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Research in Progress: Opportunities for eCollaboration in the Finnish Archipelago

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Abstract

Five municipalities in the Turku archipelago in Finland face a new challenge when they are merging to form one city on January 1st, 2009. This paper discusses the challenges ahead and describes the early stages of a research and development project which will propose, develop and implement solutions, especially involving interactive technologies, for a new city that is being formed. There is a need for new technologies and changes in working methods due to diminishing resources and physical boundaries. The need for improved collaboration is urgent for most of the small, geographically isolated, inhabited islands in the Finnish archipelago, but due to time constraints even more urgent for the new city being formed. This paper outlines how interactive web-based and mobile technologies can enable eCollaboration within and between islands and groups of stakeholders.

Keywords: eCollaboration, Virtual Community, Information and Communication Technology, eGovernment

Introduction

Finland is a country with one of the most extensive archipelagos in the world. The archipelago municipalities are often struggling to fulfil their obligation to maintain the current service level of the health care, education and other municipal services. This is a major challenge, especially for the smallest municipalities with limited resources. Even though the municipalities have few inhabitants, they need to provide a full service level. There is both a need and will to improve how the services are being delivered, which due to diminishing resources must be done very cost-effectively. These aforementioned challenges are common for most islands in the Finnish archipelago and, hence, also for the new city that is being formed consisting of the five contemporary municipalities Houtskär, Iniö, Korpo, Nagu and Pargas. The new city, most likely taking the name of Pargas, will be formed January 1st, 2009. Even though the present situation can be seen as a problem, it is certainly also an opportunity to enable good eGovernment. The status quo situation that otherwise can exist, hindering new innovations as eCollaboration and eGovernment, is discontinued by the formation of the new city, possibly leaving room for new solutions and re-engineering. It is not yet clear how, or where, the work of the new city will be performed, whether it will be centralized or dispersed. However, we assume that there will be some division and duplication of work activities at least in the short term. Also, some functions continuously need to be carried out on each geographically dispersed area. Hence, there is a need

for some collaboration technique in order to enable possible synergies, avoid unnecessary duplication of labour, and enable seamless activities, i.e. that everybody has access to the information and knowledge needed to fulfil their work duties effectively. The obvious boundaries related to the presented problem situation are physical, but there are also other, more intangible boundaries, as the resistance to change which might affect the work in the new city and compromise successful implementation of any proposed technological solutions. Technology could help overcoming the physical boundaries. The intangible boundaries, however, might be more difficult to handle. These intangible boundaries are discussed in more detail later on and some solutions that hopefully also help overcome these problems are presented.

Experiences from earlier projects in the Finnish archipelago have given us some ideas of what the problems affecting the archipelago are, and we have witnessed situations where eCollaboration would be needed, for example to enable better information dissemination between the government officials as well as between the government and citizens and organisations. However, we have also witnessed some obstacles to new technologies as eCollaboration of which a major obstacle is change resistance. Another obstacle is computer literacy among potential eCollaboration participants, which has proven to be quite limited among many government employees. These are problems which will have to be managed correctly in order to be able to infuse any eCollaboration.

In this paper we aim at defining how some of the boundaries that can occur in conjunction with the creation of the new city presumably could be overcome by the use of eCollaboration. Consequently, the paper at hand discusses implications eCollaborative technologies can have foremost for intra-governmental activities, but also for collaboration with external actors. Also, we discuss whether the use of the eCollaborative technologies can spur the development of a virtual community, enabling relationships and a community spirit to be built and social capital to be created. Furthermore, eCollaboration in this presented setting is closely related to eGovernment, which, hence, is an important aspect to consider in this paper.

Research Methodology and Research Questions

The purpose of this research is to outline the potential for eCollaboration within the new archipelago city being created in the south-west of Finland, initially for the government employees and functions, but in a broader perspective also for external stakeholders. Stakeholder in this paper refers to citizens and organisations residing in the city. The methods required for this project involve both quantitative and qualitative approaches. Initially in the planning process, the quantitative methods are mostly questionnaires of actual and wanted ICT use and collaboration methods among the employees of the municipalities and related stakeholders. However, the qualitative methods are considered to be the most important and foremost involve interviews with representatives of all stakeholder groups.

