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How blogs, wikis, and social bookmarking offer facilities that support learning in practice in communities of practice

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Abstract

This thesis deals with the question whether social software offers facilities that support learning in practice in communities of practice (CoP). The objective is to formulate hypotheses that explain the relation between the two concepts. The context of this study can be characterized as social software being applied in small, existing communities where participants already know each other and work together. This approach differs from the majority of the existing literature on social software, which normally describes social software from an individual's perspective where communities emerge gradually.

To achieve the research objective, several steps have been taken. Firstly, a review of the literature on CoPs has been conducted. CoPs are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis (Wenger, McDermott, and Snyder, 2002). Learning, meaning making, participation, and engaging are the main objectives. Learning in practice consists of three main processes, namely evolving forms of mutual engagement, understanding and tuning the enterprise, and developing a shared repertoire. To support CoPs, it is important that an architecture is available that supports the work of engagement, imagination, and alignment.

Secondly, a review of the literature on social software has been conducted. Social software can be defined as software that is aimed at simplifying the achievement and enduring of networks among people (Gorissen, 2006). In this study, three social software services were examined, namely weblogs (blogs), wikis, and social bookmarking. It is argued that social software and CoPs share several important characteristics, which makes it interesting to study this relation more closely.

Thirdly, a review of the literature on the relation between communities (of practice) and social software has been conducted. This theoretical study re-

sulted in a description of the facilities offered by blogs, wikis, and social bookmarking that support the work of engagement, imagination, and alignment.

Fourthly, an empirical study was carried out. This empirical study consisted of two parts. Ten interviews were held with students at the University of Amsterdam, which were all familiar with both social software and the theory of CoPs. This study resulted in a refinement of the theoretical description mentioned earlier, which explains the facilities offered by blogs, wikis, and social bookmarking that support the work of engagement, imagination, and alignment. Furthermore, these insights were summarized in a single conceptual framework, which was discussed in a focus group interview with a group of experts on the subject. The participants of the focus group validated the conceptual framework, but they also brought interesting contextual prerequisites to light.

Several lessons have been identified after conducting this study. Firstly, this study proves that social software can be applied within small groups of people (e.g. existing CoPs). Secondly, this study shows that social software does offer facilities that support the work of engagement, imagination, and alignment. In fact, it is argued that social software is only supportive of learning when it is applied within CoPs. However, contextual factors, as acceptance of open source values, and the willingness to participate are key to success. Thirdly, this study shows that every service offers its own unique contribution to the design framework, which implies that a combination of the three services offer the most potential to support CoPs.

To answer the main research question, ten hypotheses are developed that deal with the relation between social software and communities of practice. Finally, limitations and suggestions for further research are described.

For a Dutch summary, see appendix A (p.153).

keywords: communities of practice, social software, learning, knowledge management, weblogs, wikis, social bookmarking.

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Sometimes, people say that doing research is a lonely task. After eight months working on my thesis, I am not sure whether I agree with this thought or not. I would say yes, considering the hours and hours spending alone writing, thinking and writing again. I would say no, because of the support and enthusiasm of several persons that were somehow involved in my study. This enthusiasm came from many different sources. During this period, I wrote periodically on my own weblog where many people (known and unknown) commented on my posts. I commented frequently on other weblogs, and some people even wrote articles about my study on their own blogs. I got the opportunity to write a post on three other weblogs, namely commorg.nl[1], Frankwatching[2], and Livre.nl[3]. At some point, my weblog was even the second most popular link on a daughter page of startpagina.nl dedicated to Web 2.0[4]. This interest in my study gave me an enormous amount of energy to finish my thesis.

For now, I would like to take the opportunity to thank a few people who where particularly important, without whom I would not have been able to finish this project:

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Secondly, I would like to thank the participants of the focus group interview.

[1] see http://tinyurl.com/pfnh5, last accessed on 09-05-2006
[2] see http://tinyurl.com/pu9vm, last accessed 28-07-2006
[3] http://tinyurl.com/mr5t2, last accessed on 28-07-2006
[4] http://web2-0.startpagina.nl, last checked on 09-05-2006

Without their input and expertise, openness and willingness to participate, this thesis would not have been finished.

