

The Mobile Intranet: Managing People and Information in a Distributed Organization

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Abstract

As a result of the increasing globalisation of organizations, information systems must deal with issues of mobility. Longer distances between the members can lead to a knowledge gap, which means that two groups of people working in the same organization work according to completely different bases of information. Thus, there is a need for the members of an organization to communicate efficiently across geographical and departmental boundaries. The paper discusses motives, methods and experiences from the participatory design of a versatile Intranet application currently in use at the Division of Computer Aided Design, Luleå University of Technology in Sweden.

1 Introduction

As organizations tend to become increasingly globalised, new demands are put on their ability to deal with issues of communication, information sharing and knowledge creation. With longer distances between people, many of them with different responsibilities and activities within the organization, there is a clear need for the members of the organization to communicate efficiently across geographical and departmental boundaries (Robinson & Stern, 1997). Today, many organizations have started to recognize the importance of improving their ways of managing their knowledge assets (Offsey, 1997), and this might be particularly true for those organizations that are geographically distributed. *Knowledge-intensive* organizations, such as industrial research divisions, academic research departments or consultancy companies, often consider knowledge to be the primary asset of their organization, as opposed to the research papers or high-tech products that they produce (Starbuck, 1992).

"The actual product of the pharmaceutical industry is knowledge, - pill and prescription ointment are no more than packaging for knowledge." (Drucker, 1993)

This view on knowledge management as a condition for competitive advantage implies, among other things, that all employees are given equal access to corporate information (Nonaka & Takeuchi, 1995). A widespread understanding of the capacity of the organization will lay the foundation for an increased, and more efficient, use of the organization's intellectual capital (Stenmark, 2000). By encouraging contributions and sharing of ideas from all their members, and by handling these contributions in an efficient way, organizations will be able to utilize

knowledge resources which previously were unknown or out of reach. Instead of merely *storing* information for future use, which is still the case in many organizations, efforts should be made to add value by facilitating information *sharing* and knowledge *creation*. Successful knowledge management and creation will also make it possible to distribute responsibilities and decisions closer to the people who know the most about the task at hand.

Even though tools for web publishing are becoming increasingly easy to use, the problems with inconsistent, or poor, design and layout remain. Per definition, the information may be published and easily accessible, but the message can still be lost due to poor design of text and graphical elements. In many organizations the barrier is simply too high when it comes to efficient information sharing, and too much of the responsibility to share knowledge and information lies with one single department – or at worst, with one single person.

The Intranet project at the Division of Computer Aided Design was started in order to deal with the issues of information sharing and knowledge creation as described above.

2 Corporate context

While enjoying the benefits of a close collaboration with industry partners and other universities, the Division of Computer Aided Design is currently facing problems with decentralization. Besides of their positions at the division, some members of faculty are also holding positions at other universities, even outside of Sweden. A large percentage of the doctoral students are permanently located at various partner companies or collaborating universities. Additionally, EC research projects and other

international collaborations require extensive travelling as well as continuous exchange and sharing of information between the partners.

In previous years, monthly staff meetings have functioned as a communication channel for *formal information*, such as strategies or activity planning, while daily face-to-face communication has been the natural way to share *informal information*, such as advising colleagues on articles in progress or just letting each other know how their work is progressing. Since the formal meetings had a continuously decreasing number of participants, and since regular face-to-face communication was now possible for only parts of the staff, it was becoming increasingly obvious that the division was going through a transition phase – from a co-located academic department to a decentralized organization with new demands for communication and information sharing. As knowledge sharing across departments, functions or geographical locations is regarded as a core organizational competence (Newman, 1997), the division decided to create a virtual space that could facilitate information sharing and communication in an organization that, physically, was becoming globally distributed.

The objective of the Intranet was not to store large volumes of organizational information that the staff could access from the Intranet. The real problem lies not in the presence of information, but in the quality and accessibility of the information. There was a need to share the organization's knowledge base between the staff in an efficient way, hereby giving them greater responsibility and involvement in the organization's decision-making process. One of the goals was to make it possible for every member of the organization to work, at least to a greater extent, using the same information base and general understanding of the organization as their colleagues, independent of geographical location or work responsibilities.

3 Methodology

An information system, like any other software system, does not work just because it is robust, reliable and meets its functional specification (Winograd, 1996). A well-designed system works for people in a context of values and needs, and it also helps producing quality results and a satisfying user experience, which is completely in line with the notion of *usability*.

