Automation and E-government Services – A Widened Perspective

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ABSTRACT
This short paper questions the focus on *automation* of e-government processes, and *efficiency* in e-government, which is prevalent in both research and in practice in Swedish governments. We argue that this focus on automation and efficiency might cause unhealthy work for civil servants, and services that do not meet the demands or needs of the citizens. Hence, the role of the civil servant must be reconsidered, from a mere "overseer" of an automated process, to a highly skilled worker that provides complex services and works efficiently with information. Moreover, research on e-government should elaborate more on the changes that needs to be done in the services provided, as well as which services that are suitable for the Internet and other media.

Author Keywords
E-government, user involvement, healthy work.

ACM Classification Keywords
H.5.2. User Interfaces---User-centered design. General Terms: UCSD, Management, Design, Human Factors. Additional Key Words: Participatory Design, Studies of Organizations and Usability Studies

INTRODUCTION

This short paper addresses issues on automation and efficiency in e-government which is prevalent in both research (for example [1]), and in practice in Swedish governments.. Results presented in this article describe and reflect this focus on automation and efficiency in a case study made at three large government organisations in Sweden. The aim of this paper is to motivate a discussion where snap shots from reality are used as exemplifications to illuminate our position.

According to Grönlund [2], e-government is still an immature research area with a majority of papers on case stories and product descriptions, and few articles on theory building and theory testing. Furthermore Grönlund reports a high focus on IT, and the organization as such, and less on the role of the organization in society.

The maturity of e-government is a whole research area, and governments can be in different stages of maturity, as described by Layne and Lee [3]. Efficiency, effectiveness and meeting the citizens needs are mentioned as a driving force, however, the authors do not describe how a service within a government should be changed to meet the need of the citizen, and which types of services are suitable for the Internet. In their model, the highest level of maturity is when there is a horizontal integration of government services, which means that services are integrated between governmental agencies. This is further elaborated in the article of Punia and Saxena [4] who has developed a framework for handling inter-organisational workflows.

The aim of the e-government is automation of existing services or processes, which we have experience in our research [5, 6]. This is further stretched by the study by Krokan and Midtbust [1] in which their aim was to understand why a governmental agency in Norway did not automate. Automation and inter-organizational services is also mentioned in an article by Arendsen and van Engers [7], they see the reduction of the administrative burden as one of the larger goals of e-government.

Another dominant discourse found in contemporary research concerns the user, and user involvement; however, they often have a high focus on the citizen. Følstad et al in their study [8] has interviewed project leaders in e-government projects, asking them about user involvement. Their result shows that the project leaders think they have good user involvement, although too little HCI-methods.

However, poor usability and a stressful work situation is still a significant problem in computer supported work, despite years of research efforts to increase focus on these issues [9]. We must not forget that the user of governmental services is both the citizens, and the civil servant, i.e. the civil servant that work within the government. e-Government applications risk causing even more health problems as the strong focus on the automation and efficiency results in applications with poor usability causing a bad work environment for civil servants. Moreover, the above-mentioned articles do not elaborate on the changing role of the users, neither have they elaborated on the change of the services.

This position paper aims at discussing and interpreting the high focus on automation, and the problems this focus might lead to. We claim that research within e-government must widen the perspective to include a

discussion about services and users and not only focus on different ways of integrating governmental systems or on the processes per se.

RESEARCH SETTING

We are involved in research projects together with three public authorities in Sweden. The projects are partly funded by the Swedish Development Council for the Public Sector (Utvecklingsrådet) where focus is at computer-supported administrative work and health factors. The project goal of the organization is to get better systems for their civil servants and by this healthy work and more healthy workers. All of the authorities are developing enhanced e-governance. The research goal is to understand how an organization understands user centered system design, implements the methods, and make use of them. We are also interested in understanding what are the obstacles and beneficial factors of the implementation process. Our research group has been involved in these projects, as researchers and to support the organizations' work.

Our research aims at influencing systems development in practice; hence research is carried out in real life settings with an action research methodology [10]. Data is gathered and analysed with a qualitative research approach with interview studies, meetings with stakeholders, analysis of documentation, observations and field studies.