In the development process, action research is proposed in combination with an iterative design process to create IT artefacts for eCollaboration. The constructive method, presented in Järvinen (2001), where specifications of the final objectives and the implementation are being done in parallel, applies very well to our case. Since we do not have all information needed, there is uncertainty concerning the final objective and the development process. It means that during the development process we will get a clearer picture concerning what is needed. Action research is proposed as it involves participating in the whole design process of the systems. Iterative design seems to be a suitable approach because it is very important to involve the end-users and all stakeholders. Close cooperation with the actors facilitates usability testing at each step. Action research is an iterative process, which should incorporate the views and needs of as many stakeholders as possible. Cummings and Huse (1989, p. 47) state that action research involves considerable collaboration between the change implementer and the stakeholders the change affects, and that data gathering and diagnosis before action planning and implementation is important, as well as the evaluation of results after the action has been taken. The progress of the project should also be monitored by interviews and questionnaires. It is important to continuously follow the state of the art of the research field and incorporate new insights and technologies, such as mobile, into the development process. We acknowledge the importance of flexibility in the

development process, as we initially will not know what the final outcome should look like and what challenges will be encountered during the process.

Research Questions

In the presented problem situations, there are many questions that should be explored and hopefully answered. A question spanning the whole presented situation is:

Can eCollaboration technologies help the transition to the new archipelago city, enabling effective communication, and prove a resource-effective way of delivering community service and eGovernment?

This is, however, a very general question covering both-intra-governmental and extra-governmental collaboration activities. A more detailed research question, which corresponds to the focus of this paper, is:

Can intra-governmental work be improved by eCollaboration, and if so, what are the needed tools and what is needed to make them work?

A related question, which however is not fully explored in this paper, is:

Could a virtual community help enable better governmental communications with citizens and promote eParticipation?

This is an interesting question that should be explored in more detail, and we, hence, recommend it for future research. We believe a virtual community, or concepts adopted from the virtual community field could help provide better information flow in both intra-governmental and extra-governmental relations, and both help enable eCollaboration and function as a change management mechanism.

Aims and Structure of This Paper

The aims of this paper are: i) to describe the problem situation municipalities in the Finnish archipelago are facing; ii) to show the potentials of eCollaboration; iii) to describe the planned research supporting the new archipelago city being created; iv) to describe potential challenges when developing eCollaboration technologies; and v) to further expand the possibilities with virtual communities. The structure of the paper follows the topical order presented above.

eCollaboration towards eGovernment – Opportunities and Challenges

Communities are traditionally bound by geographic locality due to natural obstacles or distance. Communication in these circumstances is restricted, and in many situations takes a lot of resources. New interactive technology provides a solution to these problems, enabling more effective communication and participation in society (Grossberg et. al, 1998, pp. 38). This description applies very well to the problem situation described by us. eCollaboration offers a way for communities to overcome these boundaries and communicate more effectively, enabling information and knowledge to be shared. Virtual constellations consisting of people with different background and expertise offer great possibilities to accomplish innovation and solve problems. Metcalf's law applies, which states that the value of a network grows exponentially in relation to the number of members. This opportunity of gathering collective intelligence (Paavola et al., 2002) could be utilized to get better information used for example in decision making, and to avoid double labour. Technologies can enable experts from remote locations to participate (Verburg and Bosch-Sijtsema, 2007). This would enable people to focus on what they know best, and hence

provide scale-effects. Presumably, eCollaboration allows resources to be saved if travelling from and to places can be made redundant thanks to technology. Additionally, eCollaboration can, according to Verburg and Bosch-Sijtsema (2007), reduce the need for co-presence by enabling asynchronous communication. These possibilities with eCollaboration are especially important for the archipelago, as the communications often are quite time consuming.

