as possible (Leung, 2001).

We created a web-based questionnaire consisting of 90 questions. This was “sent out” to 57 people in the Nordic countries and was answered by 33, of which 10 were product specialists and 15 were account managers, both part of MHC’s sales personnel. The remaining eight were the superiors of the product specialists and account managers. We mixed our own questions with questions from a usability study (Lewis, 1995).

## **4 Research setting and technology review**

*In this chapter we will present the background of MSA at MHC, and the technical review that covers the architecture of the MSA. The review consists of three main parts:*

*The first part explains what the driving forces behind the decision to implement MSA were (4.1 and 4.2); The second part consists both of an overview and a detailed explanation of the features and functions of MSA, presented in a top-down approach (4.5, 4.6, 4.7, 4.8, 4.3, and 4.4); The third part will explain how the users are intended to use MSA (4.9).*

### **4.1 Mölnlycke Health Care's IT strategy**

As a result of MHC no longer being a part of the former mother company SCA, a new platform was introduced. The platform selection was based on the IT strategy in 1998 that stated "... development, implementation and sourcing of a common infrastructure and system platform." (Mölnlycke Health Care, 2004)

Based on this, the decision was taken to go from a legacy system to SAP R/3 with the CRM module – among other modules. An ERP system such as SAP R/3 was found to support such a strategy. The new strategy is to bring IT closer to the business. This presents new challenges for the IT systems to really support what the business demands. This should be addressed in both ends, on the one hand, the business must improve its strategic use of IT, and on the other hand, IT must support the different business processes to a higher extent, to increase the differentiation on the market (Mölnlycke Health Care, 2004).

Tools such as MSA was chosen for that reason, but also because it was highly integrated with the core system of SAP R/3 – where the Customer Master Data and the Material Master Data are stored – support the updates to come. MSA is only one of many modules within the CRM module that can be combined with each other (Mölnlycke Health Care, 2004).

### **4.2 Mobile Sales – a tool in the CRM system**

In this section, we will present our view of MSA from a more technical point of view after an interview with an IT business specialist at Mölnlycke Health Care. It is also based on information from different manuals found on Mölnlycke Health Care's intranet.

#### **4.2.1 The goal of implementing Mobile Sales**

The goal of the project to implement MSA can be found on the intranet of Mölnlycke Health Care.

*The purpose of setting Mobile Sales in place is to support the Sales Efficiency concept. This implies a different approach of the customer based on its categorization (A, B, C category) and the use of different activity types (Meetings, Mega meetings, Direct marketing, ..) to optimise the added value per customer (balance contribution – costs).*

*... Mobile Sales is the tool for the exchange of information between all parties (Mölnlycke Health Care, 2004).*

The "parties" mentioned in the previous quote, is the people that are in direct contact with the customer. That would be professional roles such as account managers, personnel at the Customer Service Centre (CSC) and at the sales office.

## 4.2.2 Supporting the sales personnel

The primary function of the offline version of MSA we investigated was the support of travelling sales personnel operating in Norway, Denmark, Finland and Sweden. Each sales person has a laptop with a version of the offline MSA application installed (version 3 in 2004). The application was still under development by CAP Gemini Ernst & Young for Mölnlycke Health Care. MSA is also loosely linked to other tools such as QlikView and Target Group Selection, which are both explained further later on in the essay.

As of 2004, MSA was implemented in the Nordic countries, England, France and Germany. The rest of the European countries also planned to implement MSA (third quarter 2004), as well as the US market (start rollout 2005). The following was stated on the MSA projects site on MHC's intranet: "When the implementation will be over for all markets, MSA offers an ideal platform to provide additional information about the customer with supply situation (latest orders and status), quotations and price offers, financial situation (open invoices) among other possibilities." (Mölnlycke Health Care, 2003)



Figure 4 – CRM infrastructure at MHC (Mölnlycke Health Care, 2004)

## 4.2.3 Standard application

MHC has chosen a standard application. The belief was that the preferred way is to modify it as little as possible, since it is costly to customize it and makes it more difficult to do upgrades. At MHC, they also want to promote global ways of working. At the same time, MHC would like the application to support the business as far as possible. For this reason they make changes if they feel the request for change might be valid for several markets. These changes will be evaluated and decided upon on a regular basis.

## 4.3 Architecture

We will here give an overview of how the different parts are interacting. As previously stated, the IT strategy in 2004 was to make the IT solutions come closer to the business it is supposed to support.

The architecture design of 2004 can be seen in Figure 5. The tools in the present architecture are not very integrated. The QlikView application for example, depends on a few manual steps before use, each week. The user needs to run an update script and load the new data in QlikView. At the time of deciding upon and implementing MSA, the functionality of QlikView Sales Statistics and Target Group Selection were not included.



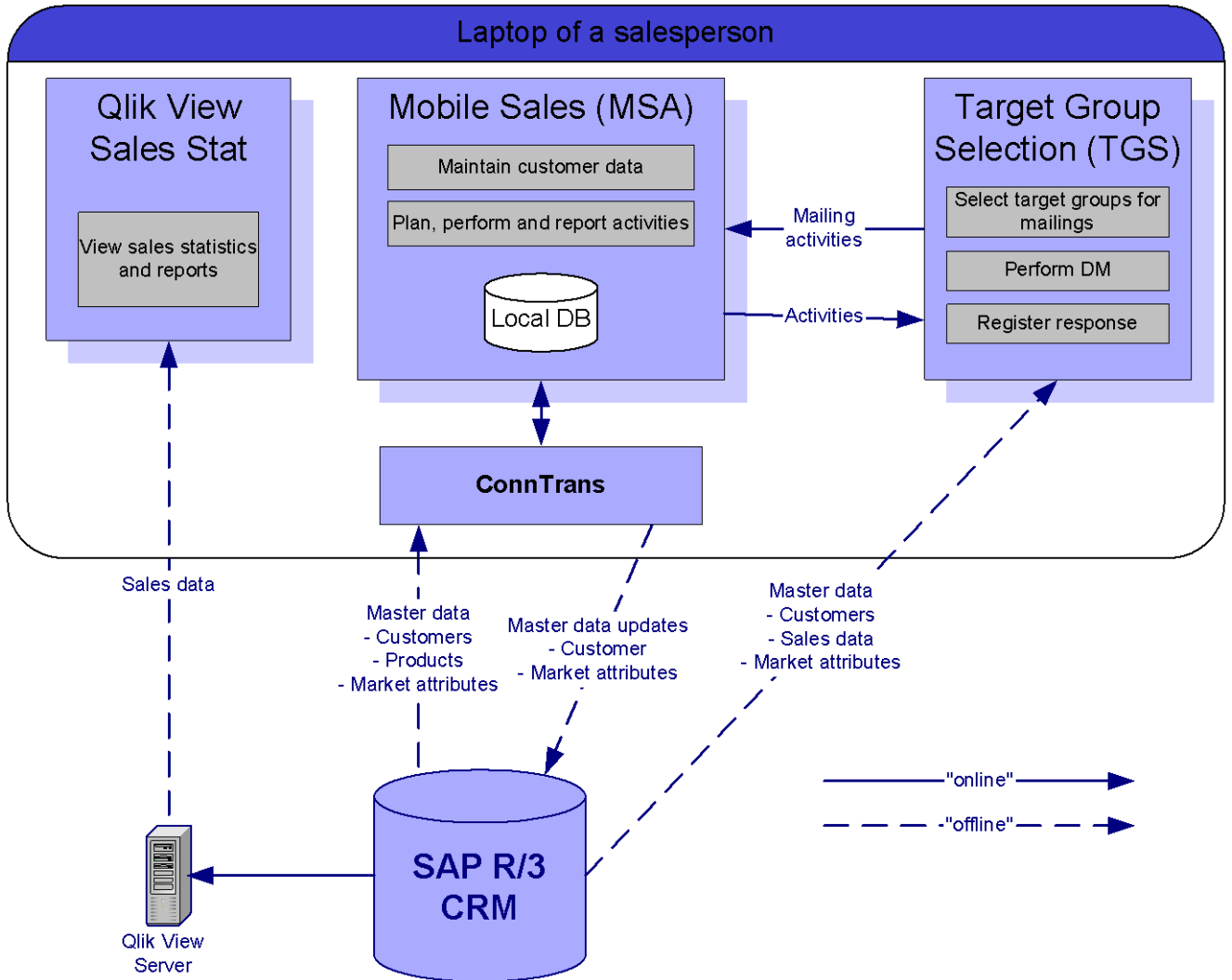


Figure 5 – shows an architectural overview of the parts of MSA (created by us).

The different parts of Figure 5 will be explained below, since this is a top-down approach.

## 4.4 Users of MSA

Here we describe the different types of users of the MSA:

- **Sales personnel**  
The Scandinavian sales personnel that visit customers, or potential customers, have been using this application since 2002, serving as test pilots in this project. Many of the sales persons worked as nurses before they started to work for Mölnlycke Health Care. This background is of course valuable when visiting hospitals since they know the jargon and the different problems nurses and doctors meet in their daily work. Their computer literacy is however limited compared to other user types as they do not use the computer every day.
- **Super users**  
is a small group of the sales personnel, that have access to more information than their colleagues have. They act as helpdesk for the rest of the sales personnel. These super users are also more interested in the MSA and therefore more experienced in the use of it.
- **Management**  
is the office users of MSA. They also have the offline database, but in practice never uses that functionality. There are great benefits for the management when the sales personnel constantly update their calendars in the MSA. Management can for example plan meetings by adding them directly to the calendars of the parties involved.
- **Acceptance group**  
is a group called “acceptance group” with members from both management and super users. Their function is to be guinea pigs, evaluating the latest updates of MSA. The acceptance group is not the same group as the super users, since the super users consist only of more experienced and interested sales personnel. This group contains members from all the other groups and is used during testing.

## 4.5 Mobile Sales Application

MSA gives the sales personnel support in various situations. Most sales persons focus on a few key areas within the MSA. Those functional areas are:

- Update a business partner
- Register a new or update a contact person
- Register a new activity
- Report a completed activity

But there are a lot of other functions that can be used, e.g. finding a phone number to the contact person at the hospital the sales person is about to visit, finding the address to a business partner, finding product

information, register a customer order, and sending a message to a colleague.

The features relevant to this thesis will be explained in more detail below.

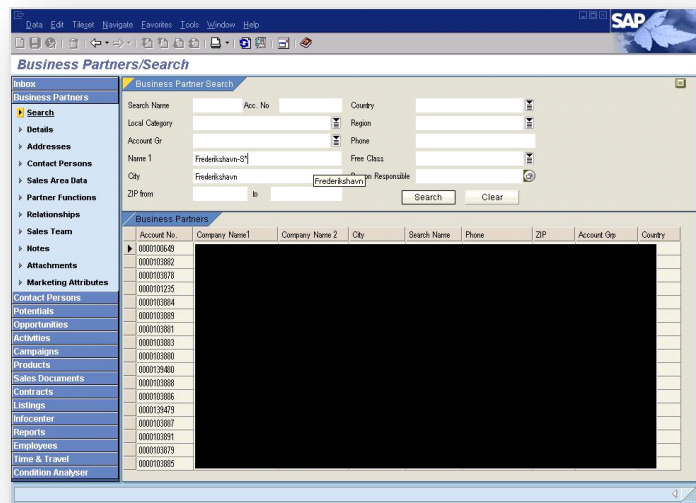


Figure 6 – Screenshot of MSA user interface.

### 4.5.1 Offline functionality

To make the application work offline, there has to be a local database running on each laptop (Microsoft SQL Server). This is the only source of data for the offline version of MSA. For several reasons this database only consists of data relevant to the owner of the laptop, and this is managed primarily by the CRM administrator for Mölnlycke Health Care.

