CSCW and the Enterprise: The Development of an eCollaboration Strategy at AstraZeneca Pharmaceuticals

JENS BÄCKBOM

KTH Computer Science and Communication

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JENS BÄCKBOM

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Supervisor at CSC was Kristina Groth
Examiner was Yngve Sundblad

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Abstract
The thesis describes the development of an ecollaboration strategy at AstraZeneca Pharmaceuticals. Building on a theoretical framework compiled from research fields such as Computer Supported Cooperative Work (CSCW), information systems and management theory, a number of strategic focus areas are found using the results from

i.) interviews with key IT strategy stakeholders within AstraZeneca
ii.) two internal surveys on usability and information/knowledge management and
iii.) a large end-user study of collaboration software currently deployed at AstraZeneca

Utveckling av en strategi för datorstött samarbete på AstraZeneca Pharmaceuticals

Sammanfattning
Denna rapport beskriver utvecklingen av en strategi för datorstött samarbete på AstraZeneca Pharmaceuticals. För att identifiera ett antal strategiska fokusområden inom datorstött samarbete utgår jag från ett teoretiskt ramverk sammansatt av forskning kring datorstött samarbete (CSCW), informationssystem och företagsledning samt resultat från

i.) intervjuer med nyckelpersoner inom AstraZenecas IT-organisation
ii.) två på AstraZeneca genomförda enkätundersökningar samt
iii.) en omfattande användarstudie av existerande system
Acknowledgements

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1 Introduction

"Great discoveries and improvements invariably involve the cooperation of many minds. I may be given credit for having blazed the trail but when I look at the subsequent developments I feel the credit is due to others rather than to myself."

Alexander Graham Bell, Inventor (1847-1922)

1.1 eCollaboration and the enterprise

Collaboration has always been the very foundation of companies. The main reason why companies are being formed is to enable people to cooperate with each other in a structured manner. There is a number of reasons for doing so; work division, specialization in alignment with comparative advantages and increased creativity to name a few.

With the birth of electricity and the invention of telephony and other means of fast communication, collaboration has taken new forms as it can now be conducted in dispersed settings, aided by technology. As computing machinery started to become increasingly capable of information storage and retrieval, corporations also became equipped with technology supporting both synchronous and asynchronous work.

During the last decades, the Internet has had a huge impact on human communication – both in terms of how people communicate in real-time and how information can be shared between different periods of time. This has affected corporations in a number of different ways, leading to the implementation of everything from intranets and company portals to the recently popularised “web 2.0” technologies such as wikis, blogs, social software, tag clouds and collaborative filtering. These technologies have made it possible to add another feature of communication and collaboration to companies – the connection of people without former ties within the organization. Adding these technologies together to form a portfolio of so-called eCollaboration technologies can be vital to a company’s performance and it is the reason behind this study. In this thesis, I describe the attempts of a large pharmaceutical company to create an eCollaboration strategy, aimed at enabling collaboration for employees at all different levels.

1.2 Project background

The AstraZeneca eCollaboration Strategy initiative was a project initiated within AstraZeneca Global Technology Operations (GTO) in order to enhance communication within the company. Before the initiative, a number of different solutions and applications were already in place throughout AstraZeneca, but to this point there had been no attempt to have a common strategy for eCollaboration affecting the entire company (hence the word enterprise-wide). Instead, some applications that were originally meant to provide a standard means of collaboration had been accepted by some business units, whereas other parts of the company had preferred to develop their own solutions that better fit their particular business needs.

As part of this initiative, a team was formed consisting of product managers, service managers and other stakeholder from within various AstraZeneca IT/IS support functions. This AstraZeneca eCollaboration Strategy Team aimed to produce an eCollaboration Strategy which would serve as input to product strategies and operational decisions.

This thesis is the result of the work done by the globally dispersed eCollaboration Strategy University Team that was formed as part of the eCollaboration Strategy initiative. The team consisted of six university students based in five different countries, and was led by myself and Jonas Myhr, an MSc student from Uppsala University. The role of the university team was
threefold: To evaluate the eCollaboration toolkit currently in place at AstraZeneca, to perform interviews with end-users at AstraZeneca in order to gather opinions and suggestions regarding the tools and to provide the Strategy Team with suggestions and strategic input given what had been learned through evaluation and interviews.

During four months, me and Jonas acted both as MSc thesis interns as well as project managers for the university team. However, since we have written two separate theses using the same information and material collected by the university team as an empirical foundation, some content will overlap between our two pieces of work.

1.3 Purpose and goal

The purpose of this thesis is to provide the eCollaboration Strategy Team with input regarding various aspects of eCollaboration at AstraZeneca today and in the near future. More specifically, the aim is to shed light on how eCollaboration is currently perceived throughout AstraZeneca, and how it could be used by the company going forward.

1.4 Research question

In order to fulfill the purpose of the thesis, it is appropriate to let the work be guided by suitable research questions. This also serves as a natural delimitation of the project scope. In this thesis, I address two main research questions:

What are the main benefits and problems of AstraZeneca’s current eCollaboration platform from a user perspective? How do end users capture these benefits, and how do they work around the problems?

Given the users’ views and a set of proposed changes to the current eCollaboration platform, what are the key areas to consider from a user perspective when developing an eCollaboration strategy at AstraZeneca?

The first question is intentionally kept broad. First, in order to be able to give valuable input to a strategy process, the research questions should not only focus on problems, but also on benefits. Second, if a technology platform fails to support users’ work they may choose to work around the problems in various ways. By also addressing the workarounds, I should be able to gain further insights in what features of work that the users need to be supported.

The second question directly addresses the purpose of the study – to provide suggestions for an intended enterprise-wide eCollaboration strategy at AstraZeneca given a number of proposed changes. Answering this question should also involve a discussion about the most important limiting factors and obstacles to the implementation of the eCollaboration strategy.

1.5 Delimitations

Due to the scope of the study, a number of delimitations need to be made. After discussions with AstraZeneca, the following delimitations were chosen:

- The technology included in the term “eCollaboration” is solely software-based. This means ruling out non-computer based technology such as telephony, teleconferencing and videoconferencing. These technologies are included in other strategic initiatives at AstraZeneca.
- The “current eCollaboration toolkit” refers to a small number of software applications provided by AstraZeneca GTO on an enterprise-wide level. Hence, I also limit myself from discussing the vast amounts of locally implemented applications available in various parts of AstraZeneca. The current toolkit is introduced further in section 3 of this thesis.
Due to time restrictions, the work could only cover a limited amount of topics. In order to be able both to assess the current technologies and future changes, the end-user interviews were chosen only to cover a selected number of such changes. This set of proposed changes as referred to in the second research question includes three technologies, which were the only changes considered in my study. The technologies are:

- An enterprise standard instant messaging client
- An enterprise-standard wiki platform
- An enterprise-wide people search/social networking capability

The “user perspective” implies focusing on strategy factors that create value by supporting AstraZeneca end users of collaboration technology. Hence, it means not considering certain technology and business aspects such as appropriate infrastructure, enterprise architecture and cost calculations.

There need to be some delimitation to the level of detail in the toolkit analysis, since there is virtually no limit to the level of detail that such an analysis can have. The toolkit analysis efforts are therefore limited to approaching the functionality of the toolkit in a structured manner, by using models for classifying along with a discussion of possible problems and limitations based on academic findings.
2 Methodology

"Each problem that I solved became a rule, which served afterwards to solve other problems."

Rene Descartes, Mathematician and Philosopher (1596-1650)

In order to assess the research questions posed in the first section of this thesis, I conducted a study consisting of a number of components. These are described below.

2.1 Structure of the study

As mentioned in the introduction, my research at AstraZeneca was conducted together with an MSc student from Uppsala University as well as four AstraZeneca employees (the “eCollaboration Strategy University Team”) hired especially for assisting with the study. Our methodology is described further below, along with an outline of the project structure.

2.1.1 Overview of the study

The first weeks at AstraZeneca were mainly devoted to getting to know the company. While conducting a literature study of current academic research related to eCollaboration, I also interviewed the members in the eCollaboration Strategy Team and studied the results of two internal company surveys. I also devoted some time to get to know the computer environment and software currently in place at AstraZeneca. This included:

- The computer client, “Topaz”
- The “eCollaboration toolkit” consisting of eRoom, NetMeeting and WebEx.
- The intranet portal “Your.AZ” used by the company for internal communication
- The various intranet sites owned and managed by different AstraZeneca business units and cross-functional entities (such as Global Technology Operations, where our study took place)

While these initial activities were aimed at getting to know the workplace, the computer system and related research, the semi-structured end-user interviews that followed make up the bulk of this study and were more directly targeted at answering my research questions. Taken together with the results from the initial phase of the study, the end-user interviews were then used to answer the questions and to make recommendations to the company.

A flow chart describing the study is depicted in Figure 2.1. It should be noted, however, that the various components of the study did not take place in quite the linear fashion that the figure suggests. For instance, the literature study continued to some extent during the bulk of the study, not only being a first step.

Also, there were some interdependencies between the phases. As an example, the first part of the literature study targeted general research about collaboration software, whereas later parts focused on specific technologies that had been brought up during the initial interviews.
2.1.2 The eCollaboration University Team

The end-user interviews were carried out in a team of six university students, globally dispersed in five different countries. Using this approach, all of the end-user interviews could be conducted face-to-face with users in Sweden, UK, US, China and France.

During the full extent of my study, I had to rely on electronic equipment and software of various kinds in order to communicate with the team of students. Since most of the work was done using AstraZeneca equipment, the main tools and applications used for communication within the team included telephony, teleconferencing, web conferencing software, a project team site (shown in Figure 2.2), document sharing systems, collaborative writing tools, a team wiki and a blog.

2.2 Literature study

Initially, I performed a literature study in order to establish a theoretical foundation for the empirical study at AstraZeneca. In order to find appropriate literature for the study, I utilized a number of academic search engines made available to me through the university library, along with the most common web search engines (such as Google Scholar). In addition, I also relied on the kind assistance of my academic supervisor, who introduced me to a number of important papers from Human-Computer Interaction research.
However, due to the nature of the study and the fact that eCollaboration is related to more than just one academic field, I also explored other research areas such as information systems research, management and strategy. Here, I relied more heavily on internet search, but also on course material from various management classes.

Altogether, the academic material used in the literature study mostly consisted of course books, research papers and articles from journals. Since some of the latest collaboration technologies were hard to come by in such research, I also utilized material from a number of consulting companies within the field of management and information technology. Lastly, I also made heavy use of AstraZeneca-specific material such as annual reports, presentation material, technology strategy documents and organization/process diagrams.

2.3 The empirical study at AstraZeneca

Even if much can be learned about a subject through a literature study, giving strategic recommendations to a company also requires gathering empirical material from the workplace in some way. Since this could be done in a number of ways, somehow a choice of method would need to be made.

Put simply, data gathering can be done in a qualitative or a quantitative fashion. Quantitative methods are based on measurements, whereas qualitative methods are based on descriptions and anecdotes to a larger extents (Wallén 1996). This does not necessarily mean that either one of them is more “correct” than the other, or that any method delivers more “objective” results. Etymologically, the word quantitative refers to a larger quantity of data, whereas qualitative refers to quality, implying “richer” data that demands larger analysis efforts. Choosing the appropriate method is not always easy, as both the quantitative and qualitative methods have benefits as well as problems associated with them.

Quantitative methods such as surveys are often used to measure the level of and put numbers to a certain phenomenon in a greater population (e.g. How many Americans will vote republican). The main benefits with using a quantitative method is that the results can be used to generalize and draw conclusions about the larger population by using results gathered from the sample populations included in the study, but with this also comes the problems of having to pose accurate questions that cannot be misunderstood and that are easy to analyse.

Qualitative methods such as interviews and focus groups, on the other hand, are often used to provide an exhaustive picture of a phenomenon (e.g. What are the possible political issues associated with voting republican). Even though they do not provide the possibility to put numbers on things, qualitative methods can instead shed light on issues not thought of by the researcher before the study. However, since such methods demands letting interviewees speak their minds to a greater extent, qualitative studies are often done on a smaller scale due to time constraints.

When choosing the appropriate method for our study at AstraZeneca, a number of things had to be taken into account:

- The size of AstraZeneca would have a significant impact on the study. Since the organization had over 65 000 employees at the time, getting a representative view of the company could be troublesome.
- Since the study was initiated within an information services organization, getting access to “regular” AstraZeneca employees (such as scientists, chemists and manufacturers) was not entirely easy. Because of this, we could only reach out to a limited number of employees.
- The study would have to be conducted in a way that would not disturb the respondents to a large extent.
- There was limited time, due to the scope of the project.
Due to these constraints, performing a comprehensive workplace study would not be feasible. Since access to employees was limited we would, for instance, not be able to perform an ethnographic study involving observation over time (as described in, for instance, Monk et al 1995). Also, performing a large-scale survey among AstraZeneca employees would not be possible, we simply did not have access to a sufficient amount of respondents for a survey.

