

# When an informal tool meets a formal organisation – supporting collaboration by a Virtual Workspace

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**Abstract.** This paper reports from a case study of the introduction of a new tool – Lotus QuickPlace™ – in a Scandinavian financial organisation. Lotus QuickPlace is a general tool for supporting communication and collaboration in small informal groups. It was introduced to support collaboration between geographically dispersed people working together. The introduction resulted in a number of clashes between the technology and the organisation's IT management practices, as well as very unforeseen uses. According to our analysis these clashes stem partly from a general misunderstanding of the character of the technology, partly from IT management or implementation models that didn't apply to a general tool for communication and collaboration. The paper discusses the implications of our empirical findings for implementation models of open technologies like Lotus QuickPlace. We show how an application of Orlikowski and Hofman (1997)'s change management model might improve the understanding of the implementation process, and further identify potential benefits from introducing a distinction between macro and micro level perspectives into the model.

# 1 Introduction

Virtual workspaces are applications based on web-technology for supporting communication and collaboration between geographically dispersed people working together in a project or a team.. Examples are Lotus Quickplace([www.lotus.com/quickplace](http://www.lotus.com/quickplace)), BSCW developed at GMD ([www.bscw.gmd.de](http://www.bscw.gmd.de)), and eRoom ([www.eroom.com](http://www.eroom.com)). Virtual workspaces are open technologies with no specific work processes built in. As such they offer support for many different occasions. One such occasion occurred in spring 2000 when a large financial company was created in Scandinavia by a merger involving financial companies (banks and insurance companies) in four Scandinavian countries. The new company, ScandinaviaBank, needed an application that could support the collaboration and communication taking place in projects following right after the merger. Lotus Quickplace™ (hereafter QP) – a virtual workspace product from IBM – was deployed to support these projects approximately 1 month after the merger.

QP is a flexible technology that offers end-users a web-based shared workspace with a folder structure, notification functions, support for custom document types and support for simple workflows. It was originally developed as an Application Service Provider (ASP) application and is thus very decentralised.

Implementation of support for communication and collaboration by a virtual workspace, or groupware, application is not always successful. Olesen and Myers (1999), for example, report on a failed action research project trying to improve communication and collaboration in a management team with a real need for such support, and with strong support from senior management towards radical changes of coordination within the group. Olesen and Myers (1999) attribute the reasons of the failed project to institutional forces, which inhibited dramatic changes in work habits. Other researchers have reported similar and other concerns with implementation of groupware: identifying technological as well as organisational and social factors (e.g. Bullen and Bennet, 1990; Orlikowski, 1992; Grudin, 1994).

In this light the implementation of QP in ScandinaviaBank must be characterised as more successful – our study showed an extensive use, but also a mixed picture. In late spring 2001, i.e. one year after the merger and with QP in operation for about a year, we carried out a study of the deployment and use of the QP technology. The study of use showed an extensive use, but also a mixed picture ranging from "dead" QPs to QPs that support business critical tasks. The active QPs cover a spectrum from a sub-intranet for 800 people over support for projects to support people doing recurrent tasks. The implementation of QP has been characterised by a number of conflicts around the management of the QP technology. They seem like clashes between the technology and the ScandinaviaBank organisation. The question we would like to investigate in this paper is the match between the tool (Lotus Quickplace) and the use in the organisation (ScandinaviaBank). The question may be phrased sharply as “Why is QP not the success as the situation at a first glance should indicate?” In the following we will analyse some selected clashes in order to understand the underlying reasons. We have chosen to use the metaphor of virus and organism to illustrate what has happened.

Section 2 contains a short description of our research method. In section 3 we present our analysis of the reasons behind the clashes between technology and organisation. Section 4 contains a discussion of our findings in relation to change management or implementation models. In particular we discuss

implications of our findings towards the change management model presented by Orlikowski and Hofman (1997). Section 5 concludes the paper.

## 2 Research method

The present analysis stems from a case study of Lotus Quickplace in ScandinaviaBank. It is primarily based on semi-structured interviews with managers and users from three selected QPs and with persons involved in the implementation process. The three selected QPs were one used by a post-merger infrastructure project and two used in the Communications Department, which was also responsible for the deployment of QP. The case study also involved analysis of the technology; analysis of documents in the three selected QPs, and an analysis of server log files.

