New organisational forms can emerge when CSCW systems are implemented in the Swedish Social Insurance Board

Kerstin Grundén
kerstin.grunden@hb.se
School of Health Care, Borås University College

Abstract

The CSCW technology enables a fexible design of the organisation compared with the old technology. New organisation forms emerge that are flexible, boundless and process-orientated. In this article a case study is presented of the development and test of a prototype in Lotus Notes for dealing with social insurance matters within the Swedish Social Insurance Board. The focus of the case study is on integration of work organisation aspects into the development process of CSCW systems. The design of the technology and the organisation could affect the work organisation of the individual as well as efficiency and quality aspects. Scenarios are proposed as a technique for discussion and design of the future work organisation of CSCW systems.

Keywords: CSCW, Lotus Notes, social insurance board, work organisation, work situation, efficiency, quality, system development work, scenarios

1. Introduction

New organisational forms emerge in parallel with the adoption of the CSCW technology, which allows a flexible communication and co-operation regardless of time and space. This is a kind of paradigmatic change of the organisation. The new organisational forms are characterised in the literature as boundless (Ashkenas 1997), flexible (NUTEK 1996), process-oriented, customer-oriented and learning-orientated (Argyris & Schön 1996). Most of these taxonomies are, however, to some extent overlapping, and no clear definitions exist (Andersen & Chatfield 1996).

The work in the new organisational forms is often organised in teamwork. The communication and co-operation are flexible both horizontal and vertical. The structure of the work tasks and work practice evolves in the practical situation and is not so formally designed compared with before. There is more of a dialogue between the personnel. In such a dialogue it also important to reflect upon different work organisation alternatives. This article especially focus in what ways are the work situation, efficiency and quality aspects affected by different design alternatives of work organisation and technology?

The new CSCW technology enables a more flexible design of the organisation and the technology. Many public sector organisations by tradition have a rather big, complex and bureaucratic structure. But even in the public sector there are many efforts to restructure the organisation and technology in order to achieve quality and efficiency gains. The central level of Swedish social insurance board (SIB) has formulated a very big project “Försäkringskassan 2005” (SIB 2005) including a vision of the future work. The project “SIB 2005” also includes many sub-projects within the following fields: analysis of the work activities, competence, technology, planning and control (Försäkringskassan 1998a). The vision is formulated in a concentrated way in the following device:

> "Let the customer do what the customer wants to do, the computer what it is able to do, the personnel what only the personnel can do" (translation by the author) (Försäkringskassan, 1998b)

The vision includes a customer orientation; e.g. by more flexible ways of interacting with the customer[1]. The customer could e.g. execute some of the work tasks of today by new functions for customer service such as information through phone systems or Internet communication. The use of the new technology also is expected to lead to a reduction of the time needed for dealing with social insurance matters. The technology is seen as the main work instrument (ibid).

According to the vision the organisation is supposed to be less authoritarian than today and more process-oriented (with e.g. self-steering groups, networks) and more of a learning organisation (Jälmestål et al 1998). The civic administration (SW. Statskontoret) criticises the project "SIB 2000" for being too ambitious (Statskontoret 1997a). Important issues have to be solved before the vision could be realised; e.g. the implementation of the new pension system and adjustments of the existing information systems according to problems that has to do with "the year 2000" (Statskontoret 1997b)[2].

The project "SIB 2005" has partly financed the development work of the prototype ELAKT by the regional office of Bohuslän[3]. In the design of the prototype Lotus Notes and a relation database are combined, in order to enable electronic dealing of pension matters. The prototype has been tested since the beginning of 1998 by a local office at Kungälv.

The *aim* of the article is to present a case study of the development and test work of the ELAKT prototype with focus on the integration of work organisation aspects into the system development process. Within CSCW system there are more organisational alternatives to consider compared with more traditional technology. This article is part of the research project "Computer-supported co-operative work at the Swedish Social Insurance Board" (Grundén 1997, Grundén & Ranerup 1997, Grundén & Ranerup 1998).

2. Background

2.1 Some organisational and technological characteristics of the Swedish social insurance board

The social insurance board of Sweden is a very big and complex organisation that administers a considerable part of the total public welfare system. The social insurance system administers about 300 milliards Sw cr. a year (Social försäkring 4/98, p. 2). Within the organisation there are about 15.000 employees. 84 per cent of the employees were women and 72 percent of the employees were more than 45 years old in 1998 (Jälmestål et al 1998).