Every sales person – or any employee for that matter – exists in the Human Resources (HR) module of SAP at Mölnlycke Health Care. The administrator of CRM/MSA “takes” the user that exists in the HR module, makes a relation to the laptop (site) of that user, and controls what information this user is allowed to access. The owner of the laptop is now able to synchronize the local database with the central SAP/CRM through an application called ConnTrans. The system landscape for making this synchronization possible is explained in Figure 5.

## **4.6 ConnTrans middleware**

ConnTrans is a utility that is part of MSA, it is used for synchronizing data between MSA and central database.

### **4.6.1 The synchronization**

The synchronization does two things. The first is to transmit the data from a local database – that has been modified by the user – to the CRM server. The second is divided into two steps, first to receive the data that has been modified on the CRM server and is applicable to this particular user. This data is stored as so-called messages in the same database but in another table. The second step of the second part of the ConnTrans session is to import the messages that have been downloaded in the previous part. The messages are taken from the temporary table and synchronized with the rest of the data already in the database in order for it to update the data.

After MSA is installed on the laptop, it takes about 60 minutes for the synchronization to finish, depending mainly on the speed of the computer hardware. It is recommended to synchronize once a day and the more ambitious sales personnel do this, as well as the users that have a fast and stable network connection. It must be done at least once a week to reduce the risk of transfer failure, due to the size of the queue in the CRM-server. It is possible for the sales personnel to synchronize the database over several different connections, such as ADSL, modem, and mobile phone. Synchronization over a mobile phone can however take a very long time, since a lot of data usually needs to be updated.

### **4.6.2 Automated ConnTrans**

Should the sales person for some reason work from the office, there is also a functionality to synchronize in an automated fashion. This function can be set to synchronize for example once an hour. The ConnTrans in this case run as a service in the Windows operating system. Some of the office users of MSA use this automated function in ConnTrans. This is however not recommended for several reasons:

1. The automated version of ConnTrans could interfere with the MSA. If a user uses MSA at the same time that the automated version of ConnTrans is running, the information in the database could be corrupted.
2. The error messages generated by the automated ConnTrans are hard to view.
3. If the user tries to run ConnTrans manually when the automated ConnTrans is running, errors will occur. Some can corrupt data, but mostly ConnTrans will not seem to work from the user point of view.
4. Two different environments will have to be supported by the MSA IT support.

This feature is still used by some users, since it is possible by the user to enable this option. The user can easily turn this feature on. In 2004 the installation package was changed to disable this feature during installation of the MSA onto a user's computer. The feature has been enabled in the previous versions of the installation package by default. This made the step to disable the ConnTrans service a manual part of the installers work process.

### **4.6.3 Application upgrade through ConnTrans**

There is a built in upgrade functionality in the ConnTrans middleware. It is a way for the developer to distribute upgrades to the MSA via the ConnTrans. Whenever a bug is fixed or a

feature is added to MSA, the developer would simply deploy this “package” to all the clients through ConnTrans. However, MHC does not use this feature in ConnTrans at the moment, instead the “packages” has to manually be distributed to all the clients and be deployed by a technician. The reason for this is that the task of deploying an upgraded package is too difficult to handle by the users of MSA.

## 4.7 QlikView

This application gives the sales person graphical sales statistics based on information that is updated once a week. Every Saturday sales statistics from SAP R/3 and CRM is transferred to a QlikView server. Every Sunday this data is split up into several different files based on e.g. sales area. From that server the data is then available for download by using the “update QlikView” function in the QlikView application (Jerrestrand, 2004).

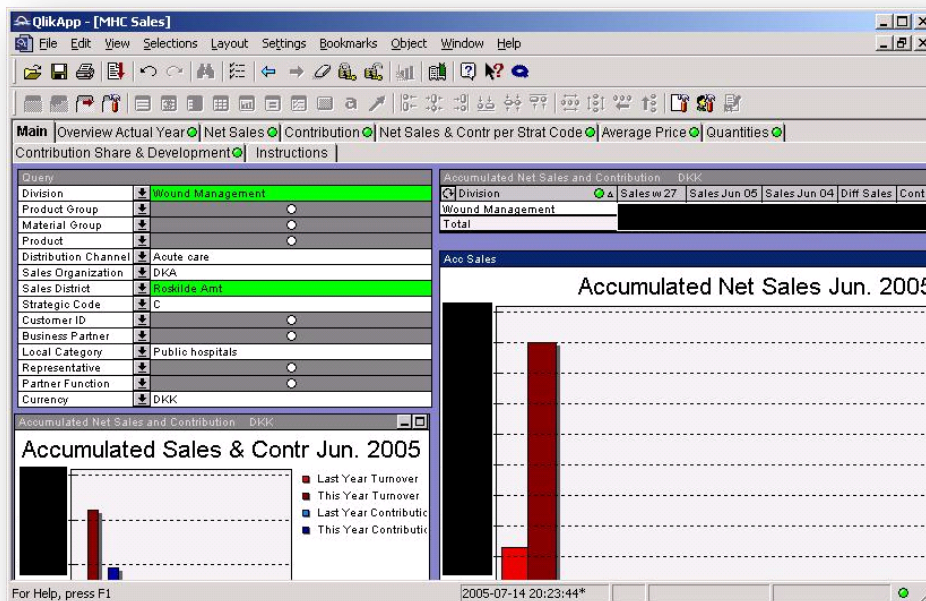


Figure 7 – Screenshot of the QlikView application

The communication from the server is strictly one way. It is only possible for the user to get data from the server, not possible to update anything to the server. This will give the user the sales data from the week before. The sales statistics can give the sales person a general overview for the sales district or the customers the sales person is linked. It can also give a more detailed description of e.g. “Net Sales”, “Contribution” (Contribution = Net Sales – Operational Product Cost – Warehousing/ Home Taking costs - Freight Costs to Customer), and “Quantities sold”. All fields can be filtered on several different criteria, such as Business Partner (BP) which is another name for customer (Tonneau, 2004).

## 4.8 Target Group Selection (TGS)

Before we start to explain how it is used, we will explain the abbreviations used.

- BP, Business Partner which is another name for customer.
- AM, Account Manager.
- BrM, Brand Manager.
- BM, Business Manager.
- Sales Ass, Sales Assistant.
- CP, Contact Person at BP (customer).
- DM, Direct mail.

TGS is a part of the QlikView application and it can – for example – be used to search for potential customers to visit. It can also be used for direct mail (DM) activities towards customers and to register their responses. The information for the list – that is generated by TGS – is based on data from previous meetings; which is received from the CRM system. The content of the list is determined by the criteria chosen for the selection, with the help of using logical selection “AND” and “OR”. Examples of this; the sales person want to select all Business Partners (BP) having the classifications (Area of Interest) “General Surgery” “AND” “Orthopaedic”. If the sales person wants to find all BPs having classification with either one of two values “General Surgery” or “Orthopaedic”, the logical operator “OR” should be used. All searchable fields come from the BP screens in MSA (Mölnlycke Health Care, 2004).

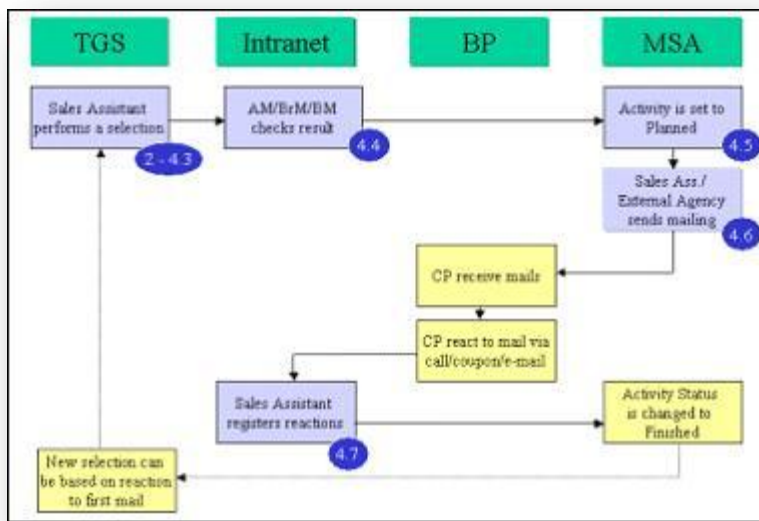


Figure 8 – The CRM process of activities using TGS (MHC internal document)

The different steps of the process for this can be seen in the picture above. First the selection is made, and then the result is checked. It is also possible to make TGS interact with MSA to plan different activities such as “Direct Mail”, “Mega Meeting”, and “Exhibition” in the calendar function of MSA. The event in the calendar of MSA is set to “planned”. Mail is sent to CP, who responds back to Sales Ass. The activities performed at the BP is then followed up and registered by a sales assistant; by doing this in TGS the status of that activity in the calendar function of MSA (Mölnlycke Health Care, 2004).

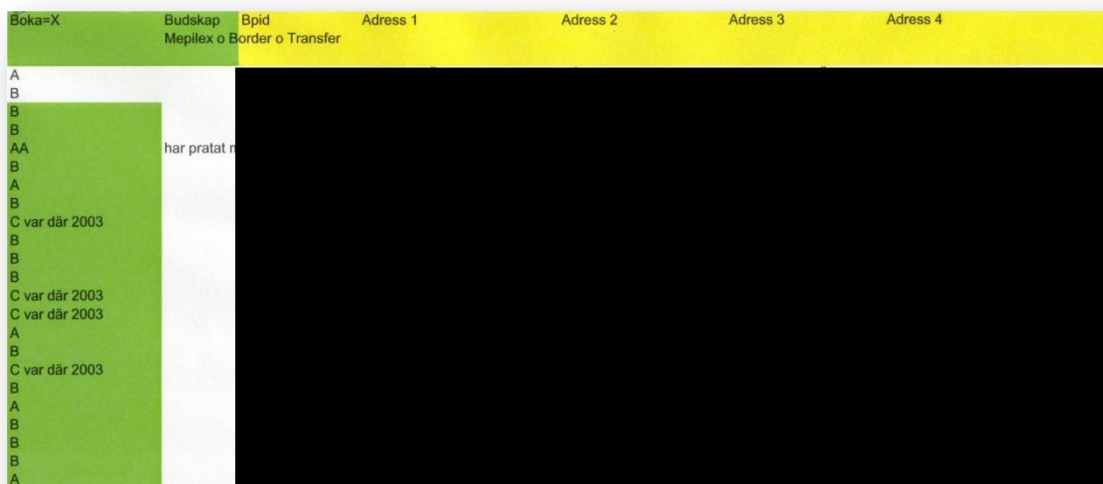
## 4.9 The intended use of MSA

By intended use we refer to the way the system should be used based on the system documentation and the work processes defined by the management. During the interviews we got a clear picture of this intended use. We also found important information regarding the processes on the Intranet of MHC.

Twice a year the product specialists are supposed to plan the following six months work. During this planning, they choose which types of customers they want to visit. This can for example be every district nurse that they did not visit the preceding year. After they have decided their criteria, they use Target Group Selection (TGS) to search for suitable customers – business partners – to visit.

### 4.9.1 Planning the meetings

When the product specialists have their list of customers, they use a ranking system so that their booker at Referens – a company that takes care of all the bookings of customer meetings for the product specialists – can see which customers that is most important. In 2004, Sweden was the only country that uses a booking company but this way of working was at the time planned to spread to more countries.