Based on the above, I chose the following approach: During the pre-study phase, I studied the outcomes of two internal company surveys in order to build the foundation for a set of semi-structured interviews. This approach would not only give me the possibility to draw quantitative conclusions about the extent of some problems, it would also make it possible to discover what problems there could possibly be. By doing so, I would hopefully be able to answer my research question about problems and benefits quite thoroughly. However, the approach would not have been possible without the university team. By having a global team of six people spread out over five countries, it became possible to conduct qualitative interviews covering all major AstraZeneca sites. The study is described in more detail below.

2.3.1 Survey material
As said above, surveys provide quantitative measurements which make it possible to generalize about a larger population to some level of statistical significance. Generally speaking, surveys demand high precision in the way questions are formulated in order to get accurate answers, as mentioned above in the discussion about quantitative methods. As part of my pre-study, I utilized the results from two internal surveys conducted within AstraZeneca, both of which contained information regarding the collaborative software currently used within the company. Utilizing quantitative data would provide me with the level of some problems associated with the software, which could help determine if the problems discovered in my own interviews should worry AstraZeneca.

One survey was conducted as part of a pre-study in the development of a new computer client, and regarded usage patterns and usability of computer software available to AstraZeneca employees. The survey was conducted among 2500 employees and had a response rate of 24%.

The other survey utilized regarded information and knowledge management within AstraZeneca. The survey was conducted among 2076 AstraZeneca employees within Research & Development, and had an average response rate of 47%. This survey was also used in order to get qualitative input (comments) regarding some of its quantitative data.

Since I did not take part in creating the surveys, it is hard for me to draw conclusions about their accuracy. I did, however, come across one possible problem with the surveys used in my study. There seemed to be some bias in the survey data, as the UK-based respondents took up a larger part among the sample population than they do in the company as a whole.

2.3.2 Interviews
There are four main types of interviews: Unstructured, semi-structured, structured and group interviews (Preece et al 2002). Most of these should be considered qualitative, except for structured interviews which are sometimes used to perform qualitative studies with a strict questionnaire. Typically, unstructured interviews are used in the early phases of a study in order to find out more about the problem area. The main benefit with unstructured interviews is that the respondent is allowed to speak freely and elaborate on his/her answers. However, the method has its problems: The interviewers easily loses control of the interview, and results from two unstructured interviews are almost impossible to compare. Semi-structured interviews are, as suggested by the name, somewhere in between the structured and the unstructured.

For practical reasons, group interviews with more than one interviewee at a time would not be possible to do at AstraZeneca – employees were simply too busy. Since I wanted interviews to be qualitative without losing the possibility to compare results between interviews, the interviews in my study were conducted in a semi-structured fashion.
In an early stage of the study, I conducted 15 interviews with the members of the AstraZeneca eCollaboration Strategy Team, with the purpose of defining a proper framework and scope for the strategy. This provided a guideline for which focus areas to consider.

The bulk of the study, however, consisted of 52 semi-structured end-user interviews with users of collaborative software in AstraZeneca and MedImmune (acquired by AstraZeneca in 2007). The interviews were carried out face-to-face to the largest extent possible by the eCollaboration Strategy University team, following a questionnaire translated into the local language.

Following the qualitative approach as described above, interviewees were allowed to elaborate on their answers and bring up topics not being asked for by the interviewer. The interviews concerned the end-users’ opinions about the software currently used for eCollaboration within AstraZeneca, assessed the proposed changes mentioned in section 1 and discussed organizational elements such as training, communication, and structural components, based on findings from the literature study.

In order to be able to address the proposed changes suggested as part of the initiative, some of the interviews were targeted towards specific users that had been part of piloting new software. In the case that a user had not been involved in a pilot project within AstraZeneca, we instead asked them if they had tried the technologies on their personal computers at home or in other companies. Quantitatively, we ended up with the following: Out of the 52 interviews,

- 37 interviews were held with users of eRoom
- 40 interviews were held with users of NetMeeting
- 12 interviews were held with users of WebEx
- 4 interviews were held with people who had been part of instant messaging pilots within AstraZeneca
- 6 interviews were held with people involved in various wiki initiatives within AstraZeneca

In terms of organizational belonging, interviewees at various levels were selected from almost all parts of the AstraZeneca organization. Even though my ambition was to select a randomised sample of employees to the greatest extent possible, this proved hard to accomplish. Most interviewees were referred to by the AstraZeneca eCollaboration Strategy team, with the exception for the interviews in France, China and all interviewees from the Development organization, who were randomly selected. The interviewee distribution is shown in Table 2.1.

The results of the end-user interviews were recorded, translated into English by the interviewer and documented using the University Team project site. When all the interviews had been conducted, results were compiled into one single document where answers were categorized.

<table>
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<th>Discovery</th>
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<th>Operations</th>
<th>Marketing/Sales</th>
<th>HR/IS/Finance</th>
<th>MedImmune</th>
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*Table 2.1. Interviewee distribution.*

1 For a description of the AstraZeneca organization, see Section 4.3.
3 eCollaboration and the enterprise: Theoretical framework

“If I have seen farther than others, it is because I was standing on the shoulders of giants.”

Isaac Newton, Mathematician and Physicist, (1642-1727)

As stated in the above section, this thesis is meant to discuss components of an eCollaboration strategy from a user perspective. However, little work has been done in terms of linking research on collaborative software to strategies on an enterprise level, which is why some modifications to the original theories are needed. The theory is presented in the following order: I first define the term eCollaboration and its main components. I then try to distinguish the different characteristics of cooperative work and how technology might be used to support the work. This is done both from a small-groups perspective by considering Computer-Supported Cooperative Work (CSCW) research and from an enterprise perspective by considering the possibilities for emergent collaboration in a large organization\(^2\). Having done so, I turn to the organizational factors that need to be in place for efficient usage of the collaborative software, in order to arrive at a framework that can be used as a starting point for the empirical study of eCollaboration in a company.

3.1 eCollaboration definition and scope

First of all, the term eCollaboration needs to be defined. Kock & Nosek (2006) define the term as

“...collaboration among individuals engaged in a common task using electronic technologies”

which implies looking upon eCollaboration as a phenomenon not limited to technology, but rather as a system where technology is put into use with a specific purpose\(^3\). This definition can be used to distinguish four conceptual elements of eCollaboration, as shown in Figure 3.1 below.

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\(^2\) The term computer supported cooperative work (CSCW) was first used by Irene Greif and Paul M. Cashman during a workshop in 1984, but has been used somewhat ambiguously by different authors ever since. According to Carstensen and Schmidt (1999), CSCW addresses “how collaborative activities and their coordination can be supported by means of computer systems”.

\(^3\) One might also want a definition of collaboration in order for the above definition to make sense. Such a definition can, for instance, be found in material produced by Forrester Research, saying that “collaboration is about people finding each other and the information they need, working together towards a common business goal”.

9
Obviously, *people* is an important element since without people there would be no collaboration. Individuals differ in many aspects which will impact how collaboration will be performed; they have different socio-cultural backgrounds, education and skill sets\(^4\).

Furthermore, the collaborative *task* (whether it is simple or complex) can have a substantial effect on the outcome of the eCollaboration, which in turn will be affected by the choice of collaborative technology.

The *technology* is a central part of eCollaboration, comprising the communication channel created by the collaborative software, as well as its technological features which will have a strong impact on how (and if) the technology is used.

Last but not least, the *context* enters as an important variable which becomes increasingly important from an enterprise perspective. Context can be thought of as a number of things; the physical items that are parts of the individual’s surroundings, the geographical distribution of individuals, social and behavioural factors, or organizational culture (Kock 2005).

Including these elements in the eCollaboration scope is not only in line with eCollaboration and groupware research (see, for instance, Kock 2005 and Orlikowski 1994), it also affects how my research questions should be addressed. For instance, in order to discuss problems with eCollaboration tools, one should also take into account factors relating to the individuals utilizing the tools and the social settings that they are part of. It also affects my further choice of models and frameworks.

### 3.2 Technology and work: CSCW vs. the enterprise

Judging from the above, eCollaboration involves technology as well as factors relating to people and their work setting. This division turns complex when considering that in a large corporation, *context* includes not only the work team, but the entire company. When turning to CSCW research, academics tend to focus on the team level, which will be too limited for discussing the needs of a larger setting.

On the contrary, research fields such as enterprise architecture research tend to consider questions about how information technology should be used in order to be aligned with business

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\(^4\) Kock (2005) chooses to make a distinction between the individual themselves and their “mental schemas”, where the latter include things such as knowledge and socially constructions.
objectives in the larger corporate setting. Hence, whereas CSCW research areas is focused on
the user experience of certain applications, the other tends to consider systems of applications
and their possible return on investment. Combining such diverse research fields would most
likely lead to a clash, and according to the delimitations mentioned in section 1.6. above, this
thesis will not take into account areas such as appropriate infrastructure and architecture, neither
will it encompass ROI calculations of the technologies in question. Nevertheless, for an
eCollaboration strategy to be relevant from both the enterprise and the user perspective, not only
small groups research can be utilized. Therefore, the theories in this section somehow need to
address the enterprise perspective.

I have chosen the following approach: I start from team-based CSCW research and work my
way up to collaboration within larger groups of people, such as a multinational company. In
order to do so, I look at the so-called Enterprise 2.0 research, which studies the implementation
of Web 2.0 technologies in corporations.

3.2.1 The CSCW perspective: Resembling co-located work
One of the early research topics in CSCW research regarded how software-supported work can
resemble working together without the help of computers. In order to acknowledge the fact that
collocated work consists of both the actual work and the workplace surrounding it, academics
invented the term awareness. Put simply, the term refers to the fact that when people work
together in a co-located setting they are aware of “what is going on” – what other people are
doing and how they do it. Meeting each other in the same office every day makes it possible to
discuss small things, tell stories and spread knowledge in different ways, become increasingly
aware of the activity of others5. An early definition of awareness was proposed by Dourish and
Bellotti (1992):

“... awareness is an understanding of the activities of others, which provides a
context for your own activity.”

Using co-located work settings as a starting point, a typical awareness system might provide
support for showing who is in a workplace, who has been there and what they were doing when
they were there (Gutwin and Greenberg 2002). Technology for supporting such information
have been subject to significant research efforts, ranging from simple presence awareness
systems to complex systems such as Portholes (Dourish and Bly 1992).

However, even though the topic has been shown significant interest, there seems to be little
consensus among researchers on what an appropriate definition of awareness should contain. As
stated by Schmidt (2002),

“The term ‘awareness’ is obviously found ambiguous an unsatisfactory. ... CSCW
researchers are obviously far from confident with using the term and thus often use
the term in combination with different adjectives, ... The proliferation of adjectives
is a clear indication that the term ‘awareness’ is found to be equivocal, that
researchers are aware that the term is being used in significantly different ways,
and that it is need of some qualification to be useful.”

I will not dive into the increasingly growing debate on awareness. In order to arrive at a
framework for making decisions or finding gaps, the term needs clarification which would be
out of the scope for this thesis. Instead, I choose to limit myself to acknowledging it as a vision
– resembling co-located work is largely done by creating awareness, and it can be done in
various ways. However, when making choices about collaborative technology, the discussion

5 In fact, awareness does not even have to be work-related. According to Carroll et al (2003), “users need
to establish and maintain a ‘background’ understanding of information that may not be directly related to
the task currently in focus. Rarely is awareness the sole or even primary task of an individual”.

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about awareness should probably not be left out – research also shows us that awareness information can be included to different extents.

A reasonable approach to framing the various aspects of cooperative work might instead be to try to find key variables that can be used to distinguish characteristics of the work. Such characteristics can then be used to classify collaborative software applications from each other, but they might also serve as a basis for making normative statements.

Johansen’s famous CSCW matrix illustrates the above (Johansen 1988). It is an example of a framework which acknowledges that co-workers can interact synchronously or asynchronously, as well as in co-located or dispersed settings. Frequently cited in research, the model distinguishes collaboration activities by the distance between co-workers and the time dependency in their work. Although trivial, it serves its purpose and I have chosen to use it as the most rudimentary classification model in this thesis. The model is depicted in Figure 3.2.

The CSCW matrix provides a reference to the dimensions of cooperative work, and an eCollaboration strategy should consider these dimensions. However, as has been said before, the framework is somewhat limited from an enterprise perspective. In order to consider the situation in the larger corporation, a model needs to acknowledge the fact that collaborative work not only means working together with a group – it also means finding the appropriate group members to work with.