The interviews were all conducted in April-June 2001. The interviews were tape-recorded, and later transcribed ad verbatim. The interviews were further analysed using the affinity diagramming technique (Beyer & Holtzblatt, 1998).

The document analysis has comprised descriptions of all QPs resident on ScandinaviaBank's QP-server at the beginning of our study (April 2001), and an analysis of the structure and contents of the studied QPs. Each QP consists of a number of rooms/folders containing documents that can be reached by a single URL.

Logging of all http transactions to and from the QP server that processes the URLs was initiated May 1, 2001. This paper draws on an analysis of the log from 22.5 working days. The log documents shows various operations on the content of the QP such as when documents are created, read, or edited and by whom.

As a second basis of the analysis we use findings from a previous case study of the implementation and use of a large Intranet in one of the pre-merger banks.

## 3 The adoption of the Quickplace Virus in ScandinaviaBank

The decision to introduce QP to support the post-merger projects in ScandinaviaBank was done quickly without thorough studies of needs and possibilities. QP was a "quick and dirty" solution: It was web-based, needed no integration with the existing security infrastructures and could be implemented very quickly.

One year after the merger and with QP in operation for about a year, our study showed that the number of active QPs had been growing steadily to about 80, and that the application was used for quite different purposes: To support organisational units, to support different recurrent tasks like translating the quarterly financial reports, and to support projects, which was the original intent. One QP was even used as a local intranet with almost 800 users.

Around July 2001 the Communications Department, that initiated the use of QP in the organisation and commissioned its use, told us that QP was probably going to be closed down. This was due to a missing approval from IT Security. According to IT Security QP had some features that violated ScandinaviaBank's IT security policy. Eventually, QP was not shut down in July 2001 because of an

intense political struggle between IT Security and the users represented by the Communications Department. A compromise was agreed where IT Security took over issuing QPs and QP got to stay. A main reason that QP stayed in the organisation was the fact that there were a little more than 80 active QPs at that time. It was practically impossible to shut it down. Some of the activities supported by QP, like the translation of the quarterly financial reports, were indeed business critical. Shutting it down would have created a lot of fuzz and complaints, and would have required that some alternative technology be offered.

QP is now a part of the organisation, and the number of active QPs is as of October 2001 up to about 120 with approximately 2000 users. The clash between technology and organisation was not only a clash of security. The clash described above represented the peak of a number of conflicts as the visible signs of mismatches between the technology and the organisation.

The management of the QP technology has caused a number of conflicts. In ScandinaviaBank there is a long tradition of assigning system owners to IT-systems. The system owner is typically the manager of a business unit. The role of the system owner is to define the purpose of the system and define rules for the proper use of it. The Communications Department is for example system owner of the Intranet. However, it has been rather difficult to find someone willing to play the role as system owner of QP. This is due to the impossibility of exercising the system owner's role in QP because it is so decentralized and general.

The typical IT system in ScandinaviaBank has a surveillance functionality that enables the system owner – or the system administrator on his behalf – to oversee and control the actual use of the system. In QP this surveillance functionality does not exist. QP is originally designed as an application for an ASP environment. In an ASP environment, the last thing you would like as a customer leasing a QP is for some system administrator to have unlimited access to the documents you choose to put in it. For that reason nobody but the members of the individual QP has access and defines who should have access to the QP and/or the various rooms in the QP.

The typical IT system in ScandinaviaBank has a Standard Operating Procedure (SOP) attached to the use of it. The SOP describes what the system should be used for, by whom and how it should be used. Each time an IT system is put to use, a SOP is written by the system owner for the use of the system. The SOP contains guidelines on how the system should be used, as well as the rights and responsibilities of the various user groups. There are SOPs for e.g. issuing a mortgage to a private customer which tells the bank clerk step by step how it should be done including the use of the supporting IT system. In the case of QP it has taken more than one year to come to an agreement about a SOP for QP. It has been very hard for the people responsible for the implementation to actually formulate a SOP for an open technology like QP. The open character of QP is documented in the use patterns observed. As mentioned, the use of the tool is ranging from supporting specific work processes, e.g. the translation of the quarterly and annual financial reports, to function as an Intranet for 800 people. The original idea fostered by the Communications Department was that it should be a communication tool for the merger projects, and that each application for a QP should argue for the business value of using QP. In practice however the use patterns have turned out to be expected as well as unexpected ones.

