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Success or failure?

..depending on computer-based technologies and employees sense of responsibility..

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Abstract

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This Master Thesis describes the problems with distributed co-operation and information flow with and without support of computer-based technologies. If computer-based technologies will be a success or a failure is not only dependent on the technologies, it is also dependent on the employees who are responsible for entering the information. If only one employee does not perform his or hers obligation the idea with distributed computer-based technologies will fail, but if they really use them and makes them reliable they will be effective tools for distribute co-operation and information.

A question raised about computer support is: Different computer systems can support distribution of information to employees working outside as well as inside the company, but how do we get them to be effective tools, and get the employees to take their responsibility for entering the information into the systems? The answer is that different computer systems do support employees working inside as well as outside the company and they will be effective tools if they contain the information the employees really needs and on their terms, since they are the once who will use them. The employees need to be a part of the decision of what kinds of information they will have in the systems and delegate who will be responsible for entering the information into them. Different employees can view different information. If the employees get some benefit from the systems and understand and feel that it is their responsibility and also sees that it affects their work in a positive way, then they will do the job. It is a question of democracy.

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The author

My name is Susanne Ekstrand and I am a student at the master program of People, Computers and Work at the Blekinge Institute of Technology. It is an interdisciplinary program of computer science and work science. The program focuses on computer systems and the users, and also how a designer can support the user and develop the computer systems to be effective tools in their work.

I have done my Master Thesis on a company who produces and sells provision. They will have a Sales Force Automation system (SFA) to support distributed co-operation and information flow out to their salesmen. The employees in particularly the departments of consumer and out of home, wants to have an Intranet to support them with information about business and staff issues. I have been studying the co-operation and information flow, to see if the desires of the employees are well founded. I have used the theory of Computer Supported Co-operated Work (CSCW) in the thesis.

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Introduction

Computer Supported Co-operative Work (CSCW) is being a research area, which covers anything to do with computer support for activities in which more than one person is involved. CSCW should be conceived as an endeavour to understand the nature and characteristics of co-operative work with the objective of designing adequate computer-based technologies. The focus with CSCW is to understand co-operative work and its problems, as to better support co-operative work. The term "co-operative work" is the general and neutral designation of multiple persons working together to produce a product or service. It does not imply specific forms of interaction or organisations such as comradely feelings, equality of status, formation of a distinct group identity. (Bannon, Schmidt, 1989)

Whatever we like it or not, computer-based technologies do change the working life and working method in an organisation. Bannon and Schmidt (1989) indicate that the system is an organisational change agent. That any software application project involves the design not just of a technical subsystem, but it also embodies assumptions about how this system will be used in the organisation. The designer does not merely design a computer system, what is being designed is a work organisation. Anderson (1996) comments that since the design process is fundamentally about intervention to create change, it must be steered by value-orientations. If the values of the users of the technology are not dominant, then those of others will be. He continues with pointing out that if this is the case, the technologies are drenched in value and hence their design motivated by assumptions about value legitimation. This makes design inevitably political. All design is design in or for someone's interests. I think design decisions in many ways are political. It is the group of management who decides if the company will invest in computer-based technologies or not. They also decide how much money they will spend on the system and to what. I believe that the group of management needs to be listening to the employees, since they in many cases have more information and understanding of which working processes who needs to be supported by a system.

The employees usually know how the information flow goes in a company and which work task the employees carry out. Co-operated work is inherently distributed and the character of co-operative work varies, according to the complexity of the interdependence, that is, depending on factors such as the distribution of activities in time and space, the number of participants in the co-operative ensemble, the degree and scope of specialisation among participants. The more distributed the activities of a given co-operative work arrangement, the more complex the articulation of the activities of that arrangement is likely to be. (Carstensen, Schmidt, 1999) Articulation work is the things that the employees do to co-ordinate their work and each other to reach the main goal. Tasks that take time and needs to be or-

ganised. Tasks are to be allocated to different members of the co-operating ensemble. Which employee is to do what, when and where. (Bannon, Schmidt, 1989) Much of the employees are dependent on the information they get from other employees in the company. The information being needed can be information that affects the work. Here the computer systems can be an advantage for making a shared information space. It can affect the way employees index information, increase the range of strategies open to the communicants and increase the probability of transmitting or receiving an interesting but unexpected message. Shared information space is obviously necessary as the context in which articulation work and mutual influence fit together (Robinson, 1993). Information space can be seen as a notice board, which contains documents who has been constructed and reconstructed of the participants and who can be adjusted to their needs.

Interactions and co-operation between different employees in a company affords certain opportunities for interaction that are unavailable to those not co-located. Face-to-face conversation provides a richness of interaction seemingly unmatched by any other means of communication. (Hollan, Stornetta, 1992) The CSCW computer-based technologies have to serve the employees not co-located with the information they need to be able to execute their work as well as the co-located employees.

When designing computer-based technologies it is important to consider which employee who will be responsible for the information in the system. The designer and organisation has to see which employee who is best to do it and they have to take the employees into the discussion and not just make the decision without them. If the employees will be equally involved in the changing process then they can contribute with their knowledge and familiarity with the work process and information being needed. Job equality, in the complex sense of sensitivity to feelings, intuitions and perspectives that are not necessarily articulated and not usually considered part of the work process at all, is a necessary condition for understanding and guiding changes. Understanding the distribution of benefit and work in different contexts is an important first step in this area. (Robinson, 1993)

In my research I have studied the co-operation and information flow of the employees in a company that produces provisions. The company has several salesmen working outside the company and they are at present using order book and pencil when taking orders at customers. In August 2002 they will begin to use a Sales Force Automation system (SFA). The SFA will support their work in some issues, but some information is not going to be supported by the system. The employees has marked their wish to have an Intranet that supports them with the remaining information and keep them up to date with what is going on at the different departments. The salesmen hope an Intranet and the SFA will get them the information they need immediately, since they today have a couple of day's delays. Studying the

salesmen work and the way they get the information today, and the thoughts of an Intranet and the SFA to support them an issue arise. Different computer systems can support distribution of information to employees working outside as well as inside the company, but how do we get them to be effective tools, and get the employees to take their responsibility for entering the information into the systems?

