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VIEWS OF COMPUTERIZATION: THE TALE OF CARESYS

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Abstract

This paper deals with how divers different groups of people can view the effects of computerization. The introduction of an IT system in home help, CareSys, is used as an example. The main objective is to analyse the effects of computerization from the perspective of different social groups where the actors are seen as carriers of the computerization process. The results illustrates that depending on the organisational position, the effects of computerization are viewed differently.

Keywords: Effects of Computerization, Evaluation, ANT, Intended and Experienced Effects, Computerization, Home help

1. INTRODUCTION

Whether the introduction of installing and using an IT system is a success or not depends on whom you ask. A study by Vidgen & McMaster (1995) show that the effects different stakeholders attribute a system depends on their perception, and Robey and Boudreau propose that we should concentrate on the “[...] *interplay of opposing forces*” (1999:179) when we want to understand the effects of computerization.

The purpose of this paper is to analyse which effects of computerization different actors attribute to the process of computerization. The effects are viewed in a time-perspective – that is how the effects change during the course of computerization. An IT system for administrating elderly care is used as an example. This approach builds on two elements: firstly, to understand the computerization process and its effects from the view of its actors, and secondly to focus the actions in the computerization process from a time-perspective. Another objective is to compare how these views differ between different groups’ of actors.

The paper starts with a short introduction on the notion of actors as carriers of the computerization process, section three describes the case study. Section four describes the analysis the results and the paper ends with a summing up in section five.

2. ACTORS AS CARRIERS OF THE COMPUTERIZATION PROCESS

This work rests heavily on a social constructivist perspective in relation to technology (Bijker 1995; Latour 1987; Law 1992; Monteiro et al. 1995). The research objective for the technological constructivist is to describe technological development, not to be normative, offer value judgment, or determine whether a certain technology supports the interests of a specific group (Winner 1993). We feel that it is important, however, to acknowledge the consequences of IT systems, and analyse whether the introduction of a new technology supports the interests and values of certain groups on the expense of others. And to offer insights and explanations that may help us understand how IT can be developed and used to support, not only the strong, but also the weaker actor groups. Design and development of IT systems always involve moral value judgments (Klein et al. 2001:81).

A fundamental question within ANT (Actor Network Theory) is how different actors reach agreement on e.g. an artefact (Latour, 1987; Monteiro & Hanseth, 1995). Technology has no inertia, no power to move or change without the application of external forces. It is only through the actions of the actors that technology is spread. It is the actors who design, adapt and use the technology; they take the decisions and make the choices that create the process of computerization. An IT system is, by this definition, a result of the people and artefacts that have taken part in its creation (Law, 1992). That an artefact survives is thus not only a consequence of its intrinsic physical qualities, but also of its cultural, social, political and economical adaptation – its history of negotiations (see e.g. Winner 1980; MacKenzie & Wajcman 1999). The negotiations are carried out by different social groups (e.g. Kline & Pinch 1996) who are “[...] *identifiable social groups that play a role in the development of a technological artefact.*” (Pinch 1996:23-24) Walsham (1993) means that stakeholder assessments are vital when trying to make sense of the social context of evaluation, and in order to understand a social process as computerization we must see it through the eyes of the people who created it.

2.1 The Effects of Computerization

2.1.1 From Idea to IT system

As the IT system is built, it changes from a project to an object (Latour 1996). The process of computerization is a process of negotiation, and the IT system is a product of compromises and adaptations (Law 1992). Computerization is illustrated as a network consisting of actors, IT systems, texts, other types of artefacts, work methods, and system development methods etc. (see Figure 1). The degree of materialization creates the shift from an idea (illustrated by a question mark) to an IT system (illustrated by a computer). In the beginning the new system is highly abstract, consisting of thoughts, sketchy ideas on paper, plans etc. During the computerization these ideas are put into a more concrete form as high-fi and low-fi prototypes, system presentations, etc., and the various actors’ different views of the IT system will become more and more shared.