The organisation of the social insurance system is based on two different historical traditions (Arbetslivscentrum 1979). The sickness allowance has an old popular origin and emerged from initiatives of a popular movement. The old age pension has its origins in the public governments. These traditions illustrate contradictory interests between the individual and the society. The design of organisation also reflects these two traditions as it combines

[1] Notice the fact that the concept "customer" is used in the vision of "SIB 2000" instead of e.g. "client".
[2] In a report from the civic administration the field of social insurance is treated as one of the fields that is expected to have most problems due to the problematic of "the year 2000" (Statskontoret 1997b).
[3] The regional system development department of Bohuslän is from January 1st of 1999 a part of the new region Västra Götaland, due to a big reorganisation of the public sector in Sweden.

democracy and bureaucracy ideals. The regional social insurance offices are detached and managed by regional councils of regional politicians as elected representatives (SW. förtroendevalda). There are also particular panels of lay assessors (SW. socialförsäkringsnämnder) where additional appointed representatives are making judgements about different social insurance matters. In the organisation there thus is an intensive interplay between politicians and employees. The National Social Insurance Board (Sw. Riksförsäkringsverket, RSV) surveys the work with the social insurances, which is the top-level authority. There are three distinct organisational levels (central, regional, and local) in the social insurance board. There are also several external agencies that have the potential to affect its activities (Czarniawska-Joerges 1992).

The financial resources as well as the staff have been reduced during the last years as a consequence of strong rationalisation efforts. At the same time the administrative process has been made more complex by constant and numerous changes in the rules and laws that regulates the daily activities. The central management of the social insurance board as well as the minister for social affairs have expressed the expectation that information technology could be a part of solution for the rationalisation efforts of the organisation (Idling, 1996, Försäkringskasseförbundet 1997).

The technological heritage is a heavy burden, as it mainly consists of big, centralised systems built on old technology (Cats-Baril & Thompson 1995, Hedberg et al. 1986). The systems are mainly developed at the central level of the organisation. Most of the systems that were developed in the 70's are still working (Statskontoret 1997b). But there has also been some systems development work on regional and local level. It seems however, to be a struggle between the central, the regional and local levels of the organisation. The central developed systems are criticised by the users for not taking enough regards to user aspects. The regional and the local levels, on the other hand, have difficulties in taking an overall perspective of the systems.

2.2 The regional system development work in Bohuslän

The regional system development department of Bohuslän (RSDD) has about six systems developers employed that give support and education regarding IT issues to about 15 local offices of Bohuslän. The RSDD also work with systems development of information systems. The system "BohusRehab" (an information system for dealing with rehabilitation issues) is a big system developed by the RSDD. A similar system was at the same time developed by the central systems development department. The centrally developed system was criticised from many users for not being user-friendly. About a third of all users use the BohusRehab system instead of the centrally system. The RSDD employees work very close to the users. They themselves characterice their style of systems development work as an *organic style*.

The systems development work is seen as very important for the employees of the RSDD, as they want to develop their special competence in the field. The development of the prototype ELAKT is such an important project for them, where their competence can be developed. The system development work was partly financed by the central project "Kontor 2005", but the future of the ELAKT prototype has been very insecure, and there were simultaneously efforts from the central level to develop other similar systems. The central level has shown very little interest in the development work of the ELAKT prototype. But the manager of the RSDD has been very positive to the development of the ELAKT prototype and has struggled to have the prototype accepted. Even if the ELAKT prototype not will be used in the ordinary work the development and test work is seen as valuable. The development and test of the prototype have increased their knowledge about the technology

and of new ways of organising work when social insurance matters are dealt with electronically.

2.3 The introduction of Lotus Notes at the Swedish Social Insurance Board

The development of the ELAKT prototype was a part of a Lotus Notes project that was initiated by RSV in the spring 1997. Five different regional social insurance offices took part in the project. The ELAKT system was the only system developed for dealing with pension matters. The most common applications of Lotus Notes were conference systems and discussion databases. Another common application was reference databases where formalised information is stored as manuals or law sections. Lotus Notes was also often used as an Intranet system in order to distribute internal information. One office also made tests using Lotus Notes to facilitate distance work.

In August 1997 the final report was published with some evaluation of the different applications. Some experiences of Lotus Notes were very positive. Lotus Notes was seen as *one* solution to attain simplicity, security, accessibility and a comprehensive view within the field of social insurance work. In the report references also is made to other positive experiences of Lotus Notes in the Swedish public administration such as the administration office of the Swedish Riksdag and the national tax department. Some general negative experiences were however, also distinguished. The project was just a test project and the involved felt the future use to be very insecure, a fact that reduced their enthusiasm. The project also had low priority from the central level and from the central EDP-department at Sundsvall. The ELAKT system was expected to get the following expected consequences according to the final report from RSV:

- A complete and always available electronically act for each social pension matter in which the documents could be viewed in chronological order.
- The way of work was expected be more flexible, and not limited by geographical or organisational boundaries.
- Other personnel should be able to attain information about the status of the matter and the responsible person for each social insurance matter, in a more easy way than today.
- The security was expected to increase, as different persons could receive different authorities.

The evaluation was however, not based on real tests of the system.

3. A frame of reference

3.1 The test of the ELAKT prototype as a part of the research field of CSCW

The study of the prototype for dealing electronic pension matters could be seen as a part of the research field of Computer Supported Co-operative Work (CSCW). CSCW is a rather mature and broad research field, which has a history of more than ten years. Bannon and Schmidt give a general definition of CSCW:

> "CSCW should be seen as an endeavour to understand the nature and characteristics of co-operative work with the objective of designing adequate computer-based technologies (Bannon & Schmidt 1991, p 4).