Our research is based on a constructivist and interpretive perspective, where we create and understand our reality by using language through communication. Interpretations are flexible, situated, and socially constructed. Research based on case studies leads to contextual in-depth knowledge, and should not be generalized. We as researchers, the context, the organization and the conditions under which the research takes place, color the results. However, the organizations and the findings are not unique or unusual and therefore we hope that the reader will find the knowledge gained applicable in other settings, and as a background to create a discussion about the focus of e-government reserach.

SNAPSHOTS FROM REALITY

In our research we have found that some stakeholders to systems development, as for example the unions, and the human resource department discuss the future work of civil servants in terms of it being more complicated and complex due to automation of services and processes. From their perspective the role of the civil servants in the future e-government where processes are automated will be to take care of complicated cases and to "support" the computer when it fails to process a case.

However, there is also a discussion where the civil servants are seen as less skilled workers that can be replaced by an automated system. An example is the view of the future organisation described by several managers in one of the organisations. In this vision of the future, there are no civil servants and the only people working in the organisation monitor computers that process all the case handling work.

"My vision of the future is three men in a bunker inside a mountain."

Even though the manager cited above have an extreme view of the level of automation, there is indeed a strong focus on automation of case handling in all authorities participating in our research projects. Automation is seen as a way of increasing efficiency in the organization. Increased automation of case handling has top priority, and all the authorities but one have implemented electronic case handling at least to some extent. Visions about the future are based on the idea that citizens (customers) fill out and send forms and applications, etc, electronically, the main part of the case handling will be done automatically and computers will "make" the decisions. When deciding on what aspects to automate in the computer systems, the work situation is seldom considered and consequently consists of what is left when the computer has done its best:

"We automate things, and the rest is a bunch of tasks for users. And these are closely connected to how we have developed the automatic process. And what is left there is something I feel we have no control of"

One of the systems development projects that we have followed as a part of our action research project has the aim to improve the decision process with a better GUI for texts and decisions sent to the customers. The main reason for this is to make the process more efficient, as it has been quite time consuming with the old system. The project also aims at automating parts of the case handling. However, as the project manager is very interested in usability, and a good work environment, it has been important to include civil servants in the system development project. After the first iteration, where the new decision text system was tested with users we had a meeting with the project manager. The civil servants testing the system had spent minutes reading and controlling the automated decisions made by the computers. They did not trust the computer, and were not willing to send decisions to customers without reading and understanding them first.

Furthermore, our studies have revealed that there is a gap between the civil servants' work and work situation, and the way this work is described in the systems development. In the systems development projects, the civil servants' work is frequently discussed in terms of simple steps and operations, that may be predefined and automated in accordance with clearly defined rules and regulations this is also discussed by Boivie [11]. Little attention is being paid to such issues as routinisation and repetitiveness of work tasks, control over work situation, control over pace and order of tasks, social support and deskilling, all of which are well-known risk factors for occupational health complaints.

It was seen as a problem that civil servants have to make decisions in complex cases where the computer

fails to generate a decision and where "human" judgement is required. These "human" decisions were seen as subjective and open to interpretations – which is the reason that the computer fails to make them in the first place – and the civil servants making the decisions were seen as incompetent.

The design and development of computer systems are based on information flow models the case handling process in the organisations that we have studies. This results in IT systems that do not support the situated nature of work. One example of this is that the system does not support that the civil servant works with several cases at once, and there is no possibility to save the work done so far in a case if you want to move on to another case or if the telephone rings. Moreover, this perspective may lead to inflexible and rigid computer systems that shape and confine work situations, as is illustrated by this comment:

"The new computer system forces you to do things in a specific way. Previously we had different alternatives"

CONCLUDING REMARKS

In the previous section we have described a few snapshots from our research projects, and in this section we would like to direct the reader to a couple of interpretations and implications of this focus on automation of e-Government services.