### 3.2.2 The Enterprise 2.0 perspective: Emergent collaboration and the strengthening of weak ties

As many of the CSCW research papers that I’ve come across have focused on awareness among co-workers in order to resemble collocated work by means of computer software, the Enterprise 2.0 research instead considers relations between individuals not currently interacting closely. In his frequently cited article from 1973, Granovetter discusses the so-called ties in social networks. He argues that in larger networks of people, there are inevitably smaller clusters of people who interact on a regular basis, be it in a neighbourhood where you meet the local grocery store salesman everyday or in the office where you meet your co-workers. Using Granovetter’s words, these small clusters of people share so-called strong ties due to their regular interaction. In contrast, the irregular interaction with friends-of-friends, distant relatives etc. is referred to by Granovetter as weak ties. These weak ties link the clusters of strong ties together, bridging gaps between neighbourhoods, regions or entire countries.

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6 This dimension is also actually also mentioned in CSCW research. As an example, Schmidt and Rodden (1996) mention that cooperative ensembles often tend to be “transient formations, emerging to handle a particular situation after which they dissolve again”. Also, some CSCW research touches upon this issue when discussing coupling.
A similar situation occurs within a large enterprise. In an office, people see each other everyday and work together in projects on a regular basis. They share the same kinds of strong ties as mentioned by Granovetter. Occasionally, there is also interaction between offices, regions or functions in a company yielding weak ties in an organization. Using the words of McAfee (2007):

“Consider the prototypical knowledge worker inside a large, geographically distributed organization…. She has a relatively small group of close collaborators; these are people with whom she has strong professional ties. Beyond this group, there's also a set that includes people she worked on a project with in the past, co-workers who she interacts with periodically, colleagues she knows via an introduction, and the many other varieties of 'professional acquaintance.' In Granovetter's language, she has weak ties to these people.”

McAfee adds another perspective. By also considering what lies beyond the strong and weak ties, he mentions interaction with potential ties:

“Beyond this group there's a still-larger set of fellow employees who could be valuable to our prototypical knowledge worker if only she knew about them. These are people who could keep her from re-inventing the wheel, answer one of her pressing questions, point her to exactly the right resource, tell her about a really good vendor, consultant, or other external partner, let her know that they were working on a similar problem and had made some encouraging progress, or do any of the other scores of good things that come from a well-functioning tie.”

McAfee illustrates his findings with what he refers to at the Enterprise 2.0 bull’s-eye, acknowledging that most collaboration takes place in the centre:

![Figure 3.3. Strong, weak and potential ties.](image)

Hence, the fact that relationships come with various strengths might be equally true in an enterprise setting. Therefore, the distinction between ties of varying strengths might be a useful complement to the dimensions in the CSCW matrix, since it takes into account that collaborating with people you don’t know well differs largely from collaborating with your colleagues.

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7 McAfee also mentions one more level of co-workers outside the potential ties, referring to the people with which no ties will every be made. I have chosen to leave it out since it serves little purpose in the analysis of collaborative dimensions.
closest colleagues. Adding the two models together, I arrive at a hybrid framework which is depicted in Figure 3.4.

![Figure 3.4. A hybrid model for CSCW in the enterprise.](image)

The hybrid model above describes collaboration along the time, space and social dimensions. It recognizes that co-workers can interact synchronously, asynchronously, co-located, dispersed and with people of varying social proximity to themselves. From an enterprise perspective, it acknowledges the various kinds of collaborative activities that can take place within a large organization, which might serve as a theoretical framework for the factors of cooperative work in an enterprise setting.

### 3.2.3 The components of a technology platform for enterprise collaboration

Having considered the various dimensions of collaboration on an enterprise level (time, space and social proximity), we can ask ourselves how work along the above dimensions can best be supported by a technology platform. However, we first need to discuss what the options are – what are the possible categories of groupware and collaborative software? Olson and Olson (2003) acknowledge four categories of groupware:

- Communication tools (including e-mail, conferencing tools and instant messaging/chat),
- Coordination support (including meeting support, workflow, group calendars and awareness systems)
- Information repositories (such as knowledge sharing systems)
- Sociality (including social filtering and capture/replay technology)

The authors also consider a number of integrated technologies, merging two or more of the above categories. Research and advisory firm Forrester Research chooses to see the primary pieces of a collaboration platform as

- Messaging (including e-mail, calendaring and contacts)
- Team collaboration
- Real-Time collaboration (including instant messaging and conferencing)
- Social computing (including wikis, blogs and social networking capabilities)
Acknowledging the seemingly fair amount of consensus between the above, and taking into account awareness systems as being particularly important from a CSCW perspective, a similar division of technologies could include the following five categories:

- Awareness systems
- Synchronous team collaboration (such as instant messaging and conferencing)
- Asynchronous team collaboration (such as e-mail, document sharing, workflow and calendars)
- Knowledge sharing systems between teams (such as wikis, information repositories)
- Social interaction with weak ties (such as social networking capabilities)

This division of technologies can be motivated by considering the hybrid model of CSCW in the enterprise described in Section 3.2.2 above. Mapping the technologies into the model, we see that all dimensions of collaboration can be covered, which is shown in Figure 3.5.

![Figure 3.5. Mapping technologies into the hybrid model.](image)

Considering the technology categories one by one, we see the following: In terms of interaction with strong and weak ties, synchronous collaboration technologies such as instant messaging and conferencing allow interaction in the lower-left quadrant (same time, different place). Synchronous interaction with potential ties is harder to accomplish using technologies such as instant messaging – but it can still be addressed through web conferencing.

Interaction with strong ties in the lower-right quadrant of the model (different time, different place) can be done with asynchronous team collaboration technologies such as work spaces and e-mail, but interaction with weak ties is a little different. Users will rarely use a work space to interact with people that they don’t share strong ties with, but e-mail might still be used. In terms of potential ties in this quadrant, wikis and social networking capabilities can offer a possibility to interact\(^8\). In fact, wikis can actually cover strong and weak ties as well, serving as a knowledge sharing mechanism between users. This also goes for social networking capabilities, which can serve as the “glue” that links weak ties together (McAfee, 2007).

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\(^8\) For instance, consider Wikipedia as an example, where people that have little or nothing to do with each other still collaborate to produce the same product.
Awareness systems are harder to classify using the above model. Even though these are generally supporting real-time awareness, according to Gutwin and Greenberg (2002) the term can also refer to asynchronous awareness (“who has been here?”). Generally speaking, though, there seems to be great consensus in research about the potential work benefits of awareness systems (Gutwin and Greenberg 2002, Schmidt et al 1992).

It can also be noted that many of the technologies considered above tend to focus on the lower half-quadrant of the CSCW matrix, since when people are in the same place at the same time, they usually require little software support\(^9\). Hence, many of the technology components of a collaboration platform will be focused on supporting geographically dispersed work (Olson and Olson 2000).

### 3.2.4 Assessing the completeness of the hybrid framework

As they stand, the classification models above cover a set of important aspects of collaborative work, aspects which should all be supported by a technology platform in a large enterprise. That said, the description may or may not be complete. Claiming that these are the only factors that need to be taken into consideration when deciding on a technology platform is a powerful statement, one which I do not dare to make. Most likely, there are other aspects and dimensions that would need consideration for a technology platform to be complete. As an example, Schmidt and Rodden take on an entirely different approach in their article from 1996. To put it simply, the authors have chosen to leave the physical dimensions of time and space – instead their work evolves from sociological studies of cooperative work. In their article, they describe a number of basic features of such work that should be supported on a CSCW operating system level, i.e. as a set of common denominators not being application-specific. In what they describe as a **CSCW platform**, they argue that such a platform should support **informal interaction** among users, **information sharing and exchange** in real-time or in an asynchronous fashion, **decision making** such as mechanisms for voting and discussions, **coordination/control protocols** such as mechanisms for workflow or meeting agendas and **domain directories** for users and objects.

Since Schmidt and Rodden’s article provides an example of how computer software can (should) support cooperative work by classifying work using entirely other dimensions than time and space, it is likely that several other classification mechanism exist, which might be just as valid as mine. However, the dimensions which I have chosen are, although trivial, still important. Since arriving at a superior set of classification dimensions for cooperative work must be considered to be out of scope for this thesis, I choose to consider the hybrid model described above to be a reasonable starting point for the evaluation of a collaboration platform from a technology perspective.

### 3.3 People and context: Organizational elements for usage

Having considered the nature of cooperative work in an enterprise setting and the technology used to support it, there are also a number of non-technical factors that need to be considered. Going back to the definition and scope of eCollaboration mentioned above, people- and context-related factors also need to be taken into account to some extent. What is needed in order for an eCollaboration platform to succeed in an organization?

A general approach to the problem of introducing technology stems from Venkatesh et al. (2003) following the work of Davis (1985). Put simply, their models describe a causal chain, where a number of factors, positive as well as negative, affect how a user perceives the software in terms of its ease of use and how well it serves its purpose. These factors taken together leads

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\(^9\) This is, of course, not entirely true. Just to mention one example, even when sharing the same desk, two persons might still be sending documents back and forth using a collaborative software.
to a high or low usage of the technology. In the case of groupware and collaborative software, some of the issues around the implementation of new software can be found in Grudin (1994), who addresses challenges for groupware developers. Even though his research concerns development and not implementation per se, many of his challenges are confirmed by Orlikowski (1992), studying the early stages of an introduction of groupware in a large organization. According to her article, there are two organizational elements that are especially relevant to the efficient usage of groupware in an organization: people’s cognitive models about technology and their work, and the structural properties of the organization such as policies, norms and reward systems.

3.3.1 Cognitive elements

Cognitive elements are the mental models or frames of references that individuals have about the world, their organization, work, technology and so on. When confronted with a new technology, individuals try to understand it in terms of their existing mental models. However, if the new technology is sufficiently different, the individual’s existing mental models will have to change. According to Orlikowski, such change is influenced by two major factors:

The kind and amount of product information communicated to individuals can be critical for the usage of new groupware technologies. If people are left to make their own assumptions about what a new technology is for, it will lead to weakly developed mental models about the technology. This is a problem for the technology transfer because if people have a poor or inappropriate understanding of the unique and different features of a new technology they may resist using it, or may not integrate it appropriately into their work practices.

The nature and form of training that individuals receive is central to their understanding of its capabilities and appreciating how it differs from other technologies with which they are familiar. According to Orlikowski, deploying a software without accompanying it with formal end-user training implies aiming for an experimental, user-driven diffusion which typically takes time. Such a slow adoption might fail in yielding a critical amount of users sufficiently fast, which is needed for a successful groupware implementation.

Furthermore, even if a formal training program is developed, the nature of the training will significantly affect how the software is perceived. If the training is too non-specific in relation to the work setting or if it does not take into account the nature of collaborative work it will inevitably fail. Also, users might perceive a disparity in work and benefit, where the groupware is perceived as useful for some whereas it becomes nothing but a burden for others (Grudin 1994).

3.3.2 Structural elements

Structural elements include the reward systems, policies, work practices and norms that shape and are shaped by the everyday action of organizational members. Orlikowski discovered three...
such structural properties that influenced individuals’ perceptions and early use of a recently deployed groupware:

The reward systems can inhibit learning and usage of the software. If the reward systems fail to take into account that learning new software takes time away from ordinary work, and if the using the software is perceived as sufficiently disruptive, usage will be hampered.

Lack of proper usage policies and procedures around data quality, confidentiality and access control might pose a problem for individuals trying to use the software. For instance, Orlikowski mentions senior executives’ worries about security and managers’ worries about personal liability as sources of anxiety when using groupware.

Lastly, the firm culture and work norms might be a problem. A hierarchical organization with a competitive culture will probably have little incentives for sharing information which is counter-cultural to the underlying premise of groupware technologies. Actually, even if usage nevertheless occurs contrary to the prevalent culture and norms, it might lead to problems in itself. As Grudin (1994) states, groupware can “lead to activity that violates social taboos, threatens existing political structures, or otherwise demotivates users crucial to its success”. This might be the case if users start to avoid formal procedures and processes, such as contacting different departments in a company without utilizing the official routes of communication or bypassing the chain of command by directly contacting executives at higher levels.

As Orlikowski’s research mainly concerns the early phases of a groupware implementation, her findings may or may not be totally appropriate for an enterprise-wide strategy in the long run. However, since her findings more or less entirely coincide with Grudin’s groupware challenges I still consider them general enough to use as a reasonable framework for my study. Taken together with the hybrid model for classification of technology described above, I will use it as a basis for my research on collaborative software in AstraZeneca.
4 The case of AstraZeneca

“Our transformation is firmly rooted in our New IS Agenda: consistency in our ways of working, cross functional collaboration, business-led innovation and customer intimacy”

Rich Williams, AstraZeneca CIO

4.1 The history of AstraZeneca Pharmaceuticals

AstraZeneca Pharmaceuticals was formed in 1999 following the merger of Astra and Zeneca and was one of the world’s largest pharmaceutical companies at the time of my study. Historically, Astra and Zeneca had produced a number of so-called “blockbusters” within a number of areas such as gastrointestinal, cardiovascular, respiratory and anaesthetic drugs, including the world’s best selling drug ever, Losec. The reason for the merger had been threefold: to achieve a global power and reach in sales and marketing, a stronger R&D platform and a greater financial strength.