Their definition takes the co-operative work among the people as departure for an analysis of the design of the CSCW technology support. The concept of *groupware* is commonly used when the perspective of the system is more technical. As Bannon & Schmidt (1995, p 13)

states there is a shortage of detailed empirical studies of consequences for the work processes when CSCW technology is used. The field of CSCW includes a broad field of technology such as video communication that mainly supports communication of more informal character, as well as complex administrative systems for more formal communication that allows communication regardless of time and geographical location. The electronically dealing of pension matters using the ELAKT system is an example of the latter case.

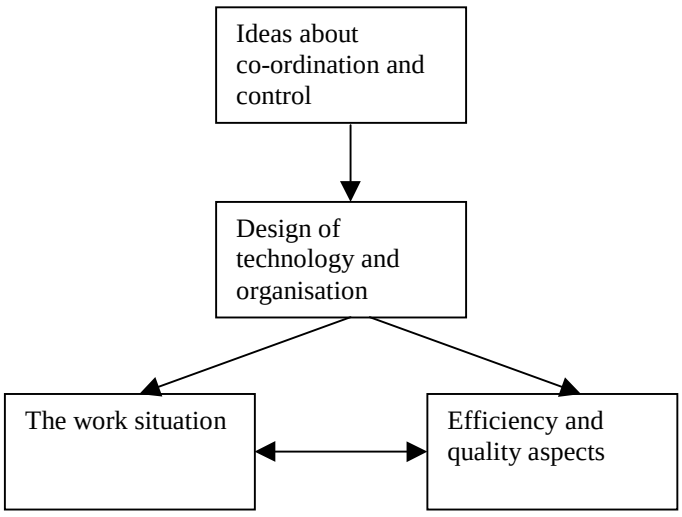
Still, the experiences of CSCW are not very systemised, and the terminology and concepts are neither very commonly accepted nor used. There are many studies done struggling to find out the central characteristics of different cases. One characteristics of CSCW is the *common information space* (CIS) as defined by e.g. Bannon and Bodker (1997). When information is organised in a database at one point in time and subsequently accessed by others in another time, the information is put in common. The workers are then able to *articulate their work* and thus *perform co-operative work* using the common information space. One aspect of the CIS that need to be further explored is the way work is organised within the CIS, in order to facilitate co-operation among the actors.

Several actors are involved in the dealing of a pension matter using the ELAKT prototype. The actors could be situated either within the organisational unit or outside the unit. The actor could even be situated in quite another organisation, but when they use the prototype they could co-operate within the same information space.

3.2 The design of the technology and work organisation can affect the work contents, efficiency and quality aspects

Grundén (1992) introduces a human-oriented perspective (the MOA perspective) of an organisation that emphasise important relationships among ideas about co-ordination and control, the design of the EDP-system and the organisation and possibilities for individual development in the work situation. In the figure below quality and efficiency aspects are added to the perspective.

Figure 1: Relationships between some important aspects of system and organisational design.



The relationships between the boxes of the figure are very complex as changes of work often generate political processes with power struggles among the actors.

Expected consequences for the organisation of work

Both the design of the organisation and the CSCW technology can be influenced by the ideas of the management regarding control and co-operation aspects. In a bureaucratic and hierarchical structured organisation there are more complex, centralised computer systems compared with a more decentralised organisation that also have more decentralised oriented computer systems, as Leifer (1988) describes. In the terminology of Mintzberg (1984) the administration of the Swedish Social Insurance Board could be described as a combination of a machine bureaucracy and a professional bureaucracy with mainly centralised computer systems. As the CSCW technology has the potential of supporting very flexible and also informal communication of an organisation it is an interesting future research issue to investigate to what extent this potential will be realised in the social insurance board.

Expected consequences for the work situation

Some important aspects of the individual work contents that can be influenced by the change of the organisation or the information system as Grundén (1992) points out. The implementation or change of information systems very often changes the patterns of *social interaction and co-operatio*n of the organisation. The contacts between the personnel can be reduced or increased. Change of media for communication can affect the quality of the communication. Face-to-face communication includes more of informal information than e.g. mail communication. Different communication media also require different co-ordination mechanism. Dealing with pension matters using CSCW technology can change the nature of communication and co-ordination mechanisms among the actors.

The *autonomy* of the work is one of the most important aspects (Gardell 1986) that also could be affected. According to the traditional taylorism the human being is seen more or less as a machine and an object for control. Other organisation theories emphasise to greater extent the importance of human values. In a professional bureaucracy or in an adhocracy (Mintzberg 1984) the workers has more influence on their work situation, based on their professional knowledge compared with a machine bureaucracy. The CSCW technology can be used in order to increase or decrease the control of the work, depending on the design of the system.

