

Designing Intranets for Viability

Approaching Organizational Empowerment and Participation

Christina Amcoff Nyström



Department of Informatics
Umeå University

Christina Amcoff Nyström
Department of Informatics
Umeå University
2006-02-06

E-Mail: christina.amcoff@miun.se

ISBN: 91-7264 002-2
ISSN: 1401-4572, RR – 06.01

Printed by Print & Media, Umeå University, Umeå

Organisation	Document type	Author
Department of Informatics Umeå University SE-901-87 UMEÅ	Doctoral dissertation Date of issue 20 April, 2006.	Christina Amcoff Nyström christina.amcoff@miun.se http://www.miun.se

Title: Designing Intranets for Viability - Approaching Organisational Empowerment and Participation

Abstract

Intranets appeared in the mid-1990s and were perceived as the answer to the need for the integration of existing Information Systems into organisations. Despite the fact that there has been extensive research regarding implementation, development processes, policies, standardisation vs. creativity and so forth, the potentiality of Intranets has not been fully exploited. Intranets offer many advantages in the form of working networks that support and enable empowered employees to participate in the development of the organisation, to enable the measurement of essential functions and to monitor undesired conditions and find suitable functions that support daily work. The research approach in this thesis has alternated between analysis, empirical studies, and design. Current literature, research findings in the form of articles, etc., are analysed, an empirical study of five organisations is conducted and finally a design of possible functions is accomplished. In the analysis of the state-of-the-art, current research can be grouped into four topics partly overlapping each other; questions concerning informatics, organisation theory, knowledge management, and design. Urgent issues for further research are identified as mainly belonging to the topics informatics and organisation theory; management and strategy, empowerment, further development processes, use, and roles. Findings from a study of five Swedish organisations show a

need for identifying the philosophy of technology in the organisations in order to make an organisation's view of technology common throughout the organisation. Furthermore, functions supporting daily work are lacking to a high degree. Further lacks and demands are identified, as well as potential functions and new possibilities. In the next section, the Philosophy of Technology is related to an Intranet. The discussion is based on a model which consists of the concepts Conception, Use, Technology, and Policy. Making the Philosophy of Technology common in organisations is connected to the empowerment of employees and is a guarantor, along with the influence of the VSM on the design, for the impact on and participation in the processes of an organisation. The next part deals with possible advantages of combining the cybernetic model, the Viable System Model, by Stafford Beer, and an Intranet. It is found that the VSM can support the design of Intranets according to essential functions such as Early Warning Systems connected to production units and levels that are to be made aware of undesired conditions in the organisation. Furthermore, functions for amplifying and attenuating information – both between parts of the organisation and between the organisation and the environment – are to be designed. Further examples of functions supporting the organisation, in order to make it viable, are given. The main contribution of the thesis is the identification of core functions in an Intranet as establishing functions for supervision (Early Warning Systems), attenuating and amplifying information between the organisation and the environment and between subparts in the organisation. Furthermore, the interface is to be designed so the underlying technology is “visible:” Where are the different parts of the Intranet located physically? Who delivers information to the different parts? Who uses the functions? Who is responsible? The transparency of the interface makes the philosophy of technology visible throughout the organisation; the concepts are the same, the actual use is the same as the intended use, and policy is active and well known and finally, the possibilities and the limitations with/inherent to an Intranet are known among the users.

Finally, examples of further research are given – both as regards the implementation of Intranets based on the VSM design and as regards making the interface transparent.

Keywords

Intranet design, Viable System Model, empowerment, democracy, autonomy, recursion, viability, participation

Language

English

ISBN, ISSN and KEY TITLE

ISBN 91-7264 002-2,
ISSN 1401-4572, RR-06.01

Number of pages.

240

Preface

It has been a long journey since the first discussions at the former Department of Informatics in Östersund about the possibilities to become a Ph D student with funding from the Knowledge Foundation. In the end of 1999 it became clear that the discussions resulted in three postgraduate students and I was one among them. Without the funding from the Knowledge Foundation, this thesis had never been written – Thank you very much. Especially thanks to Birgitta Andersson who is the person I have been in most contact with during these years. Accordingly, the studies went ahead with a flying start and in the beginning there were a lot of travels between Östersund and our associated department at the University of Umeå. Inspired lecturers – both within the NIRS¹ collaboration as well as visiting lecturers from other universities – illustrated well the width of our discipline, Informatics. Thank you all involved in the different courses and seminars for interesting discussions and seminars – both lecturers and other participants. Especially thanks to Prof Åke Grönlund who administrated the NIRS collaboration at that time. Professor emeritus Hans-Erik Nissen, turned a lot of ideas up-side-down and was also a careful reader of our first efforts with formulations in research plans. “This is questions for at least 30 doctoral theses” was a typical comment in the beginning – Very instructive indeed! Thank you Hans-Erik, for your engagement in seminars and valuable comments in the beginning. Doctoral studies are many time a very lonely work and colleagues and tutors are very important as sounding boards during different periods. A critical mass is needed according to the number of participants in seminars, discussion groups and so on. This critical mass has varied due to maternity leaves etc. Discussions and seminars are very important when the inspiration gives out

¹) Nordic Informatics Research School

and more fuel is needed. Fortunately maternity leaves ends and new postgraduate students appear on the scene so the “academic dialog” together with them and other colleagues can be continued. Thank you all – no one mentioned and no one forgotten. I would also like to thank Björn, who also had the opportunity to study with fund from the Knowledge Foundation and who was a co-author of the first articles. Thank you and good luck in the future! Prof Stig C Holmberg was my supervisor and did never (at least not as I recognized) doubt in the outcome of my studies. He has encouraged me and supported me with a lot of ideas. Thank you very much Stig, for fruitful discussions and support when it was needed. The last half-year I noticed that the journey was indeed a process in itself. Suddenly I saw the light in the tunnel – and, the tunnel had been very long and dark for a long time – I really felt the result of my writing and I understood what the contribution was. The process has not been as straight as an arrow rather irregular and even sometimes a feeling of losing ground, but it is a process of learning and that is what postgraduate studies is – a learning process. Writing in a foreign language is not easy and I am very grateful to Deborah Fronko who helped me with the proofreading and corrections, often in a great hurry – thank you! I will also mention Ulrika Danielsson and Gunilla Egonsdotter who have encouraged me when the self-confidence was low – thank you both. And last but not least I would like to thank my husband Sören who has supported me all the way from the beginning.

Aspåsnalet and Östersund, spring, 2006.

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

Content of the thesis

List of publications	4
Introduction.....	7
The Problem Domain – Research Focus, Delimitations, Assumptions, and Purpose of the Thesis.....	11
Some core concepts	15
Ideals and Assumptions	16
Theoretical Base and Research Approach.....	16
Different methodologies – Research questions and suitable methods	19
Mode of procedure in this thesis	20
The research process.....	21
Thesis – the Structure	27
Paper 1: Banck, B., Nyström, C. A. (2002). Viable Intranet for Creativity and Quality – The VICQ project.	29
Paper 2: Banck, B., Nyström, C. A (2005). Intranet - Ongoing Research and Future Directions.....	32
Paper 3: Banck, B., Nyström, C. A (2005). Intranet Use - A study of Five Swedish Organisations.	36
Paper 4: Nyström, C. A. (2006). Philosophy of Technology - A Foundation for Intranets.	40
Paper 5: Nyström, C. A. (2006). Demands on Intranets - Viable System Model as a Foundation for Intranet Design.	44
Paper 6: Nyström, C. A. (2006). Design rules for Intranets according to the Viable System Model.....	48
Paper 7: Nyström, C. A. (2005). Viable Intranets for Viable Organisations – Incentives for the Shared and Common Intranet.	51
Synthesized results of the VICQ Research Project, connection to the different papers, and the purpose of the thesis.....	56
Reliability and Generality of the Results	61
Evaluation of Method/Research Approach and Suggestions for Improvement.....	63
Further Research.....	64

Designing Intranets for Viability – Approaching

Organizational Empowerment and Participation

Reflections on the Assumptions.....	65
Closing Remarks	67
References.....	69

Paper 1: Banck, B., Nyström, C. A. (2002). Viable Intranet for Creativity and Quality – The VICQ Project. A previous version of this article was published as: Banck, B., Nyström, C. A. (2002). Intranet - a tool for power and control or a possibility to increase the quality of work *in* Second Conference for the Promotion of Research in IT at New Universities and University Colleges in Sweden (Ed.) Bubenko, J et al.

Pages 75-96

Paper 2: Banck, B., Nyström, C. A (2005). Intranet - Ongoing research and future directions. Advances in applied Systems Research, Volume I, pp. 9-18; Lasker GE (ed). International Institute for Advanced Studies in Systems Research and Cybernetics, Windsor, Ontario, Canada. ISBN 1-894613-35-X.

Pages 97-116

Paper 3: Banck, B. & Nyström, C. A (2005). Intranet Use - A study of five Swedish organisations. *Journal of Organisational Transformation and Social Change*, Vol. 2, issue 2, pp 153-180.

Pages 117-162

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

Paper 4: Nyström, C., A. (2006). Philosophy of Technology - A foundation for Intranets. *Journal of Systems Research and Behavioral Science, in press.*

Pages 163-178

Paper 5: Nyström, C., A. (2006). Demands on Intranets – Viable System Model as a foundation for Intranet design. *International Journal of Computing Anticipatory Systems, in press.*

Pages 179-196

Paper 6: Nyström, C., A. (2006). Design Rules for Intranets according to the Viable System Model. *Systems Practice and Actions Research*. Accepted after revision, 2006-01-06, to be published.

Pages 197-220

Paper 7: Nyström, C., A (2005). Viable Intranets for Viable Organisations – Incentives for the shared Intranet.

Pages 221-240

List of publications

Paper 1: Banck, B., Nyström, C., A. (2002). Viable Intranet for Creativity and Quality – The VICQ Project. A previous version of this article was published as: Banck, B., Nyström, C. A (2002) Intranet - a tool for power and control or a possibility to increase the quality of work in Second Conference for the Promotion of Research in IT at New Universities and University Colleges in Sweden (Ed.) Bubenko, J et al.

Paper 2: Banck, B., Nyström, C. A (2005). Intranet - Ongoing research and future directions. *Advances in Applied Systems Research*. Volume I, pp. 9-18; Lasker GE (ed). International Institute for Advanced Studies in Systems Research and Cybernetics, Windsor, Ontario, Canada. ISBN 1-894613-35-X.

Paper 3: Banck, B. & Nyström, C. A (2005). Intranet Use - A study of five Swedish organisations. *Journal of Organisational Transformation and Social Change*, Vol. 2, issue 2, pp 153-180.

Paper 4: Nyström, C. A. (2006). Philosophy of Technology - A foundation for Intranets. *Journal of Systems Research and Behavioral Science*, in press.

Paper 5: Nyström, C., A. (2006). Demands on Intranets – Viable System Model as a foundation for Intranet Design. *International Journal of Computing Anticipatory Systems*, in press.

Paper 6: Nyström, C., A. (2006). Design Rules for Intranets according to the Viable System Model. *Systems Practice and Actions Research*. Accepted after revision, 2006-01-06, to be published.

Designing Intranets for Viability – Approaching
Organizational Empowerment and Participation

Paper 7: Nyström, C., A. (2005). Viable Intranets for Viable Organisations – Incentives for the shared and common Intranet, white paper, not published.

Designing Intranets for Viability – Approaching
Organizational Empowerment and Participation

Introduction

*Den mätta dagen, den är aldrig störst.
Den bästa dagen är en dag av törst.
Nog finns det mål och mening i vår färd -
men det är vägen, som är mödan värd.
Det bästa målet är en nattlång rast,
där elden tänds och brödet bryts i hast.
På ställen, där man sover blott en gång,
blir sömnen trygg och drömmen full av sång.
Bryt upp, bryt upp! Den nya dagen gryr.
Oändligt är vårt stora äventyr.
Karin Boye ur "I rörelse" från "Härdarna"*

Organisations in the long run strive for survival. In order to support organisations for information exchange, several types of software have been developed during the past decades. Concepts such as Computer Supported Cooperated Work, Groupware, and Intranet are examples of phenomena created to facilitate different kinds of information exchange and knowledge sharing. Nevertheless, several questions remain about to what degree these kinds of software fulfil different demands raised by the organisations. Furthermore, what are the remaining problems with the design of Intranets and how can these problems be solved. Questions related to these kinds of issues are raised and answered in this thesis.