Boka=X	Budskap Mepilex o Border o Transfer	Bpid	Adress 1	Adress 2	Adress 3	Adress 4
A						
B						
B						
B						
AA	har pratat r					
B						
A						
B						
C var där 2003						
B						
B						
B						
C var där 2003						
C var där 2003						
A						
B						
C var där 2003						
B						
A						
B						
B						
B						
A						

**Figure 9** – A list of customers with the ranks in the first column and the message in the second. The sales message is Mepilex, Mepilex Border and Mepilex Transfer for every customer on the list. (MHC internal document)

In Figure 9, you can see the ranking system in the column to the left. In this figure, the product specialist has used the scale AA, A, B and C, where “AA” is the highest rank and “C” the lowest. When they are finished with the ranking, they write down what sales message the customer should receive before the visit, i.e. what products the product specialist will talk about. After this, they send the list to Referens via email so that they can book the meetings.

### 4.9.1.1 Weekly letter

Referens sends out a letter to the product specialists every Thursday with the booked meetings for the following week. In the weekly letter, there are usually three different types of documents included; a meeting information paper, a weekly schedule and a monthly schedule. The meeting information paper is a document that describes the meeting in detail. Examples of information from this document are the address to the customer, often complemented with a direction to the meeting place, some information about the booking and the business partner identity of the customer.

Since the product specialists can make up to six meetings per day and there is only one meeting per paper, it is a quite thick wad of paper that comes in the mail every week. On the weekly schedule, there is time and place for the meeting, the name of the customer and the same information about the booking as on the meeting information paper. Once a month the product specialists receive a monthly schedule. This contains a summarized version of all the booked customer meetings for the following month.

The form is titled 'Besök' and contains the following fields and sections:

- Relatör:** 32706
- Datum:** 2004-03-25
- Tid:** 13:30
- Kampanj:** VÄR-04
- Prio:** [checkbox]
- Klar:** [checkbox]
- Besökande PB:** [redacted]
- Budskap:** [large empty box]
- Prod.spec:** Bpid: 116576, Cpid: [checkbox], Sälj.distr: 180
- Inst:** HEMSJUKVÅRDEN
- Avd:** [redacted]
- Befattning:** DSK
- Huvudprodukt:** Sårbehandlingsprodukter
- Kontakt pers:** [redacted]
- Gatuadress:** [redacted]
- Postadress:** [redacted]
- Telefon:** [redacted]
- Kommentar TM1/TM2:** [multiple lines for text]
- På Bkort:** [checkbox]
- Boknings info:** BOKAT MED [redacted] GÅ IN VID V.C. [redacted] GÅ TILL RECEPTIONEN SOM LIGGER VI FIKET DÅR BLIR DU HÄMTAD. DETTA ÄR EN OMBOKNING FRÅN I HÖSTAS. (040310GK)
- Besökskommentar:** [multiple lines for text]
- Budskap efter besök för TM 1:** [empty box]
- Alertbesök Datum:** [empty box]

Figure 10 – The meeting information paper. The product specialists get one of these for every customer meeting they will do in the coming week. (MHC internal document)





**Figure 11 – The weekly schedule. (MHC internal document)**

Every Friday the product specialists are supposed to register the information received from the weekly letter in MSA. This day is also used to summarize the meetings completed during the week in MSA.

The work in MSA that we are going to describe here is mainly about two things; registering a new meeting and reporting a completed meeting. There are of course several other features in the program but we have concentrated on these two.

## 4.9.2 Registering a new meeting

Every office day – in 2004 it was Fridays – the product specialists are supposed to register all the new meetings that they are going to perform the following week. The procedure takes a couple of minutes and work as follows:

1. After launching MSA, they start with the calendar function where they use the top-buttons or the combo-box to select the correct date.
2. Click the correct time in the calendar.

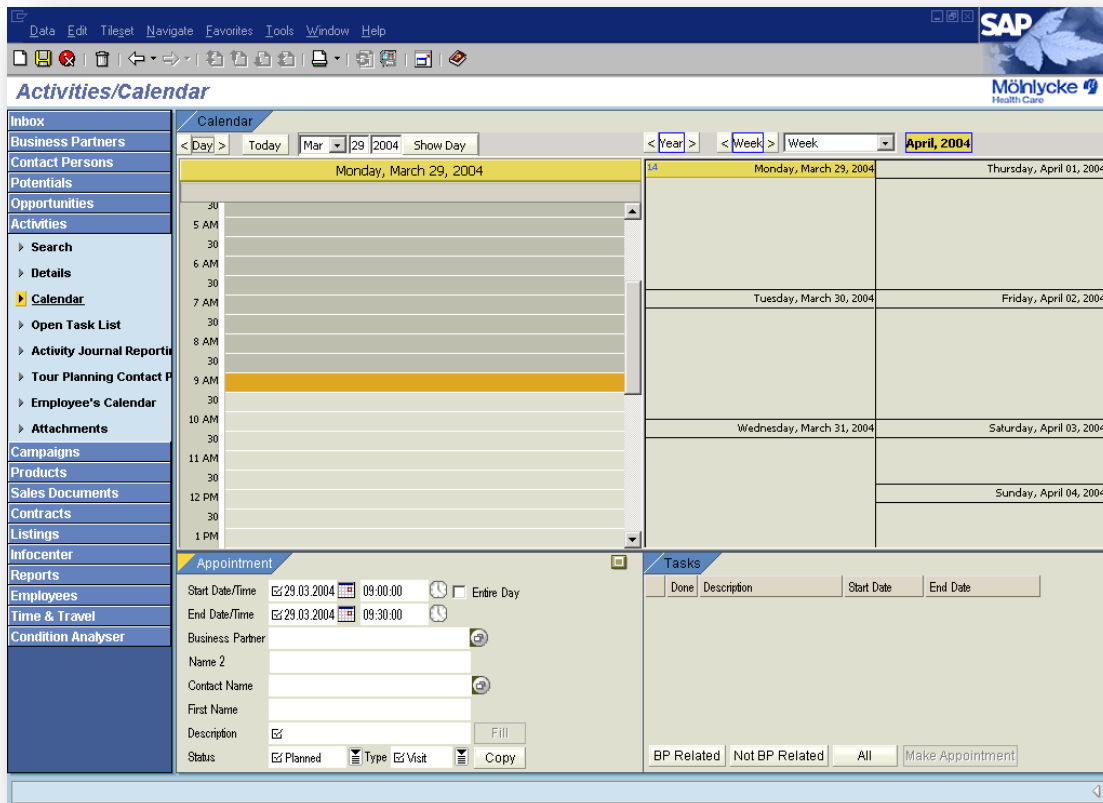


Figure 12 – Screenshot of the calendar function in MSA. Note that the sales person in this example has created a new appointment. You see the start and end time in the appointments tab.

3. Right-click on the appointment tab and select “New”. MSA writes the chosen date and time in the field “Start Date/Time”. Since the default meeting time is one half-hour, MSA automatically writes the end-time in the corresponding field.
4. When they have registered the correct date and time, they either write the name of the business partner in the relevant text field or click on the button to the right of the business partner text field. If they click the button, a new window will pop up (Figure 13). Most of the time, the product specialists register the account number because this number is on one of the documents that they receive from the booking company. However, if they have to do a search without this document they can write in some descriptive words in the other search fields.
5. The result of the search is shown in the “Business Partners” window area. Here they can select a BP by clicking one of the corresponding rows, and then clicking on the

“Select” button. When they have selected a BP, Figure 12 reappears with the data from the business partner search filled in the fields in the appointments tab.

Search Name	Account No.	Company 1	Company 2	City	Country	ZIP	Account Grp.
-------------	-------------	-----------	-----------	------	---------	-----	--------------

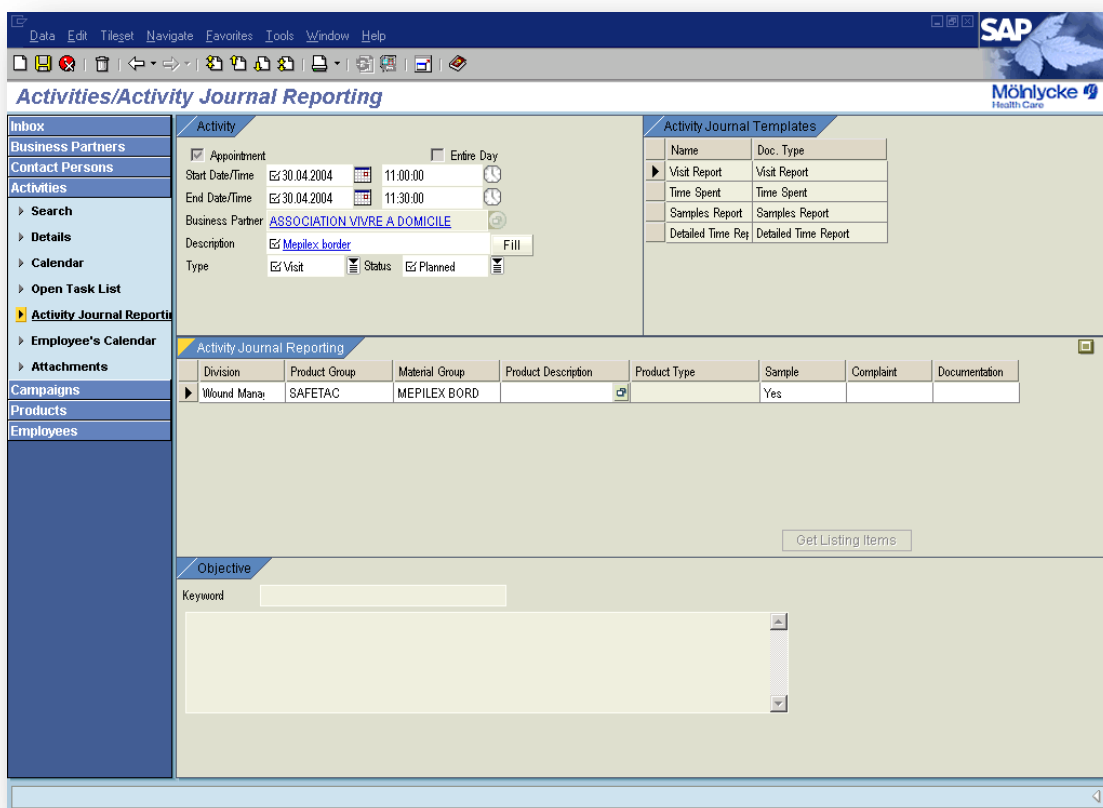
**Figure 13 – Screenshot of the business partner search function.**

6. Selecting a contact person. They do this by clicking on the icon to the right of the field “Contact Name”. After they have done this, a similar pop-up window like “Business Partner Search” appears. The name of the BP is pre-chosen but they have to click the search button to see which contact persons the particular BP has. They select a contact person by clicking on the name and then chose the select button. The product specialists are supposed to use the real names of the contact persons and not the titles.
7. After they have selected a contact person, the pop-up window disappears and the calendar view reappears with the contact person field updated with the selected name. Now they write what they are planning to do during the meeting, e.g. the “message” they intend to bring to the customer. They do this under the description field in the appointment tab.

### 4.9.3 Reporting a meeting

Besides registering new meetings the product specialists also reports the meetings that they had during the week. To do this they launch MSA and mark the meeting they wish to report by clicking on it in the calendar.

1. Click the heading “Activity Journal Reporting” in the left menu and Figure 14 will appear. In this screen, they write what product they have shown the customer, in the column marked “Material Group”.
2. After this, they choose from yes or no in the drop down menu under the “Sample” column.
3. The last thing they do is to change the meeting status from “Planned” to “Completed” in the drop down menu in the “Status” field.



**Figure 14 – Screenshot of the activity journal reporting. Here they fill in what products they have showed the customers and change the meeting status from “Planned” to “Completed” when a meeting is reported.**

Sometimes the product specialists want to have a follow up call done to the customer. The booker at Referens makes this call. To notify Referens of this, the product specialists write down what they want to know on the meeting information paper. This is then faxed or a copy is sent by postal mail to Referens. When the call has been conducted, the booker sends back a new yellow copy of the meeting information paper with the results.