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I do not think that conducting this study was such a lonely task after all, considering the number and diversity of people I wanted to thank. What I do know is that this was one of the most challenging, exiting, and exhausting things I have ever done. Nevertheless, it was worth every second...

Nieuw Vennep
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Martin Kloos

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Chapter 1

Introduction

This document contains the result of my masters thesis, which I wrote as part of the masters program Business Information Studies (BIS) at the University of Amsterdam. From December 2005 until August 2006 I studied the effects of weblogs, wikis and social bookmarking on communities of practice (further referred to as CoPs[1]).

This chapter unfolds as follows. In §1.1 (p.1) the motivation of this study is described and in §1.2 (p.2) the content of this document is outlined.

1.1 Motivation

The past year, I became familiar with the concept of social software and Web 2.0, thanks to some guest lectures, my tutor and some other inspirational sources. In addition, the university and especially the teachers of the masters program offered me the opportunity to use social software in an educational setting. In the past year, I used weblogs, social bookmarking, and wikis to support my learning process. For the first time, it felt as if this collaborative use of software actually supported my learning experience. For me, this was an indication that it could be interesting to study this phenomenon more closely.

At the same time, the theory of CoPs (Wenger, 1998) was introduced. I find this theory intriguing; mainly because of the fact that it focuses, when

[1] The title contains a subtle reference to some services that can be described as social software. For instance, the social bookmarking service del.icio.us (`http://del.icio.us`) was the first to use strategically positioned dots in their name and Internet address, which brought them much attention. Other services with similar addresses followed quickly.

considering learning and knowledge, on people and communities rather than technology. Knowledge is considered to be subjective, something that is context dependent and hard to quantify. The theory is also about exchanging knowledge through interaction and negotiation. This differs from traditional perspectives on knowledge management, where the focus often is on codifying, storing, and transferring knowledge. It also became clear that the concept of CoPs receives wide attention in both academic as well as business literature. At the same time, it is still quite an abstract concept. This makes it interesting to study this phenomenon more closely.

After reading some material on CoPs, it became clear that not much is said about how they can be supported with information technology. The literature on the relation between CoPs and technology is scarce, mainly because of the fact that technology is not decisive for its success (in fact, communities can function very well without it) and because technology does not always support communities very well (Wenger, White, Smith, and Rowe, 2005).

According to Wenger et al. (2005), technology should create a sense of togetherness over time and should deal with different levels of membership. Considering the similarities between CoPs and social software, I argue that social software can offer facilities that support CoPs and that it can support communities better than 'traditional' software. This thesis further elaborates on this thought.

1.2 Content of this thesis

To explore the thought introduced in the previous section, a conceptual framework is developed that explains the effects of social software on CoPs. To accomplish the main research objective (see chapter 4, p.35), a theoretical as well as an empirical study was conducted.

The first two chapters are dedicated to the main concepts of this thesis: communities of practice (chapter 2, p.5) and social software (chapter 3, p.23). In chapter 2 (p.5), the concept of CoPs is explained from a social learning theory and knowledge management perspective. Some drawbacks are described as well as the relation with virtual CoPs and technology. In chapter 3 (p.23), the concept of social software is introduced and some main characteristics are described. The remainder of this chapter is dedicated to the three main services that are under research in this thesis, namely weblogs, wikis, and social bookmarking.

Chapter 3 (p.23) concludes with my thoughts on the relation between social software and CoPs. A conceptual framework that forms the basis of this thesis is introduced. My research approach is the subject of chapter 4 (p.35). In this chapter, the main research objective is explained, the main research questions are described, and the relevance of the study is explained. Furthermore, the research method, research type, and research strategy are part of this chapter. Based on a review of the literature, a theoretical framework is drawn up in chapter 5 (p.53), which is refined based on ten interviews with master students Informatiekunde at the University of Amsterdam and a focus group interview with four experts. The results of these two empirical studies can be found in chapter 6 (p.75). Chapter 7 (p.131) contains a closing discussion of the most important lessons learned in this trajectory. Finally, chapter 8 (p.135) contains the conclusions, hypotheses, limitations of this study, and suggestions for further research.