The IntraNet (sic) phenomenon was originated as a concept in 1994 by Steve Telleen (1998b) and was thought to be the solution to problems concerning mainly internal

¹) Reproduced by agreement by Mats Boye, 2005-05-03, who is the possessor of the copyright to the work of Karin Boye.

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

communication and the integration and sharing of information systems within organisations through the unified interface that a web browser offered (Heide, 2002). It could be questioned if a web browser as a unified interface was the sole solution for the integration and sharing of different kind of recourses – information, functions, and communication facilities such as whiteboards and chat rooms. Was the integration successful or did it create more problems to solve?

In spite of this popularity, implementation of Intranets in organisations was not as unproblematic as developers might have thought. Furthermore, high expectations on the Intranet concerning potential for knowledge sharing, interaction among members of the organisations and information spreading were not fulfilled. In spite of the potential of Intranets, there are unexploited promises due to underused functions, missing information and/or introduction to the technology. Consequently, there is a need for making the view of an Intranet common in organisations and visualizing the possibilities and limitations of the technology. This “common making” of the view of technology and making possibilities and limitations known in the organisations, is further discussed and recommendations for how to solve these kind of problems are presented.

Some of the problems, demands, and factors related to Intranets, are visualized in Figure 1 below.

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

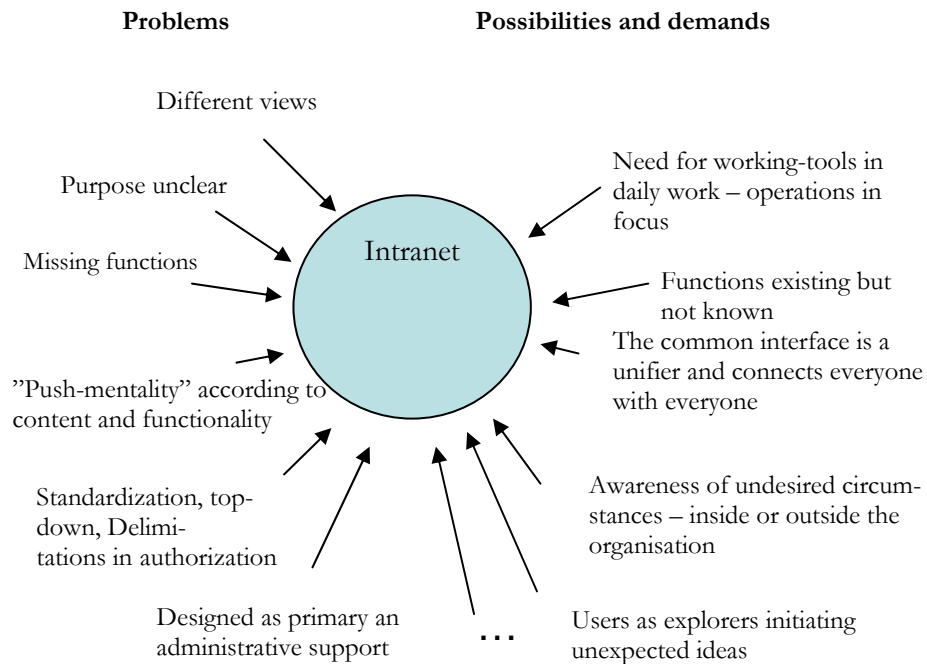


Figure 1 Problems, demands, and possibilities related to Intranets

In Figure 1 above, problems are listed on the left-hand side and possibilities and unexploited potentiality on the right-hand side. Some of the problems can be solved by making the view of the Intranet to a common concern in the organisation. Other problems can be solved by better introduction and education. According to the organisation and its goals, the view of the Intranet and the employees should be that the Intranet is an essential potential for information/knowledge spreading and sharing. Furthermore, there is often an unused potential in the view of employees as persons with limitations in access and authorization. Many researchers have already argued that great

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

advantages can be attained if the employees are *empowered* to access the *entire* Intranet – they should have equal access to corporate information (Kelly, 1998; Stenmark, 2002, 2003; Nonaka and Takeuchi, 1995). There are also advantages for the organisation if the employees know the goals and different purposes, the background factors to decisions, and can follow the outcome of production. If goals and other important issues influencing the results of the organisation are known, accepted and shared, the employees feel *solidarity* with the organisation and will act according to that feeling. Furthermore, knowing more about what is going on, the organisational structure, other employees, and strategies can be an essential part of *learning* (Jonasen, et al 1999) and also a suitable way of introducing new employees by letting them introduce themselves. Hence, increased *empowerment*, encouraging the employees to *participate* in change processes – both in terms of changes in the organisation as well as changes in the Intranet - a move from an Intranet seen as an administrative support, to the view of an Intranet where operations/production is the most important task, should lead to essential benefits for the organisation.

Many existing problems concerning Intranet use and design today could be solved and unexploited potential better utilized if an Intranet is designed as a *viable support to the organisation*. In the prolongation, an Intranet as a common concern within the organisation, will lead to increased engagement. Keywords for success are empowerment of employees, participation in change, autonomy, and viability. These keywords are further described in the section “Some Core Concepts”.

The Problem Domain – Research Focus, Delimitations, Assumptions, and Purpose of the Thesis

With roots in Informatics and the influence the Scandinavian School has had on the view of users, information system development, and participation in the design processes (Bansler, 1990), the problem domain and research focus initially became focused and delimited to the *development processes* and the *use of Intranets*. This has consequently led to a delimitation on the angle of approaches such as Human Computer Interaction and its importance for the use and acceptance of Intranets, technical architectures, and standards. These aspects are of course of great interest in terms of successful implementation but they are beyond the scope of this thesis.

The background of the interest in Intranets could initially be explained by the existence of a simple file hierarchy used at my department in the early 1990s. This file system was intended to work as an information bank where all important documents – meeting protocols, notices, policies, and other directives - as well as working material concerning course development and course realization, were stored. Everyone at the department had access to the file hierarchy and was also encouraged to deliver adequate material in order to make things easier for new employees, assistant lecturers, and others who were concerned. It appeared quite early that there were some critical aspects that should be fulfilled if the file hierarchy was to work as intended. The main problems that caused the shutting-down of the file hierarchy were poor filing routines (existence of out-of-date documents), missing documents (unwillingness to deliver material and share it with others) and different views of the importance of the file hierarchy (unreliability on the number of documents as well as the completeness of material concerning for example a certain course). These problems are not unique

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

and could be found as typical problems in the use of group-ware as well as Intranets. My interest was awakened though I could not understand the unwillingness – as I thought in the beginning as the only explanation – to share documents with others. The explanation was – as I found out later – more complex and difficult to understand and explain and demanded further investigation. Hence, thoughts and ideas about information sharing and exchange, arenas for interaction and cooperation and different tools for supporting employees in organisations were awakened. Could an Intranet be a solution?

Purpose and research questions are quite broad and not very distinct in the beginning of the research process related to the writing of a thesis. It all starts with a fuzzy interest in an issue concerning something such as file hierarchy. As the process continues and the researcher takes part in findings from literature, dialogues with colleagues, and participation in conferences, the problem becomes more distinct and defined and concrete questions arise. At this time, the formulation of problems and classification of questions is recommended as a base for future empirical studies in the research area. The empirical study, described in Paper 3 aimed at formulating and delimitating in order to generate additional research questions as well as increase the author's knowledge about the area. As the process continues further, more detailed questions arise which support the performance of the overarching aim of the research. The process can be described as in Figure 2 below :

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

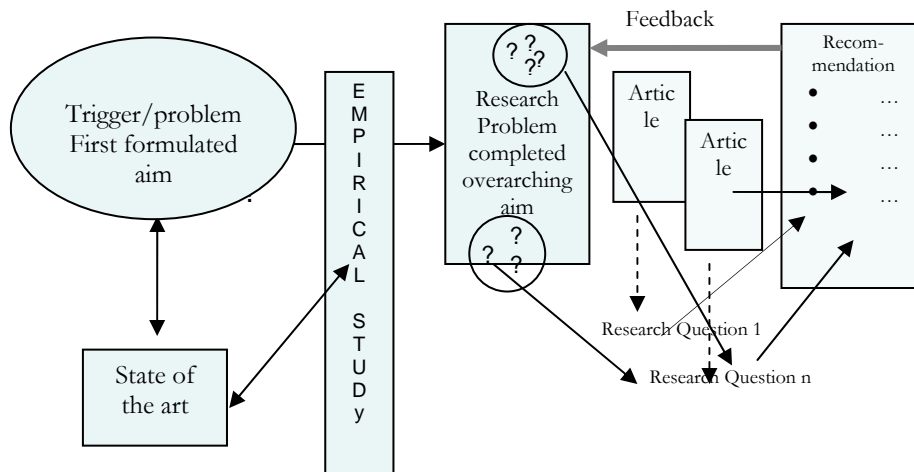


Figure 2. The travel from original fuzzy problems to an overarching objective divided into sub-research questions and how final recommendations are related to the objective

Finally, the different articles in which sub-research questions are raised and answered, are summarized, analyzed and synthesized in recommendations, “lessons-learned,” a model, or whatever form the result takes. However, these results are the answer to the overarching objective and its division into research questions.

Organisations strive in the long run for survival. Consequently, information systems such as an Intranet should support the organisation in this effort. Intranets should be designed in order to support viability in the organisation. In this thesis different issues important for the design of Intranets and supporting viability in organisations are identified, proposed, and motivated. For natural reasons, a lot of delimitations have been set. The main focus is on viability and organisations in which an Intranet can be a suitable and working tool if it is designed from this approach.

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

As a result of the problematic situation described above, problems and desires related to Intranets and the unused potentiality related to an Intranet as a common concern for the organisation and its members, the following was stipulated:

The aim of the thesis is to attain a deeper understanding of the way an Intranet should be designed in order to increase and maintain the viability in an organisation and to support empowerment and participation among members and make them view the Intranet as a common concern.

In order to fulfil this purpose/aim the following research questions were formulated:

- In what way can an Intranet become a common concern for the organisation and its members as a tool for supporting the tasks in daily work?
- In what way can *the view* of an Intranet become common in the organisation?
- What characterizes a viable organisation?
- What kind of IT support does a viable organisation require?

The order of the questions is chronological after the included articles and papers. The first two questions are related to an Intranet as a common concern. This could be carried out through the connection of philosophy of technology to the Intranet concept as described in Paper 4. Viability is important to maintain and develop. The next two questions deal with viability and suitable functions that support this viability and are answered in Papers 5 and 6. Viability is characterized by empowerment and participation and the last question is discussed in the section Conclusions:

- In what way can empowerment and participation become a natural part of the organisational culture?

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

These research questions are divided into sub-research questions which are raised, investigated and answered in the different articles and papers (included after the cover paper). In the section “Synthesized Results ...” these research questions are related to the sub-research questions and compliance with the aim is discussed.

Some core concepts

The key words presented in the introduction need further explanation. ***Intranet***. Intranet technology allows the presence of other IT systems unlike most IT and can be understood as a unifier integrating existing IT systems and providing “legacy Systems” with a new graphical interface – the browser. Consequently, traditional system development methods are not suitable for this kind of system. Intranet offers possibilities to create, share, and communicate issues important for the organisation and can be a cornerstone in the organisation’s knowledge management. ***Viability*** is important for organisations but what is viability? In this thesis, viability is to be understood as the ability to react before undesired conditions appear and to be aware of threat, changes, and new demands, both from inside the organisation and from the environment. This is close to anticipation, adaptation, and the feed-forward mechanism. ***Autonomy*** is related to viability. Autonomy means independence and the ability to manage and make decisions on important issues independent of other departments/divisions involvement. Autonomy can also be related to survival due to the need for fast decisions in critical situations. ***Empowerment*** is the belief in members of organisations, authorizing them to use different functions in the organisation’s information systems such as an Intranet. ***Participation*** depends on the encouragement of members/employees to actively be a part of change processes and giving them

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

possibilities and the authorization to influence their situation in the organisation.