## 5 User site investigation

*Here we will continue presenting our empirical findings and perform an analysis. We will describe how the sales personnel perform their daily tasks and go about their business. We will look at the discrepancies of intended and unintended use. What are the wishes of the sales personnel, and what problems do they face?*

In 2004 Mölnlycke Health Care had approximately 50 product specialists in the world. Six of these worked in Sweden. Their tasks are to visit customers, both new and old ones, to show them the products that Mölnlycke Health Care manufactures. The customers are for example hospitals, geriatric care and district health care centres and the products used are wound care only (not surgical, which also is sold by MHC but not by the product specialists).

The product specialist does not sell any products to the customer in the sense that they take any orders or sign any contracts. However, the ambition is that their demonstrations inspire and motivate the customers to order more MHC products. The product specialists are allowed to show only the products that the purchasing department of the county council has decided to buy. However, if the product specialist checks with the purchasing department they are allowed to show other products as well.

We interviewed three of Mölnlycke Health Care's product specialists, observed two of them when working with MSA and observed all three on several customer meetings. We call them Lisa, Sara, and Joan to hide their true identity. This chapter is a description of how they work, what tools they use and how they use them.

In order to make the process easier to understand we have created an overview of how the information flows during the planning, performing and reporting of a meeting. We have also written in what format the documents are when they are transported around in the system.

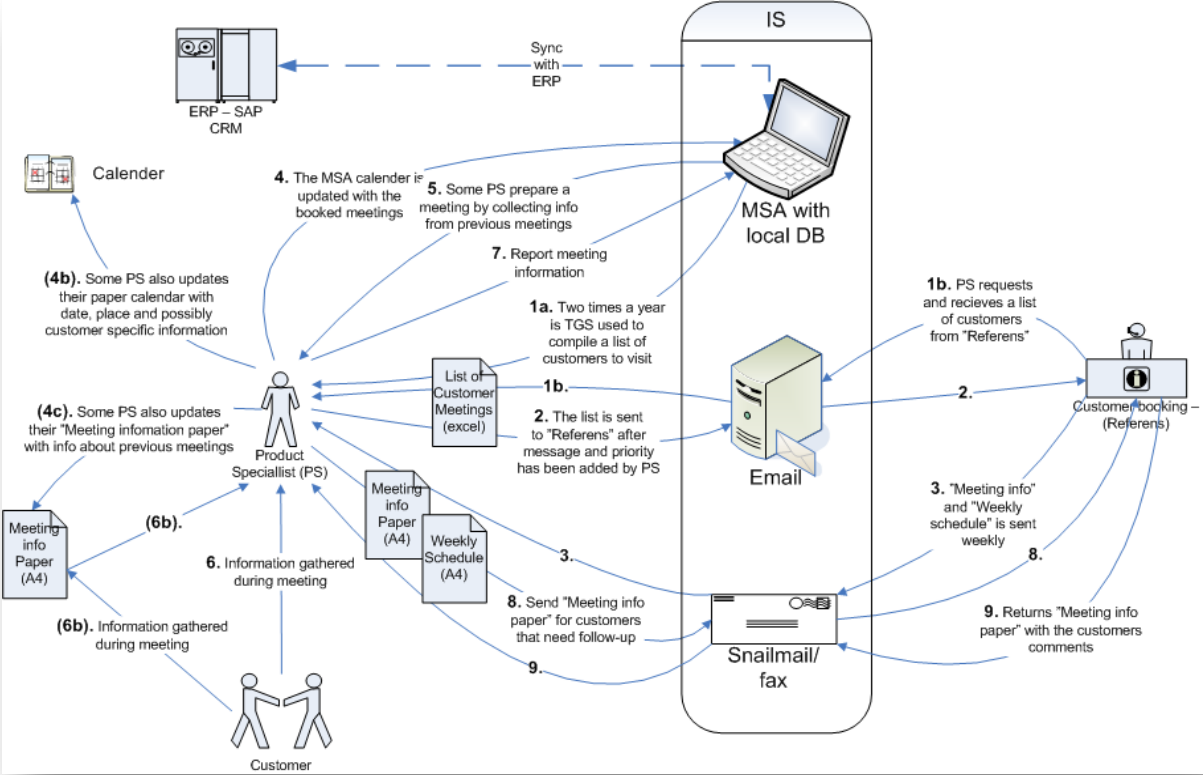


Figure 15 – Overview the process of the planning, registration, performing and reporting of a customer meeting. The information flow begins with the number 1 and ends with number 9. The letters after some of the numbers stands for the different ways the interviewed product specialists answered (created by us).

In the following text, we will describe how the product specialists do the planning, execution and reporting of a customer meeting. Every phase that we describe has equivalence in section 4.9 above.

### 5.1 Planning the meetings

During the planning, which takes place every six months, the work of producing a list of customers varies from product specialist to product specialist. One of the product specialists that we call Lisa, asks Referens to produce a list of customers according to her criteria's. Sara asks the sales and marketing co-ordinator to do the search for suitable customers in the TGS system. When Sara receives a list of customers from the sales and marketing co-ordinator she makes changes to it, if necessary, and send it to Referens. Joan talks with Referens to see if they have enough information to book her meetings. If they do not have it, Joan uses TGS to search for suitable customers. When she has a complete list of customers, she sends that list to Referens.

Boka=X	Budskap Mepilex o Bpid	Bpid	Adress 1	Adress 2	Adress 3	Adress 4
A						
B						
B						
AA	har pratat r					
B						
A						
B						
C var där 2003						
B						
B						
B						
C var där 2003						
C var där 2003						
A						
B						
C var där 2003						
B						
A						
B						
B						
B						
A						

**Figure 16 – Lisa gets an Excel list from Referens. She sends it back after she has ranked it according to MHC’s ranking criteria (AA, A, B, C). The ranking is in the first column and the message is in the second. The message in this figure is Mepilex, Mepilex Border and Mepilex Transfer for every customer on the list. (MHC internal document)**

When Lisa receives her Excel-made list with the proposed meetings, she checks it to see if there are any inaccuracies in it. Sometimes Referens proposes a customer that Lisa already visited. When she checks the list for this kind of errors, she also ranks the customers so that the booker can tell which customers she wants to visit the most. Then she sends the list back to Referens.

All the product specialists had their own way of putting together the list of customers to visit. This is because MSA does not allow the user any obvious way of performing this task. However, the suggested way is to use the TGS application. This way the user can see which customers they have not visited in a while. Based on this information extracted from TGS, the prioritized list – of which customers to visit – is decided.

The problem with not following the proposed process is that data used is not the same; it is in some cases tied to the person instead of the organisation. The organisation has not given clear instructions on the best way to conduct this important step in the planning process, i.e. the organisation has not taken the cultural changes into account (Langerak & Verhoef, 2003).

In the theoretical background we found out that it is important to minimize the need for cross-media transitions. I.e. in a scenario where the information first has been written down on paper, it can prove difficult to transfer it into the information system. The sending back and forth of paper documents between the sales personnel and the bookers is an example of this. This “problem” also gives focus to the need to get the data “at the source”, with the right tool (Brodie, 2003).

## **5.2 Registering a new meeting**

The procedure of registering a new meeting in MSA is almost performed as we described in chapter 4.9.2, how the system should be used. The only difference is the way the product specialists manage their contact persons. A contact person is an individual who works in the hospital, geriatric care and district health care centres that the product specialist is about to

visit. It is often the contact person that the booker calls to arrange a meeting or sends advertising letters to.

Two of the interviewed product specialists do not want to use names in their list of contact persons. Instead, they use titles. The reason for this is because there can be problems if they, for example, want to send a letter to the person they knew used to be in charge of a department. If they use the person's name on the letter, it may never reach its destination since the person might have moved to another department or even another hospital. However, if they only use titles in the list there can be no mistakes.

When one of the product specialists where asked for any positive sides of MSA, she said;

*If we had the possibility to let the bookers [Referens] register the meetings directly into the calendar that would be appreciated*

Even though we asked for any positive feedback, we received an improvement request. Not only product specialists, but also administrative personnel share the view that the outsourcing would be a positive move as well.

### **5.3 Reporting a meeting**

This procedure is also to the most part performed as intended. See chapter 4.9.3 above for a description of how the system should be used. In this step the product specialist uses MSA to update the status of the meeting. This could for example be done by entering into the system what product they talked about at the meeting. The difference is that some of the product specialists write down a lot more information about the meeting in MSA than others.

When the information about the meeting is written down in MSA, some of the product specialists make some additional notes. Lisa writes down the time, place, and customer in her paper-calendar, she also uses a system of codes to remember if the customer wants coffee or lunch. Then she takes some short notes from MSA about the customer on the meeting information paper received from Referens.

When Lisa visits the customer, she takes notes by hand on the meeting information paper. She does not want to use a laptop during her meetings since she wants to have a discussion with the customer. If she brings a computer, she feels the connection with the customer will be disturbed. When another product specialist was asked if she brings the laptop, she said:

*No, never. Possibly, when I need to make a PowerPoint presentation*

Sara sometimes writes down some additional info about the customer on the weekly schedule, which she then takes with her on her customer trips. Joan does not write down anything from MSA, she keeps all the information in her head. The only support she has on her trips is the weekly schedule from Referens.

The procedure for the meetings is similar for every product specialist that we have observed. It starts with the unpacking of product samples, after that the product specialist demonstrates how the products are used and which wounds it is made for. Since none of the interviewees brings their laptop on their customer meetings, they have to remember the information they receive during the meeting.



The resistance to bring the computer to the customer could stem from the uncertainty on how the customer would react to it. The mobile system is therefore not suited for the needs of the mobile user (Andersson & Lindgren, 2005).

Also the mobile device – a laptop in this case – is not designed for this particular customer site situation. The laptop does not support the discussion between the sales person and customer (Luff & Heath, 1998).

The increased attention needed to operate the mobile device at hand during the meeting, decrease the likelihood of it being used (Tamminen, Oulasvirta, Toiskallio, & Kankainen, 2004).

After the meeting, Lisa sits down and writes a short summary about the meeting on the meeting information paper. Besides the notes about follow up calls and samples, she also writes a couple of sentences about how the meeting went and how many customers attended. Sara writes down on paper any follow up issues to be dealt with after the meeting. She also takes note if the customers wanted any samples to be sent. Joan does not write anything down, she memorizes every bit of information that the meeting gave.

*I can't keep writing everything down, that wouldn't work. I have to keep it all in my head.*

Apparently the need for the mobile device in this situation is not clear for all users. One can say the “need pull” is absent (Lee & Shim, 2007).

Not all of the users report the results of the meetings as they are supposed to. This becomes a problem when the product specialist forgets information or a substitute product specialist tries to gather some information before a meeting.

*Perhaps I'm not the best when it comes to reporting a meeting, so I've heard several times. However, I don't think it's bad for the sales; it's more that someone thinks that the way to do it is for me to write more info.*

This statement shows that the user do not see any personal benefits from entering this kind of information into the CRM system. And probably does not understand that it benefits the company as a whole. This is a know issue from previous literature (Langerak & Verhoef, 2003).

The information from the questionnaire paint the same picture as the information received through interviews and observations, that the laptop is rarely used by the product specialists at a customer visit.