This thesis attempt to describe the problems with distributed co-operation between different employees located at different places and spaces of time, supported and not supported by computer-based technology. I will name the employees who have a central role in my report, by their working roles and fictitious names. I will also use the word "company" to name the company who produces provisions.

Introduction to the Company
The company started in May 2001 and is a subsidiary company to a global company that produces and sells provision. The company bought some products from another firm that also produces provision. This deal included the existing Sales Force Automation system (SFA). The SFA consist of two parts, the front office system and the back office system. The front office system is the part that the salesmen will use, and the back office system is for the employees in the company. When starting up the company, they had some trouble with the salesmen computers and to get them to work as they were supposed to. The company decided to scrap the front office system and the computers for the moment. The salesmen had to go back to use order book and pencil in the old fashion way. The company also decided to keep the old back office system and get it in working order, until they replaced it with the new updated back office system. The new back office system was implemented the first period during spring 2002 and the new front office system will be tested in the end of the spring 2002 and the company will have a kick-off in August 2002.

The products that the company produces and sells are dry soups, clear soups, canned soups, dry sauces and desserts. The products are the company selling to customers as restaurants, schools and hospitals and also to markets. All sales go through different wholesalers. The company has four employees who works as key account managers (KAM) and they are responsible for the contact with the wholesalers and their chain markets and restaurants and so on.

The company has 28 salesmen that are responsible for selling the products to different districts from the north side of Sweden to the south. There are two different sale staffs; one is the sale staff that is responsible for selling the products to restaurants, schools and hospitals and they are working under the *out of home department*. The other sale staff has the area of selling the products to markets and is working under the *consumer department*. Three of the KAM's belongs to consumer department and one of them

to out of home department. The KAM's and the salesmen co-operation go through other employees in the two departments. The salesmen have no direct contact with the KAM's.

Other employees work in the different departments inside the company. The departments are production, stock-in-trade, supply chain, finances and IT, maintenance also development and quality check. They are all more or less dependent on information and co-operation from each other.

Methods

During my fieldwork I have spent a lot of time with different employees in the company that produces provisions. I have gone about the company and talked to a lot of the employees in different services and in the different departments. I have interviewed some of them. It has been both informal and formal interviews.

The informal interviews came up when I was going around and talking to employees. They usually came up in a situation and with miner planning then the formal interviews. The formal interviews are more planned and are often executed in another place to give those who speak a chance to talk in privacy. (Ely, 1991) Using formal and informal interviews are quite good to get information about what is going on in a company and to find out from were and whom the information comes and which way it takes. I used this line of action because it gave me a comprehensive picture of the company and what the employees really did. I would never have got this information and knowledge by only using questionnaire and there was no time to actually observe every employee in their work for a longer period.

I had to use a variation of the "quick and dirty" method, since even if my period in the field was long I had to talk to quite many employees to get a comprehensive picture. The "quick and dirty" method is much shorter then a traditional fieldwork and uses predetermined research questions (Plowman et al, 1995). Anderson (1996) makes the point that there is more to ethnography than fieldwork, it is also an analytical mentality. To understand the information flow and co-operation in the company and to be able to analyse it in a correctly way, I had to understand the organisation and the employees different needs when it came to information.

I followed two salesmen from the consumer department and out of home department, in their work for a day. I used both formal and informal interviews when we were in the car driving to another customer. When we visit the customer, I observed them and took some notes on what they were doing and saying. Ely (1991) indicate that what is in the notes is facts, it is the details in the notes that is accessible to the researcher. After the days with the salesmen I had to go back with new questions to some of the employees in the departments, to get more exact information about the information flow and the co-operation.

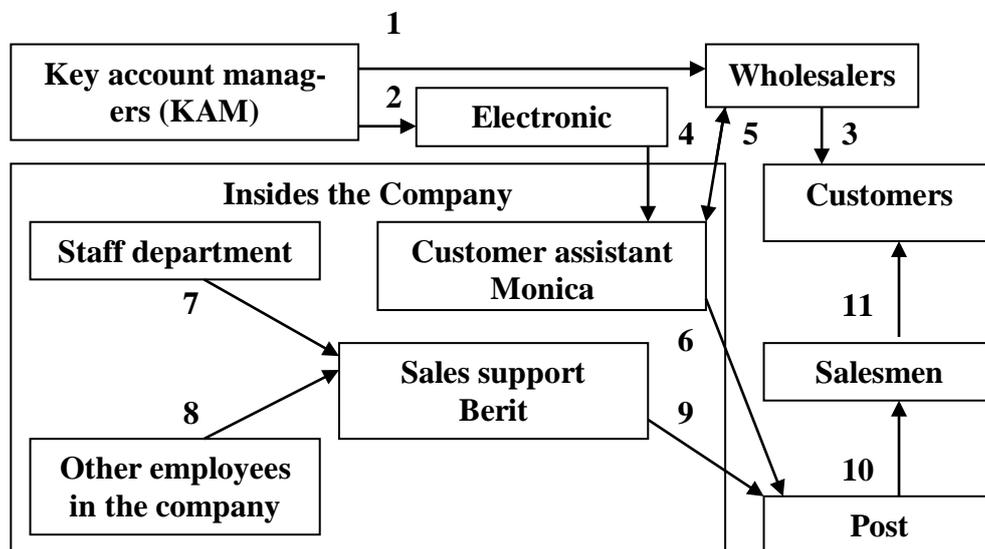# Elucidation of the co-operation, information flow and SFA

It is important that the company has a reliable and working co-operation between the different employees, to be able to sell their products and have a working business. Since the company has several employees working outside the company they want to try out computer systems to support their co-operation. The company thinks they can solve this issue with a Sales Force Automation system (SFA) and a laptop. With the laptop the salesmen also will have other programs that supports them. It will be Word, Excel and Power Point and also Lotus Notes electronic mail. They also have a printer and of course their mobile telephone.