Ideals and Assumptions

Researchers always have some kind of rucksack with respect to ideas and ideals. The author of this thesis is no exception to this rule. In this thesis some assumptions which have been made must be presented and motivated. In the next section, “Theoretical Base and Research Approach,” these ideals/assumptions are related to different researchers. *Reflections* on how the ideals and assumptions have influenced the author and thereby the results of the thesis are discussed in a later section: “Reflections on the Assumptions.” The following assumptions are presented in the thesis:

- Intranets are important as a foundation for disseminating and sharing knowledge and information.
- It is a benefit to the organisation if the employees to a high degree are empowered with respect to access and authority.
- It is a benefit to the organisation if the organisation is characterized by an open climate and democracy so that participation in change processes is natural.
- Operational units in an organisation should be autonomous in order to make them viable.

Theoretical Base and Research Approach

The main sources which constitute the theoretical base in the thesis are stated below.

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

Historical background to the Scandinavian School and its impact on the view of Information Systems Development has been collected from references as Jörgen Bansler (1990) and his colleagues (Bansler, Damsgaard, Scheepers, Havn, and Thommesen, 2000) and Börje Langefors (1966 [1973]; 1995), as a pioneer in the area of information systems analysis.

The ***historical differences between Sweden and other countries*** with respect to users' participation in systems development and influence on the working environment can be referenced to the Swedish Confederation of Professional Employees (SCPE, 2004). The move from the traditional model of ***communication***, the publisher-push model to ***the pull-model*** is described by Heide (2002), Telleen (1997), and Stenmark (2002). Telleen also points out the importance of ***open communication climate*** as critical to Intranet implementation success (Telleen, 1998a).

Jan Damsgaard and Rens Scheepers (e.g. Damsgaard and Scheepers, 1999, 2000, 2001, Scheepers, 1999) have inspired this research through their findings on ***roles, maturing phases, and use modes***.

Different aspects from the area of ***Knowledge Management*** (Polanyi, 1966 and Davenport and Völpe, 2001) have to some extent been related to findings from the study carried out in 2002 (Paper 3).

Rob Kling (1999; 2000) can be identified as the founder of the concept of ***social informatics***. His view of technology in which he points out context and the social environment as essential has been adapted in the thesis.

Roberta Lamb and Elisabeth Davidson have also been inspired by Rob Kling (Lamb and Davidson, 2000). Furthermore, they discuss the phenomenon ***Intranet islands*** which to some extent can be explained by the choice of approach systems developer uses in the beginning of developing and implementing intranets – ***top-down or bottom-up-approaches/initiatives*** (Lamb, 2001).

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

The findings from the empirical study (Paper 3) have been analysed and compared to the use modes by Damsgaard and Scheepers (1999), maturing phases (Damsgaard and Scheepers, 2000), and the need for balance between organisation, doctrine, human capital, and technology (Holmberg, 2001). Findings from Bansler et al (2000) show the phenomenon of blurred roles between the user and the developer which did not exist in the study (Paper 3).

The Cut-P² Model, described in Paper 4 was adapted from Stolterman (2000) and contributes to the development of an Intranet with a possible framework for discussing and understanding an organisation's technology through the concepts *conception, use, technology and policy*. This “framework” aims to make the view of technology common in an organisation through visualisation and dialogue about technology and its use and influence on the employees. Furthermore, in the area of ***Philosophy of Technology***, Barabasi (2003), Kelly (1998), Duane and Finnegan (2003), Jonassen et al (1999), Kayworth and Leidner (2000), can be mentioned as important to the results.

The findings in this thesis are based on the belief in ***empowerment*** (Kelly, 1998; Stenmark, 2002; Duane and Finnegan, 2003; Beer, 1972; 1974), Jackson, 2003), ***democracy*** (Beer, 1972; Barber, 1984, Jackson, 2003), and the ***power of networks*** (Barabási, 2003). Banathy (2004) extends the concept empowerment with the concept “***self-empowerment***” which is in line with the author's own thoughts. Banathy says:

*even if people fully develop their potential,
they cannot give direction to their lives, they
cannot forge their destiny, they cannot take
charge of their future—unless they also
develop competence in taking part directly*

²) Cut-P – shortening for Conception, Use, Technology and Policy

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

*and authentically in the design of the systems, organisations, and communities in which they live and work. This is what self-empowerment is about.*³

Hence, empowerment is a benefit both for the organisation and the employee.

An Intranet is an example of a network where the production units carry out the main tasks and the administration/bureaucracy has a supporting function. Hence, ***the administration has a subordinated role*** compared to the production units and consequently, the latter should be ***autonomously*** designed (Beer, 1972, 1974, 1985, 1999).

Different methodologies – Research questions and suitable methods

According to research in the area of Informatics, there are a lot of suitable methodologies and approaches – e.g. Actor Network Theory (Law, 1992), Structuration Theory, (Cohen, 1987, 1990), and Action Research methods (Baskerville and Wood-Harper, 1998). These approaches should be chosen depending on the type of problem to be solved. If the researcher is focusing on phenomenon such as citizens and their relation to IT and changes in this relation – e.g. citizens' use of e-mail in 1994-2004 - ***quantitative approaches*** such as different kinds of statistic analysis can be applicable. Questions concerning e.g. differences in frequencies in use and the classification of e-mail use (utilitarian, private, hobby activities) can be investigated and described with statistic methods such as frequency tables, and different measures of central tendency. Other research directions such as an investigation into attitudes, experiences and more subjective values, are normally supported by more

³) Banathy (2004), page 207.

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

qualitative approaches where case studies, focus groups, interviews and participated observations are common tools/methods. If the degree of complexity in the problem domain's context is high and the familiarity with the problem is low, this indicates a need for a methodology of a more explorative nature. In such a case, Soft Systems Methodology, SSM, (Checkland and Scholes, 1990) and Grounded Theory (Glaser and Strauss, 1967), are examples of suitable and well known approaches in those situations.

Problem domains can also be investigated with different degrees of *theoretical or empirical attempts*. The first case can be exemplified by an analysis of research findings using Structuration Theory (Cohen, 1987, 1990). In the latter example, the researcher can intervene to different degrees in the research process. If they intervene with the purpose of developing, using, testing, and evaluating a system development method, the researcher is involved in *action research* (Baskerville and Wood-Harper, 1998). The latter example demands a lot of effort from the researcher with respect to time spent, engagement, and ability to communicate, educate, and learn. Nevertheless, the approach or rather mode of procedure, is chosen based on the type of problem as mentioned above. In the nature of Informatics as a quite young discipline there are also a lot of approaches depending on the span of different questions and research objects. In the next section, the mode of procedure used in this thesis is presented and motivated.

Mode of procedure in this thesis

Identification and analysis of existing research literature was carried out with the aid of several sources. In order to identify (search and find) adequate references, several search engines and databases were used. As the number of references increased, for each article, the reference lists were studied and

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

further references were identified. The process continued with further searches on the new authors appearing, author affiliations, and organisations. The process is iterative by nature and has been started several times during the process of writing the thesis. The articles were categorised and analysed due to type of identified problem, methods/approaches used, keywords used, theoretical or empirical work, findings, suggestions for further research and references.

The mode of procedure used in the study (Paper 3) can be divided into the following sections; 1. Definitions and state of the art, 2. Identification and presentation of an a-priori model with initial presumptions pertaining to possible aspects, influencing the use of Intranets, 3. Formulation of questions about aspects that influence the Intranet, 4. Design of interview guides (managers and IS staff: interview guide 1 and production staff: interview guide 2). 5 Realization of field survey, 6. Results, analysis, and conclusions. The procedure was explorative and influenced by the characteristics of Grounded Theory in terms of classification of material.

In Paper 4, adequate literature and findings from the Philosophy of Technology have been related to an Intranet. A model – the CUT-P model – adapted from Stolterman was further designed by dividing it into sub-concepts.

Papers 5-6, constitute a critical review of the VSM as a cybernetic model and findings from the use of VSM in relation to an Intranet. The result was a design of suitable and necessary functions for a viable Intranet.

In Paper 7 results from Papers 4-6 are analyzed, synthesized, and summarized. Recommendations for designing Viable Intranets and for further research are given.

The research process

The researcher has many considerations and choices about directions. These choices and the motive for different

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

standpoints must be made visible so the reader can judge if the results are reasonable. The author's journey started with a brief scanning of the area of Intranet research. A lot of beliefs and conceptions were reconsidered during this identification of the state-of-the-art. Naturally, a thesis in the form of papers and a cover paper must be presented in some kind of order. This does not mean that the first paper presented, is the first one chronologically. Originally the state-of-the-art article – Paper 2 – was the first paper – see Figure 3 below, where the papers are presented in order and according to the questions they answer. The purpose of identifying the state-of-the-art of the area was first to increase the author's knowledge of intranets, second to identify areas where research was urgent and third, to delimit some research questions for further investigation. Another factor that influenced the "age" of the papers, is the procedure of communicating with journals and reviewers. This takes time and sometimes you recognize that you are working with two or three papers at the same time and the publication date can differ so that an older study may be published after studies that have been carried out later. This can be very confusing and this thesis is no exception.

The state-of-the-art was meant to be a base for the next paper – Paper 3 – in which a study of Intranets is presented. When we read the state-of-the-art article, we can see that the study in Paper 3 is included. The first version did not include the study but was revised with findings from the study in a new version. So the state-of-the-art can either be presented *before* or *after* the study. A little confusing!

In parallel, or rather after the work with the identification of the state-of-the-art, an umbrella project – VICQ – was created and possible subprojects were considered. Furthermore, ideas about dissemination and research approaches were identified. This paper – Viable Intranets for Creativity and Quality – the VICQ project – is presented as the first paper in this thesis despite the chronological order. Remaining ideas from this first paper are ideas of the umbrella project and the brief description

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

of ongoing research and common problems in the area. Ambitions about taking part in action research and testing different research approaches were good intentions but not at all realistic considering the limit time of postgraduate studies. The paper answers the question: Why should we study Intranets? So, the first two papers are based on literature studies collected from books and journals in the fields of cybernetics, knowledge management, organisations theory, informatics, and other close fields. Several search engines have also been used where other kind of resources – software, white papers, practitioners and researchers homepages, research projects, FAQs and electronic bulletin boards – have been identified.

The third paper, Intranet use - a study of Five Swedish Organisations, has also existed in several versions. The study was planned during the winter and spring of 2002 and carried out during the autumn of the same year. The purpose was both to increase our own knowledge about Intranets – the first three papers were written together with another doctoral student, Björn Banck – and to delimit the problem area further. The study mainly concentrated on the *use* and *understanding* of Intranets. Questions such as how an Intranet was used and the kind of understanding the users had about existing functions and purposes of an Intranet were formulated. In the planning phase, we were influenced by Grounded Theory with the respect to categorizing and classification. We grouped the questions into categories such as development, initiative, influence, further development, and organisation. The categories were not obvious and the number of categories increased while the study proceeded. The study answered the question: What influences the use and understanding of Intranets. The research approach was explorative because we had not found any research about the question of *use* and *understanding* of Intranets. We used pre-formulated *questions* with a mixture of open questions, statements, and questions of a more descriptive and fact based nature. The main contribution from this study was both a manifestation of earlier assumptions

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

and more precise questions directing us in different ways in further research. During the study we found that several factors influenced the use and understanding of Intranets. Furthermore, many users did not have a clue about others' use of functions nor why, they were using them. The view of Intranets differed a lot. At that time, the author's interest awakened about how Philosophy of Technology could be applied to Intranet design in order to make the view of the Intranet common in an organisation.

In the fourth paper, Philosophy of Technology – a Foundation for Intranets, influences and ideas from the area of Philosophy of Technology are applied to Intranet design. The interest in Philosophy of Technology was raised during a doctoral course in 2000-2001 with Prof. Erik Stolterman in Umeå. The CUT-P model, adapted from Stolterman, with its visualizing of the interdependence between Conceptions, Use, Technology, and Policy is further developed and refined in the paper. The model was in line with the study presented in the third paper regarding the focus on the use of the technology and factors influencing this use. Furthermore, ideas about empowerment, network effects on humans, learning *with* technology, learning *about* technology, and the importance of the context, are areas highlighted in the study of Philosophy of Technology research. The main contribution of this paper is first, the skeleton for a model for making the view of technology common in organisations through a “transparent interface” where the user can “see” where different parts of the Intranet are located, who delivers the information, and who is responsible for updates. This was also the question that was raised in the beginning of the paper. The second contribution is suggestions for further development of the CUT-P model and the implementation of the model in the organisation through work-shops and brainstorming activities. The use of the CUT-P model should focus the organisation more on formulating and spreading the policy of its Intranet and other technology in use.