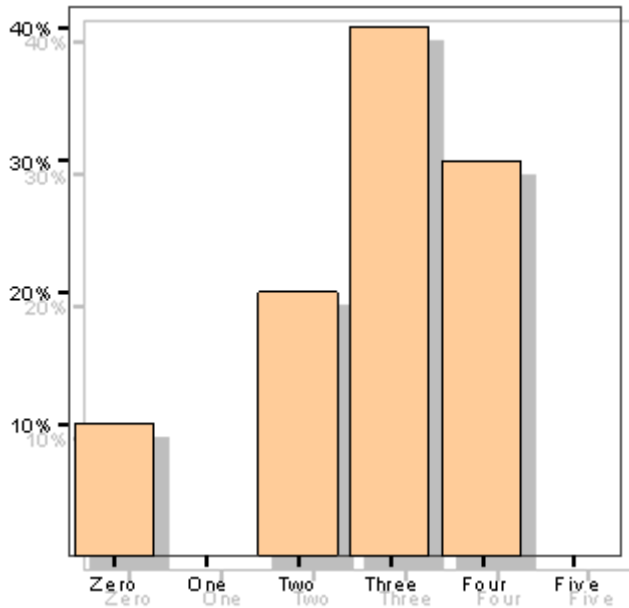


Figure 17 - How many customer visits do you have a normal day? (Product specialists only)

The product specialist has between two and four visits per day.

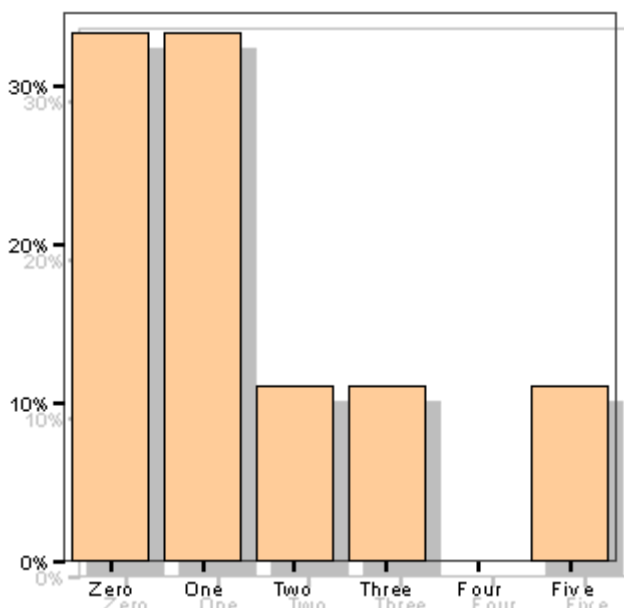


Figure 18 - How many of those visits do you bring your laptop? (Product specialists only)

In the diagrams above, we did not include the answers from the preceding question where there were no customer visits a normal day. We can clearly see that there are not so many PS who take their laptop with them during a customer visit, around four percent.

#### 5.4 Overall satisfaction

As mentioned earlier, we also conducted a paper questionnaire. The results of the charts are very similar to the results of the interviews. The users are not happy with the system and the product specialists are the most unsatisfied group. The most interesting finding of overall satisfaction is that there is not a single person that “strongly agrees” with the question.

However, some of the other applications we asked about, like ConnTrans and QlikView, are more positively perceived. The exception is TGS where the respondents are very unsatisfied.

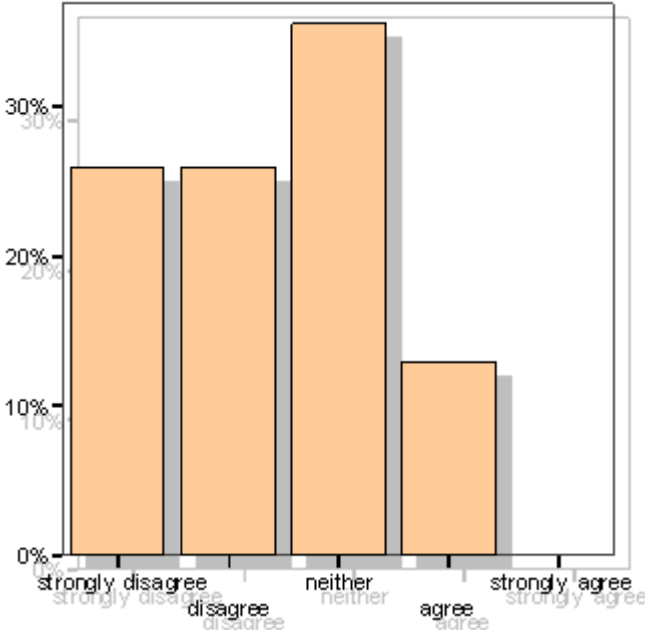


Figure 19 - Overall, I am satisfied with this system (All respondents)

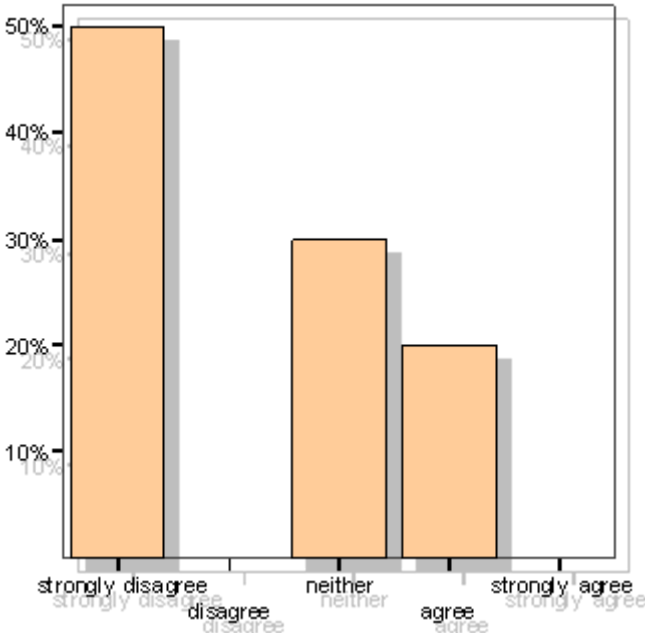


Figure 20 - Overall, I am satisfied with this system (only product specialists)

The reasons for this dissatisfaction are a number of different things, mainly usability and distrust which is described below.

**5.4.1 Usability**

A lot of the sales personnel are not used to be working with a PC at all. One reason for this is that the background of the sales force is often from health care. The computer literacy can vary a lot from different people in that line of work. However, in general people work less

with computers in the health care sector, compared to the users that are office based. Most of the users that have been in contact with the interface of MSA, feel a little lost at the beginning. One reason is that most new MSA users are not used to working with SAP interfaces that differ a lot from a de facto standard such as MS Office user interface. This becomes a problem when the users are accustomed to MS Office design (Benbunan-Fich & Benbunan, 2007).

Some of the problems when reporting a meeting are connected to the ones in the registration of a meeting. The most common thing we heard during the interviews was that the program was not user friendly enough. An example of this, you have to access different screens in the system when you are performing different tasks such as the registration of a meeting. There is no clear path to follow in the application, which supports the way the product specialists are using the application.

One of the product specialists we interview had the following point to make, a very short but clear remark that captures the picture nicely:

*It is not very user friendly.*

#### **5.4.2 Distrust**

The version of MSA that was first rolled out in Sweden in the year 2002 unfortunately had a lot of bugs. Still two years later, MSA suffers from a lot of bugs. From simply annoying ones to those that make the user loose information already registered into MSA. E.g. sometimes – for no apparent reason – the application refuses to save anything and forces the user to restart the application. This history creates a feeling of distrust among the users. They can see the potential of the application, but they do not trust it. This does of course make the users less willing to use MSA (Kim, Shin, & Lee, 2009).

## 5.5 Summary

The product specialists perform their work almost as MHC proposes. The main problem does not lie in that they do not work as they are recommended. It lies in the fact that the process is not good enough. One indication that perhaps the system does not cover the process enough is a statement of one of the product specialists.

*I have a very close dialogue with the booker.*

It is quite clear that there are too many loose documents flying around in the system. There are no less than eight different occasions when information is written down or sent by paper. This can lead to information loss in the terms that some information can be missed, some can be old when it reaches MSA and some information is never written down because of the inconvenience of the system. Most of the remarks from the “mobile” users about MSA have something to do with the user interface. Like for example this quote regarding the many windows the users have to go between.

*You have to go back and fourth a lot, compared to the system we had before.  
It is not as easy to get an overview.*

## 6 Discussion

*In the two previous chapters we have talked about how MSA is intended to be used, how it is actually used and the problems related to this. In this chapter, the empirical findings will be summarized and discussed in relation to established theories from previous research. The question for this thesis will be answered in this chapter. The question was: **How can the usage of mobile technology be improved in a ubiquitous environment?***

### 6.1 Design suggestions

To be able to answer the question for this thesis, we start by presenting our design suggestions.

#### 6.1.1 Changing the process

One of the ideas with implementing ERP is to change the work processes. Changing the way the sales personnel interacts with the booking staff is one step in this change (Davenport, 1993).

The biggest challenges lie not in the technical implementation directly, but come with the change in the sales personnel way of working. However, if the technical platform itself presents a problem the challenge gets even bigger. Since the resistance to change is great even when the technical platform work as it should, the resistance is even greater when the sales personnel experience a lot of technical problems with a new application such as MSA. They now have a “valid” excuse to resist the change (Davenport, 1993).

Generic software packages, such as ERP systems, cover the fullest range of organisational activities and processes and are adopted with the aim of achieving substantial cost savings as well as improved access to “tried and tested” solutions, new releases, and an opportunity to update procedures and align them with perceived “best practice” (Davenport, 1993).

In Figure 21 the sending of papers back and forth between the product specialist and the customer booker at Referens have been removed and replaced. The customer booker has instead direct access to the MSA, and is in that way more integrated into the CRM solution. This change will handle many of the issues discussed above. The other changes will be explained in more detail below.

The improved workflow in Figure 21 can be compared to the previous in Figure 15.

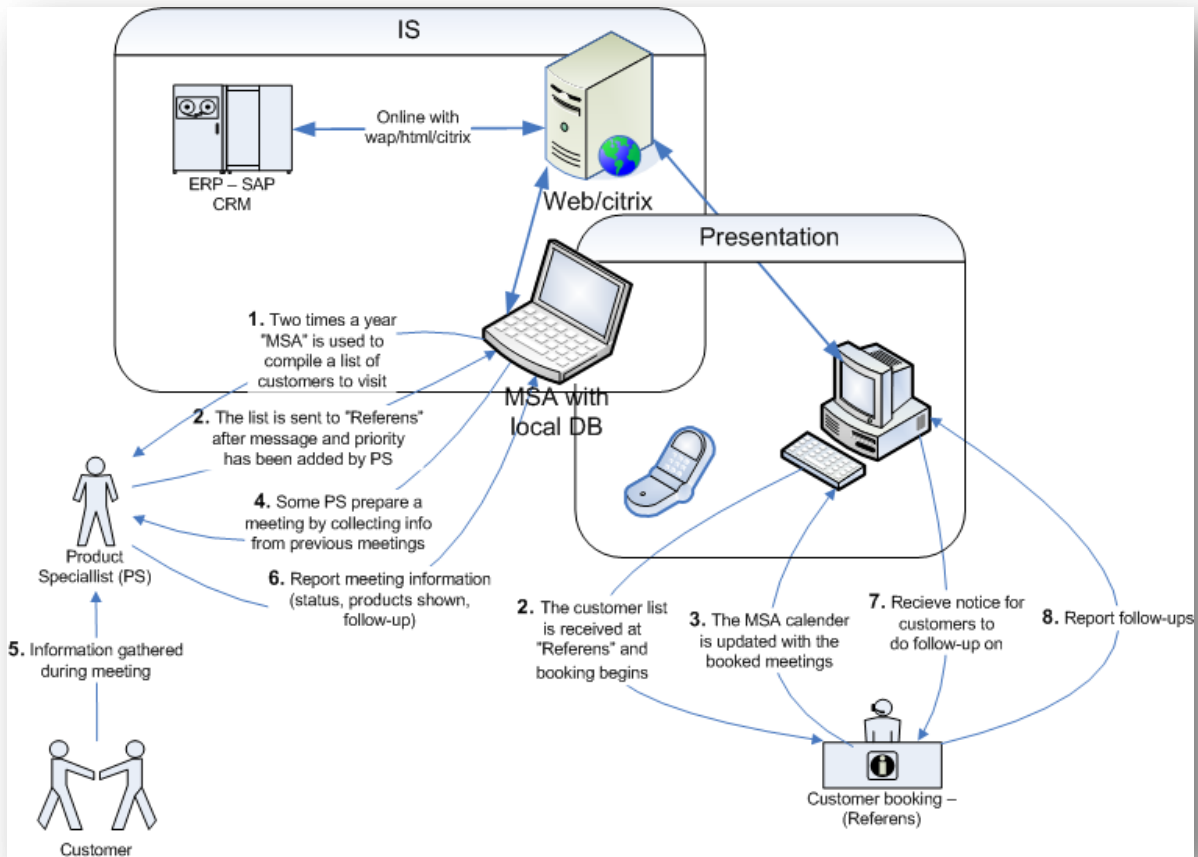


Figure 21 – our proposed view of the work process of a product specialist, where the paper handling is captured by the Information System (created by us)

### 6.1.2 Planning the meetings

All the product specialists had their own way of putting together the list of customers to visit, since MSA does not allow the user any obvious way of performing this task. However, the suggested way is to use the TGS application. This way the user can see which customers they have not visited in a while. Based on this information extracted from TGS, the prioritized list – of which customers to visit – is decided. However, the risk is that some of the product specialists will continue getting the booking company to put together the list. This is understandable since the sales personnel only do this twice a year. That is why it is important to make it easier to use TGS, e.g. with template functionality. This corresponds to steps 1-3 in Figure 21.