After the merger, a global pharmaceutical “giant” had been created. Its 2006 sales amounted to around 26 billion USD and it currently had more than 60 000 employees worldwide. The company’s major facilities consisted of seven large sites in the US, UK and Sweden but it also had manufacturing plants and sales offices spread out across the globe.

4.2 The pharmaceutical industry

The pharmaceutical industry is a huge industry, with total sales of prescription medicines at $602 billion in 2006. The United States still accounts for most, with $252 billion in annual sales. The overwhelming size of the largest companies formed in the merger wave between 1985 and 2005 has given birth to the phrase “Big Pharma”, which is often used to refer to around thirty companies (including AstraZeneca, Pfizer and GlaxoSmithKline) with revenue in excess of $3 billion, and/or R&D expenditure in excess of $500 million. Put simply, there are three different kinds of pharmaceutical companies: research-based companies, generic drug manufacturers and OTC (over-the-counter) pharmaceutical companies. Many firms are engaged in all of these three categories.

4.2.1 The value chain

The pharmaceutical value chain consists of five major steps, outlined in Figure 4.1. The first step, Discovery & Research, basically consists of two major parts: Identification of target proteins related to a specific medical condition and the development of chemical compounds that might have an effect on the target proteins. In this phase, several thousands of molecular entities are screened, although only a very few make it through clinical trials to the pharmacy itself. When a chemical compound is shown to have an effect on a target protein, the compound is patented which leaves twenty years to develop a drug out of the compound and sell it on the market. When the patent runs out, competitors are allowed to start manufacturing generic copies of the drug which creates a need for the rest of the process to move as fast as possible14.

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14 According to a study conducted by CapGemini, as much as 60% of sales can be lost in the first three months after the patent runs out. Due to this, every action taken by a pharmaceutical company that will reduce the “time-to-market” will have great implications for revenues. As an example, an average blockbuster drug with sales of $1 billion per annum would increase company sales by around $3 million if it were to be released on the market just one day faster.
The second step is called Preclinical development and includes large-scale testing of the chemical compounds on the target proteins, which among other things include animal testing.

In the third step, Clinical development, a number of so-called “candidate drugs” are tested on humans in a series of trials that are performed at the company, in hospitals, or both. When these trials have shown significant results in the treatment of medical conditions, the drugs are filed for approval by governmental bodies such as the Federal Drug Administration.

The fourth and fifth step involves the manufacturing of the drug, after which it can be marketed and sold in pharmacies. Typically, a multinational pharmaceutical company needs to work differently with the last steps on different geographical markets, due to varying regulations.

![Figure 4.1. The pharmaceutical value chain.](image)

### 4.2.2 Current trends: Pipeline draught and externalisation

One of the most challenging trends in the pharmaceutical industry of 2007 was the draught in research pipelines. According to a study made by PriceWaterhouseCoopers, the pharmaceutical industry as a whole was investing twice as much in R&D as it was a decade ago, only to produce one-fifth of the new medicines it then produced. The “blockbusters” were becoming increasingly harder to discover through research, and since many pharmaceutical giants relied solely on their ability to patent and sell new drugs, the situation started to resemble a crisis for the industry.

### 4.3 AstraZeneca at the time of the study

At the time of my study, AstraZeneca was largely organized around the various components of its value chain. There was one business unit called Global Discovery Research (“Discovery”), whose sole purpose was to generate candidate drugs that would go into the second business unit, Global Drug Development (“Development”). Within Global Drug Development, the pre-clinical testing and clinical trials were conducted after which the Operations business unit took over. Operations dealt with the “factory” side of AstraZeneca, whereas there were two business units dealing with the last step in the value chain: North America & Global Marketing taking care of marketing and sales in the US and ISMO (International Sales and Marketing Organization) doing the corresponding thing in the rest of the world. The AstraZeneca organization at the time of the study is depicted in Figure 4.2 below:
Figure 4.2. The AstraZeneca Organization.

Apart from enjoying the support from a small number of central support units such as Finance and HR, the five major business units mentioned above acted more or less autonomously from each other, each having their own internal service organizations such as, for instance, information services (IS). Hence, within Discovery there was a service organization called Discovery IS, within Drug Development there was Development IS etc.

However, in order to ensure that the business units couldn’t act completely independent from each other, a number of support functions acting across the business units had been put in place as part of the transformation of AstraZeneca from a functional organization to a process-driven organization. For instance, a number of central information services organizations were present, acting closely together with the various IS departments across the business units in order to ensure that some things followed common standards. In one of these central organizations called Global Technology Operations (GTO), the eCollaboration strategy project was initiated.

### 4.4 The eCollaboration strategy

The eCollaboration Strategy project was initiated within GTO in early 2007, as part of a larger strategic initiative called “Enabling AZ Collaboration”, meant to include the various parts of an enterprise-wide collaboration technology environment. Whereas the two other work streams in “Enabling AZ Collaboration” concerned video conferencing/teleconferencing and mobile technologies, the eCollaboration Strategy was explicitly aimed at software-based collaborative technologies.

In the scope set for the eCollaboration Strategy, focus was placed on a number of technology areas within the field of collaboration: Synchronous collaboration technologies such as conferencing and instant messaging, asynchronous technologies such as team collaboration spaces but also the recently popularised “Web 2.0” technologies – the initial idea was for the strategy to consider technologies such as wikis, blogs, tagging, folksonomies and podcasts.

This was the first time that an explicit eCollaboration strategy had been developed for AstraZeneca, even though collaborative software per se was not new to the company. However, the services currently in place at AstraZeneca had been launched independently of each other and there had been no effort in trying to encompass all collaborative technologies in one, unified strategy. By developing a strategy for eCollaboration, AstraZeneca hoped to provide end-users within the company with standardized means of collaborating with each other between business units, but also with external partners which were becoming increasingly important in the industry.
There was a lot of enthusiasm around eCollaboration within AstraZeneca. By enabling people to collaborate and exchange ideas with each other, the company hoped to spur innovation which would lead to the strengthening of the pipeline. As mentioned before, the pipeline draughts were an important issue for the whole pharmaceutical industry, which included AstraZeneca.

Furthermore, since the strategy was being developed within GTO, all technologies included in the strategy were going to be delivered to users on an enterprise-wide level, i.e. to all parts of the huge pharmaceutical company. The strategy would therefore ensure that certain technologies were made standard throughout the company, which would keep costs low since software licenses could be bought in larger quantities from fewer vendors.

4.5 Collaborative technology at AstraZeneca

As said above, collaborative software was not new to AstraZeneca. In fact, there were already a number of collaborative applications in place. Some of these were available on an enterprise-wide level, delivered by GTO. Locally, there were numerous substitutes. Since the university team work was done at GTO, we were mainly tasked with considering applications of the first kind, the ones available to all of AstraZeneca. These applications included e-mail and calendaring services, along with live collaboration software and team spaces, and are described below.

4.5.1 E-mail and calendars

Microsoft Outlook was the enterprise-wide standard for e-mail and calendars, made available to all users per default. Through Outlook, AstraZeneca employees also had access to the Global Address List (GAL), with rudimentary contact details about AstraZeneca personnel.

4.5.2 Document sharing and team collaboration

Documentum eRoom, developed and sold by EMC was the enterprise-wide standard solution for team collaboration at AstraZeneca, provided to end-users by Global Technology Operations. Its functionality included document and calendar sharing, access/version control and “check-out” of documents, workflow functionality, discussion databases and a voting system.

Apart from eRoom, there were also numerous locally deployed applications for document sharing throughout the organization. For instance, there was extensive use of shared hard drives within the Discovery and Development organization.
4.5.3 Conferencing and real-time collaboration

AstraZeneca currently had two enterprise-wide solutions for real-time collaboration. For internal use (within AstraZeneca’s firewalls), Microsoft NetMeeting was the company standard. For external use, the company used a software called WebEx. The main reason for choosing two separate solutions were purely technical – NetMeeting had no support for web conferencing and because of a rising internal demand for conducting presentations for external business partners outside AstraZeneca GTO had chosen to adopt a second system.

![NetMeeting](image)

Figure 4.4. NetMeeting.

4.5.4 Social Computing

As for interaction with weak and potential ties within AstraZeneca, there were many possibilities but with limited adoption. There were three larger people directories deployed on a company-wide level: The Global Address List made available to employees through Microsoft Outlook, the People Directory (also known as “White Pages”) made available to employees through the AstraZeneca portal Your.AZ and a expertise directory called “Skills Directory” initiated by the AstraZeneca Discovery organization but enjoying limited user adoption. There were also numerous local search solutions. Furthermore, there had been many local adoptions of Wikis throughout the organization, mainly within the Discovery organization. These were, however, created using various technologies of which none was provided on a larger scale in the organization.

4.6 The options at hand

Going forward, the AstraZeneca eCollaboration Strategy was meant to address a number of areas related to collaborative technology throughout the company. When my study began, the wide range of possibilities initially targeted by the strategy scope had however been reduced to a smaller number of options to consider. More specifically, the study would need to consider the following proposed changes:

4.6.1 Introducing Instant Messaging

Furthermore, instant messaging and presence awareness would be introduced as a service to all AstraZeneca employees. Since there had been two locally implemented instant messaging pilot programs running in AstraZeneca for a while, lessons could be learned from them.

4.6.2 Implementing an enterprise-wide wiki platform

Having realized that there were numerous wiki solutions installed throughout the AstraZeneca organization, GTO had decided that they should consider standardizing the use of wikis in the
company. Hence, it was suggested that AstraZeneca should implement an enterprise-wide standard solution for wikis.

4.6.3 **Introducing social networking capabilities**

As part of a collaboration platform, AstraZeneca was considering the implementation of social networking capabilities. Suggested functionality included:

- A search facility for finding people with a specific competency
- The possibility for users to enter their own competency information
- Possibilities for linking people together in various ways, which could then be displayed in a network-fashion or as an organization schedule

However, when developing a strategy involving the above decision areas the AstraZeneca eCollaboration Strategy Team would need also need input regarding a number of other issues. For instance, what did end-users think of the current collaborative software in the company? What were the key areas that would need to be considered as part of an eCollaboration strategy, besides the mere choice of technology? These were some of the questions that needed to be addressed, condensed into my research questions introduced in section 1 of this thesis.
5 Results from the study

“If it was up to us, we would take away the computers and replace them with pens and paper.”

Anonymous, AstraZeneca Legal

5.1 Step 1: Strategy framework and scope

The study began with 15 interviews with members of the AstraZeneca eCollaboration Strategy Team, consisting of participants mainly from GTO but also from various other IS functions and business units. These interviews addressed questions about the scope of the strategy in terms of timeframe and technology, and what an appropriate level of detail should be. In summary, there was a clear consensus among the interviewees about things such as aligning the eCollaboration strategy with corporate strategies, keeping the strategy open for continuous revisions and focusing on functionality rather than specific vendors. However, when interviewing the participants not belonging to GTO, I came to realize that there were other factors that needed consideration. For instance, one of the interviewees mentioned a “mindset problem” from GTO’s perspective regarding technology:

“Our tendency is often: How do we approach this problem with a tool? This will restrain your thinking.”

This view was also hinted about from other interviewees (although not at explicitly), which made me think that the issue was important. Furthermore, in a number of interviews the legal aspects of collaborative technology were raised as an issue to be considered in the strategy. Since the pharmaceutical industry was subject to constant litigation regarding its products, implementing information technology was seen as particularly troublesome with regards to, for instance, the possibilities of tracing information about drugs. The interviewee sighed and quoted AstraZeneca’s legal department:

“If it was up to us, we would take away the computers and replace them with pens and paper.”

The legal issues around collaboration technology would probably need a lot of attention when making decisions around implementation. However, since it has less to do with the user perspective, we decided to put less focus on it. Another issue, much more related to users, was instead raised from a manager within AstraZeneca Operations IS. It concerned the poor communication between GTO and the rest of the company, exemplified by a proposed switch from eRoom to another document sharing platform:

“As a business, we don’t know what is happening with eRoom. It doesn’t matter too much what will happen, but it would be good to know what will happen.”

Again, this view was confirmed by a number of the interviewees in the strategy team. Taken together with what is said in research about the implementation of collaborative technologies in organizations, these interviews led us to believe that an eCollaboration strategy should not be considered purely from a technology selection perspective. From this perspective, evaluating not only technology but also organizational elements as described above seemed like a suitable choice from a user perspective.
5.1.1 Results from the NGT usability survey

As part of my initial research, I also encountered a survey around usability conducted in June 2007 within AstraZeneca. Apart from containing information regarding usage patterns of various tools, the survey also included questions around the current collaboration software. The claimed usage of the tools is depicted in Figure 5.1.