The employees need different kinds of information to be able to execute their assignments in a satisfactory way. This information is about business and staff issues.

In this section I will outline how some of the co-operation and information flow goes from the company out to the consumer department salesmen. Then I will look on how the SFA and electronic mail will support this co-operation and information flow, and also how this affects the articulation work. The section finishes with an analysis.

The information flow and co-operation at present
The salesmen are dependent on the work and co-operation from other employees in the company and they are dependent on that the information reaches them in time.

The picture: Co-operation and information flow out to the salesmen.

1 and **2** – The KAM's are responsible for the contact with the wholesalers. They discuss and introduce products, activity and campaigns with employees in the right position at the wholesalers. These activities and campaigns are being called SA/VA campaigns. SA/VA stands for "connections of advertising of the week". They also discuss which price that counts when the wholesaler's chain markets buys the products from the salesmen. It depends on which agreement the KAM's makes since everything is centrally managed today. The KAM's insist upon that the wholesalers must take the product in their basis of the assortment of their chain markets. The KAM's forwards the information of SA/VA campaigns to Monica by electronic mail.

3 - Every wholesaler has customers as markets or restaurants that buys the products they sell. The wholesalers buy these products from different companies that produce and sell the products and put them in the their own assortments. The company that produces and sells the products has salesmen that visit and sells the products to the wholesalers different markets and restaurants. It is a form of chain reaction, if the company get the wholesaler to take their products into the assortment, their salesmen can sell the products to the customers as markets and restaurants.

4, 5 and **6** - Monica informs the salesmen about the SA/VA activities and campaigns so they know what is valid. It could be that the company has an advertisement out in the week 12 to 13 on one of its products, for example sauces. Monica knows which price is valid during the campaign and she has to forward this information to the salesmen. The same goes for new features and new products in the assortment. She also has to get extern information on the product number from the different wholesalers, because the wholesalers do not use the same product number of the product as the company. She also get the wholesalers price list of products. The salesmen have to have this information too. Monica sees that the salesmen has the wholesalers assortment list, since they cannot sell a product that the wholesaler does not have and the markets can only buy what their wholesaler has in their assortment. All this information to the salesmen goes by post. Sometimes Monica sends information to the salesmen and when they get it, it is already old and has no interest. Because she has got new information and the salesmen has to get this changed information immediately, but it takes a couple of days before they get it. Monica forwards the information to the wholesalers when the company changes anything about their products and prices.

7 – When it comes to information about staff issues, the employees get it from the staff department by document. The staff manager sends the document by electronic mail to all the employees who have computers and she hopes the employees will take the document and put it in a cover they have and also throw old documents. But she fears they just throw the new docu-

ment away or put all the documents they get in the first place at the cover and then they will not find the information when they need it. When the employees do not find the information, they either call the staff manager or goes to her with their questions. This takes time for both the staff manager and the employees. These information's about staff issues are also put up at notice boards, so the employees are able to se it and read it. It is just that the notice boards are too full of documents, so it is difficult to find the right information. The employees could also find the document of staff issues in the dining room, so they can take a document with them when they leave. There are lots of documents circling around every time there is a new document with information about staff issues. This information has to be sent to the salesmen through Berit.

8 and **9** – Berit makes all the sales material for the salesmen. She gets information from other employees in the company as the trade-marketing manager and the sales manager. Berit makes product sheets of the information she gets on products and new introduces to the salesmen. She records a list where the salesmen put a cross on how many of the new products they have sold in and in which market. She also makes labels to put on the shelves in the market, so the consumers can se the price of the product. She informs the salesmen if there are any risks of rest. A rest is if there are some shortfalls of the raw products. If there are, then the production department cannot produce a certain sauce for example, since they are without some component. Then the sauce can run out of the stock, therefor must the salesmen have this information as soon as possible. When they get the information about rest, they have to decrease and lie low on the specific sauce. Berit also forwards the salesmen statistic of sale once a week. She gets this statistic from the category manager. In this statistics a salesman can se what he has sold in towards his budget. Every salesman has a budget he is trying to reach on a couple of products. Often the reports she send to the salesmen are out of date when they get it and they have to await a couple of days before the new information arrive with the post. She also forwards the information of staff issues. This information is complementing the information the salesmen get from Monica.

10 and **11** – Carl is a salesman working for the consumer department and he is responsible for selling in the products to the customer. When he starts his working day he brings his sale cover with him. In the cover he has documents about the existing SA/VA campaigns and other activities, product sheets and information about the markets. The campaigns are important in case that Carl will sell in a product or not. He is dependent on them. There are also documents with information about, for example, possible rest. Other documents are price lists, assortments list of the wholesalers, address list to the markets and the list of new products.

Everyday Carl has to take his almanac with him so he can fill in information, for example if the customer wants a rack to his market. He brings with him advertising materials about the campaign products he is selling in and also a test product to give the customer.

Today Carl always is a couple of days behind with the information from the company. He thinks it will be great if there is a way to reduce this time. One day he got information about a soup that had defective consistency, if he could have had that information the same day as it was sent by post, he would have saved two days of work. As it was Carl had to go back to the markets he had visit two days before to remove the soup.

Carl is dependent on that he has the right information of his customers. One day Carl was going to visit a market he has never visit before. He checked the address list over his markets and looked in a map over the city to see were it was. He found the right way and drove there. When Carl came to the address he noticed it was the wrong address and he had to find out the right address.

The staff department is responsible for the information about staff issues and Carl thinks it can be better. One month they changed the way the travelling expenses was filled in, but they never told the salesmen about it. Carl sent in his travelling expenses to the department as he did every month, but he was fairly surprised when they sent it back to him with changes made. Carl did not understand a thing, because he thought he had done it right. He did not get any explain why they did not tell him about it before. He thinks the information from department to department in the company does not work very well.

Carl has no opportunity to get in contact with the company if the customer asks him a question on the products that he cannot answer. He cannot call them by the telephone when he is in a meeting with the customer and when he comes out to his car the moment is over. It is not an urgent question anymore. He thinks instead, that he will send the question with the orders he sends into the company later. It is just that it never seems to work.