The workers *knowledge* of the work could also be changed when new technology is used. When a big information system was implemented in the Swedish social insurance organisation during the 80's the knowledge of the personnel became more formalised, abstract and computer oriented. Some of the old knowledge of the workers of the insurance system disappeared (Josefsson 1985).

When an information system is introduced the time for dealing with a matter very often is reduced. More matters can be dealt with within shorter time than before. The *work-load* for the individual is then increased, which could result in a work situation that is more stressful and has less *variation* than before. If the work situation instead is organised so that other work-tasks can be done instead, the variation will increase.

Consequences for the quality and the efficiency of the work

There is a strong pressure on the public sector to make the work as efficient as possible and produce services with high quality. *Efficiency* can be defined as the amount of utility or goal fulfilment that is reached compared with other resources. One aspect of efficiency is *productivity*, the volume of the production compared with the used time or salary costs. Efficiency was the motive for most of the organisational changes within the Swedish local government sector as a study by Ulfvensjö (1990) shows. This is similar to the efforts within the Swedish Social Insurance Board.

The use of CSCW can contribute to increased efficiency if the time for dealing with pension matters could be reduced. If more contacts with actors on different geographical locations can be done using the electronic database, then time for distribution of paper documents can be reduced e.g. If the time for dealing with a pension matter is reduced, the client has received a better *quality* of the service. The quality of the decision-making regarding the pension matter could also be affected if the information is stored in an electronic database. The availability of the information could be better when the information is stored electronically and the programs can execute more controls of the information. Other quality aspects such as *integrity* and *security* aspects could also be affected when the CSCW technology is used.

3.3 The notion of work organisation

The meaning of the concept work organisation has changed over time and among different researchers (Macheridis 1997). This study mainly focuses the structural aspects of the work organisation. The *organisational structure* can be defined as the way of co-ordination and distribution of work-tasks in an organisation, according to Mintzberg (1983). The organisational structure could be more or less consciously planned. In organisational theory a general distinction is between the *formal* and the *informal* organisation. According to a classical definition by Litterer (1963, p. 10), the formal aspects of an organisation are aspects that are consciously planned. One example of the formal organisation is an organisational scheme. The informal aspects are conceived of as the aspects of organisation that are not formally planned but more of less spontaneously evolves from the needs of people (ibid).

One example of the informal aspects are informal social networks in the organisation. An *institution* as defined by Berger & Luckman (1989) can be characterised as a combination of formal and informal aspects. An institution of the organisation is manifested when patterns of actions become a habit among several actors[4]. Such patterns of actions could serve as *norms that control the human behaviour* of the organisation. The EDP-system could be conceived as an institution of the organisation, according to Grundén (1992). As an institution can evolve as a combination of formal and informal aspects there are more *organisational alternatives* and *organisational choice*s compared with the use of more traditional technology. Each organisational choice has different implication for the work situation of the individual, efficiency and quality aspects. But it is more difficult to specify such new patterns of communication in advance compared with the use of traditional information technology. The CSCW technology is often used in more *informal settings* and facilitates more of informal communication compared with the old technology (Kraut, 1993). When CSCW technology is introduced in an organisation drifting of the use is a common phenomenon according to Ciborra (1996).

3.4 New traditions emerge for developing CSCW systems

The traditional life cycle model for system development work is not so relevant for the development of CSCW systems. Traditional system development work has a more rigid character; most of the detailed specifications of the system are done in the early stages of the process. Supporting co-operation and co-ordination with information technology shows different characteristics from traditional system information systems (Grudin, 1994, Kyng 1991). There is thus a need for a revision of traditional system development strategies, and a new tradition of methods for CSCW is emerging, *the computer supported co-operative*

[4] Conventions as described by Mark et al (1997) could be treated as one aspect of institutions.

tradition, according to e.g. Näslund (1996). Still this tradition is very immature. Very often this tradition takes the departure in disciplines such as sociology and ethnography as means for understanding the social interaction in the work (ibid).

A *pilot implementation* could be a successful method for video communication as Grundén (1997) indicates. For more complex CSCW systems with more of programming work *prototyping* as a system development method could be a relevant approach for the development process. The specification and test of a prototype is a kind of *experimental situation*. It is easy to make changes of a prototype. The test of a prototype in real settings could generate experiences of the potential for future alternative ways of using the technology, e.g. different ways of organising the work using the CSCW technology. The test of a prototype could be seen as a *learning process* that could generate knowledge about future design of the work organisation. It's important to integrate such experience from the test work into the system development process. Such work could be systemised in different ways. The experience from the test work about the future design alternatives of the work organisation could be communicated during special meetings between the system development personnel, the test personnel and other important actors.

Scenarios could be used as a design method form discussing future possible organisational and technological alternatives (of both formal and informal character) and their consequences for the individual work situation, efficiency and quality aspects. Scenario is a commonly used method for future planning situations and has its background in military war games. Special qualities of the method is its contribution to higher level of group understanding and *qualitative casual thinking* (van der Heijden 1996)

Bardram (1996) uses scenarios as a technique within the strategy of *organisational prototyping* in order to enable discussions of different ways of organising the organisation and the technology. Another similar method is *organisational games* (Ehn & Sjögren 1991), but this method only focus on organisational issues.