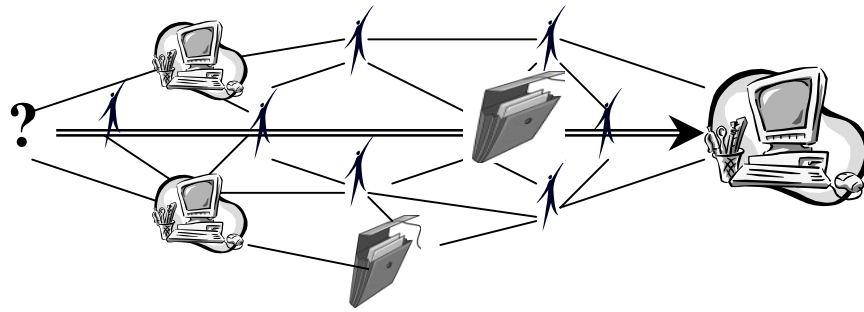


Figure 1: The Computerization Process as a network

2.1.2 Intended and Experienced Effects

Computerization is a social, economical and political process where the technology plays an important part (see e.g. Kling 1987; Iacono & Kling 1996). In order to analytically discuss the computerization process we suggest that we divide the computerization process in four overlapping phases: the planning phase, the design/adaptation phase, the implementation phase and use/maintenance phase (see figure 2) (Walsham 1993).

The planning phase refers to the initial discussions when the reasons to computerize are first raised. It is also here the change analysis and the work with the requirements specification takes place. In the second phase, design/adaptation, the system is implemented, tested and adapted. In the last phase, use/maintenance, the IT system is taken into use and maintained. With the help of this model of computerization it is possible to discuss the way intended effects differs from experienced effects (see also Davern & Kauffman, 2000). Intended effects are the effects different social groups believe the IT system will contribute to (phase 1 – 2), while experienced effects are effects of using IT (use/maintenance phase). The actors' different views of the computerization process are manifested in the effects they attribute to the use of the IT system. The intended effects show the intended and planned effects of using an IT system, and thus they mirror the role the actors attribute the use of computers within the organization. The same is true for the experienced effects. Depending on the interests and values the actors attribute different experienced effects to the use of computers.

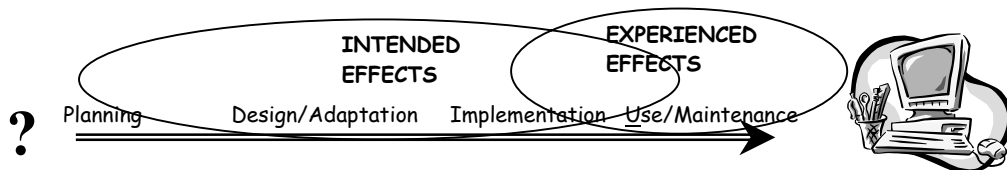


Figure 2: Reconstructed Computerization Process

The reasons for computerization are transformed into *intended effects* (see figure 2), which usually are associated with the use of IT as it is the desired future effects of computer use that is the reason for wanting to introduce a new IT system. The intended effects can be planned in the beginning of the project or emerge during the process of computerization, due to experiences of working with the project, as well as due to changes in the organization and the environment. *Experienced effects* are the organisational effects that actors experience from the computerization process. There are intended effects that are not experienced and experienced effects that were not intended. Of course, there are also effects that are both intended and experienced.

3. CASE STUDY

3.1 Research Method

Considering the nature of the research questions this study is classified as interpretive (Walsham, 1993; Walsham, 1995; Klein & Myers, 1999). The starting point is different social groups' views of the computerization process. This is also a critical study as the objective is to disclose what have been hidden and taken for granted. This is in line with Kling et. al. (2000) who argue that the critical comes into play when artefacts as IT systems are analysed from multiple perspectives, and when the goals and beliefs of different groups are examined and critically analysed.

This case is a reconstruction of a computerization process of a standardized IT system (CareSys)¹. We have been able to study the consequences of implementing and using the IT system as CareSys was implemented in 1998. One problem with doing a retrospective study is that we in some cases had problems making comparisons between the initial phase of the computerization with today due to lack of data.

The empirical data has been collected through interviews, document analysis and observations. The case centred on the work in one home help unit. The following social groups were interviewed: users (home help assistants and home help managers), project leader for the IT/Change-project, system owner, contractor and system administrator. The interviews focused questions such as reasons for computerization, the process of computerization, effects of computerization and the actors' roles in the process. Statements related to intended effects of computerization have in the analysis solely originated from documents, protocols dated from that time, since we wanted to minimize the time effect.

The second type of empirical data is historical records such as protocols from different political board meetings (1996-2001), documents directly linked to CareSys: contracts, system documentation, requirements specification, offers, etc and reports from the IT/Change-project.²

The work of the home help assistants has been observed as well as on one meeting where different stakeholders together with one of the authors and other researchers discussed the computerization of home help. CareSys has also been tested in order to gain an understanding of the system (for an evaluation of CareSys see Hedström & Cronholm, 2000).