### 6.1.3 Registering a new meeting

This part of the process should be outsourced to an external party – in the case of MHC it would be Referens. Instead of the mail communication going back and forth, this part would be integrated into the MSA platform and made editable by Referens. Having the booking company access the MHC's CRM environment from outside of the local area network could solve this. This was communicated to us by both the product specialists and managers sitting in the office. Technically this would be solved by either remote access (e.g. Citrix) or web access. At MHC this is a previously tested and used way of letting external parties' access internal systems, e.g. consulting businesses. This corresponds to step 4 in Figure 21.

In the previous research we found out that it is important to minimize the need for cross-media transitions. The proposed solution regarding registering a meeting minimizes cross media transactions to a minimum (Brodie, 2003).

#### **6.1.4 Reporting a meeting**

Not all of the users report the results of the meetings as they are supposed to. This becomes a problem when the product specialist forgets information or a substitute sales person tries to gather some information before a meeting.

When the sales personnel have the possibility to use other input devices for the reporting tasks the resistance of reporting can be overcome. The different input tools can also further develop the possibility to use them during a customer meeting or in the absolute vicinity of a meeting (Andersson & Lindgren, 2005).

The increased attention needed to operate the mobile device at hand during the meeting, decrease the likelihood of it being used. We believe that this will not change with our design suggestion; the sales personnel will not be more likely to use a smaller device during the meeting. However, the likelihood that it will be used in conjunction with the meeting will increase (Tamminen, Oulasvirta, Toiskallio, & Kankainen, 2004).

Even though the “need pull” is absent under the current situation, we discovered that the sales personnel’s have a wish for a smaller mobile device than what they already had. We took this into consideration since we added interaction possibility with a smaller mobile device. This will make the “need pull” more prominent (Lee & Shim, 2007).

The use of a CRM tool as a reporting tool is a common road to take. If it were not for the QlikView application, some of the sales personnel would never use MSA for anything but reporting customer meetings. Especially for the category of “sales users” where “Referens” takes care of the customer meeting booking, i.e. the users that get all the information they need on the pieces of paper sent to them weekly from “Referens”. To avoid this situation we suggest that information useful to the user should be more easily accessible. In our solution this could be done with a mobile device. This corresponds to steps 5-8 in Figure 21 (Langerak & Verhoef, 2003).

For the CRM idea to function, different goals have to be fulfilled. That means that information needs to be updated, e.g. the address of the BP needs to be correct in order for the mail to reach the right destination. In this respect, the MSA tool has the potential to meet this requirement. A few of the users we have been in contact with, realize the importance of this activity. Nevertheless, as explained below this is not always the case.

Since the sales personnel on the field can perform this task, it also complies with the idea that the data has to be gathered as close to the source as possible. This is important for several reasons, to minimise the loss of correct and valid data. In addition, to minimise the distortion of data further down the line within the organization. The distortion would occur if there were a need for someone else within the organization to enter the data into the system from e.g. a piece of paper.

The risk is however – as we have mentioned earlier – that if it is not easy to update the customer information, the task will be forgotten. To avoid this problem we suggest that this



task of updating the customer information can be easily performed with the use of a mobile device.

**6.1.5 Suggested architecture**

We have discussed several possible designs for the future. The one we suggested to MHC is shown in Figure 22 below and should be compared to Figure 5. The difference between the current (2004) offline and the suggested online version is on an architectural level. At the time of deciding upon and implementing MSA, the functionality of QlikView Sales Statistics and Target Group Selection where not included. Our suggestion is to integrate the QlikView and TGS functionality into MSA.

The suggested MSA system and its functions should be reached and used through an Internet browser – online – either on a laptop or from a mobile phone. One of the downsides is the need to be “online” to be able to work with MSA. On the other side, since the “offline” version of MSA is a more customized system, the high cost of maintenance and development disappears.

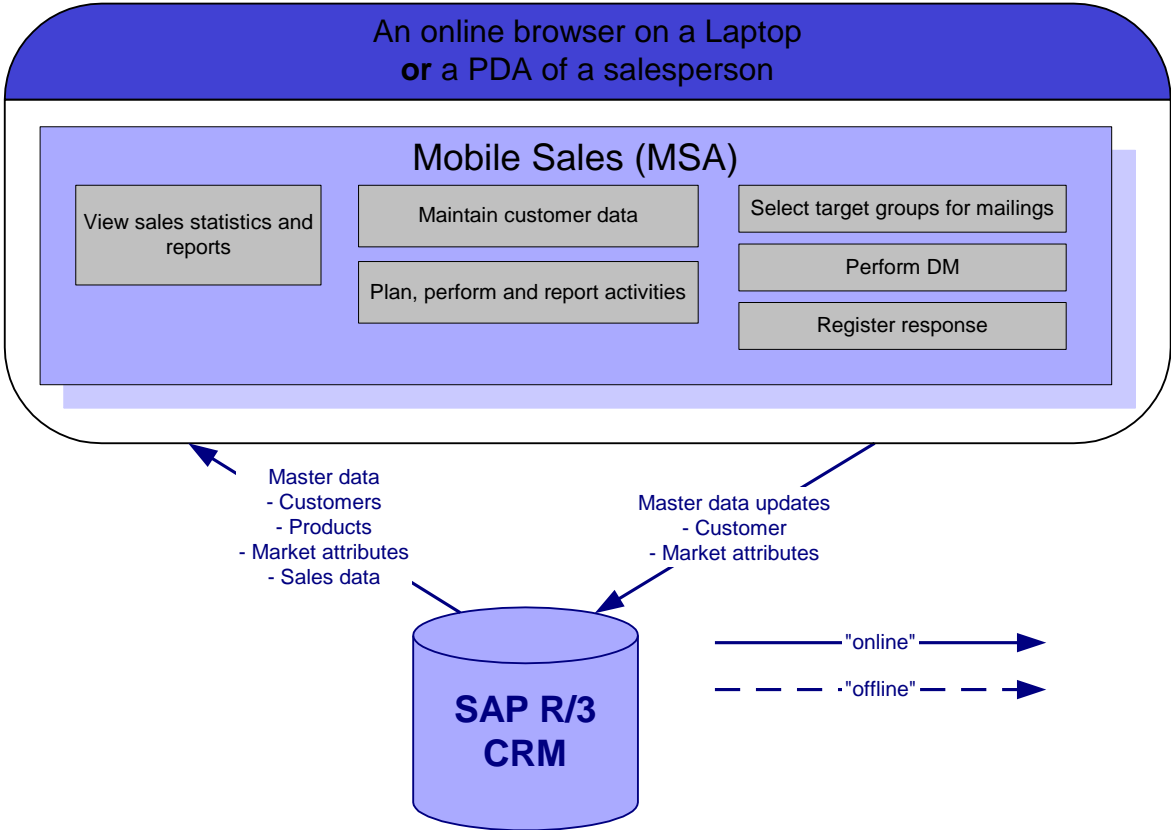


Figure 22 – A vision of the MSA system in the future (created by us).

## **6.1.6 Overall satisfaction**

### **6.1.6.1 Usability improvements**

This is a list of things that should be considered and could be improved in regards to the interface.

- The tab order is not in “order”. The usage of the “TAB” key makes the cursor move around in no apparent or helpful order.
- The interface does not comply with any common standard, e.g. the Microsoft Office standard.
- The “new” function is not very intuitive.
- No short keys can be used.
- A lot of different screens to “jump” between.

One thing we found out during the interviews and the questionnaire was that the users do not like that they have to right click and select “New” every time they want to create something new in the system. An example of this is when they are about to register a new meeting and they have to click “New” so that the system allows them to fill in the information about the meeting. It is not designed for repetitive use of this “new” function. Since it’s a very often-used part of the users work process it should be easier to repeat the task. The use of short keys would be a nice alternative here, since the sales personnel use MSA on such a frequent level.

### **6.1.6.2 Distrust**

This history of bugs creates a feeling of distrust among the users. They can see the potential of the application, but they do not trust it. To turn this trend around is not an easy task. To begin with the product quality has to be improved and over time the users will start to trust MSA.

## **6.1.7 MSA light**

Another alternative is that you take away the mobility part of the MSA and let the sales personnel use their computer when they arrive home or to the office at the evening. Then they do not need to use MSA at all. Instead, they can enter their information directly in the CRM system via their Internet connection they have at their homes.

The downsides with this solution are obvious. The time does not allow the sales personnel to log on to the CRM system every day, and even if they had that time, they would have to write down their information on paper so that they remember it later when they are going to report the meetings. When you are sitting home with your computer, maybe several days after a meeting you find yourself quite a long journey from the source of the information. With this in mind, the only acceptable solution is a diet version of MSA that are accessible via a PDA or a mobile phone. You can find the proposed solution in Figure 21, where a mobile phone or a PDA replaces the laptop.

## **6.2 Experiences drawn from the case**

We have now presented our design suggestion and will continue by answering the question we have for this thesis. The question was:

*How can the usage of mobile technology be improved in a ubiquitous environment?*

During the work with this essay, a couple of experiences became known. These experiences can be used in future projects, not only in the field of Ubicomp but also in other system development projects.

First, a variety of interaction points needs to be exposed to the users (Andersson & Lindgren, 2005).

If the sales personnel have had more ways to interact with the system, they would probably have been more positive to it. The reason for this assumption is that if they could choose how to interact with the system, the probability that there would be a way that suited their needs would be bigger than it is today. Many of the sales personnel feel that it is difficult and awkward to always be dependant on their laptop. There should be a way for them to interact with the system using a PDA or mobile phone so that their daily work would be easier.

Second, remove all the bindings between the office space and the mobile workers information and communication resources (Perry, O'hara, Sellen, Brown, & Harper, 2001).

The laptop owned by the sales person is rarely brought along for customer visits for reasons described above. In this sense the laptop is more an office space resource than a useful tool for the mobile worker. Ending up with the same suggestion but for a different reason than the paragraph above, we suggest using a smaller mobile device.

Third, it is important to both have the technology being pushed out by the provider as well as a need from the business side (Lee & Shim, 2007).

During our study we encountered that the sales person questioned the need for important parts of the system. I.e. they didn't see the need for some parts. E.g. In this study one sales person didn't see the need to report the detailed outcome of the customer meeting, he claims to keep it all in his head.