Thus, designing for usability does not imply the design of foolproof systems, but rather the need to design systems that are anchored in the activities of the users. Such a system will prove its usability by truly supporting people in their work practice. When people are using computers in their everyday work, they mainly use them as tools in order to accomplish

certain tasks or to achieve certain results. Regardless of the complexity of the actual task – sending e-mail or performing advanced calculations – it is still the task to be performed (*Work-of-the-Work*) that is of importance to the user, not the tool used to achieve the result (*Work-of-the-Tool*) (Holzblatt et al, 1993).

System developers, in general, try to understand the work of users by applying their own concepts of efficiency, reliability, usability and so forth, to an imagined work practice, which they have little or no knowledge about. Since users and developers do not share a *common practice* (Greenbaum & Kyng, 1991) or a common language, a communication breakdown is likely to occur somewhere in the development process, which could end up with the users having to adapt to the system rather than the other way around.

Ethnographic techniques, such as observations, video and tape recordings, informal interviews and field notes are often utilized to inform systems design (Ely 1991, Anderson 1997, Blomberg et al 1993, Randall et al 1994) while techniques for Participatory Design (Schuler & Namioka, 1993) are increasingly used in projects where the aim is to actively involve future users in the system design, rather than just seeing them as passive sources of information. A blend of these techniques was used in order to better understand the work context that the final system would be put into.

4 Resulting system

In order to achieve the dynamic properties that characterized most of the user needs, the Intranet was developed using *Active Server Pages* (ASP), *Wireless Markup Language* (WML), and relational database technology.

Most of the information available on the Intranet can be updated through a web interface. There is no need for the staff to learn web-publishing tools, and since the database is populated through form submissions, it is actually not harder to publish content on the Intranet than to write e-mail. For example, each field of a certain form represents text elements, such as a headline or the body of an article. When submitted, the information is stored in the database, and can then be retrieved and inserted into the web page, following the predefined format. Thus, if defined correctly in the ASP code, news headlines will always be in a bold font, while date and time for the news item will always be in italics. The user simply cannot do a mistake that will ruin the design and layout of text and graphical elements. The ASP can thus be seen as a template, which is then populated with the latest information from the database.

In order to facilitate communication between staff members, and to provide *direct access* to colleagues, tools for synchronous communication such as *ICQ*¹, *SMS* (Short Message Service) and *Microsoft Netmeeting*² were integrated into the system. ICQ is a program that will notify you when your colleagues and other contacts are online. For example, the software lets you chat and send instant messages or files in real-time. SMS is a service for sending messages of up to 160 characters to mobile phones that use Global System for Mobile (GSM) communication. GSM and SMS service is primarily available in Europe, but the system we use enable us to reach non-GSM mobile phones and pagers even in the USA³. Netmeeting is a tool that enables low-bandwidth, real-time communication and collaboration over the Internet using for example audio, video, application sharing and file transfer.

Thus, as a combination of these technologies, it is now possible to chat, send files, initiate videoconferences and send instant messages to colleagues directly from the Intranet. Additionally, the SMS functionality is used to notify students of late changes in the course schedule, and to notify the system administrator of critical temperature changes in the computer rooms.

5 Conclusion

As a result of the increasing globalisation of organizations, information systems must deal with issues of mobility. Longer distances between the members can lead to a knowledge gap, which means that two groups of people working in the same organization work regarding to completely different bases of information. Thus, there is a need for the members of an organization to communicate efficiently across geographical and departmental boundaries. By facilitating knowledge management and creation, it will also be possible to distribute responsibilities and decisions closer to the people who know the most about the actual situation.

Additionally, this decentralization means that people need to access and contribute to the corporate information flow regardless of their physical location, using a variety of client hardware, such as workstations, portable computers, handheld computers, or mobile phones.

The system design has been influenced and informed by ethnographic techniques, while techniques for Participatory Design have been used to actively involve the users in the system design.

By anchoring the design decisions in the needs and

¹ <http://www.icq.com/>

² <http://www.microsoft.com/netmeeting/>

³ <http://www.tellustalk.com>

work activities of the staff, and by actively involving the users in the design process, we have arrived at a system design that works as a true support in the everyday work activities at the division. While satisfying the needs for mobility and efficient information sharing, the Intranet also reduces workload in terms of administrative tasks. In this virtual meeting place, formal and informal contacts can continuously be taken - regardless of the physical distance between members of the organization. The dynamic properties that the users required was achieved by the use of *Active Server Pages* (ASP), *Wireless Markup Language* (WML), and relational database technology.

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