One of the basic values underpinning automation of work in the governments included in our studies is the notion that human decisions are objective and based on facts. This means they believe that decisions can be translated into computer code based on computer logic with if- and else-statements etc. There is little recognition that decisions may involve judgements, and that case handling might include subjective and contextual elements that will be impossible to transfer to computers. It seems that the thoughts of Lucy Suchman have not yet reached these governments [6]. In the perspective on work and automation presented in the results section, humans and their work are often thought of as rational and predictable. Our studies indicate that there is a tendency to elevate the rational and structural dimensions of work, as in Morgan's machine metaphor [12]. The official and structured way of representing work in the organisations in our studies is through explicit models, such as described by [13]. This perspective on work obscures human aspects of work as a complex, situated and social process [14].

However, work is more than procedures that can be defined and fully understood. Work is also a complex social process, and civil servants constantly communicate and interact with each other to solve problems and to make decisions. From the engineering oriented perspective these aspects are blurred and ignored. Instead computer supported work is seen almost as a flow of information between the computer and the user, as in use-cases[1] for example. However, work has a purpose and is driven by goals or intentions and that work is specific to the context and shaped by circumstances of the situation as it evolves – i.e. it is situated and contextual [14]. Thus the engineering-oriented perspective on users' work and work practices as well-defined models ignores the situated and social nature work. The engineering-oriented perspective does not address users' practical knowledge about their work, their understanding about "what-to-do" as well as "how-to" in a specific situation [16].

It is essential to understand users' current work practices, and how these practices may be affected and improved by new technology. A fragmentary understanding of the work situation, and the perspective on work as procedures and sequential steps or operations, may result in IT systems that are poorly adapted to the users' needs, causing frustration and strain in the work situation. The system built does not support the situated, contextual nature of the work. In our studies, we have seen that systems development is often based on an engineering-oriented view of problem solving, where the system forces the users through a workflow divided into a number of windows on the screen. Each window containing only what is believed to be relevant information for the specific task, and with no possibility to go backwards or forwards or to save or pause. This engineering-perspective is closely related to the systems theoretical perspective, which places emphasis on technical and formal aspects of the relationship between man and machine [17, 18]. In an engineering-oriented perspective, users are primarily defined by their relation to a technical system.

What will be the role of the civil servant when more and more services will be automated? Layne and Lee [3] describe a situation where systems are integrated and automated the "government employees are now becoming more an overseer of the process than a simple task-oriented assembly-line worker". In our experience it is of utmost importance to include the users in the change of an IT-system, and consider the work that will be the result of the new IT-system.

Another problem is that the user in the form of citizens, are not making decisions or using the service in a way that the government anticipated, as in one of the examples mentioned above. When automating, or putting a service on the Internet, the behaviour of the user might change, and they might pose different, or new demands on the government. This can already be seen in other e-service markets, for example banking and travel agencies as shown in the work of Värlander [19]. Värlander shows in her work that there is an overflow from e-services that affect the physical world

[1] **use case** is a technique for capturing requirements of systems that is used in Rational Unified Process
15. Kruchten, P., *The Rational Unified Process: An Introduction.* 2003: Addison-Wesley Professional.

in that face-to-face meetings become more important. E-government research can learn something from this research, and try to find out which kind of services are more suitable for virtualisation, and which should be kept in the physical world. Moreover, the role of the civil servant will change and the work will not merely be "overseeing" the automated process, rather it will be focused on meeting the new kinds of demands from the citizen, where efficiency regarding time will be less important, and information efficiency more important [19].

AUTHORS EXPERIENCE IN THE FIELD

Åsa Cajander and Elina Eriksson are PhD-students at Uppsala University, with Jan Gulliksen as supervisor. Both authors are involved in a research project with three Swedish governments as partners. The aim of the research project is improving usability and health in computer-supported administrative work.

The HCI-group at Uppsala University has been involved with e-government related research for the past decade. One major concern is that too much emphasis is put on the user experience of citizens using e-services, before the civil servants and their changing work. When moving more services to the Internet, the work of civil servants will also change. The issues around healthy work and civil servants are important and perhaps not that prevalent in e-government research. Even though the aim of the project is not first and foremost e-governance, the presented perspective plays an important role for all research in the area.

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