Electronic Government

As this paper revolves around eGovernment, we find it purposeful to here in short describe the concept of electronic government (eGovernment) and what possibilities and challenges there are to accomplish functioning eGovernment. Wimmer and Traunmüller (2000) define eGovernment as a guiding vision for public administration, that “stands for using the Internet, for re-engineering administrative processes, for achieving a virtual administration” and also “supporting an active participation of the citizens in democracy”. Lanvin (2002) separate eGovernment implementation in three phases: i) publishing information and using ICT to expand access to government information, ii) interacting with the community by broadening the civic participation in government, and iii) transacting by making government services available online. eGovernment can have direct outcomes, as cost effectiveness, savings in public procurement, and better service delivery to the community, as well as indirect outcomes, as greater transparency and accountability in public decision making, and ultimately strengthening of democracy. Furthermore, it can enable inclusion, that more people get access to government services than otherwise. (Millard, 2003) These are but a few possibilities that good eGovernment can induce. Wimmer and Traunmüller (2000) see eGovernment from four perspectives: citizens and customers, process (reorganisation), (tele)cooperation, and knowledge. They mention as a major challenge for eGovernment, finding a successful way of re-engineering and distributing the administration’s knowledge. Lenk and Traunmüller (2000), conclude that technology often is the least difficult part of the success of eGovernment initiatives, but that transformation of work processes and practices is a major obstacle and challenge, and that re-engineering is needed for example of how people within the government work and think. One example is that there is need for a change in how citizens are thought of, which should be seen as customers of the government and participants in the decision making.

Virtual Communities

As a part of eCollaboration for eGovernment, we aim at exploring whether a virtual community, or concepts derived from the virtual community field could help accomplish eCollaboration, eGovernment and the change management needed to accomplish these. Hence, we here include a short section about virtual communities.

A virtual community is according to Lee et al. (2002) “a technology-supported cyberspace, centered upon communication and interaction of participants, resulting in a relationship being built up”. This definition has been reached after compiling definitions of virtual community from several authors. According to Woolley (1998), the value of participation is the most important factor affecting the participation in an online community, which, hence, needs to be visualised clearly. Wagner et al. (2003) has explored the possibility of virtual communities enabling knowledge creation and eGovernment, and have found that virtual communities can not fulfil all eGovernment knowledge management needs. They have found that virtual communities can have a major impact on situations where knowledge needs to be created quickly and is drawn from widely dispersed sources. Virtual communities enable knowledge to be exchanged. However, in-depth knowledge from central sources, they argue, can be better supported by other knowledge management solutions. They conclude that virtual communities are effective and affordable to implement. Furthermore, they argue that virtual communities can promote e-democracy.