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

In the fifth and sixth papers, the Viable System Model by Stafford Beer is applied to Intranet design. The choice of VSM depended on the author's familiarity with the model and the fact that the model has been further developed, tested, and used for many years. Furthermore, VSM is a cybernetic model with a focus on communication in organisations and this is essential for Intranets in organisations. They should be designed to support and facilitate different kinds of communication. The research approach – both in Paper four, five, and six – is theoretical-analytic with logical discussions and conclusions rather than an effort to prove something. The contribution is the argumentation that VSM is suitable for designing Intranets and several examples of functions that should be implemented into an Intranet.

In the final paper, Viable Intranets for Viable Organisations – Incentives for the Shared and Common Intranet, a synthesized result from Papers 4-6 is presented. When the author started to write this paper, the idea was that “this will be rather easy – it is just a summary,” but how wrong I was! It became obvious that the journey also is a journey of maturing as a researcher and the results from the different papers demanded a better presentation than just a summary. Figures visualising connections are always valuable and it became clear that a summarized argumentation about problems and possibilities regarding Intranets were also desirable for visualization. Finally the author tried to put more effort into suggestions for solutions. There were a lot of “things were falling into the right place” while writing this paper and somehow I felt that I had reached my goal – I had a result and maybe most importantly: I had a strong belief that the results would work if used in the design process of Intranets.

Two general questions can always be stated about the mode of procedure/research approach/method:

- a) What is the rationale for doing things in a specific way?
- b) How do I know that the result will be as I argue?

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

To respond to the first question I argue that the different steps I have taken during the research process are in line with what other researchers (e.g. Stafford Beer – paper 5, 6 and 7) in the area of Informatics/Systems Science carry out their research. Hence, these methods are well-known, well-tried and reliable.

The way I have carried out the investigation for the state-of-the-art (paper 1 and 2) and the study (paper 3) are not controversial in any sense. Traditional qualitative research approaches have been used and have also worked out well.

In the work with applying Philosophy of Technology (PoT) on Intranet, the logical argumentation concerning lacks in existing Intranets and what PoT can offer should be enough motivation for this approach. The dividing of the concepts into sub-concepts, is also referred to findings from several other researchers.

The second question can be related to how successful and convincing a logical argumentation is. This is of course a challenge for the researcher who has to defend the result. Nevertheless, the result in the form of a) recommendations that can be implemented in the design work and b) tentative recommendation in form of models in need of further investigation would be a good base for further research and empirical testing.

The work with writing the cover paper is mostly to present a red thread and sew everything together so this section can be read independently of the papers. This is not an easy issue because somehow, most of the work is done but writing the cover paper should be a challenge – the cover paper includes the results AND my own thoughts about my work. So, if I have been personal it is on purpose. Finally, this has been a very fun and fruitful journey but sometimes a little bit too lonely.

Thesis – the Structure

The thesis includes a cover paper and a collection of 7 papers. The cover paper intends to synthesize the research documented in the papers. The last paper – Paper 7 – summarizes the findings, mainly from Paper 4 and Paper 6. This paper could also have been a “conclusion section” or “lessons learned section” in the cover paper. However, I have chosen to write these conclusions as a separate paper in order to publish the findings in a suitable journal. The structure and connection between the papers are shown in Figure 3 below.

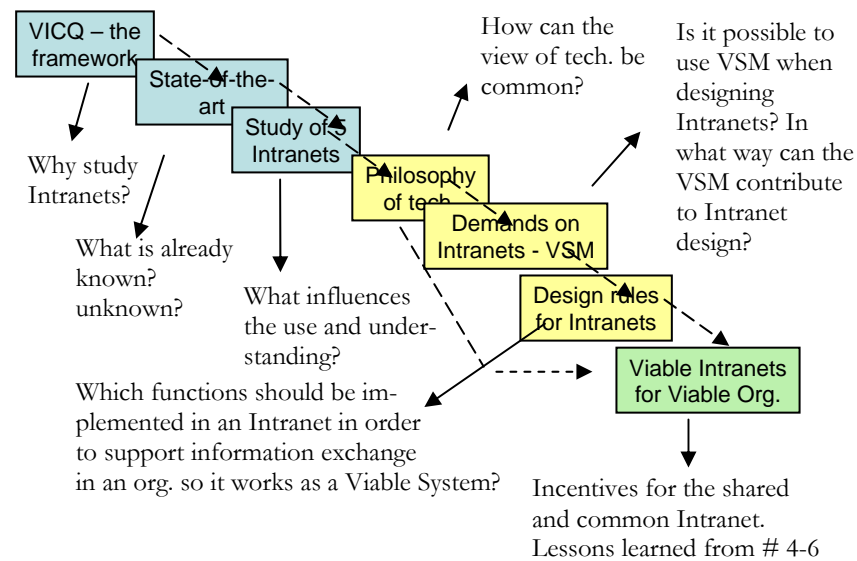


Figure 3 The different parts – papers – of the thesis, questions at issue, results from each part and connections between the different papers.

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

Results

In this section each paper is summarized and described according to the following keywords/headings:

- *Problem What is the problem needed to be dealt with/ solved? Or, what is the identified need to be fulfilled in some sense?*
- *What is already known, unknown? Research and findings of interest, questions and lacks identified as urgent to deal with*
- *Purpose. What is the purpose with the article?*
- *Research approach/ Mode of procedure.*
- *A brief summary of the paper.*
- *Results related to the purpose. What is the findings/ contribution of the paper?*

Paper 1: Banck, B., Nyström, C. A. (2002). Viable Intranet for Creativity and Quality – The VICQ project.

Department of Information Technology and Media. Mid Sweden University. A previous version of this article was published as: Banck, B., Nyström, C. A (2002) *Intranet - A tool for power and control or a possibility to increase the quality of work* in Second Conference for the Promotion of Research in IT at New Universities and University Colleges in Sweden (Ed.) Bubenko, J et al.

Problems and demands. Information systems such as Intranets are not used as stated in original intentions. Needs and potential in organisations are continually changing and therefore there is also a need for continuous development of supporting information systems. New demands and new technical challenges require new approaches to IS development. Designing Intranets differs a lot from designing traditional information systems. Consequently, new design approaches or feasible “pattern” for good design is needed.

What is already known, unknown? In the summary section below, a brief description of ongoing research is presented and some topics are identified for further research.

Purpose. The purpose of this paper is to present an umbrella project with the aim of investigating, describing, and identifying issues essential when developing and managing Viable Intranet for Creativity and Quality – VICQ. Furthermore, suitable part projects are identified and briefly described.

Research approach/Mode of procedure. Initial critical review of state-of-the-art articles in the Intranet area,

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

categorising of possible part projects based on results of the state-of-the-art.

Summary. The difference between traditional Information Systems and Intranet is discussed based on e.g. development, suitable methods, and users. The definition of an Intranet differs among researchers. Some of them include common Group Wares such as Lotus Notes while others exclude them. However, the technology allows the presence of other IT systems unlike most IT and can be understood as a unifier integrating existing IT systems and providing “legacy Systems” with a new graphical interface – the browser. The importance of *initiative and implementation* is analysed where top-down and bottom-up approaches are two extremes based on initiative. Some researchers focus on *content and functionality* where *Knowledge Management* is an important area of research. Despite the potentiality of Intranets, there are few examples of successful Intranet implementation based on knowledge sharing. Some authors explain this absence of successful examples as the focus being too much related to technology than to people. The social context should be essential. There are different *roles* based on the development processes of an Intranet. Bansler et al claim that the user and the developer could be the same person – a melting of different roles. The role of the IS department is also changing due to the feeling of loosing control of security and supervision because of the existence of end-users as developers. Power, connected to the information owner, often managers, and their willingness or unwillingness to share and deliver information is highlighted more than before. The VICQ project, Viable Intranet for Creativity and Quality, will work as a framework for further part projects. Members, academic support, stakeholders, dissemination, and expected results are presented. Issues for possible part projects for further research are *strategies and the philosophy of the managers, design and development processes*, the importance of *continuous and dynamic*

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

development, and *individualizing and implementation*. A brief description of a *pilot study* with the aim of identifying additional issues is presented which could work as a foundation for future research.

Results. The VICQ project is presented according to members, stakeholders, dissemination of results and expected results. Furthermore, based on a brief analysis of the state-of-the-art in the area, possible part projects for further research are identified. Issues of interest for these projects can be *strategies and the philosophy of the management, design and development processes*, the importance of *continuous and dynamic development* and *individualizing and implementation*. A brief description of a *pilot study* with the aim of identifying additional issues is presented which could work as a foundation for future research. The main contribution of this article is the presentation of the VICQ project and a brief description of research areas.

Paper 2: Banck, B., Nyström, C. A (2005). Intranet - Ongoing Research and Future Directions.

Presented on the 16th International Conference on Systems Research and Cybernetics. Focus Symposium on Systems Logic, AI and Engineering Cybernetics. Baden-Baden, Germany, 29 July - 5 August, 2004. Published in: Advances in Applied Systems Research, Volume I, pp. 9-18; Lasker GE (ed). International Institute for Advanced Studies in Systems Research and Cybernetics, Windsor, Ontario, Canada. ISBN 1-894613-35-X.

- An earlier revised version of the paper was published as: Banck, B & C. A, Nyström (2002). Intranet - A Threat or a Possibility? - State of the Art and Future Directions in Bødker, Keld Pedersen, Mogens Kühn, Nørbjerg, Jacob, Simonsen, Jesper and Morten Thanning Vendelø eds. Proceedings of IRIS 25 - available in CD version. Bautahøj, Denmark, 10-13 August, 2002.

Problems and demands. There are lacks due to the number of empirical studies. The *use* of Intranets is poorly investigated and questions about aspects that influence the *understanding and use* of an Intranet are being raised.

What is already known, unknown? There is a lot of research into Intranets concerning their impact on different types of organisations, e.g. intranets used as applications in areas such as increasing efficiency in banking. Furthermore, issues such as initiatives, implementation, development processes, content, view of the employees are examples of other concerns in the research. The research does not seem to be “matured” in the sense that there are a lot of different approaches according to

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

research subjects (questions) and chosen methods. Accordingly, a map of Intranet research is lacking and should be outlined.

Purpose. To identify and analyze ongoing research and urgent areas for further research in order to delimitate the research area and specify questions to be answered.

Research approach/Mode of procedure. Critical review and analysis have been done on the state-of-the-art articles in the area of Intranet research.

Summary. An Intranet often mirrors an organisation's and its managers' view of employees. An Intranet is more a tool to support the organisation in common than to solve separate tasks as traditional Information Systems do. In this article, the 'map of the world of research of intranets' is outlined, where **knowledge management, organisation theory, design and informatics** are the main cornerstones that overlap each other. There are different kinds of approaches depending on the Intranet researchers' choice of **primary problem domain**. One approach is Intranet development in a broad sense as the problem domain. Other researchers have knowledge management as the problem domain and consider Intranet as one way to handle KM. Researchers, who have chosen Intranet as the **secondary problem domain**, might have their theoretical starting points in other disciplines/spheres of interest. Examples of these disciplines are organisation theory, social science, and knowledge management. Ongoing research into Intranet mainly focuses on different aspects of **implementation and initiative** where bottom-up and top-down approaches are two extremes. The bottom-up approach could lead to the existence of Intranet islands where poor uses of common resources and to the reinvention of the wheel could be the result (Damsgaard and Scheepers, 2000). Top-down approaches where the initiative comes from management are examples of where Intranets have been used as tools for

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

standardization and making the culture within firms more common (e.g. Damsgaard and Scheepers, 1997; Lamb, 1999; 2001). The ***managing of the development processes*** is critical due to Wachter and Gupta (1997) because if this process is left unrestricted and unsupported in the hands of end-users there is the risk of failure. Other parts of the “map of research” are ***knowledge management*** and the importance of ***roles***. According to KM, requirements on functionality, user interface, and the involvement of users in the development processes are essential. Issues according to knowledge creation and management via the Intranet (Standing and Benson, 2000) and the difference and problems according to tacit and explicit knowledge (Polanyi, 1966/1998; Davenport and Völpe, 2001) are other sub-areas in KM. Several authors request an increased number of ***empirical studies*** such as social consequences (Kling, 2000), Intranet adoption (Shung-Ming, 2000) and hierarchal cultures and their possible influence on existing and planned Intranets (Ruppel and Harrington, 2001). Furthermore, the ***use of Intranets*** is poorly investigated and questions about aspects that influence the ***understanding and use of an Intranet*** are being raised. ***Empowerment*** of employees is important in organisations because of its potential when employees are highly involved in knowledge creation, cooperation, problem-solving, and information sharing. This is made possible through an increased access to the entire Intranet (Stenmark, 2002). ***Social context*** is important and a more integrated socio-technical view is critical to avoid the separation of social behaviour from technologies (Kling, 1999; 2000). The following topics have been identified as important for further research; ***Management and strategy – especially philosophy of managers and philosophy of technology - empowerment of employees, further development processes, aspects influencing the use of Intranet, and the importance of different roles.***

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

Results. The map of Intranet research is outlined. Recent research is categorized in the following areas: Knowledge Management (KM), Informatics, Design, Organisation Theory. The areas partly overlap each other. The following areas are in need of further research: Management and strategies, empowerment, development and further development processes, aspects influencing the *use* of Intranet, and the importance of different roles appearing in organisations using Intranets. The main contribution from this article is the identification of management, strategies, and empowerment as factors influencing the use and understanding of Intranets, and as important areas for further research.