Carl points out that he as a salesman belongs to the company, but in the same time he does not. It is due to the fact that he is outside the company. He must rely on the employees in the company and in the consumer department to get information and news. Carl does not know what happens in the department if someone do not tell him. He wishes to get general information about the company and rules in a way that he will not be dependent on someone else.

Today Carl does his order in an order book and sends it by post in the evening to the company. In the company the sales assistant punches in his orders in the back office system and sends them to the wholesalers.

Here I have demonstrated how the salesmen are dependent on the information they get from the company and how important it is that the co-

operation between the different employees is working. The salesmen are also dependent on the work the KAM's are doing and all this information relies on Monica. If she misses to send the information the salesmen will not have it and they cannot guess which campaigns and activities they will have. Monica and Berit are the key persons when it comes to forward information out to the salesmen. They are some kind of "informing employees" for the salesmen.

Next I will demonstrate which technical means the salesmen will have in the future and which way the information will go and how the co-operation chain will be changed.

The information flow and co-operation supported by SFA in a laptop and electronic mail in the future

The salesman, Carl, will have a laptop and a printer in a specially designed case. Lift up the lid and the laptop will be lying there and the printer lies beside. The laptop and the printer are battery-powered. Carl will be able to charge them with a 220 volt in the wall or in the car with 12 volt. Carl will charge the battery when he comes home, since it will manage a day.

There will be a modem and Carl connects on an ordinary analogue telephone line, and then he will connect through a modem pool and firewall. Carl has only accesses to the server were the SFA is and there will the data be replicated. It means that the front office system will forward all its information into the back office system and in that way the company will have the same information as Carl. Carl sends in his information and gets another information back, it can be information about new bank giro services, address changes, new campaigns, the server knows that it is for example salesman number 103 who is logging in and there are information and changes for him.

If Carl cannot send in the information for some reason, he has to keep the information in the laptop until he get a chance to send the data. Carl does not need to have a backup at home, since the SFA is a replicated system. The back office system will always have the information. If the laptop will crash then the category manager can generate a whole new database to him with all the information that he has sent into the company. If the computer crash Tuesday afternoon, Carl will only have lost a day of information. If he does not send in the data every day, instead he sends it in once a week, then he will loose a lot of information and he can never get the information back again.

Information that the SFA supports

Carl will make his order through the front office system in the SFA. He will fill in the product number, product name, amount, price and the week of delivery and send it to the wholesaler direct, instead of sending it through another colleague, the sales assistant.

In the front office system Carl will have customers card, both customers as wholesalers and customers as markets. The customer card has the name of the customer, customer number, bank giro service, address, telephone number and contact.

Carl can use different criteria when searching among the customer card. He will be able to search on customer number, turnover, name, place name and postcode. If he marks a customer for example a market, he then get all the information the system has on the customer. He can se if it is an active customer and which chain markets number it has. Carl will also have information about how the products are delivered and the customer turnover.

Carl will get information about the budget and the sale. He will be able to see which SA/VA campaigns he has been taken on an order. He will also have the possibility to go back in the history and see which campaigns the market has taken before. There are details on a certain order and he can see the product numbers, product name, price and so on.

Carl can use insert patterns to plan his work in cycles from example week 20 to 26. He can start with week 20 at Monday and fill in which customers he will visit that day. Carl reaches the customers through a list from a database. When he has filled in every week in the cycle, he will have created his first inset pattern and he can use the pattern over and over again. In the system there will be an almanac, and Carl does not have to put his meetings with the different customers in it. The almanac is updated automatically by the system through the inset patterns. Carl will also have the company agreement with wholesalers and their groups of markets in the front office system, the assortment lists and the price lists from both the company and the wholesalers.

Co-operation in the future
The co-operation and information flow out to Carl will be changed in some ways. Berit will be responsible for entering some information to him into the SFA, the information will be in the front office system, as well in the back office system. Carl will be able to see his sales statistic every day if he wants, but it will be Berit who is putting together the sale instead of the category manager. She will also put in the information of product number instead of Monica and all the information about customers, as address and telephone number and so on.

Monica will still be getting information from the KAM's by electronic mail and she will enter this information of SA/VA campaigns and also the assortment list and price lists from both the company and the wholesalers into the SFA.

The company has decided that everything that goes by post out to Carl today and who is not being supported by the SFA, will as far as possible go by electronic mail. The sales manager and trade-marketing manager will

send their information to Carl by mail, instead of going through Berit and so will the other departments and employees also do.

The company has not decided what to do with the specification of travelling expenses that Carl sends in by post today. The company thinks that maybe he can send travelling expenses by electronic mail, but he will still have to send the receipt by post.

Since the SFA is a replicated system, the category manager has the same information in his back office system that Carl has in his front office system, when Carl has sent in his data. In this way they can discuss the information or Carl can ask questions of what he will do with some data. The category manager can see the volumes that Carl has sold in and he can guide him in the system. They can see the same picture but must guide each other by the telephone and their voices.

Here I have tried to show how the SFA and the laptop will be used and to point out the changes that will occur in the co-operation and information flow. The employees in the company will not go through Berit anymore if it is not material who is going to be entered into the SFA.

Next I will analyse the change that the SFA and the electronic mail will make for the salesmen, but also to the co-operation and information flow.