3.2 The Social Groups of CareSys in 2001

The social groups included in the analysis of CareSys are the executive committee, section managers (users), home help assistants (users), system administrator, contractor, system owner/community care committee, and the IT/Change project (see figure 3).

The system owner – which is also the community care committee – is closely connected to the IT/Change project, as the IT/Change project acted on the behalf of the system owner. The executive committee are ultimately responsible for providing high quality home help for the citizens, and they decide on the available resources as well as the high-level goals for home help.

¹ The IT system will henceforward be called CareSys, which is a pseudonym.

² For reasons of confidentiality the documental records will not be referred to in their real name, and will not be listed in the reference list. But is available on request.

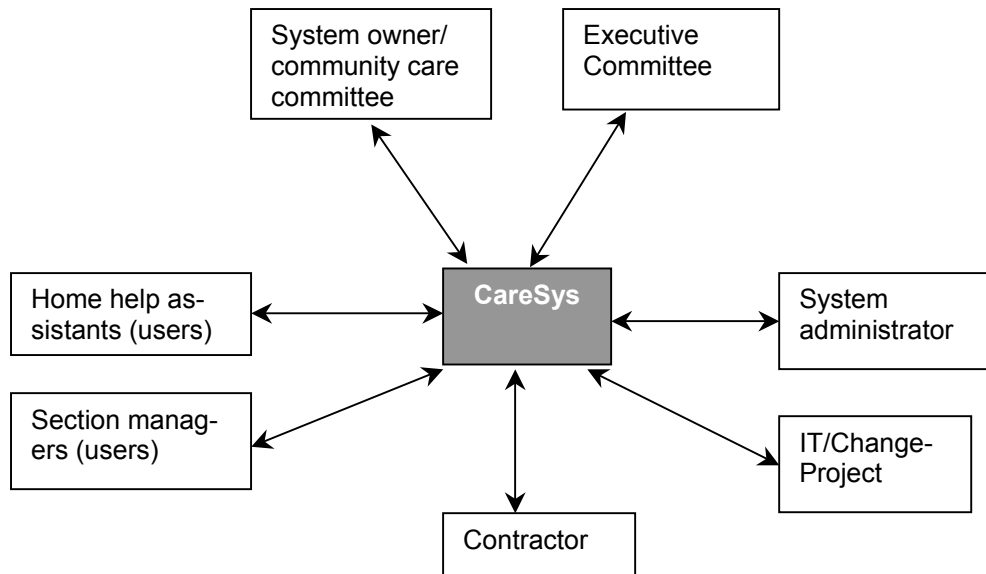


Figure 3. The social groups influencing CareSys in the use-phase

4. THE ACTIVITIES OF THE SOCIAL GROUPS

The activities in table 1 are actions by different social groups that in some way change the status of the computerization process, often official decisions that can be found in protocols or reports issued by social groups within the local government. These activities are sometimes an effect of a breakdown, as for instance when the executive committee repeatedly requested the social welfare department to integrate their system with CareSys, or when the service provider orders an evaluation of CareSys.

The story of CareSys started in 1994 when the board of local government decided to “*Inspect certain fundamental issues within the jurisdiction of the community care committee*” (Protocol meeting executive committee, 1994) They already had an IT system for debiting, but there was a need to purchase a system that could support more actors and processes and was cheaper to maintain and technically capable to deal with the shift to the year 2000. One of the important issues the community care committee wanted to inspect was development of simple and efficient administrative routines and systems for evaluating and follow-up the care with the elderly as well as the organisation (Commission document, 1994). Nothing is mentioned about IT-support, but from the formulation it is easy to see that they had the purchase of an IT system in mind. The project leader who in an interview said that they saw the need for an IT system long before the start of the official IT project supports this. An IT system is first mentioned in a report from 1995, when the project leader of the IT/Change-project states: “*The need for appropriate technology for time-registration that automatically will provide basis for debiting and invoicing is acute [...] technology for registering time will probably increase the productivity through knowledge about the actual circumstances.*” (Report, IT/Change-project, 1995)

The executive committee issued money to purchase an IT system in 1996. The same year the IT/Change-project creates a separate IT-project. An offer is sent out later the same year, and in 1997 a contract is signed with the contractor carrying CareSys. CareSys is put into use in 1998, and in 1999 an external consultant is commissioned to carry out an evaluation of the system. The same consultant also gets the assignment to try to increase the uses of CareSys. “[*The external consult*] is doing a project in [a home help unit]. Is [CareSys] something we can use? Or not? Can we improve [CareSys]?” (Interview, system administrator, 2001)