4. The test of the ELAKT prototype at a local social insurance office

4.1 The methodological approach

The *methodological approach* of the empirical work is that of *a qualitative case study* (Merriam 1994). Several *personal visits* to the organisation at different stages of the test work are made. *Qualitative interviews* are made with the main actors (system developer, project leader, staff at the local office that are testing the prototype). The interviews with the test personnel are made as *group-interviews* with two or three informants. The interview situation is then more socially dynamic compared with traditional interviews with one informant. The interview then also becomes a *learning situation* for the participants according to Kvale (1997), where different aspects of the issues could be analysed and discussed. The interviews took about an hour, in average. Most of the interviews were tape-recorded and re-written word by word. The researcher also attended one *meeting* where the test personnel were educated in the ELAKT prototype by the system development personnel. Some *written documents* have been studied, such as manuals and descriptions of the prototype.

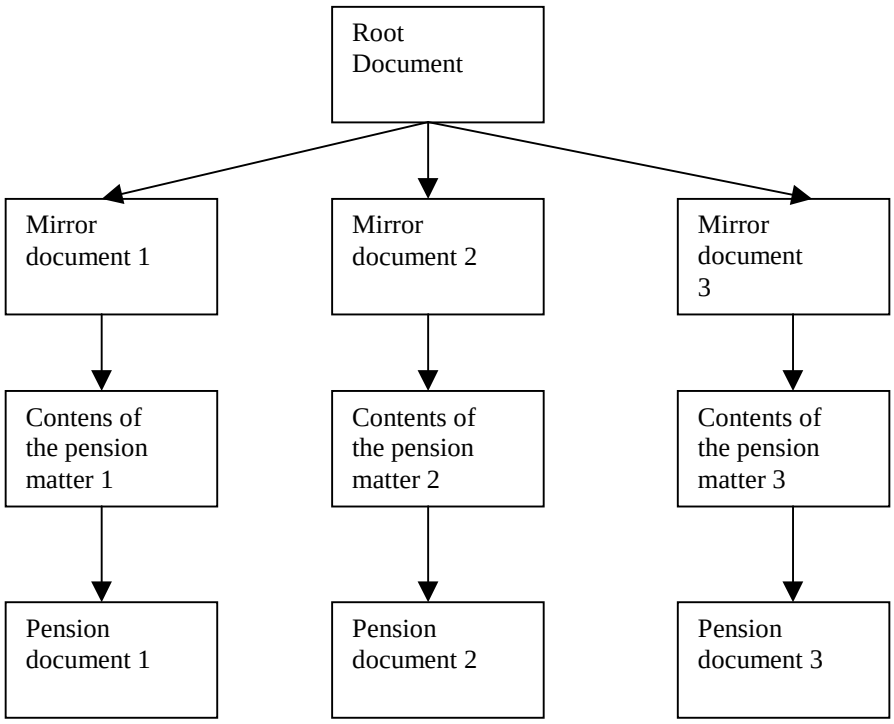
One aim of testing a prototype is to receive as good knowledge as possible about the future consequences that will arise when the prototype is used in the ordinary work. The informants therefore were asked, during the interviews, about their expected consequences of using electronic dealing of pension matters in ordinary work for the work situation, quality and efficiency aspects.

The fact that the prototype is tested of the staff of just *one* local office means that the potential of the technology to change the work organisation among different offices is not realised during the test. The test work is also made in parallel with the ordinary work, which means that the potential of changing the work organisation within the office is not realised. The informants instead are asked about their expected changes of the work organisation, changes of their work situations and expected changes of efficiency and quality aspects.

4.2 The ELAKT prototype system

The prototype system ELAKT consists of a relation database in Sybase with a graphical user interface in Visual Basic. The relation database is used for keeping record of current matters. Statistics can also be produced from this database. The relation data base is connected to Lotus Notes which is used as a document database The documents are stored in Lotus Notes. Information from the relation database can be mirrored and presented in Lotus Notes. All information needed for handling pension matters can be stored electronically in the ELAKT prototype.

Figure 2: The structure of the ELAKT prototype system (Jansen, 1997).



A root document is created for every person with a current or completed pension matter. Figure 1 shows the system structure for a person that has three current or completed pension matters (there could, of course, be several more).

4.3 The planned future work process compared with the work process today

The work process of today for dealing with pension matters is initiated by an application for social pension from the client. Most of the local offices have separated the further dealing of the matter into two different departments. The investigation department makes the investigation work that is necessity for the matter. In the investigation work contacts can be

taken with consultants or medical doctors. When the investigation work is finished and a final decision is proposed the matter is transmitted to the person that should report on the case to the social insurance committee. A date for the meeting is booked. The personnel at the pension department are informed about the matter and they start the accounting work. This work is finished when the final decision in the social insurance committee is made. If the proposal from the investigation department is allowed, information about the fact that the matter is finished submitted to the central information system in Sundsvall and the pension is paid to the client. After some specified time the matter could be followed-up. If the client makes a new proposal for social pension a new matter is initiated and a similar work process takes part.