Chapter 2

Theory of communities of practice

This chapter describes the first main concept of this thesis, namely the theory of communities of practice (CoPs) based on Wenger (1998). This theory is perceived from a social learning perspective, which is the subject of §2.1 (p.5). In §2.2 (p.8) the theory of CoPs is placed within the context of knowledge management theory. This is done to strengthen the theoretical basis of the concept and to emphasize the importance and popularity of the concept today. Because learning is essentially what takes place in CoPs, §2.3 (p.12) describes the learning process that takes place within these groups of people. An architecture for learning, which explains how communities can be supported, is introduced in §2.4 (p.14). Some drawbacks of CoPs are formulated in §2.5 (p.16). §2.6 (p.18) and §2.7 (p.20) are dedicated to virtual communities and technology for communities.

2.1 Introduction to social learning theory

"Our institutions ... are largely based on the assumption that learning is an individual process, that it has a beginning and an end, that it is best separated from the rest of our activities, and that it is the result of teaching." (Wenger, 1998, p.3).

This is the opening sentence of the book *Communities of Practice: learning,*

meaning, and identity, written by Wenger (1998). This basic assumption, namely learning as an individual, separated activity, still lies at the heart of many learning initiatives today. Learning often takes place in classrooms, with teachers that instruct courses that contain learning objects, little bits of content that can be put together or organized (Downes, 2005). Slowly, people realize that this might not be the best approach to learning and gradually, we see a movement towards more practice based, life-long learning initiatives. A practice based, life-long approach to learning also forms the central starting point to the social learning theory of Wenger (1998), a theory that has received wide attention in recent years. This section describes a preliminary introduction to this social learning theory. However, in order to understand and position this theory in perspective, it is important to briefly describe some basic learning theories first.

Three learning theories

Broadly, three basic learning theories can be defined, namely behaviourist, cognitive and constructivist theory. *behaviourist* theory focuses on the stimulus-response principle and selective reinforcement. Learning is considered the result of stimuli and responses through the use of rewards. A content area is broken into component sub skills, which are sequenced, and then transmitted to the receiver, often by direct instruction. After absorbing the specific parts of a content area, the receiver is able to combine these parts as a whole and apply them when needed. This theory sees the receiver as a passive learner who needs external motivation and who is affected by reinforcement (Chen, 2003). Many learning processes, as described in the first paragraph, are based on this behaviourist approach to learning. The behaviourist approach to learning dominated educational settings for many decades (Chen, 2003).

Cognitive theory focuses directly on the structure and operation of the human mind. This theory is based on the information processing approach, which is concerned with the way people collect, store, modify, and interpret information from their environment, how the information is retrieved and stored, and how people use this knowledge and information in their activities (Chen, 2003). This theory, thus, focuses on internal cognitive structures and learning is viewed as transformations in these cognitive structures (Wenger, 1998).

Constructivist theory builds on this cognitive approach and views learning as a process of knowledge construction, with concept development and comprehensive understanding as the main objectives. It includes important issues such as

motivation, self-directed learning, and a focus on the social context of learning. Chen (2003) describes two main aspects of constructivism: firstly, learning is a process of knowledge construction instead of absorption, which is the dominant approach in behaviourist theory. Because knowledge is constructed based on one's own perceptions and conceptions of the world, everyone constructs a different meaning or concept. This implies that learning cannot be transferred from teacher to learner by words, but learning only takes place when learners are actively involved in the process. Secondly, knowledge is considered highly related to the environment in which learning is experienced and knowledge is constructed. This implies that learning should be task-oriented (Wenger, 1998) and focused on the practices of the communities.

Social learning theory

The *social learning theory* of Wenger (1998) further elaborates on this constructivist theory and places learning in the context of our lived experience of social participation in the world. Learning is considered part of human nature and is life sustaining and inevitable. The underlying assumptions as to what matters about learning and as to the nature of knowledge, knowing, and knowers are based on four major premises (quoted from Wenger, 1998, p.4):

- We are social beings;
- Knowledge is a matter of competence with respect to valued enterprises;
- Knowing is a matter of participating in the pursuit of such enterprises, that is, of active engagement in the world;
- Meaning - our ability to experience the world and our engagement with it as meaningful - is ultimately what learning is to produce.