The politicians repeatedly demanded, without success, that the social welfare department should integrate their system with CareSys. In September 2001 the executive committee gives the community care committee’s secretariat the assignment to “[...] return with a plan for purchasing a

complete IT-support system for the local government.” (Protocol, meeting the executive committee, 2001)

Table 1. Events concerning the computerization process involving CareSys from a time- and social group perspective

	Contractor	Executive Care Committee	System Owner/Community Care Committee	IT/Change-project	Users (Home help assistants, Section managers) & System Administrator
2001		Decides to create a plan for purchasing a new IT system			
2000		Request to social welfare department to connect to CareSys			
1999		Request to social welfare department to establish connection with CareSys		Publishes final report from IT/-Change-project	
1998					CareSys starts to be utilized and administered
1997	Signs contract		Signs contract		
1996		Grants money for purchasing a new IT system		Starts IT-Project and sends out offer	
1995		Mentions technology			
1994				Starts change project	

The computerization process can be said to begin in 1994 (see Figure 4) when the Social Democrats presented a private motion where they among other things suggested that ‘[...] *elderly care in our local government should be analysed in a thorough and scientific manner, thus resulting in ideas and action plans for care until the beginning of the 21st century*’ (Private motion for the development of elderly care, 1994). A project plan for purchasing a new IT system for elderly care was presented in 1996 (Project plan for implementing a new IT system for elderly care, 1996). In November 1996 it was decided that CareSys was going to be the new IT support for elderly care (Purchase of CareSys, 1997). A contract was entered between the system owner (also the community care committee) and the contractor. CareSys was finally implemented during 1998.

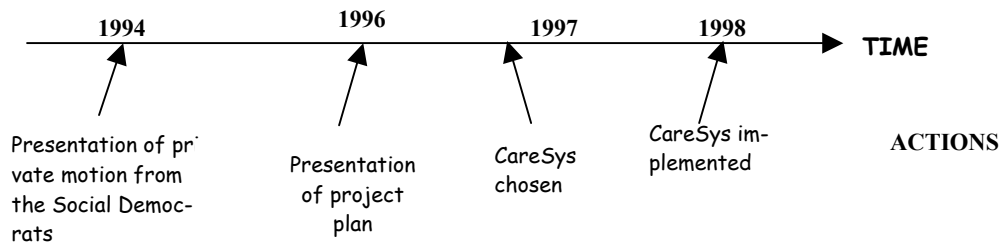


Figure 4: The Purchase of CareSys

4.1 Different Views of CareSys

The different social groups' intended and experienced are sketched in table 2 together with the initial reasons to computerize. In some cases social groups have evolved over time. Some actors started out as part of the same social group (the system owner and the system administrator was members of the IT/Change project), but in the last phase of computerization, the use phase, they have changed into several groups with different norms, values and interest.

System Owner/Community Care Committee

In the first phase of computerization, the community care committee view the installation of a system as way to increase efficiency and improve administration, which is more clearly defined in the second phase: *"The community care committee's primary interest in CareSys is to secure satisfying routines for debiting of fees, bases for compensation for service providers and following-up of achievements, etc."* (Protocol, community care committee, 1997) In phase three one can see that some of the intended effects have failed to be met as the politicians repeatedly demand the social welfare department to integrate their system with CareSys in order to fulfil expected savings in administrative efficiency. A representative of the system owner says that the effects are not as positive as expected even though the costs for administration probably has increased. He states that the main purpose of purchasing CareSys *"[...] was to ensure that the elderly obtained correct fees, but also to support organizational- and staff planning."* (Notes meeting, 2001) He says that the administrative routines concerning billing have improved. The system owner also states that CareSys is not used to its full potential.

Home help Assistants (users)

There is unfortunately no data related to intended effects of installing a computer system for the home help assistants. But the interviews disclosed that the effects they experience from using CareSys are contradictory. At one hand they experienced a lot of problems with CareSys, problems leading to disrupted work routines, which decreased the efficiency. These problems made them experience a dilemma between their nursing and administrative role.

The positive effects of using CareSys has to do with a better understanding of administrative routines and the home help assistants mentioned that they now better than before could answer the elderly and their relative's questions about their invoices. They enjoyed using CareSys; it had made them experts in this specific field. Using CareSys has changed their work routines and assigned them special areas of responsibility.