The introduction of QP has also created problems in relation to other technologies. As ScandinaviaBank is facing the implementation of a corporate Intranet covering the new organisation, problems of where to draw the boundary between QP and Intranets and email are becoming very apparent. Using the analogy of virus in summing up the meeting between the informal tool and the

formal organisation we can say that the virus has spread in the organism since April 2000, and in July 2001 the main attack of the immune system was set in – after the analysis of the application and identification of it as a virus. It had properties that didn't fit the organism. The attack was too late, and the organism and virus is now adapting to each other.

### 3.1 The bureaucracy and the instant team virtual workspace

Banks, like other large financial organisations, have a lot of the traditions of the bureaucracy in their business units. In this sense ScandinaviaBank is not unique. However, as another part of the picture, ScandinaviaBank also employs modern project organisation principles in their business development units. IT Development, for example, is organized very much like a modern consulting organisation with a very flat structure – no line managers but project leaders having full management responsibility of project members. In the customer oriented business units, the traditions of the bureaucracy are still enforced because it is the organisation's way of ensuring equal quality service and trust to their customers. The bureaucratic heritage is also visible in the way IT implementation and IT use is handled in the customer-oriented part of ScandinaviaBank:

- System ownership as described above where the basic idea is that (the manager of) a business unit is in charge of defining the business value of an IT application, and hence the proper use of it in relation to the business processes.
- Control as a central bureaucratic notion is, of course, built into the organisational structure for example by strictly definitions of security levels, so that each job title in the organisational units is associated with defined levels of security clearing. And all IT systems have built-in mechanisms for controlling how they are used and how the business processes they support are performed.
- A third consequence is the centralised and hierarchical IT security structure. A central unit in the bank issues access to all systems in the bank and thus controls who has access to what according to the SOP of the IT system.

Lotus QuickPlace is a virtual workspace application. Virtual workspaces are standard applications for collaboration and communication in small teams. Originally virtual workspaces were developed as ASP applications, where either the software developer or a third party hosts the application and rents it to the customer on a per-use basis. This background gives the application some basic characteristics:

- Virtual workspaces are very open in terms of which kinds of collaboration it supports. There is no suggested workflow inscribed in the application for example to support projects, recurrent tasks, interest groups etc. The members of a virtual workspace like QP need to agree on how to work together using the tool in the specific context (e.g. using the tool as a shared archive, or as a coordination mechanism for collaborative work).
- A second characteristic is that they are very quick and easy to set up and learn to use, once the server is up and running.
- A third characteristic stemming from its origin as an ASP application is the distributed security infrastructure. There is no central system administrator with extensive access rights. And there is a very flexible way of controlling the number of users of the QP. Any manager of a QP can set up a room, and invite others to participate in this room as managers, authors or readers.

These characteristics make the software both cheap to purchase and – so it seemed – easy to implement in the organisation. The QP manager(s) sets it up, i.e. define the structure – rooms, folders, document types as well as access rights to each room and folder.

The brief comparison between the bureaucratic traditions of IT management in financial institutions and the decentralised self-service virtual workspace highlights some obvious reasons for the conflicts reported in our study. We need however to take a closer look at two aspects of the adoption of QP in ScandinaviaBank in order to understand the underlying reasons for the conflicts and the implications for others wanting to exploit open technologies like virtual workspaces. The two aspects we will be looking at are the implementation effort and the system management.

## System Management

When the opening of a new QP is granted, two QP managers are assigned centrally by IT Security. The two appointed QP managers define everything happening after that; as mentioned above they are even able to invite other managers. This distributed nature of the security model in QP was originally motivated by the need to ensure privacy of data to the users in an ASP context. The QP manager defines who can use the QP and the author of a document solely defines who is able to read and edit it. This distributed security model also enables a manager to create new "sub-rooms" potentially without access from the two QP managers originally appointed by IT Security.