Fourth, the designers should make the cross-media transitions easy to perform or to design the system to avoid the transitions altogether (Brodie, 2003).

From a ubiquitous point of view, matters get complicated with all the different medias being sent back and forth. To avoid data being lost in translation we suggest removing the paper media. The problem encountered started by the weekly schedule being sent in paper format. This resulted in the sales personnel using the paper to take meeting notes, which makes the risk of notes getting stuck on paper immense.

Fifth, in the case where management actively encouraged private use of the mobile device there is an increase in the user satisfaction (Scheepers, Scheepers, & Ngwenyama, 2006).

Even though we did not witness any discouragement from the management for private use of the mobile device, we still suggest actively encourage private use to increase both the user satisfaction and the relatively low computer knowledge.

Sixth, mobile applications designed to be used in a certain way, will be used differently by the user if they falsely identify it with another application already familiar to the user. In the example from the related work, the application was designed to be read as a newspaper. But

the user instead tried to use it as they were browsing the internet (Benbunan-Fich & Benbunan, 2007).

The problem we saw was that the user tried to interact with SAP user interface with the same approach as with MS Office user interface. This creates a feeling among the users that the system is not user friendly. This led to a discrepancy between the suggested work process and actual work process when it comes to the user interface.

Seventh, trust can be built on lots of different factors. The most important is structural assurances followed by perceived benefits of the service and personal propensity to trust (Kim, Shin, & Lee, 2009).

Compared to the case in related work – structural assurances promised the reliability of financial transactions, the protection of individual privacy and transactional confidentiality to the banks customer – the users of MSA did not get the same assurances. The users of the system in our study experienced a lot of initial bugs, e.g. the save transaction was not always successful and data was lost as a result. This should be considered when a new feature is released or the system is rolled out to another region.

Another thing that became clear after some time was that MHC did not conduct enough studies on how the sales personnel performed their daily work, before the work on implementing the tool started. Of course there were several reasons for this particular tool to get chosen, but maybe there were not enough options to choose from. Nevertheless, even if none of the other tools was a realistic choice, a study to find out how the users go about their daily business should have been done. Based on the study the final version of the tool could have been adapted to better fulfil the users needs. This in turn would have made the users more satisfied.

### **6.3 Recommendations for further Research**

When working with this thesis we have come across a number of interesting aspects that need to be further researched.

#### **6.3.1 Laptop security**

Since the data has to be accessible offline for the user of MSA, the data is stored in a local database as stated previously. It is hard to appreciate how much of a security issue this is. This could be interesting to investigate. There have been discussions in regards to database encryption or a similar solution.

#### **6.3.2 Offline downsides**

The downsides of using the offline version is that the data is not up to date between synchronizations, the MSA application installed on the laptop needs to be updated, and the code needs to be maintained. Should the laptop get misplaced or stolen, the “connection” between the user and that laptop is closed by a CRM administrator, which makes further synchronization by the user impossible. The data already in the local database is also protected since the MSA requires username and password to start. The vulnerability of the database is hard to appreciate and would be interesting to investigate further.

## 7 Conclusion

From interviews, observations, and questionnaires at the user's site, we have come to the conclusion that there are several ways to improve the usage of mobile technology in a ubiquitous environment. Our design suggestion contains improvements to the work process and the information flow, which are according to the experiences drawn from the case.

Our study shows that as long as the sales personnel using the system do not benefit from working with it, the system will not be properly used. The mobile CRM system is reduced to a reporting tool for the sales person using it. This in turn will call for a change on a technical level, to make it easier to use while being mobile.

Based on these findings we suggest improving the workflow process as well as the technical architecture to encourage the use by the mobile sales personnel. This is done by adding more interaction points, remove bindings, have both technology push and need pull, avoid or simplify cross-media transitions, encourage private use of mobile devices, avoid similarities with other non related applications and when it comes to trust the most important factor is structural assurances.

The proposed process will eliminate a lot of papers being sent back and forth. The technical changes will make it possible for mobile users to access CRM information while being e.g. at the customer.

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## 9 Appendix

To gain information from more people than the ones we have interviewed we decided to make a questionnaire. It was sent out to product specialists, account managers and their superiors in Scandinavia and the rest of Europe.

In this chapter, we present some of the questions from the questionnaire. We have chosen to present the ones that we think are the most interesting for our thesis.

<b>Mobile Sales Usability Questionnaire</b>
<p><b>Based on:</b> Lewis, J. R. (1995) <i>IBM Computer Usability Satisfaction Questionnaires: Psychometric Evaluation and Instructions for Use</i>. <i>International Journal of Human-Computer Interaction</i>, 7:1, 57-78. <a href="#">Abstract</a> <a href="#">About question.cgi</a></p>

Please rate the usability of the system. Remember that this is an **anonymous** questionnaire.

- Try to respond to all the items.
- For items that are not applicable, use: **NA**
- Add a comment about an item by clicking on its  icon, or add comment fields for all items by clicking on **Comment All**.
- To mail in your results, click on: **Mail Data**

Optionally provide comments and your email address in the box.

Mail Data
Comment All







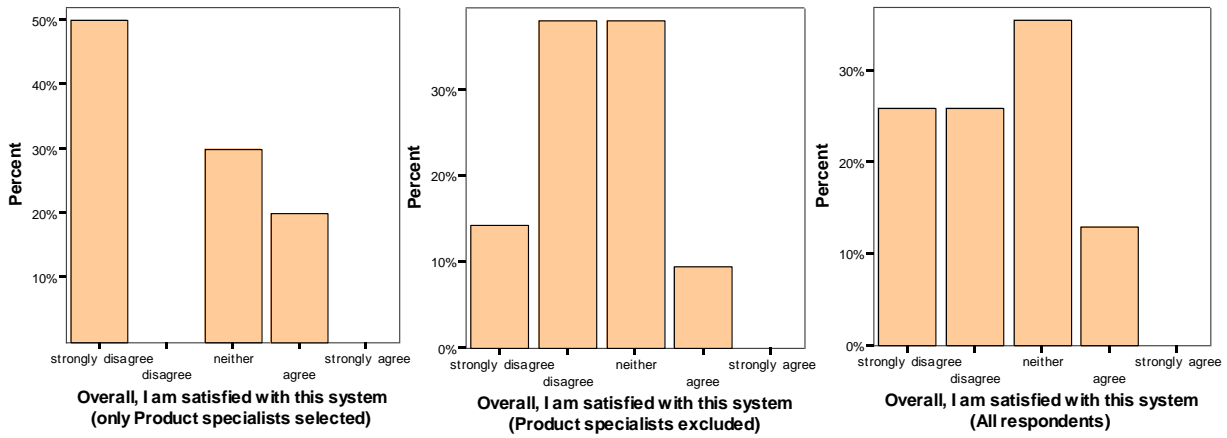
QUESTIONS ABOUT MSA		1	2	3	4	5		NA
1. Overall, I am satisfied with how easy it is to use this system 	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
2. It was simple to use this system 	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
3. I can effectively complete my work using this system 	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
4. I am able to complete my work quickly using this system 	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
5. I am able to efficiently complete my work using this system 	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
6. I feel comfortable using this system 	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>

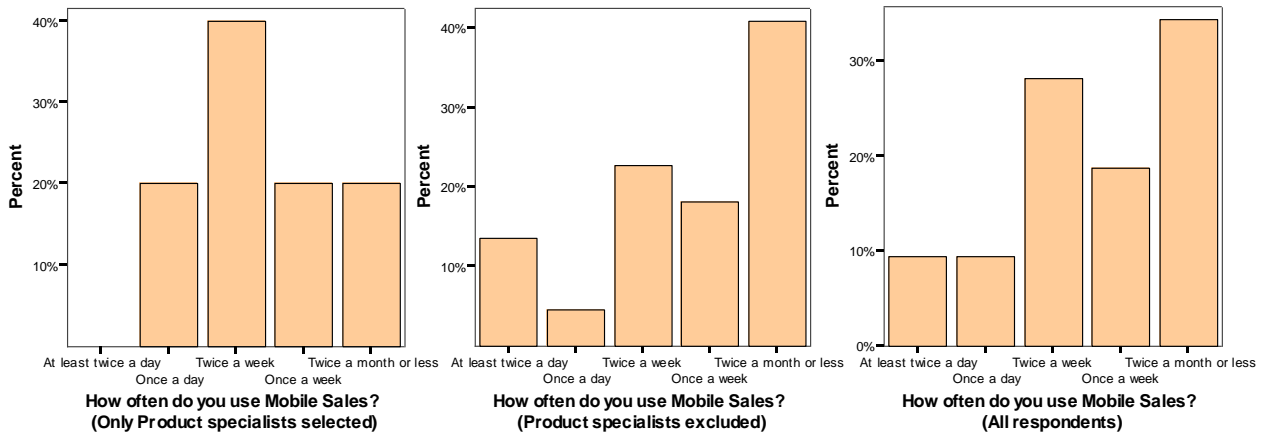
Figure 23 – Screenshot of web page with usability questionnaire

### 9.1.1 Overall, I am satisfied with this system



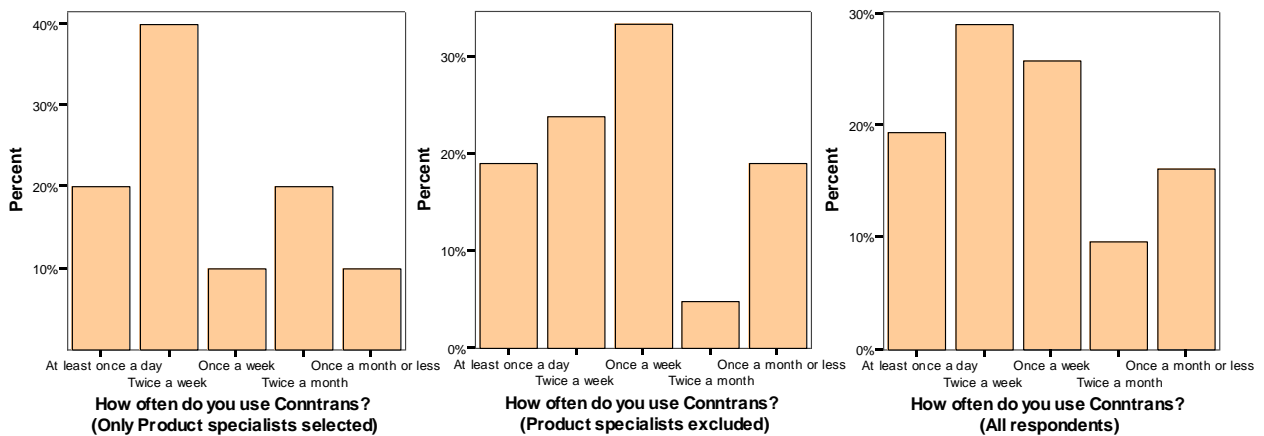
This charts mirror the results we found in the interviews. The users are not happy with the system and the product specialists are the most unsatisfied group. The most interesting finding with this question is that there is not a single response that “strongly agrees” with the question. However, some of the other applications we asked about, like ConnTrans and QlikView, are more positively perceived. The exception is TGS where the respondents are very unsatisfied.