![Figure 5.1. Usage of collaboration software as percentage of AZ employees.](image)

As can be seen in the figure, usage of the collaboration software varied to a large extent. Whereas 67% of AstraZeneca employees used NetMeeting, only 21% used eRoom. In the case of WebEx, the figure was as low as 8% which was partly explained by the fact that the service was aimed at users with needs for conferencing with external parties. Naturally, not all employees would engage in such activities.

Furthermore, in terms of satisfaction the figures were also interesting. According to the survey, 82% of AstraZeneca users found the eCollaboration tools helpful, but an equal percentage of users found that improvements to the tools were needed. This was an interesting finding, that led us to believe that an end-user study could be motivated since the usability survey mainly contained quantitative data. By asking end-users about their experiences from using the software, perhaps I would find out the reasons behind these figures.

5.1.2 Results from the survey on Information management and Knowledge management in Research & Development

I also studied the “Survey on Information & Knowledge Management in AstraZeneca R&D” conducted in mid-2007 and presented to us by one of the members in the eCollaboration Strategy Team. Since the survey concerned the use of document sharing capabilities in AstraZeneca R&D, it served as important input regarding the issues that would need to be addressed in the end-user study. Studying the survey output, we noted issues around technology as well as structural elements.

First of all, the survey stated that the overall satisfaction with infrastructure supporting collaboration had increased compared to the situation in 2004, something which seemed to be largely attributable to the adoption of eRoom. Quoting one of the respondents:

“Most of my use of Information Infrastructure relates to the use of eRooms, which I have found to be very useful indeed in sharing and accessing information, a huge step forward.”

This finding was also reflected by the answers to a question in the survey regarding the overall satisfaction of information sharing within projects. The survey showed high satisfaction scores in this area compared to others.
Using the nomenclature proposed by Orlikowski (1992), a number of structural elements seemed to be present following the implementation of eRoom. A recurring issue was, for instance, the lack of consistent use of eRoom between projects, suggesting lack of proper procedures and policies:

“Information is poorly managed due to its inaccessibility. ... eRoom is a very powerful tool in our decentralised organisation but unfortunately not used consistently across similar project teams, suggest within functions the sharing of common best practice of eRoom tools…”

Furthermore, another information sharing issue regarded the scattering of information in different places, with little or no way for the user to know where to look for it. This had partly to do with the access policies around eRooms, but also with the lack of procedures around where to store which information:

“Information sharing is hampered by too much information being stored in different locations, especially in access-controlled eRooms, with no clear understanding of when these should be transitioned to [other systems] or deleted.”

Also, information sharing between projects was considered limited. It seemed like information was being “locked into” project eRooms, with little or no transparency between projects:

“I frequently have to get information from many different drug projects, but find that the information is often not made available to me by default (e.g. it may be in eRooms that only a few people have access to)”

The issue about information sharing was also reflected in the survey results regarding the re-use of previous experience and know-how in the organization. In these areas, the survey produced very low satisfaction scores. It was suggested by respondents that this partly had to do with limited collaboration between various parts of the company, which would lead to duplication of efforts:

“I think we have some underused expertise in-house. We should encourage even more crossing borders (of project teams, departments, sections, sites...) for ideas and experience. Occasionally we have to solve the same problem twice, because we did not know it was already encountered”

(Discovery, Montreal)

Another respondent confirmed the lack of processes, combined with the incentives needed to overcome the time needed to find the right information:

“I think much more knowledge sharing between drug projects is essential. Unfortunately, it is not supported by the often very tight timelines given and I think that there has to be better processes for this. It takes too much time to find out which projects, if any, have experience from what I’m just about to do”

(Development, Mölndal)

Summarizing the results from the initial study, there were indications that the analysis framework developed in the theory section would be an appropriate way forward when moving into the end-user interviews that were to follow. Because of this, I decided to assess the proposed changes as well as the initial interview results using this framework, in order to develop proper guidelines for the end-user interviews.
5.2 Step 2: Applying theory

In terms of a technology platform, AstraZeneca had proposed three changes (the introduction of an instant messaging client, a wiki platform, and a social networking capability), which were to be considered by the university team. Would these changes really bring any collaborative capabilities that weren’t already in place in the organization? In order to answer such a question, I assessed the proposed changes, along with the input from the initial interviews against the evaluation framework.

5.2.1 The technology platform

Considering the current collaboration capabilities within AstraZeneca, these were mapped into the evaluation framework in order to find out where there was lack of capabilities.

First of all, with regards to the technology areas mentioned in the framework, AstraZeneca’s current capabilities covered three areas, plotted in Figure 5.2 below.

By using NetMeeting, AstraZeneca covered the synchronous dimension of interaction with strong ties. Using WebEx for conferences to which not only the closest colleagues were invited, synchronous interaction with weak ties could also be achieved.

By using eRoom, AstraZeneca also covered the asynchronous dimension of interacting with strong ties, since the tools provided team collaboration functionality. However, for interaction with weak ties and potential ties it seemed like eRoom provided little or no assistance. Even though it should be possible in theory to use eRoom for knowledge sharing between project teams, the users didn’t seem to think so. Judging by what had been said in the knowledge management survey about the poor information sharing between projects it seemed like the software didn’t provide this capability in practice.

In terms of awareness, there was some support in the current technology. For instance, eRoom provided a means of seeing who had been working with a specific document\(^{15}\). In terms of real-time awareness information, there was little software support for it. By logging on to NetMeeting, users could see if someone else was also logged on to it, but there was no way of telling whether the other user was currently busy, at his/her desk or available for discussions.

\(^{15}\) In the words of Gutwin and Greenberg (2002), this would answer the question “Who has been here?” and “What have they done?” to some extent.
Apart from the three areas in the time/space/social proximity space covered by AstraZeneca’s current collaboration capabilities, the question was whether the collaboration capabilities could expand in some way. Judging by the evaluation model, there was room for improvement in the down-right half of the model, assuming that the “same place” dimension was largely supported through on-site facilities. Also, there were currently no capabilities in place for synchronous collaboration with potential ties. Could the proposed changes address these issues?

One proposed change regarded wikis, which could also be an alternative in terms of asynchronous collaboration with weak (or even potential) ties. The case of Wikipedia gave some reason to believe that wikis could provide this capability. In order to assess whether it would do so for AstraZeneca, end-users would need to be asked.

Furthermore, in terms of social interaction with weak ties, AstraZeneca had no central solution in place. Judging by the evaluation framework, this would provide a way of interacting with weak ties in an asynchronous fashion, which could motivate the introduction of such a capability. This would, however, also need confirmation from end-users.

Also, in terms of awareness systems, no capabilities were in place which would motivate the introduction of an instant messaging software if it was to include presence awareness features. Although awareness technology enjoyed significant support in academic research, the question remained whether it would be appreciated to the same extent by AstraZeneca employees.

5.2.2 Cognitive elements
Judging from the initial interviews and the survey results, there were some concerns about the strategy being too technology-focused, which was why including the cognitive elements seemed appropriate. Since one of the interviewees had mentioned the poor communication about “what was happening with eRoom”, the end-user interviews should assess this issue in a greater depth.

Regarding the training component of the cognitive elements, I did not find too much confirmation about training being a huge issue in AstraZeneca. When asked about training, however, many respondents in the initial interviews claimed that training “wasn’t needed” for using the tools, since these were considered fairly easy to use.

5.2.3 Organizational elements
In terms of organizational elements, the survey results led us to believe that there was an issue around reward systems not taking collaborative efforts into account, supported by the quote around project timelines being too tight for users to be able to share information.

Also, there seemed to be a lack of proper policies and procedures around how to use the tools, as many quotes from the survey stated that information seemed to become locked into access-restricted areas. This also applied to the use of eRoom in an inconsistent fashion between projects.

The work culture and norms at AstraZeneca seemed to be a positive factor for collaboration rather than a negative one. For instance, the survey results signalled that there was a need for more information and knowledge sharing, which led me to believe that the culture would facilitate information sharing rather than prevent it. However, since the survey was conducted in Research & Development, the results might not reflect the organization as a whole. Since the end-user interviews would cover all AstraZeneca business units, this should be tested further.

5.2.4 Moving into the end-user interviews
Having conducted the initial interviews and studied the results from the two surveys along with relevant academic research within the fields described in the theory section, I constructed a set of interview guidelines to be used in the interviews with AstraZeneca end-users conducted by the eCollaboration Strategy University Team. These guidelines can be found in the appendix.

In the interviews, we touched upon the perceived problems and benefits with eRoom, NetMeeting and WebEx, taking into account cognitive and structural factors as laid out in the

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theory section above. In order to assess the proposed changes, we also asked them about their experiences from using wikis, instant messaging and social networking services. At the end of each interview, the interviewees were given the opportunity to discuss the future challenges their particular business unit would be facing in the near future, and how that related to collaboration issues. By doing so, and by giving the interviewees a possibility to elaborate on their answers, I hoped to discover additional issues worth consideration in the eCollaboration strategy, not currently present in the initial focus areas.

5.3 Step 3: The end-user interviews

As stated in the previous sections, the end-user interviews addressed a number of areas related to current and new software, as well as training, communication and organizational elements. Altogether, we interviewed 52 people in a period of one and a half months. The interview results are described below.

5.3.1 The current eCollaboration Toolkit

In terms of the current eCollaboration toolkit, users were asked for their opinions about eRoom, NetMeeting and WebEx, respectively.

Regarding eRoom, it was used by almost all of the interviewees. However, not all functionality in eRoom was being used. The software was mainly used for sharing documents, conducting discussion threads and voting. Features such as calendars and workflow management were hardly used at all. When asked about the main benefits of eRoom, a number of features were mentioned. First of all, the main benefit with eRoom seemed to be the fact that it was a centralized solution, as mentioned by one of the interviewees:

“It's really useful to have all of the information I need for my project in the same place.”

Furthermore, users liked the fact that eRoom provided an asynchronous way of working, which provided the possibility to work in different time zones – an important feature in a global organization such as AstraZeneca. Frequently, users mentioned that they appreciated the way eRoom replaced the need for sending documents via e-mail – not only did eRoom make it possible for large groups of people to work together with one document, the software also made information easier to find.

There were also some negative opinions about eRoom. A recurring complaint had to do with a lacking integration between eRoom and other applications, such as Microsoft Word, Excel and Outlook. Another problem had to do with the search functionality, which many interviewees complained about. Often, the search returned irrelevant or incomprehensible results with little or no connection to the initial search string entered. There were also a lot of issues around management of the software: setting up access rights to documents was seen as particularly tedious, and getting access to eRooms which a user didn’t belong to was seen as “hopeless” by some users. The reliability of the software was also questioned by some, as was the user interface which was seen as “old-fashioned” and “requiring to many clicks”.

However, in many cases there was no consensus around the problems and benefits of eRoom. For instance, whereas some people used eRoom as their only software for sharing documents, there were others who relied on a multitude of applications for doing the same thing. In such cases (for instance, in parts of the organization where there was extensive use of shared hard-drives), people tended to be a lot more sceptic towards eRoom. Many of these interviewees asked for a standardized solution, since documents became hard to find when it was spread out between different applications.

Regarding NetMeeting, it seemed to be well-used by the interviewees from all parts of the AstraZeneca organization. The software was used for many different things, including sharing/working on documents together and conducting remote training sessions. Many of the
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interviewees claimed that their work would not be possible to do without the capabilities brought to them by NetMeeting, since their project team was spread out geographically. As a result of using the software, some respondents claimed that it allowed them to reduce their travel expenses:

“I am sure that I am saving one trip to England per month by using it.”

In terms of the software’s benefits, I came across a number of them. Interviewees mentioned the possibility to work from home, being able to work together on a file in real-time while not being co-located, the opportunity for inter-departmental meetings, saving time from not having to send material via e-mail, being sure that everyone has access to accurate information and the richness of communication compared to a telephone call.

In terms of problems related to the software, interviewees mentioned that it could be complicated to switch meeting hosts, that there often were connection problems, that it was tedious having to keep track of other attendees' IP-addresses and that the network service tended to be quite slow. Hence, many of the issues mentioned around NetMeeting had more to do with the network capabilities than the software in itself. When asked about how they usually responded to these problems, interviewees mentioned having to reschedule the meeting, getting used to the slow connection.

The most striking issue around WebEx was the fact that many of the users had barely heard of it. Those who in fact did know it had, in most cases, attended a number of presentations conducted through WebEx, but very few had actually initiated a conference using the tool. However, on a lot of occasions, there was a natural explanation for this. Since WebEx was implemented for collaboration with external business partners, it wasn’t very surprising to see that scientists with little or no contact with external sources didn’t know about the software.