According to Wenger (1998), learning is essentially about participation. Such an approach has broad implications for what it takes to understand and support learning. It implies that learning is a matter of engaging and contributing to the practices in which they are involved.

Engagement in social practice is the fundamental process by which we learn and so become who we are. Meaning is what learning ultimately is to produce, which is created in a process that is described as negotiation of meaning (Wenger, 1998, p.52). According to social learning theory, learning is situated in practice and the social groups in which learning takes place are defined as *communities of practice*. In this light, practice can be defined as: "*... the way tasks are done, spontaneous, improvised, responding to a changing, unpredictable en-*

vironment, driven by tacit knowledge and weblike" (Seely Brown and Duguid, 2000). The concept of CoPs was also studied by Seely Brown and Duguid (1991), who saw CoPs as groups of people in which working, learning and innovating takes place. In this thesis, the focus is on Wenger's ideas of the concept.

In the next section, the concept of CoPs will be described and positioned within perspective of the theory of knowledge management, to emphasize the origins and impact of this concept. After that, the process of learning in practice, which takes place within CoPs, will be described.

2.2 Communities of practice and knowledge management

As described above, the basic assumption underlying the theory of CoPs is that engagement in social practice is the fundamental process by which we learn and so become who we are (Wenger, 1998). Learning is situated in practice and CoPs are the reification of the social groups in which learning takes place. Following (Wenger et al., 2002, p.4), CoPs can be defined as:

> *"...groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis."*

A group of people sharing a passion lies at the heart of CoPs. Participation is voluntary and open to anyone who has interest in the subjects. CoPs will emerge from this shared interest and the interaction among participants, which

	What's the purpose?	Who belong's?	Who holds it together?	How long does it last?
Community of Practice	To develop members' capabilities; to build and exchange knowledge	Members who select themselves	Passion, commitment, and identification with the group's expertise	As long as there is interest in maintaining the group
Formal work group	To deliver a product or service	Everyone who reports to the group's manager	Job requirements and common goals	Until the next reorganization
Project team	To accomplish a specific task	Employees assigned by senior manager	The project's milestones and goals	Until the project has been completed
Informal network	To collect and pass on business information	Friends and business acquaintances	Mutual needs	As long as people have a reason to connect

Table 2.1: A comparison between communities of practice and other forms of communities. Derived from Wenger and Snyder (2000).

implies that CoPs cannot be designed: they can only be designed for (Wenger, 1998, p.229).

As Wenger (1998, p.122) argues, not every social configuration, or community can be labeled as a CoP. This would render the concept useless. There are, of course, characteristics that can be identified in order to classify a community as a CoP. Table 2.1 (p.8) contains a comparison of CoPs and other forms of communities. This figure is derived from Wenger and Snyder (2000), who separate among types of groups based on their purpose, their way of belonging, their social bond, and their duration.

Although originally positioned as a social approach to learning, CoPs are often used as a subjective approach to knowledge management. The importance of CoPs in terms of knowledge management is described by numerous authors (for instance, see Kimble and Hildreth, 2004; Pan and Leidner, 2003; Hildreth and Kimble, 2002; Wenger et al., 2002; Seely Brown and Duguid, 2000; Wenger and Snyder, 2000). Wenger et al. (2002, p.8-12) argue that traditional knowledge management was mainly centred on information technology but that the focus should be on the practice in which knowledge is created, on both the tacit and explicit dimensions of knowledge and on the dynamic, social and individual nature of knowledge. Wenger et al. (2002, p.166) therefore, define managing knowledge as *"coordinating the activities of a variety of players who help discover, diffuse, or apply knowledge"*. Pan and Leidner (2003) illustrate the importance of CoPs to knowledge management by arguing that CoPs do not follow traditional organizational boundaries, but instead, define their own, informal boundaries. By defining their own boundaries, they can fully exploit their own competencies, thus contributing to the organization, without complying with functional structures. This way, CoPs become *engines for acceleration* for an organization (Pan and Leidner, 2003). The organization benefits from the CoPs by acknowledging that knowledge cannot be separated from its context.