Today all documents that are needed for pension handling are paper documents. The acts are physically stored in a big archive. When external actors such as consultants or medical doctors need information about the act copies have to be made and sent to them. The current dealer of the matter stores the act. When the work is transmitted from the investigation department to the pension department the act is physically transferred to the current dealer.
The overall functions of the work process of today are similar to the work functions of electronically handling of pension matters. When the local office receives an application for social pension certain information about the client is registered in the relation database and a root document as well as a mirror document is created (see figure 2). It is also possible to create specific documents that belong to the pension matter. Documents can be scanned into the electonical journal or transmitted as a Word, Excel or Jetform document or directly written into the database. All information that earlier was stored in a paper journal now can be stored electronically[5].

All further dealing with the matter is then registered in the ELAKT system. The investigation department is initially dealing with the matter. When they have finished the investigation, the person that should report on the case to the social insurance committee transmits the authority to the pension department for the further dealing with the matter in ELAKT, when the date for the meeting is noted. Then the investigation and the pension department can deal with the matter in parallel until the final decision is made. The responsible dealer of a matter can delegate the authorisation to read the whole electronic journal or part of it to consultants/advisors, deputies or the insurance doctor. The switchboard operator also could be authorised to read some elementary information of the journal.

The main changes of the work have more to do *with change of the work organisation and work methods instead of changes of the work functions*. The information about the matter is registered, stored, retrieved and transmitted electronically instead of paper documents. This implies a potential for future organisational changes, which could lead to consequences for the individual work contents, quality and efficiency aspects of the work.

4.4 Initiation of the test work

The ELAKT prototype was demonstrated for several participants from different local office in the region of Bohuslän, during the spring 1997. Several offices showed an interest to participate in the coming test work. The main advantages of the ELAKT system were interpreted by the participants as a way of keeping the pension documents in a better order than today. The system also seemed to reduce the need of sending documents by post to different actors of the pension handling. It would also be easier for actors at different geographical places to look at the same document in ELAKT.

The local office in Kungälv was chosen as a test office by the project management due to some reasons; the office was situated just about a SW. mile from the system development

[5] According to the law, decisions still need to be stored also as a paper document.

office. The co-operation among the staff was positive and they were interested in technical issue, as well as the manager of the office. One of the staff members also was a system administrator of the pension system. The test work of ELAKT started in the spring of 1998. About four persons at the local office in Kungälv took part in the test work in the beginning, from the department of investigation work as well as the department of pension handling. They attended two days of education in the ELAKT system[6].

4.5 Experiences of the test work

The test of the prototype was made in parallel with the ordinary work. Some of the pension matters were administered manually as well as registered in the system ELAKT. Some of the documents were scanned into the ELAKT system. The test personnel tried to do most of the test work during times of not too heavy ordinary workload.

According to the interviews, the test personnel were very enthusiastic and positive to the ELAKT system. The test work was causing them more work than just handling the pension matters in the ordinary way, but they thought it was very interesting to be able to take an active part of the development of the system. They were aware of the fact that it could be another similar system that is chosen for the future work, but they did not see this as a big problem. Instead they thought they learned a lot from the test work and they could try a quite different way of work than before, a way of work that they thought will be a kind of a model for the future work.

There have been *some technical problems* such as too long response time. There also have been some troubles with the scanner, but most of the troubles seem to have been solved by the system developers.

The *work organisation* of the local office has not been changed due to the test work. But *the individual work situation* for the test personnel has changed. They have to do more work than before. They have increased their knowledge about how to handle pension matters electronically

The test personnel receive *system support* from especially one of the system developers, who seem to be very enthusiastic and engaged in the work. He has continually contact with the test personnel by phone:

> "If we have not talked to him in three days, he phones us!"
> (One of the interviewed test persons).

They also could ask questions of more general technical character using a discussion database in Lotus Notes.

In order to follow the test work and discuss any changes of the system meetings are held with the system developers, the project leader and the test personnel. But these meetings have not been as frequent as in usual development work, because of the frequently used discussion database and the ELAKT database. Using the ELAKT database the system developer and the test person could look at the same document at the same time. The uncertain future of the ELAKT system due to decision made in the central part of the organisation have affected the speed of the development of new functions and changes of the system, according to a system developer.

4.6 Expected consequences of using electronic handling of pension matters in ordinary work

[6] As mentioned in section Method, the researcher took part in one of the days of education in the ELAKT system.

Consequences for the organisation of work

All of the informants think that *the distribution of pension matters could be more flexible among the different organisational units as well as among the social insurance staff*. You don't have to move the physical documents, you just change the authority. You then can reduce the workload for one office that not have enough personnel capacity at the time (eg due to vacancies or disease) and move the dealing of some pension matters to another office. The system can produce current *statistics of the workload* of each office (and each of the pension dealers) which could be used for decisions about change of the distribution of the matters.