Paper 3: Banck, B., Nyström, C. A (2005). Intranet Use - A study of Five Swedish Organisations.

Journal of Organisational Transformation and Social Change,
Vol. 2, issue 2 pp 153-180.

- *Revised version of paper published as:* Banck, B, Nyström, C. A. (2003). Intranet Use - A Study in Five Swedish Organisations. In Conference proceedings Promote IT 2003 (eds), Knowledge Foundation in Sweden, 5-7 may 2004, University of Gotland, Sweden. available on CD.

Problems and demands. The potential of Intranets is not exploited. Many functions in Intranets are not used. The view of an Intranet, its aim and purpose are unknown and/or differ between different stakeholders. There is also a demand for more empirical studies concerning the use of Intranets.

What is already known, unknown. The Intranet research “map” was outlined in the earlier Paper 2. It was concluded that aspects influencing the understanding and thereby the use of the Intranets were poorly known.

Purpose, The purpose was to investigate the way in which different aspects influence the use and understanding of an Intranet.

Research approach/Mode of procedure. The chosen approach was qualitative with an explorative aim. The study was carried out among five organisations representing both public and private sectors. One dairy, two county councils, one electricity company, and one systems development company were chosen. These organisations had established Intranets and the number of employees was rather high which was one of the

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

criteria for participating. Background material such as annual reports, manuals, and policies were studied and together 30 interviews were carried out. The interviews were based on two interview guides. The first guide was aimed at managers and IS representatives and covered background aspects of the Intranets, as well as data about the businesses and their Intranets. The second guide was directed to all kinds of users and covered aspects of the use of Intranet and in what way users could influence the content and understanding of the Intranet. The persons interviewed represented end-users, managers and members of the IS staff.

Summary. This article presents a study carried out in 2002, concerning the use of Intranets in five Swedish organisations. The purpose is to investigate in what way different aspects influence the use and understanding of an Intranet. An explorative approach is used, based on two interview guides. The first guide is aimed at managers and information systems (IS) representatives and covers background aspects of the Intranets, as well as data about the businesses and their Intranets. The second guide is directed to all kinds of users and covers aspects of the use of an Intranet and in what way users can influence the content and understanding of it. The persons interviewed represent end-users, managers, and members of the IS staff. Results show that the Intranets in the study are poorly matured and that the main-use mode is ‘publishing’. The underlying philosophy of the Intranets seems to be self-information rather than informing others. Furthermore, the use and understanding of the Intranet differs between end-users, managers, and IS staff, according to trust and ideas of responsibilities. There were many concrete ideas about extended content and suggestions for improvements. Among missing functions, tools for supporting daily work were mentioned as desirable. The focus of the Intranets seems to be more on supporting administrative tasks than supporting production. The five Intranets were in the phase of growing

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

and spreading and further functions should be implemented. Four of the organisations had weakly anchored doctrines. All of the organisations had changed from a technical to an organisational focus, where responsibilities had moved from the IT department to the information department. In some organisations there were discrepancies between actual content and actual use and, in some cases, function affiliated with higher use-modes was not used. This discrepancy could be explained by a lack of general ideas, lack of information and education when the Intranets were introduced. Finally, important aspects to be considered when investigating the use of Intranets in further research are identified. These aspects are strategies, social context, further development processes, competence, and the Intranets' organisational affiliation as well as the culture of the organisation.

Results. Results showed that the Intranets in the study were poorly matured and that the main use modes were 'publishing' rather than 'transacting'. Nevertheless, the purposes of the Intranets indicated desirable use related to higher use-modes that support knowledge creation. There were visions and demands for functions that included higher use-modes. In some organisations there were discrepancies between actual content and actual use and, in some cases, function affiliated with higher use-modes was not used. This discrepancy could be explained by a lack of general ideas, lack of information, and education when the Intranets were introduced. One organisation had a good balance between human capital, organisation, doctrine, and technology. This organisation differed also from the others according to its higher level of competence and experience of system development. Four of the other organisations had weakly anchored doctrines. One of the organisations had in its doctrine a focus on centralization of the Intranet. This was also known in the organisation. Most users felt empowered in their use of the Intranets. There was some confusion about who was responsible for further

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

development in the organisations. The initiation of the Intranets had with one exception been top-down approaches. The Intranets were static rather than dynamic but among the users there was the desire to create personal profiles that influence the look of the interface. Intranets were used both to support services and as working tools. All organisations had changed from a technical to an organisational focus, where responsibilities had moved from the IT department to the information department. Consequently, new roles as authors and editors had appeared. The underlying philosophy of the Intranets seemed to be self-information rather than informing others. Furthermore, the use and understanding of Intranet differed between end-users, managers, and IS staff, according to trust and ideas of responsibilities. Finally, important aspects to be considered when investigating the use of Intranets in further research were identified. These aspects were ***strategies, social context, further development process, competence,*** and the Intranets' ***organisational affiliation*** as well as the ***culture of the organisation***. The main contribution of this paper is increased knowledge about Intranets and examples of unexploited functions – both existing and non-existing, but desirable. The findings confirm that the users should be empowered and more involved in the design and changes in the Intranets so that good ideas can be implemented.

**Paper 4: Nyström, C. A. (2006).
Philosophy of Technology - A
Foundation for Intranets.**

Journal of Systems Research and Behavioral Science, *in press*.

- Revised version of paper published as: Nyström, C. A (2004). Philosophy of Technology - A Foundation for Intranets in Proceedings of the Fourth Conference for the Promotion of Research in IT at New universities and University Colleges in Sweden - Promote IT 2004, Vol. 2, pp 446-457. Karlstad 5-7 May, 2004

Problems and demands. There is a discrepancy in organisations based on the view of technology and there is a need for anchoring IT policies and creating a common view of the technology in use. Possibilities and limitations in the technology are poorly known and should be discussed and visualized. Suitable models or methods supporting this “thinking and talking” about technology are missing. The problems and demands were partly identified and highlighted as important in Paper 3, by Banck and Nyström (2005).

What is already known, unknown? Intranet makes the spreading and sharing of information, communication and knowledge management possible in new ways compared with traditional Information Systems. Despite the growing numbers of Intranet implementations, there are also a lot of failures concerning implementation, development, and acceptance. The importance of Philosophy of Technology and the fact that the Intranet phenomenon is rapidly growing in businesses and organisations raises questions such as: How can the Philosophy of Technology be used to support Intranet development in order to make the technology more human and usable?

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

Purpose. The purpose of this paper is to examine how to deal with the question: *How can purposes, goals and the view of the Intranets as a dynamic and viable tool, be made visible and shared within an organisation?*

Research approach/Mode of procedure. Analysis of literature in the field of Philosophy of Technology and compared with actual Intranet research.

Summary. In this article, the Philosophy of Technology is discussed in relation to Intranets. In order to guarantee the creation of human information systems, the Philosophy of Technology, PoT, in organisations should be *identified, made visible and shared*. Shortcomings with the use of Intranets, problems with a discrepancy in the view of technology, a missing common view, importance of policies and the potential of the Philosophy of Technology are analyzed and discussed. Furthermore, **network effects** and their positive influence on empowerment are presented. Openness in an organisation with a high degree of **empowerment** can be compared with Open Source Communities where the creation of open systems enables the members to share intellectual key values. The performance incentive in this type of group seems to be prestige considerations rather than monetary rewards. Several findings point out the potential of Intranet use to enable and support **management** and to formulate and spread of goals. Different **communication** technologies such as web based collaboration technologies, offer a number of different ways to communicate and collaborate. Consequently, communication in virtual teams together with culture, technology, and leadership, are identified as important areas with significant challenges. Technology can also be used in the **learning** process, i.e. learning *through* technology and learning *how to use* technology. In addition, technology can support learning by exploring with technology, visualizing with technology, constructing realities, creating technology supported learning communities, reflecting

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

with technology learning by doing and finally, learning by reflecting. Empowerment of Intranet users enables the employees in an organisation to learn about the organisation, its goals, ongoing projects, organisation, and other colleagues. This increases the quality of human capital in the organisation. Hence, collaboration and vertical communication are to a high degree supported by functions in an intranet and are examples of technology supporting learning.

One way to make the conception of technology *visible* to the different users in an organisation is to discuss and reflect upon technology from different points of view. These reflections and discussions can be carried out with the use of the CUT-P model adapted from Stolterman (2000). The model shows the connection between the concepts; ***conception***, ***use***, ***technology***, and ***policy***. These four concepts are interdependent and influence each other. The concepts in the model have been further divided; E.g. *Conception*; positive and negative. *Use*; intended use, actual use, misuse, underuse, and erroneous use. *Technology*; technology under-development and technology we have “heard about.” *Policy*; outspoken, shared, visible, anchored, and governing. The model should be understood as a model for *thinking* about how technology can and should be understood in an organisation and how this can be related to the policy of the organisation. The model may also be used for *establishing, mapping, analyzing and changing* PoT in an organisation. Existing system development methods as well as design or intervention models should be influenced by and connected to PoT. A critical investigation of development models and methods should be carried out in order to identify improvements based on PoT terminology.

Results. The Philosophy of Technology can contribute to the design of Intranets with issues dealt with in the Philosophy of Technology field such as ***network effects*** and ***empowerment***; e.g. Open Source communities where people collaborate and share key-values. This collaboration is based on trust and

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

encouragement among the members and prestige has a subordinate role. **Management**, the spreading and anchoring of goals and purposes in the organisation is of vital importance. **Communication**; interaction and communication between different persons and groups becomes more and more critical and technology offers many opportunities, especially when groups are spread out geographically, i.e. virtual working groups. **Learning**; technology can be used in the learning process and enables members to both learning *through* technology as well as learn *how to use* technology. Furthermore, technology makes visualizing, construction, and creating possible in relation to different kinds of learning situations. Finally, the CUT-P model presented and further developed can be used in the common-making of technology as a tool for analyzing, visualizing, debating, and discussing technology and the use thereof (thinking and talking). The main contribution of this paper is the argumentation for empowerment, the importance of further development of the CUP-P model and the ideas presented about visualising possibilities and limitations through a transparent interface in order to make the view of the Intranet common in the organisation. The paper also highlights the importance of anchored and active policies where the purpose and goals of the technology are outspoken.

**Paper 5: Nyström, C. A. (2006).
Demands on Intranets - Viable System
Model as a Foundation for Intranet
Design.**

Presented on the 5th Conference of Computing Anticipatory Systems – CASYS'05 – in Liège, Belgium, 8-13 August, 2005. International Journal of Computing Anticipatory Systems, *in press*

- Revised version of paper published as: Nyström, C., A. (2005). Demands on Intranets - Viable System Model as a Foundation for Intranet Design in Proceedings of the Fifth Conference for the Promotion of Research in IT at New Universities and University Colleges in Sweden - Promote IT 2005, Borlänge, Sweden, 7-9 may, 2005.