### 9.1.2 How often do you use Mobile Sales?



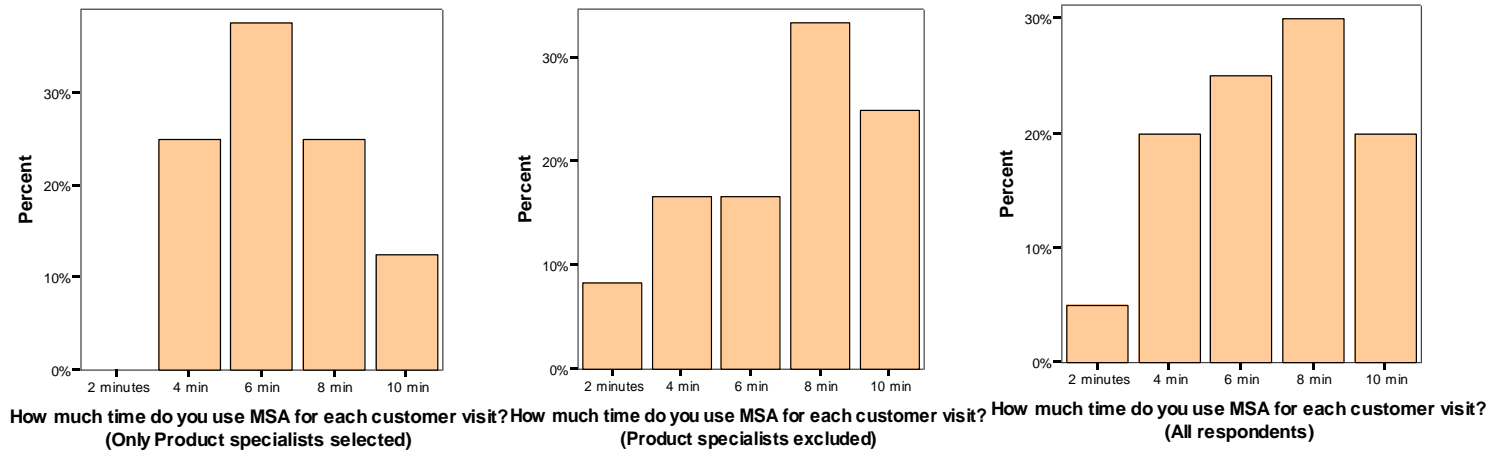
20 percent of the product specialists use Mobile Sales every day, but there is also 20 percent who only use it once a month or less. 40 percent use it once a week and the reason for this is probably their office day which they have every week. Note that there is not a single product specialist that uses MSA every day.

### 9.1.3 How often do you use ConnTrans?



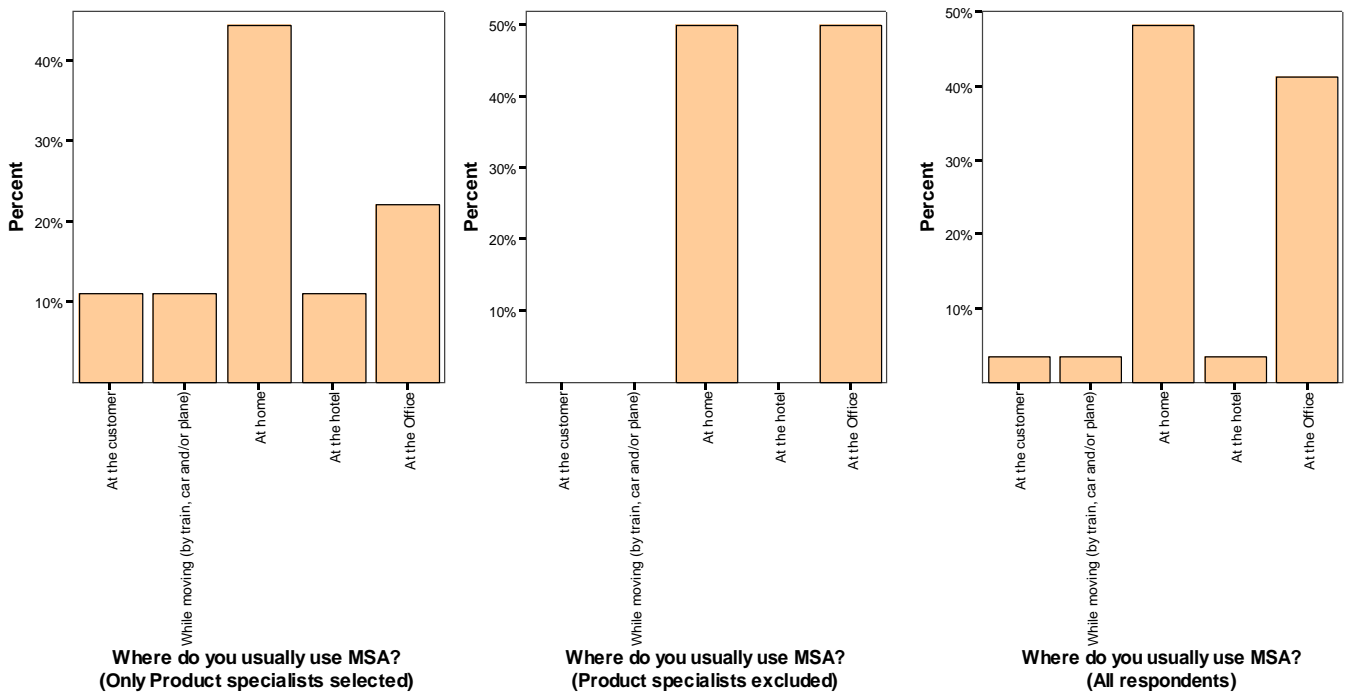
The use of ConnTrans is more frequent than the use of MSA. A fifth of all product specialists use it at least once a day.

### 9.1.4 How much time do you use MSA (Mobile sales) for each customer visit?



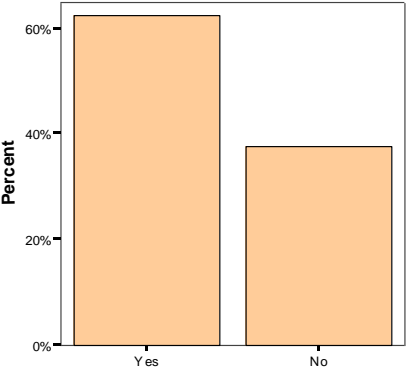
Among the product specialists, “6 minutes per customer visit” is the most common choice. Almost 85 percent of all respondents (90 percent of the product specialists) have chosen a time interval between four and eight minutes.

### 9.1.5 Where do you usually use MSA?

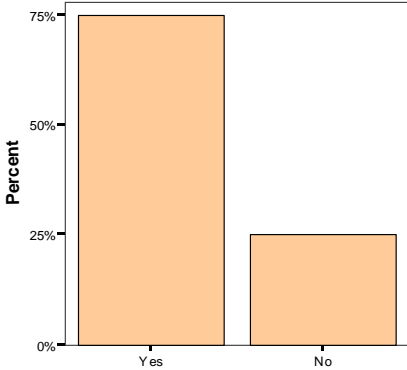


Since we wanted to find out where the users used Mobile sales, we asked this question. The product specialist’s most common answer (near 50 percent) is “at home”. If we exclude the product specialists, we find that MSA is only used at home or in the office.

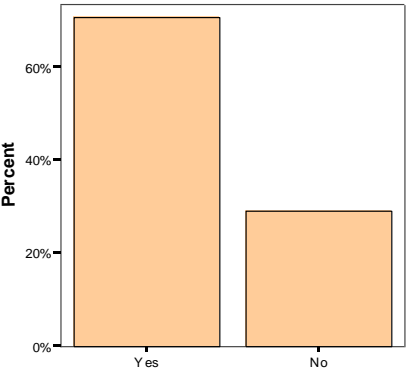
### 9.1.6 Do you update your CPs (contact persons) as soon as the information about them has changed?



Do you update your CPs as soon as the information about them has changed?  
(Only Product specialists selected)



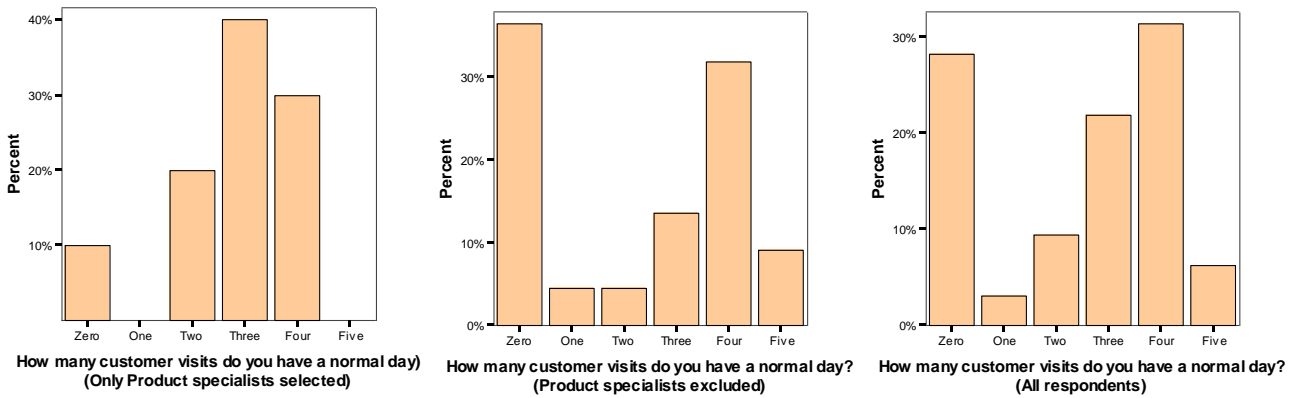
Do you update your CPs as soon as the information about them has changed?  
(Product specialists excluded)



Do you update your CPs as soon as the information about them has changed?  
(All respondents)

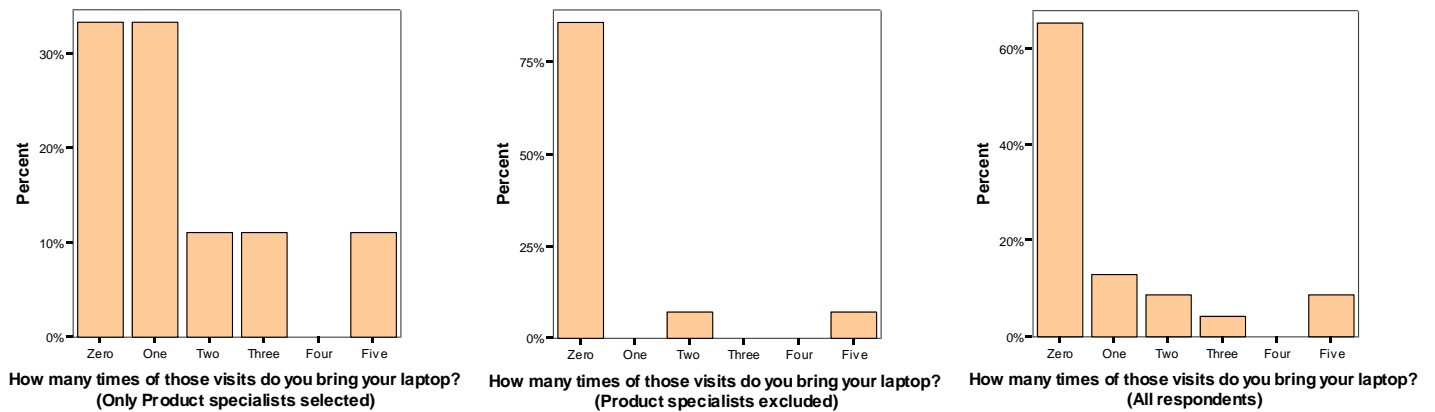
Since we wanted to know if the users update the information about their customers, we asked this question. The majority of the users do this update as soon as the information has changed. Product specialists are least likely to update as soon as possible.

### 9.1.7 How many customer visits do you have a normal day?



The product specialist has between two and four visits per day. The other sales personnel have between one and five visits per day, but the majority lies around three to four visits per day.

### 9.1.8 How many times of those visits do you bring your laptop?



In the diagrams above, we did not include the answers from the preceding question where there were no customer visits a typical day. We can clearly see that there are not so many persons who take their laptop with them during a customer visit.