SFA support distributed co-operation and work
The information age has made it possible for employees to collaborate with colleagues on the next continent as well as across the company house. In the same time the users have got limitations that was never a problem when the teamwork was working side by side. The telephone permits fairly natural conversation, but both sender and receiver must be available at the same time. Electronic mail does not provide the immediate feedback people take for granted in ordinary discourse. (Brittan, 1993) The salesman, Carl, has to work with limitations on the information when he is working outside the company that the employees in the company do not have to face. They can only go to the employee they think have the information and get the information they need. I think computer-based technologies supports Carl when he is working outside the company. I think the advantages with the SFA outweigh the disadvantages. Carl will use the front office system of the SFA when he works. The SFA gives Carl the benefit of having a lot of information with him when he has meetings with his customers. In the front office system Carl has all the information he need about the customer in the customer card and he can see what the customer bought the last time he visit the customer. Carl will be able to take the orders, enter the information into the front office system, and send the data to the company when he comes home in the late afternoon. The SFA will also make the key account managers (KAM's) work visible to him with the campaigns of "connections of

advertising of the week" (SA/VA campaigns). The KAM's have prepared these campaigns with products and activities to help Carl sell the products. The customer assistant, Monica, has a key role since she is the one who forwards information from the KAM's to Carl. She will enter information into the SFA and it will be visible to both the front office system and the back office system. It will be price list, assortment lists and SA/VA campaigns. Berit will take over the responsibility to enter the information on product number, put together the sale statistics and the information on the customers. Berg (1999) call the information technologies "reading and writing artefacts", that is technologies that are tools which can receive input, transform that input and produce output. Berg thinks that the two central activities in reading and writing artefacts are co-ordination and accumulation. Accumulation can be the specific way in which a form is filled in, from the top to bottom and introduces a temporal order. The order form co-ordinates activities of other interrelated entities, it can articulate the activity of a user, taking place in a different time and space, to the activity of another user and his activity. I think the SFA in some way is a reading and writing artefact. Monica and Berit enters information to Carl from another time and space, and when Carl sends in his information in the late afternoon he receives their information and he can co-ordinate this information into his working day, to do a great work selling the company products. The transformation in this case is that the information transform from being just information to become a sales tool. It will be a way for Carl to compete with his competitor and get the market to buy the company products instead for the competitors. In this way Carls work will be more effective when supported by SFA.

Carstensen and Schmidt (1999) state that one of the prevalent approaches to design of systems to support interaction and co-operation is a shared workspace based on lesson from early What-You-See-Is-What-I-See systems. These should be integrated in computer-based systems by which the users can communicate, interact, co-operate, and share workspaces, like documents and so on. The SFA will support Carl by being a shared information space with the employees in the company. Carl will send in the information to the company and they will be able to see the same view as he sees, since the SFA has two parts, the front office and the back office systems. It is two different "worlds", but yet the same. The SFA offers the employees who work with it shared knowledge. Carl can by the SFA and telephone have a communication and co-operation with employees in the company. In this way he and the employees in the company get a concrete picture of the company-shared goal to sell a lots of products and bring in a profit. The sale will be more visible when Carl and the employees in the company can have a sale statistic every day. The employees in the office can see in this way that there work has meaning. Employees use the systems to mediate their work towards a goal, but from cognitive perspective em-

ployees as well as systems are considered as information processing devices. From the system's point of view, information processing and information transfers are the main processes for the functionality of the system. (Artman, Waern, 1999) Schmidt (2000) indicates that the members in the course of the project construct the shared goal. He argues for that the design task is finished when the designers have a shared goal. In the context of selling provisions the employees have a shared goal, but their work is not finished until they have reach the goal and then it starts over again with a new goal to reach. Through the company goal the employees know what they have to do to make the company be a paying concern.

The disadvantages with the SFA will in some ways be the same as today, when Carl uses order book and pencil. He has no opportunity to get immediate feedback from the company when the customers ask him something about the products. If Carl does not have the answer in his covers and documents then he does not have it. Carl has his mobile telephone but he cannot call the company when he is on a meeting. He has to wait until he is out of the meeting or write it down and send it with the orders by post to the company. If he calls the company to ask the question it will still be a time before he sees the customer again and the risk is that he will forget both the answer and the question. The SFA will not support these kinds of immediate information need. Since he will have electronic mail in his laptop, he can write the question in a mail when he is back in his car and send it when he comes home, I think this is his best chance to get such questions answered. In this way he will have the answer to the question with him in a mail the next time he sees the customer and if he like, he can print it out and have it on paper instead. Another disadvantage is that the SFA will only support Carl with some of the information he needs, as the sales statistic and the price lists. The remaining information must be supported in another way.

Employees, articulated work and change
Members' knowledge is what people have to know to do work, and how that knowledge is deployed in the ordering and organisation of work. Button (2000) thinks it is the explication of member's knowledge, for the purpose of design that is the point of collaboration between design and sociology in CSCW that is important. I think member's knowledge is important in the way that they do not only know how to do work and how it is deployed in the organisation, but also why the ordering is like it is. This is essential to get the right employee to do the right work when developing a computer system. The organisation has to know which employee who will, for example, enter the information into the system, because if it is not the right employee who does this work, the system may fail. Grudin (1988) question the disparity between those who will benefit and those who must do the work with the systems. He argues for that the systems fails because it require that some employee do additional work, while those employees are not the ones

who perceive a direct benefit from the use of the systems. He argues for that it requires a better understanding of how groups and organisations functions and evolves. I agree, it requires an understanding of the work process, what the employee does and her co-operation with others and how this is articulated. Monica will enter some information into the SFA, but will in some way not benefit from it. She is just informing the salesmen about the KAM's work with campaigns. She also enters information about price list and assortment list. Berit will putting together the sales statistic and enter the information of customers and also product numbers. There are a couple of benefits that Monica and Berit will get by using the SFA. The first one is that they know that Carl get the information immediate and that the information is valid and not old and maybe of no interests any longer when it reaches him. The other is that they have not done a lot of work that they have to do again since it might become old before the salesmen get it. The employee who are responsible for entering the information into the SFA, are still the ones who are responsible for sending the information to Carl by post today. It is the "informing employees" who still will inform the salesmen.