Problems and demands. There is a need for Intranets that support the organisation in order to make it viable. The potentiality in Intranets is not exploited due to monitoring of operation parts of organisations. Functions in Intranets should also be designed in order to amplify or attenuate information flows – both within the organisation and between parts of the organisation and the environment. The Intranet used as a normal tool in daily work in operations must be manifested instead of an Intranet seen as just an administrative concern for bureaucratic tasks.

What is already known, unknown? The Viable System Model is a cybernetic model used for diagnosing and designing organisational structures and communication so that necessary and sufficient conditions for viability can be met. The model has been used for designing and diagnosing different kinds of organisations at different levels - firms, government, and departments - where its use highlights existing or missing

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

functions, communication patterns and information flows in communication channels and relates the results to a viable system. The advantages of using the VSM and the strength of this cybernetic model should be connected with the Intranet phenomenon as a tool for supporting function in an organisation. The VSM has not been connected to the Intranet phenomenon as a cybernetic tool before and the result of this combination has therefore not been investigated.

Purpose. The purpose of this article is to answer the question: *In what way can the VSM serve as a pattern in the design of Intranets and in the extension increase the viability of an organisation?*

Research approach/Mode of procedure. Analysis of literature and findings from the use of the VSM related to findings from the Intranet research area.

Summary. VSM and Intranets offer the opportunity to increase the quality and the viability of organisations. Consequently, the **combination of VSM and Intranets** would be of great interest for both Intranet developers as well as organisational developers. Characteristics of the VSM such as highlighting the importance of operations, monitoring operation units through some kind of **Early Warning System**, **autonomy** and **empowerment**, should be used as patterns and a base for essential parts/function in an Intranet. Possible functionality in Intranets which could be used in the different systems in VSM is identified and described. According to System 1, Operation/Action, Early Warning Systems, communication links, and different kinds of collaboration tools should be established. In System 2, coordination, planning meetings with supporting systems as calendars, planning systems, electronic whiteboards, and schedules, would be suitable for the system's main tasks. In System 3, control, monitoring systems with sensors in System 1 are needed. A comparison of desired conditions and outcomes must be

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

possible to carry out. Hence, System 3 needs some kind of “map of the system with information about acceptable conditions.” Development and Intelligence which are carried out through System 4, are supported in an Intranet by functions for collecting, presenting, and analysing external data. System 4 forwards the analysed information to System 3 and System 5 – policy. Furthermore, some possible functions can be interactive functions where the environment can comment on and react to the organisation. Filters that transform information from the environment to desirable representation and vice versa are needed. System 5, policy, can be supported by tools for presentation and different kinds of decision support systems, planning systems, and presentation/simulation tools. In summary, Intranet design based on ideas of the VSM can support organisations through the functions above and through information exchange and information sharing functionality, Early Warning Systems as personalized agents, filters combining, and aggregating or filtering information according to content and finally through information agents indicating that something is undergoing change in the organisation. These agents prompt the Intranet user so that they become aware of changes. The conclusion in the article is that the design of organisations based on VSM and Intranet should be designed together. The main conclusion is that VSM can benefit Intranet design, as well as vice-versa. There exists a “win-win circumstance” where there is a mutual dependency between the design of an Intranet and the design of an organisation in compliance with the VSM. There is a need to detail and specify the requirements of the corresponding functions in the Intranet according to the VSM. Further research should focus on the design of requirements based on the VSM and intended for Intranets: What functions should be implemented into an Intranet in order to support the information exchange in an organisation so that it works as a viable system?

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

Results. For each system in VSM, several possible functions for an Intranet that supports an organisation in order to increase its viability, are identified and presented. Some examples are as follows; System 1 (operation/Action); Early Warning Systems, communication links, collaboration tools, System 2 (Coordination); Calendars and planning functions, System 3 (Control); monitoring functions, System 4 (Development/Intelligence); functions for collecting, presenting external data, interactive functions with possibilities for external persons to communicate, and filter functions, filtering information so it suits the receiver of the information, System 5 (Policy); functions for presentation, decision support functions, and functions for planning. The main contribution is the argumentation that VSM can work as some kind of pattern when designing Intranets. Several examples of functions are given.

Paper 6: Nyström, C. A. (2006). Design rules for Intranets according to the Viable System Model.

Submitted to the Journal Systems Practice and Actions Research, 2005-06-09. Accepted after revision 2006-01-06.

Problems and demands. There is a need for Intranets that support the organisation in order to make it viable. The potentiality in Intranets is not exploited due to monitoring of operation parts of organisations. Functions in Intranets should also be designed in order to amplify or attenuate information flows – both within the organisation and between parts of the organisation and the environment. The Intranet used as a normal tool in daily work in operations must be manifested instead of an Intranet seen as just an administrative concern for bureaucratic tasks. Continued from Paper 5 (see above).

What is already known, unknown? The Viable System Model is a cybernetic model used for diagnosing and designing organisational structures and communication so that necessary and sufficient condition for viability can be met. The model has been used for designing and diagnosing different kinds of organisations at different levels - firms, government, and departments - where its use highlights existing or missing functions, communication patterns, and information flows in communication channels and relates the results to a viable system. The advantages of using the VSM and the strength of this cybernetic model should be connected with the Intranet phenomenon as a tool for supporting functions in an organisation. The VSM has not been connected to the Intranet phenomenon as a cybernetic tool before and the result of this combination has therefore not been investigated.

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

Purpose The aim of this article is to answer the question: *What functions should be implemented into an Intranet in order to support the information exchange and communication in an organisation so that it works as a viable system?*

Research approach/Mode of procedure. See paper 5 above. The information flows between the sub-systems in VSM are identified and exemplified in general. Due to the quite complicated nature of the VSM, the information flows are further exemplified with a university department as a scenario and the system-in-focus. Desirable corresponding functions, based on viability, are identified and described. These functions might be represented in an Intranet but they could also be better solved without computer support, e.g. different kinds of face-to-face meetings. Some suggestions for further preparation and necessary steps are given. Finally, the identified functions are related to some other approaches: Intranet technology use modes, Synergy-4, and empowerment vs. control.

Summary. The Viable System Model, VSM, by Stafford Beer is a model used for diagnosing and designing organisational structure and communication so that necessary and sufficient conditions for viability can be met. The model has been used for diagnosing different kinds of organisations at different levels - firms, government, and departments - where its use highlights existing or missing communication patterns and information flows in different communication channels and relates the result to a viable system. In a previous article, VSM and the Intranet concept were discussed and examples of advantages of combining the two concepts when designing or redesigning organisations, were given. In this article VSM is combined with the Intranet phenomenon and possible functions in the Intranet that support information exchange between different systems are identified and described. VSM was chosen because of its support of empowerment and cooperation within organisations which is in line with the view

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

of the author. The aim of this article is to answer the question: *What functions should be implemented into an Intranet in order to support the information exchange and communication in an organisation so that it works as a viable system?* Examples of concrete functions that support the different flows in an organisation organized based on the VSM are given. Furthermore, these functions are mapped to Intranet use modes and discussed from the Synergy-4 approach and in terms of empowerment vs. control as an argument for their implementation.

Results. In a previous article (Paper 5), examples of suitable functions to implement into an Intranet in order to support and increase the viability in an organisation, were given. These functions were identified with the VSM as a pattern when designing the functions. Each sub-system in VSM was analyzed and functions were identified. In this article, the connection between these sub-systems was analyzed and further functions were identified and presented. Furthermore, the result was analyzed according to Intranet use modes, and discussed from the Synergy-4 approach and in terms of empowerment vs. control as an argument for implementation. These analyses show that implementation of suggested functions would move the use of more advanced use modes such as interaction, searching and recording. Synergy-4 is strengthening according to suggested functions where for example policy and intentions could be more easily spread out and anchored. Empowerment vs. control should be considered in the design of Intranets according to control activities such as training and education. The main contribution of this paper is examples of functions based on the VSM, analyzed and related to different use modes and the Synergy-4 model with its emphasis on the interdependence of Competence, Management, Organisation and Technology.

Paper 7: Nyström, C. A. (2005). Viable Intranets for Viable Organisations – Incentives for the Shared and Common Intranet.

Problems and demands. See sections above.

What is already known, unknown? See sections above.

Purpose. To analyze, synthesize and summarize the findings from Papers 4, 5, and 6 and to identify questions for further research.

Research approach/Mode of procedure. ---

Summary. Despite the increased number of intranet implementations, there are still many examples of failures in content, influence, knowledge sharing and engagement. Findings indicate and explain some of those shortcomings in terms of a missing view; no outspoken purpose and a top-down initiative where the development and elaboration processes are too controlled and standardized and where engagement and ideas are hampered. Furthermore, the potentiality in the Intranet concept enabled by the empowerment of the employees is to a high degree missing in the examples of successful implementations. Intranet implementations should not be ends in themselves. The purpose of this technology should be to support the organisation. In order to make the organisation viable, the intranet should be designed to support and facilitate interaction when sharing knowledge and communicating in the organisation. This paper presents ideas to be considered when planning and designing an intranet in an organisation. Those ideas are primarily based on the concept of empowerment and common making due to the technology in use. The common making of the view of technology could be

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

carried out through the active use of Philosophy of Technology, here represented by the CUT-P model which shows the connections between conceptions, use, technology and policy. Second, ideas have been inspired by the Viable System Model. Corresponding functions in an intranet are presented in VSM terminology. The contributions can be divided into four paragraphs:

First, recommended functions to be implemented based on VSM. Second, recommendations in which the policy of the organization is supplemented by the CUT-P model being operationalized additionally. Third, an implementation model where suggested functions and corresponding changes in the organization are realized. Finally, a model of the interface with the aim of developing the interface so that the underlying technology is visible and ideas from the VSM are visualized in the interface. The two models require further research.

Results. The findings presented in this article have two kinds of implications/contributions: First, some tangible proposals/recommendations are given. These recommendations are directed both to practitioners as well as researchers. Second, ideas and assumptions are presented as the basis for further research where the emphasis should be concentrated on developing different kind of models. The findings from combining VSM, Intranet and Philosophy of Technology are summarized in the following: **Critical functions** are recommended for implementation into Intranets/organisations. These critical functions are divided into general functions, which support whole organisations and in need of further development, and specific functions which support a given part of an organisation and are rather well specified – paper 5 and 6.

General Functions are: Functions for the management of long-term information are developed and implemented. Examples of long-term information are instructions, and

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

policies. This type of information does not demand urgent actions; rather it is to make the receiver aware of plans and restrictions in the future. Presentation formats, “alarm clocks/agents” and channels must be carefully considered. Functions for the management of short-term information are developed and implemented. This kind of information often makes the receiver aware of events and obligations in the near future. A well thought-out analysis of receivers and channels based on the importance and expected reactions of the information must be carried out. Functions supporting interaction and collaboration such as whiteboards, conference systems, chat systems (instant messenger) are developed and implemented. Functions supporting decision-making – simulation, data stores, calculating and presentation, are developed and implemented. Functions supporting daily work with the purpose of putting the focus on operations are developed and implemented. Some examples are dependent on the kind of organisation the Intranet belongs to.

Specific functions: Early Warning System(s) are developed and implemented. Sensors or equivalents should be implemented where needed. Suitable communication channels are identified and established/implemented. This can be within the Intranet or outside if the type of EWS is not a natural part of the Intranet. Control function(s) for each EWS is/are identified and connections between them are established (a communication channel). A “map” of the entire system/organisation with acceptable conditions implemented is designed and is available for the Control function(s) so that signals from the EWS can be understood and taken care of.

A “Gate-keeper” is established between the environment and the organisation, where information from the outside is taken care of. Some of the information is collected and some information is sent by external sources. The information that is collected can be handled in advance by intelligent agents – pre-programmed agents with instructions to carry out specific tasks such as search for similar course curricula, exceptions to the

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

rules at Swedish universities published on the web, and the ability to learn based on collected results. The information, both information to the organisation and information from the organisation, is further developed; aggregated, summarized, structured, and commented based on the receiver of the information. Some of these “damper/amplifiers” can be designed as automatic functions but most of them require human decisions with support from suitable functions in the Intranet.

Search functionality. Intelligent agents are developed, which mainly support the “search” within the Intranet (Ginsburg, 2001). Ginsburg points out the advantages of the use of agent technology as a support for document management. The owner of documents can be made aware of whether or not the document has been read in the last month, and thus act on this. The use can be expanded to issues other than document management. These agents should support search abilities in the Intranet and also put demands on the recording of information based on well developed structures and indexing. (see use modes; Damsgaard and Scheepers, 1999).