It is obvious that QP hereby compromises the hierarchical and centrally managed security model normally used in ScandinaviaBank. Neither the central security unit, IT Security, has any way of controlling access to rooms or documents, nor does a QP manager have any means of controlling what is in "his" QP. It is also clear that the previously described role of System owner used in the bank is not very useful for QP. The system ownership is reduced to formulating criteria for starting and shutting down QPs.

What we see is a tradition of centrally managing both technology and the use of the technology on a macro level in ScandinaviaBank. Their tradition is not fit to handle a technology like QP where both access rights, what the system should be used for and how it should be used is defined at the level of the individual QP – the micro level. The tradition of centrally managing IT is also clear when we look at the way QP was implemented.

## Implementation

The QP implementation effort is understood more clearly when contrasted to the way on of the pre-merger banks previously implemented an Intranet. Intranets have in some organisations been the first experiments with bottom-up IT initiatives, where Intranet-sites have emerged decentrally. This was however not the case in ScandinaviaBank. The Intranet implementation implied defining a number of communication channels, as well as roles and workflows for publication of documents within the channels. The implementation of the Intranet included a formalised education effort where editors and authors in a two-day seminar learned about system features as well as how to write for the new medium, and where all readers were introduced to the Intranet by video-presentations within all organisational units. The SOP written for the Intranet is a 50+ page document.

In May 2000 the Communications Department was commissioned to distribute QP in the company. Some resources were spent on customizing the look of the application, but apart from that the only formal means of implementation was an email to potential QP managers and oral communication. A potential QP manager should send an email to IT Operations applying for a QP. The original idea was

that the application should contain a business justification, but in practice all applications were approved. The rule of thumb for granting an application for a QP has been that the use was justified when there were members from geographically dispersed organisational units. We have analyzed the applications for the QPs, and there have been very few formal applications with descriptions of the business purpose of opening the QP.

In contrast to the Intranet implementation there was neither educational effort of users nor any guidelines as to how the QP could and should be used to support various communicational and collaborative needs. A 5 page SOP (compared to the 50 page Intranet SOP) was written containing information about how to open and close down a QP, but was first issued one year after QP was introduced. As to how they should set up and use the QP, the users were left with the general guidelines provided by the software manufacturer.

As noted above creating and setting up a QP is by default distributed to the manager(s) of the QP. The QP manager(s) define the initial structure (rooms and folders) of the QP and the authorization structure. In all cases an important precondition for a QP to work, is that the users of the QP must come to an understanding of:

- The purpose for which they want to use QP,
- How the QP should be structured to support the intended use (“what is the content”)
- The work flow of using the QP as intended (“how should we use it”)

We attribute the limited implementation effort by ScandinaviaBank as being due to a problem of not knowing how to implement it. They have no experience with implementing open, context-specific systems for collaboration like virtual workspaces.

One obvious conclusion from this is that ScandinaviaBank’s normal implementation model does not fit the implementation of an application like QP – it overlooks the activities at micro level. In fact one may argue it works against it, as the traditional implementation model creates expectations among some users that proper use and justification of use is centrally defined and accompanied by a formalised education effort. When this does not happen, some users “miss” the opportunity to get to learn about the features of the new application. And, as we have seen above, the QP application implicitly includes assumptions that the group of potential users of a QP come to an agreement about that a QP should be used, for what it should be used, and how it should be used. This has led to an underutilisation of the application’s potentials. They were not exploited due to a lack of understanding of how it could be put to use and a lack of experience on how to agree on such use decentrally.

### 3.2 The micro and macro level of implementing a virtual workspace

The implementation of a QP takes place at two different levels. There are activities at a central level to establish the QP-server, initiate the individual QPs, etc., i.e. establishing the infrastructure at a macro level. And there are activities at a local, or micro, level when an individual QP is set up, i.e. defining its structure and access rights, and the dynamic reconfigurations of the structure and content when the QP is in use. ScandinaviaBank’s challenge has been that they have only seen the macro level of implementation. Table 1 summarizes the reasons why ScandinaviaBank experienced conflicts around implementing QP.