Factors Affecting the Success of eCollaboration

Developing functional eCollaboration environments with active communication and collaboration is not an easy task. However, if done correctly, the presumed outcomes provide a substantial value for all stakeholder groups. The challenges when developing the proposed technologies will concern technical issues and organisational and social ones as well as reaching systems with great usability and good content. Rutkowski et al. (2002) show that problems can occur in virtual collaboration and that you have to take many aspects into account when designing virtual collaborative environments, aspects regarding technology as well as social aspects. Hence, the development and implementation of eCollaboration technologies is not only a technical issue, but rather an organisational one. The value of using the developed technologies must be visible in order to attract users. The stakeholders should be involved at a very early stage of the development, and their viewpoints should be taken into account, which is recognized by Lee et al. (2002). According to Woolley (1998), the value of participation is the most important factor affecting participation, in his case an online community. The value of participation, i.e. what people actually can get out of participation, is something we have to make visible to the potential users. One interesting study regarding the presented case is whether it makes a difference for the success of the electronic communication that there exist relationships already in the physical community, and if it does, to what degree. A question is then how easy it is to transform the collaboration taking place in a real life environment to a digital environment. London (1997) states that existing communities can be strengthened by electronic networks. It will be interesting to see if this is true. Another related question is if it makes a difference that the existing physical communities are situated on different locations, which may lead to that possible existing problems are being transferred also to the digital environment. If so, it is presumably a problem situation. This is a situation we would like to improve with the help of the creation of a virtual community. That the people engaging in electronic collaboration should find new common ground and develop an esprit de corps. Trust is often recognized as probably the most important factor in electronic communications, and is, hence, an important part of eCollaboration and should be considered in an early stage of development (Camarinha-Matos and Afsarmanesh, 2007). Trust involves both trusting the other participants as well as the technology and systems used (Patokorpi and Kimppa, 2006). Camarinha-Matos and Afsarmanesh (2007) recognize that building trust is a pre-requisite for effective collaboration, but that it is difficult and time consuming to accomplish. They furthermore recognize that, in addition to capabilities and competencies of the partners within a team, also other more subjective factors play in, as for example personal preferences. In the proposed eCollaborative environments, there is no option of who to collaborate with, so this factor might be a problem situation for the effective function of the eCollaboration. Additionally, Camarinha-Matos and Afsarmanesh (2007) argue that it is important for a virtual organisation to early on develop and agree on the common principles of working and sharing together. They also recognize the importance of agreeing on the roles and responsibilities of each partner. We believe this is vital for the new Archipelago city, and a pre-requisite for the whole project. Chatterjee and Sarker (2007) find that social interaction and relationship development is important in accomplishing collaboration, possibly even more important in an eCollaborative setting. Social interaction and relationship development is one of the key components needed when building trust, one of the key factors affecting successful eCollaboration. In addition to the social dimension of the challenges presented are technological limitations that might occur. For example, many collaborative technologies are poorly equipped for handling security issues, i.e. they are not built for the type of activities that require higher security, instead they rely on the members to control the content, which Wikipedia for example is a case of. Especially regarding solutions developed for government purposes, we have to consider the security issues very carefully when developing the applications. Using collaborative tools developed by Google for example, probably is not an option, even though there are business organisations using it (Traunmüller 2007). User-generated content, sometimes referred to as member-generated content, refers to the data, information, discussion, expression, and feelings generated in discussions led by members (Hagel and Armstrong, 1997). User-generated content provides significant possibilities, regarding information creation and dissemination and the possibilities for organisations to save resources when users are doing the work of creating content. Hagel and Armstrong (1997, p. 76) find that user-generated content often can be quite deep and specific, and that this richness is something that an organisation can have difficulties competing with. While government employees we have been in

contact with think that in principle the idea of user-generated content is good, they argue whether this approach would be appropriate for their purposes. Reasons stated foremost concern security, trustworthiness and qualitative issues of the expected content. The problem is, hence, to ensure the quality of the content.

Other challenges concerning eCollaboration tools for government purposes (eGovernment) are that no errors can be tolerated in e-government, every classified transaction and bit of information must be securely transferred and that laws and regulations might hinder the development of some services. For applications aimed at the citizens, it is important to ensure that every citizen gets the same level of service, which presents a further challenge. Also regarding eCollaborative solutions developed for eGovernment, it is vital that everybody speaks the same language and uses the same terminology, so that they will be able to understand each other. Hence, prerequisites of successful eGovernment implementation are to introduce a common taxonomy and guidelines for communication. Furthermore, it is important to create work methods and rules concerning documentation principles, enabling storage of information and knowledge. (Traunmüller 2007)

It is well known in eGovernment literature that change management and re-engineering of work processes will be needed in order to accomplish eGovernment services, as Wimmer and Traunmüller (2000) put it, establishing of eGovernment systems requires breaking of old-established structures, which means that organisational processes need to be re-engineered to support the technical facilities. This also applies in the situation we have described. Change management literature generally refers to the importance of providing all stakeholders with good information about what is being done and why in order to help accomplish transitions. In the action research approach proposed, this is included as the stakeholders actively should be a part of the development.