Other information does not always reach Carl. He has trouble today with the staff information in that way it does not always reach him working outside the house. Carl gets the information too late and he cannot rely on that he get it at all. Co-operative work is a tricky phenomenon. We are all somehow engaged in co-operative activities of various sorts in our everyday lives and we routinely observe others working around us. As participants of a co-operative effort we routinely take its orderly accomplishment for granted. We have to do some things to get the work done. In depending on the activities of others, we are "not interested" in the enormous contingencies and infinitely faceted practices of colleagues, unless these may impact on our own work. (Schmidt, 2000) When it comes to the salesmen and the staff issues, the staff department does not see them. The salesmen are rarely at the company and when they are, it is not certainly that the employees in the staff department see them anyway and certainly, the salesmen work does not impact on the staff departments work. This is not the problem either, since it is Berit who is responsible for forwarding the staff issues to Carl at present. Maybe she never got the information of the travelling expenses and maybe she only forgot it. I have never been able to get an answer on that. Maybe this problem will be solved with the laptop since Carl will have access to electronic mail in it. Today the staff department use electronic mail to forward the staff issues to the employees that has electronic mail. This can be a way to get out the information to Carl and the rest of the salesmen too, since every department will have the responsibility to get out their own information to the salesmen.

In some way the SFA change the articulation work and co-operation in the organisation and the way the employees get information, but in other ways it will support the articulation work as it works today. Designers of

technology are usually confronted with the task of designing systems that will be used for long periods of time. No matter how well they may have fitted the situation initially, circumstances of the situation of use changes, the needs change, the uses change, the users change, the organisation changes. (Henderson, Kyng, 1991) The articulation work is noticeable between the KAM's, Monica and Carl. Monicas assignment will be affected of the SFA in the way she has to enter the information from the KAM's into the SFA instead of sending the information by post to Carl. She has to work closely to the SFA. The KAM's work will not be affected by the system, since they will continue to send their information to Monica by electronic mail, as they do today. The SFA will affect Carl's work in a total way. Luff and Heath (1989) describes construction site where the system tended to transform the ways the foreman worked, but also affected the employment, that is to say, the system needed a person who was responsible to deal with it. The new employee had to enter the allocation information and transform it into the form required by other members of staff. The SFA's front office system will change the work when Carl is taking orders and get sales statistic. Some of the chain will disappear between Carl and his co-operation with the sales assistant, since he will manage the ordering by himself and he will be able to se a more comprehensive picture of his customers and sales. Through the SFA Carl will have more control over his work and he will not need some of the other employees in the company in the same way anymore.

The remaining information
Carstensen and Schmidt (1999) argue for that planning and re-planning are essential co-ordination activities in collaborative settings. That it requires communication channels and structures through which the participants can negotiate. The participants need to keep track of the work, as it evolves as a result of their distributed activities. The laptop will offer the employees at the company and the salesmen a communication channel through the electronic mail. It is not that the electronic mail will give feedback in a way that real communication does, but it offers the salesmen the information quicker. Today Carl always is a couple of days behind with the information from the company. If he had have electronic mail when he got the information about the soup with defective consistency, he could had that information the same day as it was sent by post, and he would have saved himself two days work. It is important for Carl to plan his working day and he must be able to re-plan the day too. Getting the information from the company immediate helps him to co-ordinate his work in a better way.

Other information as documents of new products, product sheets and so on will not be supported by the SFA, but will be sent by the electronic mail instead. Electronic mail communication is surely the paramount success of computationally mediated informal communication. Groups are us-

ing it even when in close physical proximity. (Hollan and Stornetta, 1992) I can see problems with this. Today it is very easy to send someone an electronic mail, whatever they really need the information or not. It can be loots of information this way and it is very easy to throw a document away by mistake, just because they might not really look and read the information. I believe that Carl will be either overburdened with electronic mail with information on the products, rest, staff issues and other information or not have any information at all. The other employees who have sent their information through Berit will be using the electronic mail to forward their information to Carl by themselves. It is possible that Carl instead of having not enough information today, he can be loaded with information instead. Berit is not just only forwarding the information today, she also sees that it will not be any redundancy in it. When the other employees send their information by themselves it might be double and even treble with the same information. There can be two or more employees who have the same information and thinks they will send it to Carl, so he has it since the information is important. The worse thing that can happen is that nobody sends the information since they believe someone else will and then Carl will have less information then he has today. The only way to solve these problems is to let the employees discuss and decide who will be responsible for sending which information to the salesmen.

When Carl is on a meeting with a customer he needs to have information with him. Carl can either print out all the documents he will need, or he can have them in the mail program. Carl will has to have a very good structure on his different folders in his electronic mail program, if he will has any chance to find the information he need and when he need it. It can be difficult to find the information. If Carl prints out the information he will still has to use covers when he is doing his work. It is easier to have a cover with him to the customer, to be able to find the information he need, then search in the folders of the electronic mail. In this way the only advantage with getting the rest of the information by electronic mail, is that he get it quicker.

The salesmen or the KAM's will not have the same opportunity to work close with the other employees in the company, as the employees who are in the company and can walk over to a colleague and get the information they need. There is a richness of face-to-face conversation and its interactions are constructed via mechanisms of facial expressions, tone of voice, and body language. A logical extension to this line of thinking is that the people at a distance will never stop being at a disadvantage until we use the same mechanisms to interact with each other when we are physically close as when we are physically distant. (Hollan and Stornetta, 1992) Until this perfect media will be developed, I think the company, its employees, and specially those outside needs to have their remaining information, that is not

supported by any computer systems more than electronic mail, in another computer system, like an Intranet.

A possibility to support information flow

The company needs to support the salesmen with another computer system, like an Intranet, that can contain the information the company wants to send to them by electronic mail. The Intranet can be a good solution, since it will not just support the salesmen, it will support the whole company with this kind of information.

In this section I will outline the employees thoughts of an Intranet. Their thoughts of the information are in many cases the same as the information the salesmen will not have in the SFA. I will finish it with an analysis of its advantages and disadvantages.

General thoughts of an Intranet

Some managers and employees in the company have thoughts of an Intranet to distribute the information that are not supported by computer systems today. They think the Intranet can collect all kinds of information. There can be a Web Page with general information and information about staff issues, and also the possibility to log into their individual Web Page with information that concerns their work. Another possibility is a Web Page with information about certain projects and those involved would be jointly responsible for it.

The employees think that the Intranet can contain important information about the products, visitors and statistic of sale. How much the company produces this week, information from different conferences and cars for official use. They also think it can involve an almanac so they can see if their colleagues are here today or not and make a reservation for a room when they need to have a meeting.