Amplification of the policy from the approach of running development work with a dialogue on the CUT-P model: Conception, Use, Technology and how these are related to Policy (paper 4).

Ideas and fundamentals in need of further research: ***Model/Method for the Implementation*** of the functions into an Intranet/organisation. Steps to be carried out can be: identification and delimitation of autonomous operational units, identification of acceptable conditions in these operational units, establishing of sensors, identification of adequate control systems, identification and design of channels between operational units and control systems. This model/method should be further developed, preferably in an action research project. Furthermore, a ***model of the Intranet interface is developed*** in which the underlying technology and the VSM as a skeleton are made visible. This interface should be

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

transparent so the Philosophy of Technology is visible (paper 3 and paper 4). Questions to be addressed are: *Where are the different parts of the Intranet situated? Who uses the information and why? Who delivers the information? Who is responsible? What potential does the technology offer? What are the limitations of the technology? In what way can I influence the technology and the use of the technology?*

Further research should focus on the design of the implementation model to enter these recommendations into an Intranet and organisation, and the model of the interface that reflects the channels and connections in an organisation and the underlying technology.

Synthesized results of the VICQ Research Project, connection to the different papers, and the purpose of the thesis

The results from the different papers are briefly summarized. The results can be divided into two categories:

- Recommendations that can be implemented into the design work with Intranets. These recommendations would be possible to adapt and implement without further research but when they are implemented in the design work they will probably trigger different kinds of analyses – see for example Early Warning Systems below.
- Tentative recommendations in the form of brief models that should be further investigated and in need of further research.

According to the first group, the result is derived from both the application of VSM (Papers 5 and 6) and Philosophy of Technology (Paper 4), and the findings from the study (paper 3). The first group consists of recommended functions designed with the VSM as a “pattern.” These functions support both different tasks in the organisation as well as interaction between essential parts of the organisation.

- ***Early Warning Systems*** that connect the operational units with some kind of control function and monitor different conditions and states in the operations. The different conditions in the production must be analysed and acceptable states identified. A connection between the production and monitoring/control system must be established. These functions are essential for viability and a prerequisite for autonomy.

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

- ***Gate-keeper or environmental guard.*** These functions are established between the environment and the organisation and adapt information to and from the organisation so that it suits the receiver – aggregates, summarizes, amplifies, and damps the information. This function can be compared with the concept encoder/decoder – see Millers’ Living Systems (1978).
- ***Search functionality*** in the form of intelligent agents. These agents can be used both within the Intranet and between the organisation and the environment. Within the Intranet, the agents can supervise the stored information and check when different documents are accessed. If documents have not been accessed for say three months, the agent can prompt the owner of the document about this. The owner of the document can store the document in a long-term archive, delete the document or market the document again. The contribution is up-dated information. Agents can also be instructed to search information inside and outside the Intranet, collect it and distribute the information through the organisation. Search abilities are improved.
- ***Recommended up-dating of policies*** according to the view of technology within the organisation. The up-dating should include both a description of how to work with this “view analysis” and concrete questions to deal with. The different concepts in the CUT-P model and their sub-concepts should work as a platform for these questions.
- Suitable functions are designed to manage ***long-term or short-term information***. Great effort is put on the

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

choice and design of presentation formats, “alarm clocks” and channels.

- **Interaction support.** Functions such as whiteboards, conference systems, chat systems (instant messenger), are developed and implemented.
- **Decision-making support.** Functions for simulations, data stores, calculating and presentation, are developed and implemented.
- **Daily work.** In order to put the focus on operations, tools for supporting the main tasks are developed and implemented. Examples depend on the kind of organisation the Intranet is a part of.

The other group, tentative recommendations in need of further investigation, is also based on results from the use of VSM (Papers 5, 6 and 7) , the Philosophy of Technology (Paper 4) and the empirical study (Paper 3). This group consists of two models.

- Model or Method for the **Implementation of** some of the **functions** described above. For example, the implementation of Early Warning Systems into the operational units demands an analysis of the kind of undesired conditions that might occur. Each kind of function above should be evaluated from the approach of whether or not it is possible to design and implement it without support from some kind of model/method.
- **Model of the Intranet interface** where the VSM as a skeleton and the underlying technology are made visible. The VSM should be visible in the sense that users in the operational units easily find the control functions monitoring and connecting the Early Warning Systems in the operations. Some kind of relational map

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

where different parts that often communicate and interact can be used in the interface. This interface should be transparent so that the Philosophy of Technology is visible. The interface should visualise the location of different parts of the Intranet. Who uses the information and why? Who is the deliverer of different kinds of information and who is responsible for updating the information? What kinds of possibilities does the technology offer and what kinds of limitations rules. How can the user influence the technology and the use of the technology? The design of the interface can benefit from being built on metaphors other than the traditional GUI:s, for example “islands” and “buildings” can be used.

The following purpose and research questions were initially formulated for the thesis:

The aim of the thesis is to bring a deeper understanding to the way an Intranet should be designed in order to increase and maintain the viability in an organisation and to support empowerment and participation among members of the organization and make them view the Intranet as a common concern.

In order to fulfil the purpose/aim the following research questions were formulated:

1. In what way can the Intranet become a common concern for the organisation and its members as a tool for supporting the tasks in daily work?
2. In what way can the view of an Intranet be made common throughout the organisation?
3. What characterizes a viable organisation?
4. What kind of IT support demands a viable organisation?

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

5. In what way can empowerment and participation become a natural part of the organisational culture

The first issue, Intranet as a common concern, must be established through an active policy. Purpose and goals of the Intranet must be known and anchored. Purpose and goals must also be possible to influence through member participation in change processes. By moving from the view of Intranet as an administrative concern to the view of Intranet as a tool with functions that support daily work in operations, the advantages of using an Intranet increase. These issues are discussed in Paper 4 in which the advantages of using the Philosophy of Technology when designing Intranets are discussed.

The second issue of a common view of the Intranet in the organisation is mainly discussed in Paper 4, the Philosophy of Technology, and Paper 7. Possibilities and limitations of the Intranet should be known through a transparent interface as described in Paper 7. Issues such as “who is responsible for delivering information? Who is in charge? Who uses what?” should be dealt with through an interface where the content, use and communication channels are made visible.

The third issue is treated in Papers 5-7. The use of the VSM describes desirable conditions in a viable organisation. Viability is discussed and visualized in Paper 7, Figure 2 which presents the different conditions necessary for viability and/or a result of viability and how these conditions are related.

Viable organisations demand different kinds of IT support to maintain viability. Examples and answers to issue no. 4, are given and discussed in Papers 5-6 and summarized in Paper 7. Examples of IT support for a viable organisation are: Early Warning Systems where monitoring functions maintaining undesired conditions and events are implemented. Other examples are intelligent agents programmed to guard signals and conditions in the environment so that necessary actions can be carried out if desired. Viable organisations are also

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

characterized by collaboration and interaction. Functions for participation are therefore necessary for viability. Tools for collaboration and communication are also a fundament for empowerment.

The fifth and final issue can be seen as a synthesis of the four previous issues and their corresponding answers. The answer can be found in Paper 7 where recommendations for designing Intranets are given as well as advice and ideas for further research. By offering an Intranet with open access and a common view of the technology related to its possibilities and limitations, empowerment and participation will be embedded in the organisation.

Consequently, by answering the five research questions above, the purpose of the thesis: ... *to bring a deeper understanding to the way an Intranet should be designed in order to increase and maintain the viability in an organisation and to support empowerment and participation among members of the organization and make them view the Intranet as a common concern* is fulfilled.

Reliability and Generality of the Results

The findings in this thesis can be seen as an answer to the desires and demands formulated in the study from 2002 (Banck and Nyström, 2005). Furthermore, problems, desires and suggestions for further research collected from a number of articles in the field, have been an input to the problematic situation that was in need of a change. The *reliability* of the findings are discussed and logic is analyzed in terms of the problems and desires arising in the different organisations and to what degree they are solved/supported by the suggested recommendations in this thesis. A final test of the reliability can only be carried out through implementation and evaluation of

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

the recommendations in a real situation. This is recommended as a suggestion for further research. This reliability could also be “measured” through a “desktop test,” i.e. a limited interview study of the organisations from the 2002 study could be carried out and the problems and demands that arise at that time and/or new problems/desires, could be discussed in relation to the recommendation in this thesis. Either the Philosophy of Technology or the application of VSM have been used as “patterns” or influences in earlier Intranet design. This is a new approach in the area of Intranet design. Nevertheless, the Philosophy of Technology contributes tools for “thinking and talking” about the technology in use and should be implemented as a natural part of the culture of the organisation. Consequently, VSM as a cybernetic model has worked as a “pattern” and I argue that the functions identified and designed, could increase the quality of an Intranet and increase the viability of the organisation. Especially the functions for “Early Warning” are essential for viable organisations. Furthermore, visualising the connections between functions in the organisation and making the technology transparent would increase understanding and thereby support active use of the Intranet.

According to *generality* in the findings, it is argued that designing Intranets based on a combination of VSM, Philosophy of Technology here represented by the CUT-P model, are valid for any kind of organisation at least types of organisation similar to those in the study. The empirical study (Paper 3) based on five organisations has, in combination with findings from other studies, been used as a source and exemplifies problems to solve and desires and fulfil. The characteristics of the organisations in the study are not specific in any sense, compared to other studies of organisations. The findings in this thesis are based on research on existing circumstances in a number of organisations and businesses. The findings can therefore be valid for several types of organisations. Further research should be carried out based on

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

type of organisation and how an Intranet works in different types of organisations. von Krogh (1998) points out that it is critical with an open climate and a wish to communicate and “help” colleagues and others in an organisation if the intranet is to be a contribution or not, so it is not obvious that the findings in this thesis will work in *every* kind of organisation. Nevertheless, every organisation needs channels and support for communication and an Intranet with a design based on VSM can be valuable.

Evaluation of Method/Research Approach and Suggestions for Improvement

The chosen mode of procedure has worked well. The research approach was qualitative by nature and the empirical study was carried out from an “explorative approach” with strains, or influences from Grounded Theory in terms of the “coding” of categories or classes. These categories were to some extent assumed in the beginning, but they were completed as the study progressed.

Several questions have been raised during the work with the different articles. These questions have concerned both the mode of procedure and the reliability of results. Below I present and introduce a discussion of some of the most urgent questions that have appeared.

If you have chosen a model as a kind of inspiration – or in my case, as a “pattern” – how was the model chosen and how do you know that there are not any better models? The answer to the first question, the motive for the choice of VSM, can be found in my knowledge of and familiarity with the model. Furthermore, VSM is a cybernetic model with the aim of

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

supporting, managing and controlling the system to which it is applied or implemented. This was also what I was missing in the design efforts I had met, both in practice and in the literature. The possible existence of better models can be discussed. Better for whom and to what purpose? The VSM was an answer to that which I was missing and to my knowledge, there are no similar models.

Suggestions for improvement of studies of Intranet:

- a follow-up study with interviews in which results and the probability of results is discussed,
 - action research where the different functions suggested in the results are implemented for the purpose of evaluation.
-

Further Research

There are several questions which have emerged due to the results of the research process in the articles. The combination of VSM and Intranet results in the following issues to be dealt with

- The design of an implementation model for Intranets based on the essential ideas in VSM as identified and presented in Papers 5 and 6. Special efforts should focus on functions for Early Warning and feed-forward mechanisms.

The application of the Philosophy of Technology to Intranet results in the following issues to be dealt with:

- The Intranet interface should reflect and support critical information channels. As concerns the interface, the

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

following questions must be answered: *Where are the different parts of the Intranet located physically? Who uses the different parts? Who delivers information to the different parts? Why? What is the purpose of the different parts? Who is in charge?* Answering these questions results in a visible Philosophy of Technology where:

- conceptions about technology and other employees' use of the technology are the same (or close to) and become known or visible,
- the actual use of the Intranet is the same as the intended use if there is no delimitation in the intended use
- the policy of the Intranet is visible and active and governing,
- the technology is known in relation to its limitations and possibilities

There remain many questions concerning efforts with anchoring and visualizing policy in an organisation. Accordingly, further research questions as described above are urgent.