When asked about their use of WebEx, the interviewees who had actually used it mentioned receiving and giving remote training sessions, conducting online conferences, demonstrating new products or services, maintaining vendor relationships and communication with other AstraZeneca facilities abroad. In terms of the software’s benefits, interviewees mentioned the possibility to “raise their hand” during meetings, the chat functionality and the possibilities to communicate globally. One interviewee compared the software to NetMeeting, saying that WebEx’ functionality was more “complete”.

The software’s limitations were similar to the problems with NetMeeting. Connectivity issues were mentioned, but in the case of WebEx, users also mentioned that WebEx sessions were complicated to set up. Apparently, in order to set a meeting up a user had to go through an eight-step process which effectively scared some users away from using the software. Also, external users (not within AstraZeneca) sometimes experienced problems with the software since they were forced to download a certain client in order to use it, which did not always work properly. Furthermore, compared to NetMeeting, users complained about how meetings in WebEx had to be set up in advance, with the organizer having to send out links to everyone invited which prevented the software from being used for spontaneous collaboration.

5.3.2 Piloted technology

We also asked the users what they thought about instant messaging, wikis and social networking software. On a number of occasions, the users had been part of pilot initiatives regarding these technologies. If they had, we asked them about their experiences. If they hadn’t, we asked them
about their experiences from using similar software outside the company and whether they felt such capabilities would be useful in their work at AstraZeneca\textsuperscript{16}.

Regarding instant messaging, we talked to four people having been part of piloting such software in the company. Their experiences were both positive and negative, where the positives mainly referred to the possibilities to ask quick questions, not having to schedule meetings. One of the interviewees considered presence awareness to be the main benefit of such software:

“[Instant messaging] gets more useful after-hours due to the presence functionality. You can see if someone is still in the office if you need a quick answer. That saves a lot of time”

The negative opinions about instant messaging mainly concerned the possibilities for misuse. For instance, one interviewee claimed that the pilot she had been part of was not particularly useful in her work, instead she and her colleagues mostly used it to schedule lunch breaks.

Since most of the interviewees hadn’t been part of instant messaging pilots, we asked them about their experience of such software from outside AstraZeneca. Among those who had encountered the technology, some of the respondents claimed they had used it at home, some at previous jobs. Again, the opinions differed to some extent. The positive opinions regarded the possibilities to have short conversations, check peoples’ availability, transfer files, store chat logs and get instant responses to questions. Some users also considered instant messaging time-saving. Again, the negative opinions mainly regarded misuse and the disruptiveness of instant messaging:

"I used to have this in my previous company. It was nice to have, however people would spend their whole day sending messages instead of working."

Furthermore, time zones were brought up as an issue by some respondents. Since the company had offices in all time zones, these respondents found instant messaging less useful when working in geographically dispersed teams:

“The time difference (Södertälje, Wilmington and Montreal) in my project makes asynchronous communication more important.”

Six of the interviewees had been part of piloting wikis within AstraZeneca. Some of them had been responsible for setting up the pilots, whereas others had been involved in the roll-out of a pilot in their specific office or region. We asked these interviewees questions about their experiences from the pilots, and got both positive and negative feedback.

Most of the wikis that we encountered had been set up within the Discovery and Development units, and were used for sharing information around drug projects of various kinds. There had also been initiatives within various information services units, such as a wiki containing information about travel advice when travelling to AstraZeneca sites around the world, and a wiki containing people-related information. However, only the R&D-related initiatives seemed to have gained sufficient user adoption.

When asked about their wiki experiences, the interviewees tended to be quite positive, but some problem areas were also mentioned. In terms of the benefits, most interviewees mentioned the transparency of information when presenting it in a wiki. For instance, as a number of drug projects had joined one of the wikis, they have started to exchange information and lessons learned from their projects, connecting projects in a way that had not been done before

\textsuperscript{16} When asking them about external use, we used Wikipedia, Skype/MSN and Myspace/Facebook/LinkedIn as examples.
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One interviewee claimed that such transparency increased the quality of research being done, while also avoiding the duplication of efforts.

"[the wiki] increases the quality in what we do, since it forces people’s ideas out of their heads. In this way, everyone has to motivate why he/she is working with something, since the work becomes visible to everyone else."

Others were overwhelmingly positive when comparing the wiki to other technologies currently deployed at AstraZeneca:

"I think it is the best thing I have seen since I started working for AZ, and I genuinely think that it is one of the best things that has happened in terms of working with projects. Because I think email is a very bad way of sharing information, intranets which are requiring you to go else where to put information in can create a barrier to people actually doing that."

One interviewee mentioned how such transparency of information could be useful in order to get new employees “up to speed”, since it could provide an easy way of getting an overview of company-related information.

In terms of the negative opinions among people having been part of piloting wikis, most had to do with accuracy and security of information. Some people raised concerns around the intellectual property problems arising from information being jointly created in a wiki. First of all, since anyone could edit the information some interviewees were worried about users deleting information by accident. Second, there were concerns about how to make people responsible for their actions in a wiki, and whether information could be traced to its origin. Third, some interviewees mentioned concerns about the wrong people gaining access to the wiki which could result in loss of non-patented information.

Since only six of the interviewees had been part in wiki pilots, we asked the other interviewees about their thoughts around using a wiki in their work. Many of these interviewees claimed that they would find wikis highly useful in their work, mainly related to sharing experiences between project teams, business units, regions and countries. Specifically, the use of a wiki for information sharing between clinical trials teams was mentioned, as well as dictionary and translation purposes:

"Wikis would be useful if a global Wiki could explain all of the acronyms and expressions used in AZ. It would make things easier when we have to talk with people from other departments that use a lot of weird acronyms we don't understand."

There was also negative feedback regarding the potential use of wikis within AstraZeneca. For instance, I encountered a cultural problem around wikis due to an employee having altered information about a drug in the online dictionary Wikipedia:

"I think wikis have a bad reputation in this company, since the accident with someone at AstraZeneca editing the information in Wikipedia."

Again, most of the negative opinions around wikis among employees who hadn’t taken part in piloting the technology had to do with maintaining the information. Keeping such information accurate, up-to-date and secure was seen as a clear issue:

"[...] if you have out of date information on there and people are reading it, it can actually do more harm than good."
“There is no clear governance model and no clear way of keeping track of the security issues.”

Also, some interviewees mentioned the risk of wikis ending up becoming “swamped” with unstructured information, if work-in-progress information wasn’t deleted as it became inaccurate. Largely, however, the attitudes towards wikis were positive. In fact, most negative response came from people that never had been involved in wikis.

Regarding social networking capabilities, none of the interviewees had been part of any pilot project within the organization. Therefore, I instead chose to explore the need for such functionality. We did so by asking the interviewees if their work required them to find other people with a specific competency within the company, and if they knew of a tool that could help them to do so. If the need existed, and if they didn’t know of such a tool, we asked them how they approached the problem instead.

In many cases, the interviewees claimed that they would find it useful for them to be able to find people with specific competencies. Many people claimed that they had been in such a situation, the typical thing to do would be to ask someone next door if they knew anyone with such a competency, then turn to other sources:

“If I need to find someone, I first ask the people in this corridor. I then call the receptionist. If that doesn't work, I try through my informal channels - such as people I know in the Legal dept.”

I also came across other ways of solving the problem. In some departments, employees relied on excel spreadsheets containing people information, others downloaded PowerPoint files containing organization charts in order to see who belonged to which organization in order to pinpoint where someone was working, which would imply having a specific competency. During the interviews, we also came across various databases which contained different amounts of information about people. Some of the interviewees only used the global address list, which basically required a user to know the exact name of the person he/she wanted to get in touch with. Altogether, we came across six different people databases in AstraZeneca, containing varying amounts of information. None of these systems contained competency-related information, though.

Regarding whether a social networking capability would be useful, several of the interviewees saw clear benefits from using such a software. Among other things, they mentioned that it would save them time when trying to find someone, which would be especially useful for someone being new to the organization. Other interviewees mentioned that they would find it useful to be able to look someone up if they were planning to approach the person, or if they had been approached:

"When a person I don't know comes to contact me, I wish I could find his/her job responsibility, the direct or indirect relationship with me. It'll be nice to have photo because I sometimes can't tell the gender by only a foreign name."

However, many interviewees claimed that the most important feature of a social networking capability would be the possibility to find a specific competency, which sometimes proved impossible to do within AstraZeneca. According to one interview, this had led to an increased usage of external consultants:

“Yes, it would be so useful to be able to find people given a specific competence. The information is not even available at the HR. If I need someone to work on statistics for instance, then I have to outsource it and hire someone outside AZ to work on it.”
Even though most users tended to support the idea of a social networking capability, not everyone agreed. For instance, some interviewees mentioned that letting people find each other could lead to some key people becoming “swamped” with questions, or that it could even lead to sub-optimal usage of resources due to people bypassing the formal “chain of command” contacting each other too freely. Many interviewees were also concerned about the legal issues concerning people information, related to sensitive personal information as well as the need for updated information. Also, some users expressed worries about the language being used in a people search facility not being harmonized between countries, making it hard to understand whether a “manager” really was a manager or something else, depending on which country he/she was working in.

5.3.3 Addressing organizational issues

Except for asking the users about their opinions about technologies, we also assessed the organizational elements as proposed in the theory section.

In terms of training, we asked the respondents whether they felt that they had been properly trained to use the software mentioned in the interviews. We also asked them if they felt such training would be needed, and where they would go to find training material or other information around collaboration tools such as eRoom, NetMeeting or WebEx.

Most of interviewees claimed that they considered themselves properly trained to use the collaboration tools, or that the software was easy enough to use so that no training would be needed. However, some of these interviewees also said that they had trained others in their office on how to use the software, indicating that there at least had been a need for training. This was also confirmed by other interviewees, who claimed that there was indeed need for increased training, at least on how to use the more advanced features of the tools. One interviewee mentioned that her frequent interactions with external business partners made her computer skills more important, since meetings with the external partner often took place using WebEx:

“When dealing with external parties, you get a little scared of using the more advanced features of the tools, what if something would go wrong? It would give a bad impression to the partner.”

We also encountered some specific training issues. For instance, some users complained about poor training on how to set up access rights for eRoom. For NetMeeting, many users claimed that they had required training on how to start the application and connect to others, after which the usage was considered fairly self-explanatory. In terms of training on WebEx, interviewees complained about the tedious process for scheduling a WebEx meeting, involving nine steps until the meeting was completely set up.

When asked about where training material could be found, we received numerous different answers. Some users had no idea about where to look for additional training on a certain application, whereas others quoted a number of different sources for such training: the company portal, “help” buttons in eRoom, a local helpdesk, a colleague down the corridor, department-wide training sessions through NetMeeting, e-learning material etc. While some did not know about where to find training material because they saw themselves as sufficiently proficient in using the software, others simply had received no information about where such training could be found even though they thought it was needed. We were told that this mainly had to do with training being conducted in a decentralized fashion – even though a technology might be provided centrally it was often up to the various regions or departments to train their users on how to use the technology.

In terms of communication about the tools to users, we asked the interviewees how they had found out about a specific software, and if they knew where to find additional information about their options for collaboration. The answers we got to the first question varied depending on the technology and the region. First of all, eRoom had been launched through campaigns and internal marketing in some offices whereas NetMeeting had gained adoption through word-by-
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Moreover, there was a regional difference in terms of communication. In the AstraZeneca “hubs” (USA, UK and Sweden), most people had heard about the technologies from someone in their local office – typically one of their managers had told them to start using a specific technology in a project. Outside the hubs, many interviewees had heard about the technology from someone belonging to a “hub” office – in many cases this technology was only used when communicating with the hub whereas another software was used locally. However, in nearly all cases knowledge about the technology had spread through word-by-mouth.

When we asked the interviewees about where more information about technologies could be found, we received many different answers. Whereas some users referred to the helpdesk, other said that they would most probably ask a colleague first. Other users referred to online help, however when asked about where such help could be found many interviewees hesitated and could not give an answer. Some interviewees did not know about any place to turn to in order to find out about their options for collaboration.

The main problem encountered during several of the interviews had to do with eRooms becoming disorganized and “messy” after a while, which made information very hard to find. When asked about the reason for this, interviewees mentioned a lack of proper naming conventions of files, different ways of structuring information from one project to another, regional differences in the use of eRoom, but also a general confusion about when to use eRoom or other, local solutions such as shared hard drives.

During the interviews, we also discovered a conflict between the policies and the software meant to support it. In the interviews within Discovery, we were told that the company policy around information sharing was “share first – then close”. This basically meant that information was to be seen as common property by default, and made available to everyone within the company. When needed, access restrictions on information should be imposed when there were intellectual property risks. One interviewee told us that this was the company standard procedure for information sharing since some years, but that it had not been adopted to the fullest extent yet. However, none of the document sharing platforms used in the company seemed to be designed this way, according to a number of interviewees. Instead, all information was treated as access restricted by default – the only way of sharing it with a wider audience was to assign individual users access rights to the information. When sharing information with larger audiences, this approach quickly became tedious.