The Web Page for staff issues can for example be of how long the hour of work will be the day before a "red" day as Christmas Eve. There can be company rules of employment, document of staff issues, vacant jobs, information of annual meeting, different forms of employment and contract of employment, and also different records. The employees will like to be able to apply for holidays on the Intranet.

The Intranet can also contain information from the union who affects them. There can be information of technical issues and when it is time for a change of password, or when the mail server is down and so on. The employees wish to have general information on the Intranet like the menu and also to be able to inform the dining room about guests. There can be telephone directory, pleasure, and information about what the other departments are doing. When they have the opportunity to see the nurse of the company and to see new recipe, and also be able to do the specification of travelling expenses on the Intranet.

Individual Web Page with information

The employees who are particular interested in a Web Page with individual information, are those who works in the consumer department and out of home department. They think a password and username would protect their Web Page. The information in it will be on for example the statistic of sale, product number for the export, information of products, information from the salesmen and customers, to form the basis of the markets, share of the market and market analyses, alarm of the products so called rest. Some want to have result of the economy, take orders of the salesmen and their reach quota, invoice of sale, deliveries and prognoses of products and so on.

Some of the employees want to have a mutual Web Page with information for those affected by it. They see it as a form of project room, with all the information that affects a certain project. This form of project room can be interesting for example the KAM's and the employees and managers who work close to them. Even the side of market and sale can use a page like this. The employees think a Web Page for a special group can be a bridge between different departments and help them co-operate.

There can also be a channel for information from and to the salesmen, where they can ask questions about the products and the product number and have their questions answered. One Web Page can contain information of employment. There can the managers get information they need when they have an interview with a person, or take a person into the company employ.

If an Intranet

The mangers and employees who think an Intranet can be a good solution for collecting information have also arguments for its development and structure. If the company decides to develop an Intranet it must be structured in a good way. It is important to classify what an Intranet is because it is a quite wide concept.

The company also has to carry out that it is here that the information is. It must be a habitual with the employees to check up on the Intranet and there cannot be too much information either. The employees want to be responsible for the information in it and there must be an easy way to publish the information and to keep it up to date.

[G] Unit

In a way the company already has an "Intranet", but not a structured one and not everyone can reach it. It is the [G] unit. In the [G] unit all the employees who have computers, have their own map. There they can put documents and other information they want other employees to see and read. It is just two things, the first is that they cannot put any confidential information there and the second is, that it is really hard to know where to find the information they are interested in. Because they have to know which employ-

ee who has the information and look under his or her map, but it is not sure that the information one employee wants is there at all. If the employee, who puts the information in his or her map, wants another employee to read the information she or he has to tell that employee with an electronic mail anyway. The employees outside the company can only reach the [G] unit if they are in the company network in another country.

Viewing an Intranet

The parts above depict what kind of information the Intranet can contain, and I think that is the type of information the company has to view to its employees. With different accesses of course, depending on the information is confidential or not.

As I argued for before (p. 21), I can see problems with the electronic mail and its role to support the salesmen with the rest of the information that the SFA do not support. I think this kind of information can come in an Intranet instead. In that way the electronic mail will not be loaded with information and it can instead be used to support urgent information as the information about the soup with defective consistency.

The Intranet will also view the responsibilities of different employees to enter the information into the system. For example, the production department can view the information of possible rest instead of sending it by electronic mail, and the sales manager can introduce the sales statistics so the employees know how the company is doing. Instead of sending electronic mail to a lot of different employees in the company, the employee who needs to forward the information only has to enter it into one place, the Intranet. It will then be up to every employee to check the Intranet and see what new information there is. It must be the right employee who enters the information so the Intranet will work, but this is the same problem as with sending the information by electronic mail. Some of the employees in the company want to be responsible for the information in the Intranet. These are the employees who see a need of viewing information to all the employees, inside as well as outside the company. The Intranet can support them with some of the information they need and everyone will have the same information. With one difference, depending on the roles and authority of the employees, they have more or less information. The whole company needs for example to know how the company is doing, but the sales manager will have a different knowledge of the sale then an employee in the production department will have.

If the company will have an Intranet with an information channel for the salesmen, they can use it to get customers questions answered. In this way the question and the answer will be on view to all salesmen and perhaps there are more than one salesman who wants to have the same questioned answered. In another way this will be a way to inform all the salesmen about the products and customer need, and the salesmen will enlarge

their knowledge. A system can be great in one situation but be wrong in the next. It is important that the system is adjusted to the employees and their needs. (Löwgren, Stolterman, 1998) That is why it is important to listening to the employees and see to their needs and what they can benefit from the system. It is quite impossible for a manager to know what the different employees are in great need of, if they do not discuss it with them.

With different project rooms on the Intranet, several employees will benefit from the information on it. A project room for the KAM's, Monica, sales director, sales manager and others involved in their work will get the same information at the same time. They will have the information gathered in one place and they will all know where to find it. They will have a chance to reflect on the information and then discuss it when they have a meeting. Reflection can direct to a collective of knowledge where the members can share a mutual model of their assignment (Docherty, 1993). It can be a complement to the face-to-face meetings.

For the purpose of designing usable and useful computer systems for co-operative work settings we need to know what makes work situations complex to competent actors and how computer systems may be of assistance to reduce or otherwise cope with this complexity. (Carsten, Schmidt, 1999) This may call for the Scandinavian school of participatory designs (PD). PD attempts to involve users in the actual design of systems and introduce knowledge about work, organisations, and interaction and so on into the design process. Fieldwork may provide data about the organisation of work and collaboration at work, and about the use of technology at work. (Button, 2000) The employees need to be involved in the discussion of an Intranet and have the opportunity to make their statement and to decide which employee is about to do what. A way to involve the employees and the managers into discussion of an Intranet is to use workshops. A workshop purpose is to help the participants to focus on the real world and how it is working instead of thinking on economy and technology. (Kensings, Halskov Madsen, 1991) The participants can discuss problems they have today and the advantages and disadvantages with an Intranet. It is a way for the employees to take a step back and reflect on their work. In the same time they can reflect on how an Intranet will affect them and their work. This will lead the Intranet to be deeply rooted in the organisation and when it is rooted it will not be a problem to acclimatise the employees to use it and get the information from it.