Why are CoPs considered to be so crucial for knowledge management? To understand this, it is necessary to look at how the concept of knowledge management has developed in recent years. In the early days of knowledge management, knowledge was often considered an object, which could be captured, codified and stored. Knowledge management was mainly focused on optimizing these three processes (Wenger et al., 2002; Hildreth, Wright, and Kimble, 1999). Knowledge was extracted from experts and codified in a readable format, which was then stored so that others could retrieve it. Technology that 'supported' knowledge management was also focused on storage and retrieval

of so-called knowledge assets (Boisot, 1998). Many of these initiatives failed, because people did not understand the stored knowledge, the stored knowledge did not reflect real practices, or organizations were unable to motivate people to use these knowledge bases (Wenger et al., 2002, p.12).

Slowly, it became clear that it was not that easy to capture, codify and store knowledge. In fact, could the content stored in those databases be even considered as knowledge? Or was it merely information (Hildreth and Kimble, 2002)? The focus of knowledge management systems slowly began to move towards the creation, transfer and application of knowledge (Alavi and Leidner, 2001). But then again, can knowledge easily be created by or in knowledge management systems?

The difficulty of capturing, codifying and storing knowledge, as well as the problem of knowledge creation by knowledge management systems shifted the focus towards more human aspects of knowledge. This became also reflected in the variety of definitions of what constitutes knowledge. For instance, Nonaka and Takeuchi (1995) (from Choo, 1998) define two types of knowledge, namely tacit and explicit knowledge. Tacit knowledge, in their view, is based on the fact that we know more than we can tell. It is the implicit knowledge used by organizational members to perform their work and to make sense of their worlds (Choo, 1998, p.111). Tacit knowledge is interwoven with the context and the experiences of its respective 'owner' and therefore, hard to transfer (Russel, Sambamurthy, and Zmud, 2001). It comprises concepts as values, beliefs, experiences, emotions and know-how (Skok and Kalmanovitch, 2005). Explicit knowledge can be codified and is therefore easy to transfer (Choo, 1998; Russel et al., 2001). Explicit knowledge is often defined as know-what.

This tacit / explicit knowledge dichotomy has received wide acceptance in organizational and scientific literature, because it recognizes the intangible, human related side of knowledge. However, not everyone accommodates with it. For instance, Hildreth et al. (1999) differentiate between hard and soft knowledge. Hard knowledge is positioned as the traditional approach to knowledge management (Hildreth et al., 1999). Soft knowledge is positioned as being less quantifiable, and harder to capture, codify and store. It is the implicit knowledge that is embedded in peoples' everyday experiences and actions (Wenger, 1998; Hildreth et al., 1999; Seely Brown and Duguid, 2000). Examples of this kind of knowledge include tacit knowledge that cannot be articulated, internalized experience and automated skills, internalized domain knowledge and cultural knowledge (Hildreth et al., 1999). In contrast to Nonaka and Takeuchi

(1995), Hildreth et al. (1999) consider hard and soft knowledge as a duality rather than a dichotomy. This means that both hard and soft knowledge are equally important and have to be taken into account when managing knowledge.

As mentioned earlier, many technological oriented tools exist that support hard knowledge. However, fewer tools support the soft approach to knowledge management, which is considered much harder to manage and much more implicit. The implicitness of soft knowledge also implies that this kind of knowledge is 'lost' when experts leave the organization. This urges for approaches to knowledge management that know how to deal with this. It is argued that the answer can be found in practice based communities, or CoPs.

CoPs are positioned as an approach to knowledge management that is focused on knowledge and knowing in practice (for instance, see Lave, Wenger, and Pea, 1991; Seely Brown and Duguid, 1991; Wenger, 1998) and has gained wide attention in recent years. As Hildreth and Kimble (2002) put it: "CoPs provide an environment for people to develop knowledge through interaction with others in an environment where knowledge is created, nurtured, and sustained." Value is "... given by social participation - in particular, by being an active participant in the practices of social communities, and by constructing an identity in relation to each community" (Fowler and Mayes, 1999). Storytelling, improvisation and knowledge spreading are among the most essential activities of CoPs (Seely Brown and Duguid, 2000). CoPs take the soft side of knowledge management into account, without neglecting the hard side of knowledge management.