Reflections on the Assumptions

In the beginning of this thesis I stated some assumptions and these assumptions should be commented according to choice and motives. First, I argued that it is a benefit for the organisations if “*the employees to a high degree are **empowered** according to access and authority.*” Furthermore, **democracy** and **open climate** are also assumed to be important. Obviously, these assumptions and beliefs are not shared among a number of managers at different levels in businesses and organisations. However, in contrast, there are also a significant number of managers who agree with this statement. The advantages of empowerment, based both on own experiences, findings from

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

research and discussions with a number of persons representing academia (staff, researchers, students), and trade & industry, are many. I have a strong belief in human beings as curious and innovative when the opportunity arises, and supporting challenges, but also an awareness of the nature of human beings as afraid of and sceptical of changes because of uncertainty about the future. According to the 2002 study (paper 3), several interviewees had a lot of concrete, often innovative, suggestions for improvement of Intranets, but a lot of the interviewees did not feel as they had anybody to hand these suggestions to. The reason was either a lack of confidence or distrust based on the belief that the development processes could not be influenced. These are examples of unexploited knowledge and also missing opportunities related to allowing employees feel the pleasure of being able to influence and participate in changes. If the opposite occurs, there were also examples of this, an open climate supports and encourages members to actively engage themselves in their daily work. There is a lot to win for businesses and organisations if employees are “relieved.” These effects can in the long run probably be measured in monetary terms but surely in measures of increased quality of delivered products or services. Satisfied employees show more solidarity to the organisation than if the opposite rules. *Empowerment supports and is a fundament for participation.* A second assumption was “operational units in an organisation should be **autonomous** in order to make them viable.” I do not think anybody will argue against the advantages of viability but maybe against the existence of autonomous units. This can be thought of as a threat to higher levels in the organisations and a feeling of losing control. I argue that there are advantages to autonomous units’ capacity to act and react in relation to their ability to make decisions about their own activities.

The contribution of the Philosophy of Technology field should not be understood as an effort to implement *one* view if there is a risk of missing new opportunities. In Paper 4, I discuss the desire that the *intended use* of technology should be

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

the same as the *actual use of* the same. It is a fact that new opportunities have been explored when people have used technology in a way that was not intended from the beginning. These possibilities should not be hampered. My idea of combining PoT with Intranet is to make the view of technology visible and thereby known. Debating and discussing the technology in use would lead to an identification of the possibilities and limitations of the technology.

As concerns the use of VSM as a pattern for designing Intranets, it can be mentioned that VSM is subordinate to Intranets in the sense that the aim is not to implement VSM into organisations, the aim is to design Intranets with viable characteristics with the aid of VSM as a pattern.

Closing Remarks

Intranets have no intrinsic value in themselves but should be appreciated in relation to their value for the organisation as a tool for collaboration and participation. Furthermore, an Intranet can never solve problems rooted in other fields. However, well functioning Intranets are dependent on an open climate and a willingness to share knowledge and information as well as to learn and learn from others. Viable organisations are learning organisations. When designing supporting tools such as an Intranet, the user must always be in focus because of the complexity and uncertainty of human behaviour. Accordingly, human tasks can never and should never be totally automated. Viable organisations are characterized by high flows of information within and without the organisations. Decision-making at the right time is essential and depends on humans with a high level of knowledge, adequate information and suitable tools for communication as well as access to historical data records. A well designed Intranet, based on empowerment, trust and an open climate, where empowered employees can

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

deliver, share and collect thoughts, ideas, and suggestions can be such a tool.

We are living in a changeable time and the concept of learning organisations is of more current interest than ever before. Learning organisations are characterized by high flows of information and support, therefore, different functions that support the information exchange must be present. Consequently, a learning organisation can never have a complete or perfect Intranet but must have an Intranet which is continuously improved. This puts high demands on how an Intranet is developed.

The combination of VSM and Philosophy of Technology applied to Intranet, is a well thought-out effort to improve an Intranet based on engagement, up-dating, participation, and in the long run will support and improve the viability of an organisation.

Empowered employees are a fundament for participation and sharing of key-values in organisations. This is essential for viable organisations.

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

References

- Banathy, BH. (2004). A Short Story of My Life. *Systems Research and Behavioral Science*. 21(3), pp 203-208.
- Banck, B. & Nyström, C. A (2005). Intranet Use - A Study of Five Swedish Organisations. *Journal of Organisational Transformation and Social Change* (Ed.) Yolles, M. Iles, P., pp. 153-180, 4Edge, UK
- Bansler, J. (1990). Systemutveckling – teori och historia i skandinaviskt perspektiv (Systems Development – Theory and History From a Scandinavian Perspective), Lund: Studentlitteratur.
- Bansler, J., Damsgaard, J., Scheepers, R., Havn, E. and Thommesen, J. (2000), Corporate Intranet Implementation: Managing Emergent Technologies and Organisational Practices. *Journal of the Association for Information Systems*, vol. 1, paper 10.
- Barabasi A-L. (2003). Linked: How everything is connected to Everything Else and What it Means for Business, Science, and Everyday Life. Penguin Group: NY.
- Barber B. (1984). Strong Democracy: Participatory Politics for a New Age. Berkeley and Los Angeles: University of California Press.
- Baskerville, R and Wood-Harper, A.T. (1998). Diversity in information systems action research methods. *European Journal of Information Systems*. Vol. 7, pp 90-107
- Beer, S. (1972). Brain of the Firm. Allen Lane The Penguin Press.
- Beer, S. (1974). Designing Freedom. John Wiley & Sons Ltd. Chichester, England.
- Beer, S. (1985). Diagnosing the system for organisations. Biddles Ltd. Guildford and Kings Lynn, UK

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

- Beer, S. (1999). On the Nature of Models: Let Us Now Praise Famous Men and Women, Too (from Warren Mc Culloch to Candace Pert). *Informing Science*, Vol 2. No 3. Pp 69-82
- Checkland, P.B. and Scholes, J. (1990). *SSM in Action*, Wiley, Chichester
- Cohen, I.J. (1987). Structuration Theory and Social Praxis, in Giddens, A. and Turner, J.H. *Social Theory Today*, Polity Press, Cambridge.
- Cohen, I.J. (1990). *Structuration Theory and Social Order*, Macmillan, London
- Damsgaard, J. & R. Scheepers, (1997). Using Internet technology within the organisation: a structurational analysis of Intranets *in* Proceedings of the International ACM SIGGROUP Conference on Supporting Group Work.
- Damsgaard, J. & R. Scheepers (1999). Power, influence and Intranet implementation. *Information Technology & People*. 12. (4), pp. 333-358.
- Damsgaard, J. & R. Scheepers (2000). Managing the crises in Intranet implementation: a stage model. *Information Systems Journal*, pp. 131-149.
- Damsgaard, J. Scheepers, R. (2001). Using Intranet Technology to foster organisational knowledge creation *in* Proceedings of the 9th European Conference on Information Systems, pp. 674-686.
- Davenport, T., H. and Völkel, S. C. (2001). The rise of knowledge towards attention management. *Journal of Knowledge Management* 5. (3), pp 212-221.
- Duane, A. & Finnegan, P. (2003). Managing empowerment and control in an Intranet environment. *Information Systems Journal*. 13, pp 133-158.
- Ginsburg, M. (2001). Improving Knowledge Management via Effective Document Management system Design; International Symposium on Information Systems and Engineering (ISE'2001) – Workshop: Knowledge Management Systems: Concepts, Technologies and Applications.

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

- Glaser, B. G. & Strauss, A. L. (1967). The discovery of grounded theory: strategies for qualitative research. New York: Aldine.
- Heide, M. (2002), Intranät – en ny arena för kommunikation och lärande ('Intranet – a new arena for communication and learning'), Sociologiska institutionen, Lunds Universitet.
- Holmberg, S.C. (2001). Taking Syntegrity-4 from Assumption Mode to Reflection Mode. *Systems Research and Behavioral Science*, 18, pp. 127–35.
- Jackson (2003). Creative Holism for Managers. Wiley and Sons Ltd. UK.
- Jonasen DH, Peck KL, Wilson BG. (1999). Learning with technology – a constructivist perspective. Prentice Hall. NJ.
- Kayworth T, Leidner D. (2000). The Global virtual manager: a prescription for success. *European Management Journal*. 18:2; pp 183-194.
- Kelly K. (1998). Den nya ekonomin – 10 strategier för en uppkopplad värld. Eng title; New Rules for the New Economy. Timbro förlag.
- Kling, R. (1999). What is Social Informatics and Why Does it Matter?. *D-lib Magazine*, Vol 5(1). <http://www.dlib.org/dlib/january99/kling/01kling.html> [accessed 2004-11-22].
- Kling, R. (2000). Learning about Information Technologies and Social Change: The Contribution of Social Informatics. *The Information Society*, 16: 3 (23 August).
- Lamb, R. (1999). Using Intranets: Preliminary Results from a Socio-technical Field Study *in* Proceedings of the Hawaii International Conference on Systems Science, IEEE Computer Society Press.
- Lamb, R., Davidson, E (2000). The New Computing Archipelago: Intranet Islands of Practice, Organisational and Social Perspectives on Information Technology *in* Proceedings of International Federation of Information Processing, (R. Baskerville, J. Stage and J.I. DeGross, eds) Working Group 8.2, Aalborg, Denmark.

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

- Lamb, R. (2001). Tracing Influence through Intranets of Compliance; HICSS-34 *in* Proceedings of Hawaii International Conference on System Sciences.
- Langefors, B. (1966 [1973]). Theoretical Analysis of Information Systems, Lund, Auerbach and Philadelphia, PA: Studentlitteratur.
- Langefors, B (1995). Essays on Infology – Summing Up and Planning for the Future, Lund: Studentlitteratur.
- Law, J. (1992). System practice, vol. 5, no. 4
- Miller, JG. (1978). Living Systems. McGraw-Hill.
- Nonaka, I., Takeuchi, H. (1995). The knowledge creating company. Oxford University Press: New York.
- Polanyi, M, (1966/1998). The tacit dimension; Knowledge in Organisations. (Prusad, L ed) (pp. 135-146).
- Ruppel, C. P., Harrington, S. J, (2001). Sharing Knowledge through Intranets: a study of organisational Culture and Intranet Implementation; IEEE Transactions on Professional Communication. Vol 44. No 1.
- Scheepers, R. (1999). Intranet Implementation – Influences, Challenges and Role Players. Doctoral Thesis. Faculty of Engineering and Science, Aalborg University, Denmark.
- Shung-Ming, T. (2000). An impact model of Intranet adoption: an exploratory and empirical research. *The Journal of Systems and Software* 51 (pp. 157-173).
- Standing, C. & Benson, S. (2000). Irradiating Intranet knowledge: the role of the interface. *Journal of Knowledge Management*. 4. (3) (pp. 244-251).
- Stenmark, D. (2002). Designing the New Intranet, doctoral dissertation, Dept of Informatics, Göteborg University. Gothenburg Studies in Informatics, Report 21.
- Stenmark, D. (2003). Knowledge creation and the web: factors indicating why some intranets succeed where others fail. *Knowledge and Process Management*. 10(3): 207-216.
- Stolterman E.. (2000). Lecture, 6-7 November 2000. Dept of Informatics, Umeå University, Sweden.

Designing Intranets for Viability – Approaching Organizational Empowerment and Participation

- Swedish Confederation of Professional Employees (in Swedish: TCO – Tjänstemännens Central Organisation) (2004). website: <http://www.tcodevelopment.com>. [Accessed 11 February 2004].
- Telleen, S. (1997). The Intranet Paradigm, website: <http://www.iorg.com/papers/paradigm.html>. [Accessed 12 February 2004].
- Telleen, S. (1998a). Intranet Organisations: Strategies for Managing Change, website: <http://www.iorg.com/intranetorg/> [accessed 2005-05-03].
- Telleen, S. (1998b). The Difference Between Internet, Intranet, and Extranet. <http://www.iorg.com/papers/iw/19981019-advisor.html> [accessed 2005-05-03].
- Wachter, R.M. and Gupta, J.N.D. (1997). The Establishment and Management of Corporate Intranets. *International Journal of Information Management*, 17: 6, pp. 393–404.
- Von Krogh, G. (1998). Care in knowledge creation. *California Management Review*. 40 (3): 133-153.

Designing Intranets for Viability – Approaching
Organizational Empowerment and Participation