Through the Intranet, the company can inform the employees with general information, for example, what is going on in the different departments. If the employees know what is happening in the company, they will get feelings of "knowing" the company. That is to say, a feeling of belonging to the company, and not like now, when Carl does not always feel that he belong, since he never knows what is going on in there. Working outside the company, this may be a way to get a comprehensive picture of the com-

pany. Carl works in the south region and can visit the company when he collects advertising materials, but how is it to work in the north region of Sweden and never or rarely visit the company? With an Intranet all salesmen will at least have some kind of picture over the company through the information they can get on the different departments and what is going on in there. Senge (1995) indicates that our inner picture is built on conceptions and stories of how the reality works, and that our behaviour is dependent on it. One salesman in the north region may not have the same picture of the company as a salesman in the south. With an Intranet and some general information, they will at least have some kind of common picture.

Since the employees want to be able to see the Intranet in different ways with their own Web Pages or project room, and some employees only want to have a general Web Page with common information. They need to have a base upon where they can build there own Web Page with the information they want. Carsten and Schmidt (1999) argue for that since co-operative work cannot be prescribed to the level of detail that computer based systems require, the designer has to establish basic building blocks and platforms so that the employees themselves can establish a CSCW system fulfilling their needs. They continue with calling for attention to those new and better platforms and operating systems that have to be established. These must be based on an improved understanding of the essential characteristics of co-operative work and how these characteristics can be transformed into new requirements for the basic technology.

The co-operation and work is complex between the different employees and their information need is large, especially for those working outside the company as the salesmen and the KAM's. If the company really want to support them and help them to work effective they need to be listening to their opinions and wishes and not only minimise them. The company has to "demolish the walls", metaphorically speaking, and spread "light and air" over the information through an Intranet. The company needs to have fresh ideas and creativeness when it comes to distribute information and make it visible to the employees. It is a question of democracy, the employees who are affected of the information, also needs to be involved over the decision of how to view it and make it reliable (Muller, 1995). The advantage with an Intranet is that it will support every one of the employees in the company, wherever they are, and they will not have their electronic mail overloaded with information. They will have the right information at the right time, in the right place and it will give the employees the opportunity to jointly realise new ideas and co-operation. The Intranet can, if it is managed in a right way, break the borderlines between the different departments. It can make a more productive and effective co-operation. The disadvantage is that the employees need to take their responsibility and really enter the information into the Intranet and also keep it updated. Because if only one employee does not perform his or hers obligation the idea with an Intranet will

fail. It also has to be a habit to use the Intranet, even to those who are resistant to too much technology. If computer-based technologies will be a success or a failure is not only dependent on the technologies, it is also dependent on the employees who are responsible for entering the information.

Conclusion

The Sales Force Automation system (SFA) do support some of the co-operation and the information out to the salesmen, in that way it does support the salesmen at work. One of the SFA's advantages is that it supports communication and shared information space between the salesmen and the employees. The employee at the company has the same picture in one part of the SFA, the back office system as the salesman has in the other part, the front office system. Via the SFA and telephone they can have communication about the data. Today the salesmen get the information with two days delays, and this delay will disappear with the SFA. There are some disadvantages with the SFA, it is among others that it only supports some of the information that the salesmen needs. This means that the salesmen only get information with limitations. Another disadvantages with using the SFA is in some way the same as when the salesmen works with order book and pencil, they cannot get immediate feedback from the company when they do not have information in the system that the customer wants to know.

The SFA will in some ways change the co-operation and the information flow out to the salesmen, but in some ways it will not. It will still be the same employees, who enter the information into the SFA, who are sending the information out to the salesmen with the post. Other links in the information chain and co-operation will disappear or will be changed.

The company thinks that the salesmen will have the rest of the information, which is not supported by the SFA, in the electronic mail. This can be a problem since it can be a lot of information and some redundancy too, because the employees in the company will send the information they think the salesmen needs by themselves, instead of going through the sales support as they do today.

Some of the managers and the employees want to have an Intranet that supports them with all kinds of information, from business to staff issues and also common information of what the different departments are doing. I think this is a good idea since the information that the SFA do not support the salesmen with, can come in an Intranet. Viewing new products, sales statistic and problems with possible rest, will not only support the salesmen, it will support all employees who are affected of that information in the company. The Intranet can for example have a channel for the salesmen viewing customers question and answers to them. There can also be different forms of project room, where the employees involved in a certain project can get information about the project. It can be a bridge between different departments and different employees inside as well as outside the company. The employees will have the right information at the right time, in the right place. Then the electronic mail can be used to support them with information that is acute. Using an Intranet all employees will have access to the

same information space. The employees will need to have clear borderline for who is to entering which information into the Intranet.

Participatory design (PD) and workshops are good ways to take the employees into the discussion of an Intranet and of which kind of information it will support. Through workshops the managers and employees together can stipulate their responsibility. The employees know how the information flow goes and why the co-operation is the way it is. The workshop may begin to discuss these kinds of knowledge and through the discussions the employees will become absorbed in the Intranet. It is important to anchor the Intranet in the company and this may be a good way to start.

The company has to support its employees as much as it can, especially those working outside of it. If the employees get the tools they need and feel that the company supports them, they will work more effective and perform more. In the end this may take a turn for the company and the employees will bring in more profit.

To get the SFA and an Intranet to be supporting tools for the employees inside as well as outside the company, they need too contain the information the employees really needs and on their terms, since they are the once who will use them. The employees need to be involved in the process of development as much as they can. They do not have to be involved of the decision of what kinds of platforms the company will use. Instead they need to be a part of the decision of what kinds of information they will have in the Intranet and who will be responsible for entering which information in both the SFA and the Intranet. If the employees understand and feel that it is their responsibility they will do the job. If computer-based technologies will be a success or a failure is not only dependent on the technologies, it is also dependent on the employees who are responsible for entering the information.

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