During the interviews, we discovered that collaboration was perceived differently throughout the various business units in the AstraZeneca organization. In Discovery, the interviewees tended to be concerned with information and knowledge not being shared between projects and work groups, which, in the eyes of some interviewees, hampered creativity and reduced research quality. In Development, there were similar worries about knowledge not being shared – but in this case the worries had to do with “lessons learned” rather than the actual research data. Instead, interviewees tended to be more worried about data accuracy than knowledge sharing. This largely had to do with regulatory policies regarding policies and storage of data set by the Federal Drug Administration – since drug development involved the testing of new drugs on humans there were strict legal demands on how information was to be gathered, stored and treated. This was also reflected in the interviews with people from Marketing and Sales, where there were similar concerns – if the company ended up in a litigation involving marketing activities all communication with involved parties had to be retrieved which created a demand on how information was stored and searched. Also, due to a reorganization of the marketing organization, one vice president expressed worries around lacking incentives to collaboration and share information due to employees being evaluated on individual performance – if a salesperson would share information with a colleague it could take away his own competitive advantage.
Hence, there were apparent differences between the various parts of the AstraZeneca organization in two aspects: the more research-oriented business units were generally more positive towards sharing information and knowledge, they also seemed to be more open to information being treated in more unstructured manner. In the business units corresponding to later stages of the value chain, the situation was almost the opposite – people were more suspicious to sharing information, and there were higher concerns about information structure.

5.4 Adding the pieces together

As stated in the above sections, my study at AstraZeneca contained a number of components, involving two company-wide surveys and an end-user study based on academic research findings. I also conducted a literature study in order to arrive at a suitable classification model for collaboration technology. In order to answer my research questions in a proper way, the results from these components need to be put together. Sticking with the division between technology and organizational elements, the findings are described below.

5.4.1 Technology issues

Judging by the evaluation model described above, AstraZeneca currently has capabilities in three areas on an enterprise-wide level: Synchronous collaboration with strong (NetMeeting) and weak (WebEx) ties and asynchronous collaboration with strong ties (eRoom). The three changes proposed by AstraZeneca are likely to add to these capabilities on some occasions more than others:

First of all, the evaluation model suggests that there might be a need for asynchronous collaboration between weak and potential ties at AstraZeneca. This is partly confirmed by the survey on information and knowledge management, where I came across complaints around poor information sharing between project teams. By introducing a wiki platform on an enterprise-wide level at AstraZeneca and keeping it open for contribution, this issue might be resolved to some extent according to our end-user interviews. In the interviews with employees having piloted wiki technology, we saw evidence of wikis creating an increased transparency between project teams, i.e. between weak and potential ties. Thus, wikis might indeed add another dimension of collaboration capabilities at AstraZeneca.

Instant messaging, however, seems to bring capabilities already in place to some extent. Since the technology mainly brings another way of communicating with close colleagues synchronously, the technology would not bring any new collaboration capabilities according to the evaluation framework since such technology is already in place at AstraZeneca through NetMeeting and WebEx. However, the end-user interviews also suggest that instant messaging would indeed add another dimension in terms of the additional awareness capabilities due to the presence functionality, where a user’s status is displayed (whether the user is available for discussions, for instance). This would indeed be an improvement - neither NetMeeting nor WebEx is capable of displaying status messages.

Furthermore, the end-user interviews indicate a clear need among AstraZeneca employees for finding other employees with specific competencies, a finding supported by the many local solutions to the problem that we came across during our study. This supports what can be seen in the evaluation model – that AstraZeneca lacks capabilities for asynchronous collaboration with weak and potential ties. Since finding other people in order to work together must be seen as interaction with weak and potential ties, the evaluation model seems to be right here. This can motivate the introduction of a social networking platform with a people search functionality, which is one of AstraZeneca’s proposed technology changes. However, since the interviews did not include users having piloted such software it is hard to tell whether the software would really add such collaboration capabilities in practice. Apparently, the local solutions to the problem have not solved the issue to a great extent, and even if finding out why would be an interesting research topic we did not have time to do it in this study.
A recurring issue around collaboration technology in AstraZeneca seems to be a lack of standardization in certain technology areas such as document sharing, which is confirmed to some extent by the interviews and the low usage figures on eRoom\textsuperscript{17}. During our interviews, we came across at least five different systems used for document sharing, but most likely many more are deployed throughout AstraZeneca. Since the interview results also suggest that users appreciate having their information gathered in one area (instead of having to navigate between a number of different applications), this would call for an increased standardization of document sharing platforms.

5.4.2 Organizational issues

By assessing the survey on information and knowledge management, we saw that there were indeed some concerns around the collaboration software not fully supporting the needs for collaboration in AstraZeneca. The concerns raised had to do with information sharing between projects (i.e. between people not always interacting with each other on a daily basis, the so-called weak ties), raising the following topics which were largely supported by the end-user interviews: Inconsistent usage of collaboration software throughout the organization, information being spread out over different storages, troublesome access right management and a lack of incentives for information sharing.

During the initial interview phase, we had also heard that there might be a problem regarding technology being too much in focus from a GTO perspective, and that there might be issues around communication to the rest of the company. This was confirmed by the end-user interviews – users were not always aware of their options for collaboration, or where to find additional information about the technologies. In terms of training, the main issue seemed to be a lack of focused training efforts rather than lack of training itself – it was largely left up to the various business units to train their own users.

Another important issue had to do with the cultural differences between different parts of the AstraZeneca organization. Since the company not only employs research-focused chemists, but also business-focused salespeople and others, the work cultures as well as the collaboration needs vary significantly between users.

The findings from the study are shown in Table 2.1, presented for each one of the technologies. The table summarizes chapter five and shows: i) to which dimension a certain technology belongs (in terms of time/space/social proximity) and ii) technology-related issues as well as organizational factors that we encountered during the interviews. Following the nomenclature of Orlikowski (1992), the table distinguishes between cognitive and structural elements, where the former relates to communication and training of users and the latter refers to the factors related to the organization rather than individuals. As an example, wikis were thought by some to have a bad reputation in AstraZeneca, which has to do with people’s cognitions about the technology and should therefore be sorted under “cognitive elements”. The problems related to the lack of naming conventions around wiki information should instead be seen as a structural problem, since naming conventions should be contained in the policies for usage of wikis\textsuperscript{18}.

\footnote{\textsuperscript{17} Compare the low figure with, for instance, the figures on NetMeeting where there are fewer alternatives to choose from.}

\footnote{\textsuperscript{18} It should be noted that I have put comments about adoption and usage under “cognitive elements” in the table. This is, of course, a simplification. Claiming that low usage of a software only has to do with user’s cognitions is a bold statement, and does not take into account that the software might suffer from very poor usability.}

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<table>
<thead>
<tr>
<th>Software</th>
<th>Technology dimension</th>
<th>Technology issues</th>
<th>Cognitive elements</th>
<th>Organizational factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>eRoom</td>
<td>(+) Improves</td>
<td>(+) Improves information sharing</td>
<td>Limited adoption (21% usage)</td>
<td>Not consistently used</td>
</tr>
<tr>
<td></td>
<td>(-) Lack of</td>
<td>(+) Standard solution</td>
<td>Not all features used</td>
<td>Lacking incentives to learn tools</td>
</tr>
<tr>
<td></td>
<td>integration</td>
<td>(+) Limited search</td>
<td>Poor training on access rights mgmt</td>
<td>Access management issues</td>
</tr>
<tr>
<td></td>
<td>(+) Local alternatives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NetMeeting</td>
<td>(+) Enables</td>
<td>(+) Enables dispersed teams</td>
<td>Extensive adoption (68% usage)</td>
<td>Policies and procedures for virtual meetings?</td>
</tr>
<tr>
<td></td>
<td>dispersed teams</td>
<td>(+) Rich communication</td>
<td>Training needed for starting application</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(+) Reduced travel</td>
<td>(+) Reduced travel</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-) Connectivity</td>
<td>(+) Connectivity issues</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>issues</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WebEx</td>
<td>(+) More “complete”</td>
<td>(+) More “complete” than NetMeeting</td>
<td>Very limited adoption (8% usage)</td>
<td>Policies and procedures for virtual meetings?</td>
</tr>
<tr>
<td></td>
<td>than NetMeeting</td>
<td>(-) Tedious process to set up meeting</td>
<td>Tedious set-up → no spontaneous meetings?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-) Connectivity</td>
<td>(-) Connectivity issues</td>
<td>Training needed for starting application</td>
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<tr>
<td></td>
<td>issues</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wiki pilots</td>
<td>(+) Information</td>
<td>(+) Information sharing between projects</td>
<td>Bad reputation in some parts of AZ?</td>
<td>Lack of taxonomy and naming conventions</td>
</tr>
<tr>
<td></td>
<td>sharing between</td>
<td>(+) Knowledge base creation</td>
<td></td>
<td>Information accuracy concerns</td>
</tr>
<tr>
<td></td>
<td>projects</td>
<td>(+) Increases quality</td>
<td></td>
<td>Security and legal concerns</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IM pilots</td>
<td>(+) Allows quick</td>
<td>(+) Allows quick interactions</td>
<td>Some users afraid of misuse</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>interactions</td>
<td>(+) Check people’s availability</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>(+) Disruptive according to some</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>(+) Clear/critical</td>
<td>(+) Clear/critical need according to some</td>
<td>How to prevent key people from getting “swamped” with questions</td>
<td>Privacy concerns</td>
</tr>
<tr>
<td>Networking</td>
<td>need according to</td>
<td>(+) Pinpointing people</td>
<td></td>
<td>Information accuracy concerns</td>
</tr>
<tr>
<td></td>
<td>some</td>
<td>(+) Reduced need for consultants</td>
<td></td>
<td>Formal “chain of command” in the way?</td>
</tr>
<tr>
<td></td>
<td>(+) Many local</td>
<td>(+) Many local solutions</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>solutions</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Table 5.1. Summary of end-user interview analysis.
6 Summary and Conclusions

“Technology makes it possible for people to gain control over everything, except over technology”

John Tudor(1954 -)

6.1 Answers to research questions

The two research questions introduced in section 1 will now be revisited and summarized.

What are the main benefits and problems of AstraZeneca’s current eCollaboration platform from a user perspective? How do end users capture these benefits, and how do they work around the problems?

Having considered input from the end-user study, the strategy team stakeholders and the two surveys, I arrive at a number of topics related to technology as well as organizational elements. Most importantly, the main problems seem to be related to the latter, as the technology-related problems are largely outnumbered by the benefits, summarized below:

From a technology perspective, my interview results suggest that eRoom facilitates document sharing for many people, and that it is appreciated for being a standard solution throughout the company. The software seems to be considered superior for information sharing within projects compared to earlier alternatives, however a number of similar, locally implemented systems remain throughout the company. This causes some users to call for an increased standardization of document sharing software. The most important problems with regards to eRoom’s technical functionality have to do with its integration with other applications, its search functionality and its access management system. Whereas the poor search functionality and the access management system are hard to work around, users sometimes surpass the poor integration by saving documents on local disks.

The capabilities that NetMeeting bring to users seem to be appreciated, and the software is well-used in AstraZeneca according to the usability survey studied. Many AstraZeneca users benefit from the software since it enables dispersed teams to conduct meetings, bridging geographical gaps and reducing travel costs. According to some users, it also enables a richer communication compared to, for instance, teleconferencing. The main issue around NetMeeting’s technical capabilities has to do with the process of setting up meetings, related to connectivity and network issues. Sometimes, this forces users to postpone meetings. On other occasions, users share presentation material with others using e-mail instead, which makes it harder to be sure that everyone has access to the same presentation material.

WebEx’ capabilities are essentially the same as NetMeeting’s, although WebEx is considered to be more “complete” by some since it also includes other features. The main technical benefits relate to the possibility to collaborate synchronously with external business partners on a larger scale. The problems mainly have to do with the tedious process to set up meetings, and that the software does not enjoy widespread adoption throughout the company.

Apart from problems around technology itself, I also encountered a number of organizational problems related to collaboration technologies. Since theory suggests that collaboration should not be looked upon as merely a technology field, these problems should also be highlighted as findings. First of all, communication to end-users seems to be a problem. One of the most apparent organizational problems around collaboration software in AstraZeneca is that end-users tend not to know where to find information about the software – sometimes they hardly even know the software exists! Many interviewees first found out about a software through word-by-mouth, suggesting a lack of communication to end-users from the organization.
Also, there are two main problems around training of end-users in AstraZeneca. First of all, training is not dealt with by the same organization that provides the technology. This leads to a duplication of efforts, since users work around the problem by developing training material locally throughout the company. Since training material is developed in this way, end-users might be confused about where to go in order to find information and training around collaboration technology. In the interviews, we encountered users who did not know at all where to turn in order to develop their eCollaboration skills, even though they believed they needed it. The second problem also has to do with lack of incentives to learn how to use the applications, since such training takes time away from other work.