The consultation of consults, advisors and the medical doctors could also be done in a more flexible way, according to the informants as they could be given the authority to read special insurance matters in the ELAKT system and discuss by phone with the dealer of the matter. One of the system developers expects the work to be *more specialised than today*, both on the office level and on the individual level. The competence of the staff will then be used in a more effective way than before.

Consequences for the individual work contents

All the informants think that more technical knowledge will be needed in the future work.

> "You need to be a technician in order to work at the social insurance board". (One of the test personnel).

The test personnel are somewhat worried about the fact that *some of the personal contacts could be less or replaced with electronic communication.*

> "Today do we solve much of the problems by meeting and talking to each other…What will happen if this communication is replaced with mail communication and you never meet the persons?" (One of the test personnel).

The social interaction among specialists and the dealers of the insurance matter could e.g. be reduced, as most of the information about the client is stored in the electronic system. The meetings could then be reduced and important information of a more informal character could be lost, which could affect the quality of the decisions that are made.

> "You can talk about people's attitudes and such things. Such information can be seen as banalities from the view of an outsider, but it is important aspects for us, I think". (One of the test personnel.)

One of the system developers expect the future work to be both more specialised for the personnel that deals more complicated social insurance matters. If the work is becoming more specialised, the formal work group could be spread around several offices, which could affect the personal contacts among the group members. The personnel that deals with insurance matters that are less complicated and could be finished during the visit of the client, could be more of generalists.

One of the system developers expects the work with electronically handling social matters to be more formalised and controlled. There could be controls in the programs of the contents of the acts e.g. that certain documents are needed.

> "Each dealer with pension matters has worked in a rather independent way, but I think this is going to be changed and the work will be more controlled and formalised… the dealer will probably regard this as negative". (One of the system developers)

It will also be easier for managers to receive information about the number of matters that each dealer is working with.

Expected consequences for the quality and the efficiency aspects of the work
Changes of the organisation of work and the individual work contents also can affect quality and efficiency aspects. Will there be any change of the *quality aspects*, such as the contents of the decisions that are made or integrity and security aspects, due to the use of this CSCW technology? If consultants and experts could be contacted in a more easy way the quality of the decisions that are made in the handling of social insurance matters could be increased. But if important informal information is lost due to less personal meetings then the quality of the decisions could deteriorate.

Most of the informants expect the electronically dealing of pension matters to be *much more safe than today*. One of the test personnel compares the security aspects of electronically dealing of pension matters with electronically dealing of patient journals at hospitals. The authorisation could be given much more restrictive with pension handling, as much less of the personnel need to have information of the contents of the matter, compared with the journal of the patient.

Will the *efficiency aspects* change such as the time needed for each pension matter or the division of work among the workers, when the pension matters are handled electronically? The test personnel expect *the time for dealing a pension matter to be reduced*. Today much time is spent on searching for documents that have "disappeared". There will be much less paper in the archives.

> "Today it's a terrible mess". (One of the test persons).

They also think the system will *reduce the need to make copies of documents* and send them to external actors such as experts, when handling a pension matter. Using the ELAKT system the actors could instead look at the same document at the same time. When a client makes a demand of getting the information stored about his matter, you also could print the information from the system instead of making copies of each document.

But the test personnel think that *the paperless office is a myth*. It is easier to read a paper than to read on the screen.

> "It is more or less impossible to sit and read on a screen the whole days".
> (One of the test persons)

There could also be a feeling of security to have the information on a paper document compared with the screen, according to the test personnel. It is easier to bring a paper if you are going to discuss with a colleague.

5. Discussion

The results from the interviews show that the test work has generated experiences and knowledge about possible ways of using the system in the future work. These experiences need to be systemised and integrated into the development process, in order to enable the articulation and design of the future organisation. Several *discussions and decisions* about the future design (both formal and informal aspects) of the work organisation when the CSCW technology is used, need to be made before the electronically dealing of pension matters can be fully integrated in the ordinary work. Scenario is a technique that could be used for such a discussion. Figure 1 could be used as a model specifying different scenarios, e.g. for

discussion of aspects of design of the following aspects of work organisation: *distribution of work tasks, control and co-ordination aspects, social interaction and co-operation, the paperless office.*

The distribution of work tasks
The use of electronically handling of pension matters integrated with the ordinary work will require decisions about the actual distribution of pension matters among different offices and individuals. The potential of handle the pension matters more flexible among different parts of the social insurance organisation will not be realised until many offices use the system. This could then be an instrument of using the staff *more efficiently,* as the workload could be held more constant. The stress of to heavy workload could then be reduced which could improve *the work situation of the individuals*. This way of distributing the matters in a more flexible way will probably also requires a change of the *organisational culture* towards a more co-operative and wholeness-oriented attitude. Otherwise there could be struggles among organisational units and among the staff. Important issues to solve are to decide which of the personnel that will participate in the decision-making about the distribution of pension matters and on what criteria's will the decisions be made (e.g. statistics about current work load).