Proposal of eCollaboration Technologies for the New Archipelago City

As presented in the introduction, the challenge is to quickly develop and implement solutions enabling the new city to take over the duties of the municipalities from day one. To tackle this challenge, an R&D project that would develop, build and implement tools and systems for enabling and improving the operations of the new city and its stakeholders has been proposed. These tools, applications and systems will be used for interaction within the new city, between government and citizens and among the citizens themselves. The challenges facing an undertaking of this magnitude are considerable, involving not only technological, but organisational and societal issues. The presumed opportunities and possibilities, however, are substantial enough to motivate the large work effort needed.

To create solutions to the unique problems of the Finnish archipelago, specifically for the new city of Pargas, we propose the utilisation of new interactive web-based and mobile technology to create such eCollaboration tools that primarily would enable the development of intra-governmental communication and, secondarily, in a broader perspective also interaction with the community, foremost citizens and organisations, to enable civic participation. These correspond to the first and second phases of Lanvin's (2002) eGovernment implementation classification. The potential benefits from the accomplishment of such tools are considerable for both citizens and government officials. The general benefits include creating better interaction between stakeholders, improved information dissemination, and enabling economies of scale, with the help of new interactive media and the content tailor-made to serve the needs of both government officials and the citizens. The areas of government, the civil society, entrepreneurship, and education can be expanded, to create more with less, avoid duplicate labour, or accomplishing things previously not achievable.

Collaboration Supporting Intra-Governmental Activities

Collaborative technologies need to be developed to suit the special requirements of the archipelago city. The development work has to be done in close cooperation with all the main stakeholders, which translates to iterative design. Societal issues and clinging on to old work practices also loom large and resistance is to be expected. Changes are inevitable both in work practices and communicative practices which is likely to demand change management at the grass root level. The final test of the technological solutions is the usability by end-users. Therefore some type of user involvement and user-centred approach is required.

Tools enabling eCollaboration are generally found to be e-mail, chats and forums, e.g. by Lee et al. (2002) and Rutkowski et al. (2002). It can be argued whether these tools actually are enough to support effective eCollaboration. Electronic Collaboration has the potential of enabling new knowledge to emerge. We believe this is possible when you put together people from different disciplines having different backgrounds. The collective intelligence here plays a major role in accomplishing something that fulfils the Braudel rule (Keen and Mackintosh, 2001). Collective intelligence has great potentials that should be explored. Such collective intelligence could be gathered through technology enabling user-generated content, and stored in a knowledge repository for later use and revision. Such a knowledge repository is an important part of eCollaboration, since it for example might reduce duplicate labour. Information in such a knowledge repository could for example be good practices. The knowledge repository could be built upon wiki-technology, enabling simple co-authoring of information, and used either internally within the government or as an open solution available to everyone.

Wikis has risen as a very important tool for collaboration and a space for collective intelligence. Schaffert et al. (2006) claim that wikis can serve as a knowledge platform for a community of practice, where members of the community can share their knowledge and information with the group, work together or discuss issues. Schaffert et al. also state that a wiki can be used by new members of the community to get informed about the community and its practices. They furthermore regard wiki as a good technology for creating interdisciplinary and intercultural communication environments where people from different backgrounds can be brought together and discuss a common topic. We believe this is one of the most powerful features of wikis, and other virtual communication and collaboration means. By bringing together people with a different background, knowledge can be created that otherwise couldn't have been. Lee et al. (2002) state that there is a lack of tools enabling true knowledge transfer and in-depth sharing among the participants. We believe wiki can be an important answer to this request.

We believe it is important to stress that participating in should be possible both using web-based and mobile technologies, as they each have their own strengths and weaknesses. Together, these technologies presumably could support the new working methods needed in the archipelago. People usually prefer a personal computer, if available, as it is easier, quicker and more comfortable to use. However, people are often on the move and do not have access to a desktop computer, something we believe that applies especially to the people in the archipelago. Then, the ubiquitous nature of mobile devices is needed to allow virtual work on the move (Verburg and Bosch-Sijtsema, 2007). The main advantage with mobile devices and applications are their ubiquitous nature, which enable in this case work to optimally be done whenever and wherever, that is, it gives freedom to the user (Keen and Mackintosh, 2001). Ideally, the user can do the work at the optimal time, e.g. when he has time to spare, which is quite common in the archipelago when travelling with ferries from one island to another. Chatterjee and Sarker (2007) recognize that mobility enables workers to be flexible, to be able to keep their routines and obligations even though they are on the move, something that often is required from the workers in today's organisations.