Furthermore, we encountered a number of problems around lack of proper policies and procedures for using the collaboration software. For eRoom, lack of procedures for how to label documents and structure information tends to make eRooms hard to overlook after a while. Also, similar lack of procedures for how to conduct virtual conferences could lead to time being lost in meetings. There are also problems around information sharing due to access restriction policies, where there might be a mismatch between organizational policies and software design.

Lastly, another important organizational aspect is the fact that there are cultural differences throughout the organization in how collaboration and knowledge sharing is perceived. The research oriented business units in AstraZeneca tend to be more positive to open knowledge sharing, whereas the business units associated with the development, manufacturing and sales demand tighter security, data accuracy and structure.

Given the users’ views and a set of possible changes to the current eCollaboration platform, what components should be prioritised in an eCollaboration strategy at AstraZeneca from a user perspective?

Taking selected topics research and applying these to the study results in the above sections, I arrive at a number of considerations for an eCollaboration strategy at AstraZeneca. The considerations have to do with technology (related to the changes proposed by AstraZeneca) as well as organizational issues.

In terms of introducing instant messaging on an enterprise-wide level, the dimensions considered in the evaluation model give little support since the functionality already seems to be brought to users through NetMeeting and WebEx. However, with an increased presence awareness support the introduction of instant messaging might still be motivated, as such functionality was considered valuable by a number of interviewees. Judging by the interviews, the main considerations besides choice of technology should involve proper policies around usage, as well as retention policies from a legal perspective.

Introducing a centralized wiki platform should probably have the highest priority among the proposed changes. According to the dimensions in the evaluation model, wikis bring an additional capability in terms of asynchronous interaction between people sharing weak and potential ties. This was largely supported in the interviews, since the functionality brought to users through wikis also seems to solve many of the issues around information sharing between projects. The main considerations, however, should involve procedures and training around maintaining information up-to-date and useful, also addressing the security issues arising from open access to information. Most likely, there needs to be incentive systems in place supporting update of the information contained in such a platform.

Judging from my evaluation model, social networking capabilities would bring additional value to AstraZeneca by adding possibilities for asynchronous interaction with weak ties. Since the interviews revealed a clear need for such a capability due to the multitude of workarounds, introducing these capabilities should have a high priority. Considerations should involve keeping information up-to-date, while at the same time making sure that privacy and security is considered.
In addition to prioritising the proposed changes as mentioned above, the interview results also suggest a need for an increased standardisation of the software platform used for collaboration, not only with regards to the introduction of new technologies. Hence, an overall priority of a collaboration platform should involve standardizing the collaboration platform across the organization, taking into account the inherent differences in needs between different business units.

In my study, I also came across a number of organizational issues that need consideration as part of an eCollaboration strategy. Primarily, I suggest two organizational considerations in relation to the eCollaboration strategy at AstraZeneca, not directly related to any specific technology.

In relation to document sharing and virtual conferencing, my study suggests that an increased focus should be put on developing and communicating policies and procedures for working with the collaboration toolkit, which might resolve some of the issues encountered around information being hard to find due to inconsistent usage and naming conventions.

Even more importantly, AstraZeneca should increase its focus on communication to end-users, since my research suggests that such communication is missing to a great extent today. Such communication could involve creating a “one-stop shop” with information about collaboration capabilities in place in the organization, which will become increasingly important as new technologies are being deployed.

It should be noted that the above recommendations suggest that less focus should be put on training, at least formal training since this issue was not highlighted in the interviews. However, the interview results suggest that the training currently conducted in AstraZeneca might be too decentralized, with training material being developed in multiple locations with no central coordination, which might imply a sub-optimal allocation of resources. My interview material is, however, too limited to draw such conclusions.

Also, although out of scope for this thesis, one of the main considerations from an information services perspective regards the legal risks and security issues that arise from increasing communication and knowledge sharing within a pharmaceutical industry. These issues are being dealt with in several aligned corporate strategy initiatives throughout AstraZeneca, but deserve to be treated with equal importance in a strategy as the user-centred considerations described in this thesis.
7 Reflections and discussion

“Follow effective action with quiet reflection. From the quiet reflection will come even more effective action.”

Peter Drucker, Professor (1909-2005)

7.1 Academic relevance

In my thesis, I have reached a number of conclusions regarding the user perspective of an eCollaboration Strategy in a large corporation. However, some questions still remain. First and foremost, my results can be questioned from a number of perspectives. I will deal with some of these below.

7.1.1 The respondents

An important problem regarding the study has to do with the selection of respondents in the study. Due to the fact that the team conducted its work within a service organization of a large company, there were internal company requirements as to how staff within other parts of the company should be approached. From an AstraZeneca perspective, the modus operandi of choice would have implied reaching out to end users via so-called service managers, who would act as aggregators of information from the various parts of the company. This would have produced a clear bias to the responses collected in a study, since this would have limited the access to actual end-users, instead only providing us with aggregated opinions, “filtered” through the service manager.

Luckily enough, I managed to avoid such an approach. Instead end users were selected in various other ways – some of them volunteered to participate in the study, others were randomly selected in a list of e-mail addresses. This is still not perfect – the volunteers most probably already have had some kind of working connection with the IT Support organization, making them non-representative users and therefore yielding a bias in the results. Randomly selecting AstraZeneca employees without reaching out to them via an IS function would provide a more representative sample, but proved hard to accomplish.

One might also question the sample size. Is a sample of 52 respondents really enough to make statements about a company with over 60 000 employees? In order to provide a representative picture of the company as a whole, most probably a sample size of a larger size would have been required. However, given the chosen method, a study with more respondents would not have been feasible with the time restrictions at hand. Hopefully, the global team approach has somewhat reduced the severity of these problems – since interviews were conducted at many different AstraZeneca sites with employees from most disciplines and levels, the most common problems associated with collaboration tools are likely to have been discovered. However, going forward, I would recommend that AstraZeneca instead approaches the research topic by conducting surveys among a larger sample of respondents, something which proved impossible to do in this particular study. Such a survey would likely lead to more powerful results, which could be compared over time and be used to make more viable decisions about collaboration software in the future.

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19 This can, for instance be seen in Table 2.1, which shows a bias towards manager levels and certain business units (Marketing/Sales, HR/IS/Finance and Discovery).
7.1.2 The university team

This thesis is based upon the findings of the university team work at AstraZeneca. Also, the material gathered during the study is used as a basis for two different theses. From an academic perspective, a number of reflections can be made about this.

First of all, since the end-user interviews were conducted by six different people in five different countries, the interview results have many sources of error: First, the questions needed to be formulated in English by me and my co-researcher. Then, questions needed to be properly communicated to the remainder of the team. The team members then translated the questions into their local language (in the case of China and France) and posed them to respondents. The respondent interpreted the questions, answered them and the answers were recorded by the interviewer. After that, the answers were translated back to English by the interviewer and communicated to me using only collaboration tools and telephones. Lastly, I read through the interview results and summarized them. Altogether, many things could go wrong in this process.

Furthermore, getting comparable interview results can be hard due to cultural differences. As an example, there were occasions when our team members refused to ask the interviewees about their age, since such questions could be perceived as rude. Also, the attitudes toward students differ from country to country, which sometimes led to employees being sceptical about the study.

Altogether, drawing conclusions from the interview results is troublesome from many different perspectives. In order to cope with this, we made great efforts to ensure that all team members had an understanding of the interview process, the questions and the overall purpose of the study. We also tried our best to inform the respondents of the purpose, in order to prevent any problems of getting answers to interview questions.

Another issue might be the fact that I and my co-worker from Uppsala University were project managers for the study, whereas the rest of the university team were hired to perform the interviews. Since me and my co-worker were coordinating the study and doing most of the academic research, we could jointly develop the study approach on a daily basis. Obviously, with such an approach, keeping the rest of the team informed of our approach might be an issue. This could possibly have affected the outcomes of the study. Hopefully, we were able to avoid this issue by only considering the written interview outputs, after having thoroughly discussed the approach with the rest of the team. We also made extensive use of our team portal, were all research material was shared with the rest of the team in order to keep them informed of the work progress.

7.2 Business relevance

Second, my results might be subject to question as to whether they are relevant to AstraZeneca from a business perspective. Since the sole objective of a company is to provide value to its shareholders, one might ask if acknowledging the user perspective creates shareholder value per se. Does collaboration always have business relevance per se?

Also, there are other, non-user related issues that need careful consideration in an IT strategy such as the eCollaboration Strategy at AstraZeneca. For instance, since the company is developing pharmaceuticals there are numerous legal concerns regarding how information is treated. Since the development process involves testing non-approved pharmaceuticals on humans, information needs to be fully reliable and traceable. Furthermore, since all patient information is sensitive, rigorous security routines must be in place, putting restrictions on which software can be used.

Furthermore, collaboration software often comes at a cost for a company, which should be taken into account when making decisions about which system to use. In my work, I have chosen not
to make any detailed calculations with regards to the cost of systems, instead many of the areas for consideration treated in this thesis regard functionality and organizational issues.

### 7.3 Topics for further research

This thesis has, among other things, raised questions about the linkage between computer-supported cooperative work and the enterprise-level strategies that are considered by companies as of today. Having discussed this linkage with various researchers, it seems that the topic is reasonably unexplored. Since this study has been focusing on one single company, performing a larger study of the collaboration practices between companies could be of great interest for CSCW researchers.

Furthermore, AstraZeneca is somewhat special due to the fact that the company is a result of a merger of two pharmaceutical giants. Because of this, the company’s information systems, technical support etc. will probably be very heterogeneous compared to a company that has grown organically, maintaining a unified technology strategy along the way. In such a company, the approach to a collaboration strategy might be entirely different and could be subject to research.

Also, in a business context much attention is paid to the outcomes of implementing collaborative software. Since measuring the dollar value of collaboration tends to be hard to do, very often qualitative measures are being used instead. However, the area seems fairly unexplored which would suggest another interesting research topic. Finding appropriate metrics and methods for measurement in order to evaluate the business effects of implementing collaborative software would be highly beneficial to companies.
8 References


Appendix A: eCollaboration strategy team interview questions

This guideline was used to some extent during the initial interviews with the 15 members of the eCollaboration Strategy Team. However, deviations were made as the respondents were given the opportunity to elaborate on their answers. Therefore, it should not be seen as a strict guideline *per se*.

Describe yourself!
- Business area
- Role
- Age
- Years with AZ, experience from other companies
- Educational background

What is your role in the eCollaboration team?

University Team outcome will be used as input to larger process/strategy. What is your preferable outcome of the overall eCollaboration Strategy?

How does the eCollaboration Strategy fit into AstraZeneca’s corporate strategy?

What are the most important business requirements for an eCollaboration strategy?

Do you see any other problems and obstacles to the strategy, seen from your part of the business?
Appendix B: End-user interview questions

Introduction to the respondent
Describe yourself!
- Business area
- Role
- Age
- Years with AZ, experience from other companies
- Educational background
- Does the respondents consider himself/herself an experienced IT-user?

eRoom questions
Do you use eRoom?
- If NO, why not? Do you use other tools to share documents and information instead? Why those tools?
What do you use eRoom for?
Tell us about how eRoom brings value to your work!
Are there any problems related to eRoom?
- If YES, how do you address them?
How did you first learn about eRoom?
Where can you find information about eRoom?
Do you feel that you have been properly trained in how to use eRoom?
- Would such training be needed?
Where can you find support and training about eRoom?
Besides eRoom, do you use any other software to share documents and information? If YES, which software and why?
Further suggestions for improvement?

NetMeeting and WebEx questions
Have you ever used NetMeeting or WebEx?
- If NO, why not?
What do you use it for?
Tell us about how NetMeeting and WebEx bring value to your work!
Are there any problems related to NetMeeting and WebEx?
- If YES, how do you address them?
How did you first learn about NetMeeting and WebEx?
Do you feel that you have been properly trained in how to use NetMeeting and WebEx?
Appendix B: End-user interview questions

- Would such training be needed?
Where can you find support and training about NetMeeting and WebEx?
Further suggestions for improvement?

People search and Skills directory questions
Do you know of any tool in place that can help you to find a person with a specific competence within AstraZeneca?
- If YES, which tool?
During your time at AstraZeneca, have you ever used software for finding other people within the company?
- If NO, why not?
Describe a situation when you used it! (opinions? problems?)
What where you looking for?
How did you first get to know about the software?
Would being able to find people through software help you in you work?
What features would you like to see in such a software?

Web 2.0 capabilities questions
Have you ever used/consumed a
- Blog
- Wiki
- Instant Messaging client
- Social networking site
in AZ, other companies or on your spare time? For each of the above technologies, ask the following questions:
- Reading or contributing? (in case of Blogs, Wikis, social networking information)
- What do you think about using such tools in your current work?
- How could it improve your performance?