Section Managers (users)

We do not have any data on the home help managers before CareSys was installed. The home help managers mostly see the effects of using CareSys in terms of providing more accurate information.

Before the installation of CareSys they suffered from problems of updating many information sources, and there were problems keeping information consistent in the different locations. They say it is much better now.

System Administrator

The system administrator was also part of the project group responsible for the purchase of CareSys, and can thus be seen as standing for the same view as IT/Change-project, and as in earlier cases there is a lack of data from the initial phases of computerization.

She says the reason for purchasing CareSys mainly was to make the administrative routines for billing work, and that to purchase a system that supported the rest of the organization was less important: *“The process of billing was the most important reason to computerize. And if we also got a system that was appropriate for the organization was it of course a bonus. But it was most of all the debiting. It was what we worked hardest with and something that just had to work.”* (Interview system administrator, 2001)

She sees several different types of experienced effects. They now have a system that is technically working, has changed the home help assistants’ work routines as well as increased the home help assistants’ awareness about the importance of register accurate data. She states as well that using CareSys has increased the home help assistants’ knowledge about the organizational and administrative routines. Another effect she sees is that the installation of CareSys has forced the high-level management to raise questions about IT-management.

Contractor

When the contractors tried to promote CareSys they stated that the intended effects were improved strategic planning, increased efficiency and better administration. *“CareSys will provide improved management, simplified routines, improved access to information, improved legal rights for the individual.”* (Offer CareSys, 1996) They also meant that CareSys would support political decisions, increase the competency and organizational knowledge as well as increase service quality.

The experienced effects have not met the intended effects. The contractor was very disappointed with the limited use of functionality. The local government has, according to him, bought parts they do not use.

IT/Change-project

The initiating reasons to computerize were that they had an old and costly IT system that did not support the current organizational structure. They also felt they needed support for following up as well as providing an IT system for the whole organization.

The reports issued from the IT/Change-project in phase one states that CareSys’ intended effects were to reduce costs and increase productivity. The project sees IT as a tool for increased efficiency and improved administration. *“Technology for decentralised decision support and time registration increases the productivity by providing knowledge about the actual situation.”* (Report IT/Change project, 1996) They also wanted the future system to be an IT-support for everyone working with elderly care. The intended effects in phase two matches these effects.

The project leader states that using CareSys has made data more accurate, which produces better information for planning and managerial support. He says that using CareSys probably does not save any money, but that computerization has increased the IT-maturity in the organization and changed the users’ standpoints about computers. *“CareSys has provided the necessary basis for developing a more modern system, which might make it possible to spread the usage.”* (Interview project leader, 2001) He says that CareSys is not used to the extent it was expected.

He means that the reason they purchased CareSys was that the old system was going to be shut down and that they need a more modern system that was easier and cheaper to maintain and change. He also said that they saw the need for a mutual IT system for the whole organization.

Table 2. The Groups' intended and experienced effects of computerization

SOCIAL GROUPS	Initiating reasons to computerize (1995-1997)	Intended effects phase 1 (1994-1996)	Intended effects phase 2-3 (1997)	Experienced effects (phase 4, 1998 →)
Community Care Committee	New systems are needed for time-registration, debiting and documentation.	Increased efficiency and better administration. Improved organizational evaluation.	Secure satisfying routines for debiting of fees, bases for compensation and following-up achievements.	Lack of integration between different systems. Difficult to obtain information that provides a good overview.
Home Help Assistants	Not part of the process	Not part of the process	Not part of the process	Disrupted work and time consuming. Increased organizational knowledge. Increased service quality, more responsibility and different work routines. More enjoyable work.
Section Managers	Not part of the process	Not part of the process	Not part of the process	More accurate information.
System Owner/Community Care Committee	New systems are needed for time-registration, debiting and documentation	Increased efficiency and better administration. Improved organizational evaluation.	Secure satisfying routines for debiting of fees, bases for compensation and following-up achievements.	Better administration. There is a potential that is not used. Lack of integration between different systems. Difficult to obtain information that provides a good overview.
System Administrator	Not part of the process	See IT/Change-project	See IT/Change-project	A technically working system. More responsibility and different work routines. Increased organizational knowledge. Has forced the management to analyse the IT-organization.
Contractor	Not part of the process	Improved strategic planning. Increased efficiency and better administration. Support for political decisions in the system. Increased competency and organizational knowledge. Increased service quality.	N/A	Lack of spread of usage. Use a very small part of the system.
IT/Change- Pro-	Lack of inte-	Reduced costs	Composed in-	Did probably not