Applying Concepts and Tools from Virtual Community in Facilitating Government External Relations

To enable phase two of eGovernment, as proposed by Levin (2002), we propose the development of a virtual community incorporated in the eGovernment system. The objectives with such a virtual community are to lower the threshold for participating in the community, be a means to accomplish and enabling citizen participation (eParticipation), enable an esprit de corps to be built, and improve the overall transparency of the new city. Requirements for accomplishing this is for example that the city officials acknowledge the potentials, and approves the citizen influence of the city. This requires re-engineering of work practices and good change management. Also, to enable and encourage participating, the value of the virtual community needs to be visualised clearly. If successful, the virtual community could help overcome many of the challenges listed in this paper. Presumably for example, participants in the virtual community could help create content needed in the city, as for example information material.

The first step of the process will be to develop technologies enabling electronic communication and collaboration, according to the users' needs. This can also lead to relationships being built and later on to the creation of a virtual community. It is for the future to show if this will be the outcome. The optimal situation within the new city is when everybody feels that they belong and can contribute, which are the central features associated with a virtual community. A virtual community could have major possibilities, not at least for citizens. We believe accomplishing a virtual community could help accomplish good change management, by enabling better information dissemination, and especially if a feeling of unity could emerge among the city citizens. Wagner et al. (2003) argue that virtual communities can promote e-democracy, and a possibility related to this is that a virtual community could help improve the transparency of the government and enable citizens to have influence on the government activities and decisions. However, as Preece (2000) has recognized, a virtual community cannot be created, hence we cannot be certain that collaboration will happen that will enable the formation of a virtual community. We can only introduce the technologies needed to allow communication, and also promote collaboration and show how the technologies can be used. Whether then enough communication and collaboration will take place, and an esprit de corps emerge between the members to the point where it can be called a virtual community, we cannot anticipate.

Limitations and Further Research

We recognize that there are still much to consider regarding the presented research areas. The scope of this paper has only permitted us to outline and present the problem situation and propose the work method and possible solutions. More research should still be made into what actually is needed, and more specifically what eCollaboration technologies to be adopted; information that preferably should be gained through action research where a more focused view could be developed after witnessing the actual, practical needs. As argued earlier, the potential effect of a virtual community as an enabler of eGovernment would provide an interesting study. Regarding this, both theoretical as well as practical studies would be needed.

Conclusion

Opportunities related to the implementation of eCollaboration are substantial. In addition to improved communication and collaboration compared to the existing situation, also new possibilities can emerge. By using eCollaboration, boundaries can be overcome which for example enable people that otherwise couldn't have participated in collaboration to participate. Consequently, eCollaboration can have a democratizing effect. Technically speaking, creating tools enabling eCollaboration presumably is rather simple, but organizationally it offers a major challenge. Successful implementation of such technologies requires change management and re-engineering of work processes. The usability and creation of the content can also be challenging. Electronic collaboration offer great possibilities for improved work and communication.

Economies of scale can be accomplished if double labour is reduced, and existing information is used more efficiently. The collective intelligence of the participants of eCollaboration can enable new and better knowledge to be created and eCollaboration also offer methods to better disseminate information. The development of the eCollaborative technologies should be based on the needs of the users, rather than on technological finesses. The design process should therefore be iterative. The different stakeholders should be participating in the development as much as possible. We conclude that developing functional eCollaborative environments with active communication and collaboration is not an easy task. However, if done correctly, the presumed outcomes will most likely provide a substantial value for all stakeholder groups.

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