The process underlying the construction and nurturing of soft knowledge in CoPs is called Legitimate Peripheral Participation (LPP) (Lave et al., 1991). LPP is the process by which newcomers become full members by learning from old-timers and by being allowed to participate in certain tasks that relate to the practice of the community (Kimble, Hildreth, and Wright, 2000). Hildreth and Kimble (2002) map participation, which forms the key constituency in the process of negotiation of meaning, to the soft definition of knowledge. Participation remains undefined without another constituent process, which is called reification. Reification means giving concrete form to something that is abstract. Both participation and reification form a duality that is part of the process of negotiation of meaning. Hildreth and Kimble (2002) map reification to the hard approach of knowledge management. The similarities between hard knowledge and reification, and soft knowledge and participation show why CoPs are so important to knowledge management nowadays and explain the recent

success of this approach.

This section also exposed an important problem in knowledge management, as well as in learning, namely the lack of decent technological support. This lack of support resulted in the cultivating of CoPs as an answer to the management of soft knowledge. This places the focus from hard to soft knowledge but introduced the question whether, and if so how CoPs can be supported with technology in order to enhance the process of learning in practice, the central process of CoPs. This question forms the focal point of this thesis.

So far, the role of CoPs in knowledge management and its relation with the social learning theory is explained. It is explained that the concept can be used as an approach to both learning as well as knowledge management, which makes it extremely valuable. In this thesis, the focus will be on the process of learning in practice that takes place in CoPs. The next section further elaborates on this process.

2.3 Learning in practice

What is going on in a CoP is rarely being considered as learning explicitly, because learning is inevitable and ongoing. Learning involves being engaged in, and participating in the development of an ongoing practice. Following Wenger (1998, p.95), learning in practice includes the following processes, which will be described below:

- Evolving forms of mutual engagement;
- Understanding and tuning the enterprise;
- Developing a shared repertoire.

Evolving forms of mutual engagement
CoPs exist by the virtue of their members. Membership in a CoP is not arbitrary, but emerges from some form of participation and interest in the activities of a CoP. Members are engaged in actions that are central to the community and membership is therefore a matter of mutual engagement (Wenger, 1998, p.73). Whatever makes mutual engagement possible is essential to a CoP. Members interact with each another, thereby establishing norms and relationships of mutuality that reflect these interactions (Wenger, 2000). An important requirement for mutual engagement is that members are included in what matters in a CoP. This mutual engagement is not something that is created at the beginning of

a CoP, but is something that is under constant development. Members have to trust each other and know each other well enough to interact productively (Wenger, 2000). New members join the community and others leave, thereby influencing the process of mutual engagement in a CoP. The change of objectives in a CoP also influences mutual engagement. Evolving forms of mutual engagement include things as "...discovering how to engage, what helps and what hinders; developing mutual relationships; defining identities, establishing who is who, who is good at what, who knows what, who is easy or hard to get along with" (Wenger, 1998, p.95).

Understanding and tuning the enterprise

The enterprise is what keeps a community together. It represents the main objectives and initiatives that represent why a community exists. It is completely defined by the community itself and is the result of collective processes of negotiation, which reflects the full complexity of mutual engagement (Wenger, 1998, p.77). The members of a community are bonded together by their collectively developed understanding of what their community is about and they hold each other accountable to this sense of *joint enterprise* (Wenger, 2000). The enterprise comprises more than just the task of a community: it also comprises things as beliefs and mutual accountability. It basically is the context in which a community operates. To be able to contribute and to be competent requires a thorough understanding of what the enterprise is about. The enterprise itself is also under constant negotiation. The objectives and the context in which a community operates may change. Furthermore, a community always seeks ways to improve its work, thereby tuning the enterprise. The community must recognize gaps in its knowledge as well as remain open to emergent directions and opportunities (Wenger, 2000). Understanding what the enterprise is about is therefore a constant process, not just for newcomers. Understanding and tuning the enterprise includes things as aligning engagement, learning to become and hold each other accountable; struggling to define the enterprise and reconciling conflicting interpretations of what the enterprise is about (Wenger, 1998, p.95).