ject	grated IT-support. The current IT system is designed for a different organizational structure. High costs for maintenance and development. Problems with organizational and economical assessment. A great part of the home help organization lacks IT-support.	and increased productivity. Increased efficiency and better administration. Improved quality. IT-support for home help managers.	formation about the elderly. Simplify the administrative routines for debiting, registration, invoicing and statistics. A modern and appropriate IT-support for home help management. Will simplify their work considerably.	reduce costs as planned. Lack of spread of use. Increases organizational knowledge. More accurate data. Increased organizational IT-maturity. Increased planning and managerial support.
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4.2 CareSys as a tool for Efficiency and Organizational Ability

Efficiency and organizational ability are two categories that illustrate the different types of effects that can be found in table 2. Using IT as a tool for efficiency means to view the use of an IT system as a way to “[...] *reduce the cost of performing a particular process or task.*” (Fitzgerald, 1998:17-18) With organizational ability we refer to the organizational actors’ capability to carry out their work and “[...] *create value by action for its clients/customers.*” (Goldkuhl & Braf 2002)

The story of CareSys illustrates how the IT/Change project’s view of the effects of CareSys changes from mainly viewing CareSys as a tool for efficiency to seeing CareSys as tool that in particular increased the users’ ability to act within the organization. The representative of the IT/Change project (project leader) also saw the computerization process as contributing to an overall increased organizational ability to make decisions about IT-related organizational changes.

The story also shows that the executive committee as well as the system owner were true to their initial views of CareSys as a tool for efficiency while the home help assistants valued how well CareSys supported their work as home help assistants. That is whether CareSys increased or decreased their organizational ability. The system administrator who views CareSys as an instrument for changing the home help assistants’ work and roles gives voice to the same perspective.

We believe that the role of home help assistants is changing from a primarily nursing role to a nursing and administrating role. The installation of CareSys is one instrument to change the home help assistants’ view of administration and computer use. The project leader means that the computerization process of CareSys has changed “[...] *beliefs and attitudes*” concerning computer use and if “[...] *we said that it is time to go back to the old ways and register on paper, people would think we were crazy.*” (Interview, project leader of IT/Change-project, 2001) Organizational ability means different things for different groups.

4.3 CareSys – A Success or Failure?

CareSys can be seen as a failure as the system probably does not save money as expected, and the community care committee has had problems getting people using the system even though the system owner made enrolment inescapable since the use of certain functions is obligatory. That CareSys has had problems gaining support can be seen by the many activities intended to increase the numbers of actors using CareSys. The executive committee also seem to view the system as a failure as the only comment that can be found in recent material is that CareSys failed to live up to its promises and they now support the purchase of a new system. Also the contractor views CareSys as a failure and is disappointed as there is a negative view towards the system and the effects he hoped for failed to be realised.

From another viewpoint CareSys can be seen as a success, the project leader of the IT/Change-project argues that they now have the IT-competency to do a better job in purchasing and installing a

more modern system. *“A system that will be used by more people using more advanced functions.”* (Interview project leader, 2001) He says this even though he acknowledges that CareSys probably failed to contribute to cost reduction and increased efficiency. CareSys can be seen as a success also from the point of view of the home help assistants who were more positive than negative towards using the system. This even though they had experienced many problems and found the system difficult to use. They felt using CareSys has enriched their work, and increased their organizational knowledge leading to better service.

5. SUMMING UP

By drawing on examples from a case study within elderly care, we have illustrated how contradictory different actor groups can view the effects of computerization. There can be as many answers to the question of success as there are actors, which make it less than straightforward to value the effects of computerization.

That organizational effects of computerization are contradictory is also shown by Robey & Bodreau (1999) who propose that we should use research methods that illustrate and take into account these sometimes contrasting views. Viewing the effects of computerization from the perspective of different social groups together with following the trajectory of effects makes this possible.

We believe that it is fruitful to analyse the effects of computerization from the viewpoint of social groups. Dividing the computerization process into different phases has allowed us to explore how the effects of computerization changes over time, which also allows us to compare how the actors view effects during the different phases. Due to lack of data we have not always been able to completely follow the trajectory of effects in different phases of computerization, but the case study shows however that this will be possible in future research. The fragmented data has also limited the possibility to draw any definite conclusions on different views. This will also be tested in further research.

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