<b>Issue</b>	<b>Virtual workspace implementation and management</b>	<b>ScandinaviaBank traditions for implementation and management</b>
<i>Implementation – macro</i>	Establishment of QP server, and definitions of processes to open and close a QP	Standard Operating Procedures and education
<i>Implementation – micro</i>	Definition of QP structure: rooms/folders and access rights based upon agreements on how and why to use the QP	-
<i>System management – macro</i>	No central means for control of use except level of activity and QP size	Management tools for the system owner. Central and hierarchical security structure: Access rights and security levels are centrally defined
<i>System management – micro</i>	Distributed and flat security structure: Access rights and security levels are defined at individual QP level	-

Table 1. Clashes – at two levels – between QP and ScandinaviaBank.

We might draw several conclusions from our case: We might conclude, that there is simply a bad fit between the organisation and the technology. But, what we see when we study the use of QP is in many cases a sensible use. The application seems to have earned its justification through its use. We could also conclude, that ScandinaviaBank just should have chosen another virtual workspace application with better management features and a more hierarchical security structure.

While the two conclusion might be reasonable to draw, we think that a third conclusion is much more interesting with implications for other organisations as well.

In retrospect we can say that ScandinaviaBank to some extend failed to understand what kind of technology they were dealing with. They treated it as a traditional bank IT application with a system owner controlling the use, and a SOP for proper use. Hereby, the open-ended nature of the application is not well captured, which for example is illustrated by the intention to formulate one SOP for the application. Understanding QP as a general and open-ended infrastructure, where the concept of a SOP is only meaningful for each application of QP, seems more fruitful.

With the understanding of QP as an IT application follows the intended use of traditional IT management models which only provide very superficial guidance for the implementation process, if any. One characteristic about these kinds of open systems for communication and collaboration is that their use patterns are very hard to plan or predict. When e-mail was introduced, nobody imagined the amount of e-mails, as well as the diverse communication patterns that have emerged. Virtual workspace applications seem in this sense to behave like e-mail. This is why the analogy of a virus is appealing. A virus is not just an enemy infecting an organism; it is something that changes the organism. Viruses can e.g. help an organism cope with more dangerous viruses (such as changing

markets). A virus also changes the organism irreversibly. Once the virus is introduced in the organism, it will never leave again. So is the case with e-mail and will perhaps be the case with virtual workspaces. Despite the virus-like character of open technologies like virtual workspaces, an organisation like in our case can learn to cope with them and avoid some of the clashes.

## 4 Discussion

The discipline of introducing IT in an organisation is commonly referred to as diffusion or change management and guided by implementation models. Traditional models of change management sees change as something following an *unfreeze, change, refreeze* model (Kwon and Zmud, 1987). *Unfreezing* is the phase of motivating people and creating a readiness for change. *Change* is the process of actually implementing the change, and *refreezing* is the process of consolidating the change and return to some new equilibrium. The approach has been criticized as inappropriate in the turbulent conditions that most modern organisations face and/or when introducing open-ended and context-specific technologies like groupware (Orlikowski and Hofman, 1997). However the traditional unfreeze-change-refreeze model is still used as the basis for current research on change management (see e.g. Kirveennummi et. al. 1998). The approach might be useful for implementing large systems like ERP or CRM solutions with centralized redefinitions of the work processes and maybe even organisational structure. However, for several reasons the framework does not seem very useful for the case we have been dealing with.

It would be hard to identify who should “unfreeze” and what should be unfrozen in the case of a virtual workspace implementation. The QP service in ScandinaviaBank is introduced centrally in the organisation to support projects following the merger. However, at this level it would be hard to identify the part of the business it would make sense to “unfreeze”, since the general introduction of the service has no direct effect on any specific work processes except for IT management work processes. Not until individual QPs are deployed, does the technology have any impact on work processes in the user community. The deployment of each new QP is however decentralised and spread over time as needs are identified. If the deployment of every single QP was considered a change process in itself – which does make sense – the unfreeze-change-refreeze model seems like a clumsy approach. The unfreeze-change-refreeze model implies a centrally managed effort of implementing a change in an organisation. This is against the very nature of virtual workspaces and would ruin the economics of providing it to the organisation.