Developing a shared repertoire

A shared repertoire exists of resources that were created during the pursuit of an enterprise. What defines the repertoire is that it belongs specifically to the community. The repertoire of a community includes "...routines, words, tools, ways of doing things, stories, gestures, symbols, genres, actions or concepts that

the community has produced or adopted in the course of its existence and which have become part of its practice" (Wenger, 1998, p.83). Developing a repertoire enables the community to understand its own state of development (Wenger, 2000). From a shared repertoire perspective, competence means having access to the repertoire and being able to use it appropriately (Wenger, 2000). The development of a shared repertoire, styles and discourses include activities like renegotiating the meaning of various elements; producing or adopting tools, artefacts, representations; recording and recalling events; inventing new terms and redefining or abandoning old ones; telling and retelling stories; creating and breaking routines (Wenger, 1998, p.95).

2.4 Design for learning

As argued, learning is inherently a social act, which takes place in CoPs. CoPs are centred on a shared interest of a group of people and therefore, CoPs, as well as the process of learning that takes place within them, cannot be designed. For instance, consider a flower: you cannot force a flower to grow, but you can facilitate an ideal surrounding for the flower to flourish. The same holds true for learning in CoPs: learning can only be designed for. The challenge therefore is to offer a learning architecture that offers facilities that support the process of learning in practice. For instance, a learning architecture includes combinations of traditional facilities, such as real estate, information technology, and organizational structure (Wenger, 1998, p.237).

According to Wenger (1998), such a learning architecture should support the work of three modes of belonging, namely engagement, imagination and alignment (see figure 2.1, p.15). The modes of belonging will be described in the remainder of this section. They will be further explained in chapter 5 (p.53)

Engagement

Engagement is defined as active involvement in mutual processes of negotiation of meaning (Wenger, 1998, p.173). It involves the ways in which we engage with each other and the world (Wenger, 2000). Through engagement, we learn what we can do and how our surroundings respond to our actions. Engagement is bounded by physical (in time and place) as well as psychological limits (the complexity someone can handle), which can be an opportunity as well as a limitation. The work of engagement is basically the work of forming CoPs. Engagement requires the ability to take part in activities and interactions, in

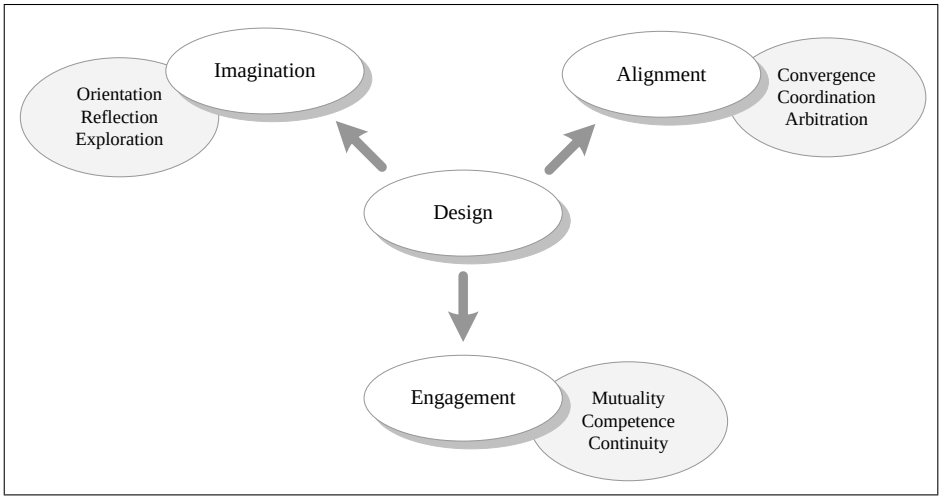

Figure 2.1: Learning architecture: three infrastructures for learning. Derived from Wenger (1998, p.237).

the production of artefacts, in conversations, and in the process of negotiation of meaning. To support learning, engagement requires access to both participative and reificative aspects of the practice. It should enable one to contribute to the pursuit of an enterprise, to the negotiation of meaning, and to the development of a shared repertoire. It also requires access to the full reificative arsenal of symbols, tools, language, documents, and so on.