Control and co-ordination aspects
The CSCW technology makes it possible to *control* the work more thoroughly than today, by monitoring the number of matters, and the way the matters are executed. The actual design of the control of the work process must also be taken into account in the design process. One control aspect to decide about is the authorisation of the personnel to read, change and write into the electronically acts. The authorisation of electronically acts could be made more restrictive than today, which could lead to improvement of such *quality aspects* as *integrity and security*. *Co-ordination mechanisms* could also be changed with electronically dealing of pension matters. The control of the co-ordination of authorisation could e.g. increase if the transfer of authorisation from one dealer to another is given by the electronic system instead according to programmed rules of the dealing instead of communicating in a more informal way among the dealers.

Another aspect of control is the degree of *formalisation* and *standardisation* of the work (Grundén 1992). The work could be more formalised and standardised when using the electronic database compared with working with paper documents. There could be controls in the program that specifies what kind of documents that each act should include as well as the contents of the documents. The degree of formalisation can affect *quality aspects* of the service and *the individual work situation*. There could be advantages of a high degree of formalisation of handling the matters because of the fact that all clients should have as equal an comparable dealing of a matter as possible. On the other hand a high degree of formalisation could lead to a more rigid treatment of the matters where the matters are suited to fit the rules in the programs and the individual adjustments could be more difficult.

If formalisation of the dealing of the matters will be affected *then the work situation and the knowledge* of the individuals also would be changed. The more of the knowledge of the insurance's that is programmed into the software, the less the dealer of the matters need to keep in mind which in turn can affect the learning possibilities and autonomy of the work situation. As knowledge of a technical character seem to be more important in the future work, a fact that could reinforce a tendency of more formalisation and standardisation of the work that also was a consequence also of the early stages of the computerisation within the social insurance organisation (Josefsson, 1985).

Social interaction and co-operation
When CSCW technology is used in the work, the ways of the social interaction and co-operation among the personnel could be changed. It is therefore important to be aware of that different ways of interaction and co-operation could affect the *qualities of the communication*. In face-to-face interaction more informal information are communicated compared with e.g. e-mail interaction. Decisions about suitable ways of social interaction and co-operation must be done so that important information not is lost due to the chosen way. Even if there are technological facilities that enable communication regardless of time and space, there probably also will be a need for personal meetings because of the quality aspects of the communication. The result from the interviews indicates that informal communication is important in the work process of today.

The interviews point to the fact that the individual work contents could be more specialised than today for the dealers with more complicated matters. This will require a change of the work organisation. One way is to gather the specialists within a field in one office and distribute all matters in a field to that office. This would probably reduce the personal contacts with the clients and affect the quality of the service. Instead the specialists could be distributed to many offices. Then the contacts with the members of the work group could be made using the CSCW technology, but the personal meetings will be re reduced. The CSCW technology could also be used for communication and co-operation with consultants and doctors on different geographical locations.

The paperless office
In theory the future use of the electronically system could reduce the amount of paper documents produced and distributed from and around the system. A reduction of the amount of paper documents also would reduce the manual work of storing paper documents and keeping them in order, which could increase the *efficiency* of the work. Documents stored in the electronic system also could be more available as they probably are easier to retrieve[7] compared with storing of paper documents in an archive. The vision of the paperless office was formulated decades ago, but still many offices seem to have a lot of paper documents (Hedberg, et. al 1987).

To what extent will the theoretically potential of the paperless office be realised in practice when pension matters are dealt with electronically? This aspect of the design has very much to do with informal ways for people to interact with the electronically system. Different people have different individual habits to produce paper documents from the system. Some people prefer to read information from a paper document instead of from a computer screen, especially when the information is discussed in personal meetings. The actual number of hours per day working with computer terminals for the individual also is of importance. Health problems such as pains from muscles or eyes could be a consequence of working too many hours on end, in front of the computer screen. The actual *security and availability* of the future electronically system also of course, could affect the *confidence of the system* and the number of paper document produced.

6. Conclusion

The study shows that there are important discussions and decisions regarding the work organisation that need to be made during the development process. Due to the flexible character of the CSCW technology there are more organisational alternatives of the design of

[7] There could of course be a risk also in the electronically system that documents are registered and stored in a wrong act, due to human failures, but probably there will be programmed controls preventing this situation.

the work organisation to take into account, compared with the use of more traditional technology, especially *regarding the distribution of work tasks, control and co-ordination aspects and social interaction and co-operation and "the paperless office"*. There is *a need of co-ordination between the design of the technology and the organisation* and to *integrate* such decision-making into the development and implementation process. Different design of the technology and organisation could lead to different consequences for *the work situation of the individual and efficiency and quality aspects. Scenarios* (e.g. using the figure 1 for formulating different alternatives) could be a method for articulation and integrating such discussions into the design process.

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