Orlikowski & Hofman (1997) has suggested a different approach suitable for open technologies like groupware. They suggest distinguishing three kinds of change: *Anticipated change, emergent change, and opportunity based change*. Anticipated change is planned ahead and occurs as intended by the originators of the change. In our case, the anticipated change is e.g. the establishment of the routines for applying and creating new QPs as well as the management of the server, etc. Emergent change is defined as local and spontaneous changes, not originally anticipated or intended. Whereas some of the uses of the QP in our case can be seen as anticipated, the anticipation is on a very abstract level like “we anticipated that projects would use QP”. The anticipation neither says anything about concrete uses, nor of any specific benefits. All concrete uses and benefits in our QP case must be characterised as emergent changes. The last kind of change identified by Orlikowski and Hofman is opportunity-based change. Opportunity-based changes are purposefully introduced changes resulting

from unexpected opportunities that might arise after e.g. the introduction of a new technology. By the very definition, emergent changes, and to some extent opportunity-based changes, acknowledge the situated character of the relation between work and technologies (Suchman, 1987).

While the Orlikowski and Hofman approach recognizes change as an ongoing process consisting of shifts between anticipated, emergent and opportunity-driven changes, and that various technological and organisational changes made during the ongoing process cannot, by definition, all be anticipated ahead of time, it fails to grasp fully the QP challenge described in our case.

With a technology like QP the change processes involved in the integration of QP into the organisation take place at two very different levels. There is the central introduction of the QP service, which we choose to call a *macro level change*, and there are the decentral change processes related to the introduction of the individual QPs and the dynamic reconfigurations, called *micro level changes*. Thus, in order to understand better – and maybe thus plan better – the implementation of open-ended and context-specific technologies like virtual workspaces we suggest the introduction of a distinction between a macro and micro perspective, or between the infrastructure and the individual application. As previously argued the centralized introduction of the QP service and the implementation of individual QPs in e.g. a project are very different change processes. Yet they are equally important. Characterizing implementation of individual QPs as emergent changes ignores, or downplays, their importance, as well as the possibility of facilitating the planning of micro level changes. Examples of the changes processes at macro and micro level are provided in table 2.

	Macro	Micro
Anticipated	IT-Management, process of issuing, setting up and closing QPs, QP infrastructure.	Defining folder structure, invite members, agree on uses of individual QP applications
Emergent	QPs for projects, recurrent tasks, organisational units etc.	The development of an archive of presentations in a QP
Opportunity-based	Introduction of general functions like e.g. archiving functions or search patterns	Using the QP for supporting a new work process when realising the potential

Table 2. Examples of change processes at macro and micro level.

Implications of introducing a distinction between macro and micro level change processes include being able to help an organisation like ScandinaviaBank understand, foresee, and maybe establish a readiness for handling some of the clashes between technology and the organisation proactively. For example, identification of the important micro level change processes could have helped them create an environment supporting these change processes (for example a unit or a group to collect experience and distribute advice). And it would have helped ScandinaviaBank see from day 1 that for example a general SOP is only meaningful at a very general level.

## 5 Conclusion

Our case study of the implementation and use of a virtual workspace application has illustrated some difficulties with implementing open, context-specific IT applications for communication and collaboration in a formal organisation. We think that the difficulties are typical and prevalent in organisations with bureaucratic traditions for centrally managed IT systems with a strong emphasis on IT security and stability.

We would like to draw two overall conclusions from our study that are both relevant for organisations that already have, or are planning to implement open-ended communication technologies like virtual workplaces:

Firstly, hoping to predict the use patterns of these technologies is more or less obsolete. We used the virus-metaphor to illustrate the adoption. Like e-mail, virtual workspaces have no specific use patterns inscribed. These emerge over time as people do their daily work and agree to use the system. Eventually, it will over time change the patterns of communication and collaboration in the organisation – not as a result of a „one-shot“ central change management effort, but as local changes over time.

Secondly, despite the virus-like character of the technology, change management efforts are not useless. We found Orlikowski and Hofman's (1997) model of change useful as a point of departure. We have, however, argued that their change management model, as well as traditional models, tends to ignore the changes happening on a micro level close to the existing work practice. We therefore suggest making this visible by introducing a macro/micro distinction to guide the introduction of open, context-specific technologies for communication and collaboration.

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