Imagination

Imagination can be explained as creating images of the world and seeing connections through time and space by extrapolating from one's own experience (Wenger, 1998, p.173), in order to orient ourselves, to reflect on our situation, and to explore possibilities (Wenger, 2000). This creative process of creating new images has a great influence on the way we experience the world and our sense of place in it. Imagination ensures that two people, who are essentially doing the same thing, end up with a completely different learning experience, but it also allows us to see other meanings, other possibilities, and other perspectives. As Wenger (1998) argues, imagination requires the ability to look at engagement through the eyes of an outsider. It requires the ability to explore, to take risks, to reflect, and to create unlikely connections. In terms of participation, imagination requires an open mind and the willingness to expose oneself. In terms of reification, imagination requires material to use in the process of

imagination.

Alignment
Alignment is defined as coordinating your energy and activities in order to fit within broader structures and to contribute to broader enterprises (Wenger, 1998, p.174). Through alignment, members of a community become part of something bigger, because they do what it takes to play their part and to become effective beyond their own engagement (Wenger, 2000). Alignment enhances the effects of actions by coordinating multiple localities, competencies, and viewpoints. It requires the ability to coordinate perspectives and actions in order to direct energies to a common purpose. It requires the ability to connect local efforts to broader styles and discourses, and the ability to communicate the purpose, needs, methods, and criteria of an enterprise. In terms of participation, alignment requires members with multimembership and boundary practices. In terms of reification, alignment requires artefacts that can be shared.

By combining these three modes of belonging, an architecture can be created that support the process of learning in practice in CoPs. Therefore, these modes of belonging form an important ingredient of this thesis. Before the concept of social software is introduced in the next chapter (p.23), some possible drawbacks of CoPs are discussed.

2.5 Drawbacks of communities of practice

Although CoPs become more and more accepted as the new organizational approach to knowledge management and learning, there are some drawbacks that may prohibit CoPs to be fully adopted.

One major drawback is that, because of their informal character, the benefits of CoPs are hard to quantify. Wenger et al. (2002) try to measure the value of a CoP by calculating the Return on Investment (ROI), by multiplying the numeric value of a saving with the share of the community in percentage and the degree of certainty. A 2 million dollar saving, with a 50% share of the community and a certainty of 80% will result in a reported saving of $800.000. It is obvious that this does not offer a very solid definition of the ROI of a CoP. Others (for instance, see Fontaine and Millen, 2004; Kimble and Hildreth, 2004; Lesser and Storck, 2001) focus on the social capital of CoPs, which seems to offer better results. Social capital can be defined in terms of the existence

of a series of connections among individuals, the development of a sense of trust among these connections and the availability of a common interest or shared, common understanding (Lesser and Storck, 2001). They argue that these dimensions aptly apply to CoPs, thus it seems legitimate to state that it is through these dimensions that CoPs are of benefit to an organization. Fontaine and Millen (2004) examined thirteen practices and found that it was through the use of anecdotes and timesavings that the communities contributed to the organization. Although the benefits of CoPs can be partly explained from a social perspective, the results are subjective by nature. Managers today often want quantifiable results, which might form a problem in the case of CoPs.

Another drawback is that CoPs rely on a free transfer of information and knowledge. In order for knowledge to transfer freely, it must be considered as a public good (Ardichvili, Page, and Wentling, 2003). However, more often knowledge is still considered a private good (Mclure Wasko and Faraj, 2005, 2000). A proprietary view on knowledge is devastating for the success of a CoP, because it paralyses the exchange of knowledge and information, and the learning abilities of the community.

The fact that CoPs are self-directed and self-motivated is an advantage as well as a drawback. Firstly, the fact that they define their own enterprise and objectives does not always mean that those are aligned with broader, organizational objectives. When these are not aligned, the benefits of a community can be very small or even negative when they work against each other. Secondly, it is possible that communities become too self-directed and slowly drift into non-existence. When the organization somehow relies on the community, drifting into non-existence could be a serious problem (Kimble and Hildreth, 2004 from Gongla and Rizutto, 2004).

Another problem that communities might face is a lack of a shared identity, which can result in failure of the community. (Hislop, 2004, from Kimble and Hildreth, 2004) conducted three case studies within three large organizations and found that only one was able to share knowledge among communities. The others failed because of a lack of shared identity and lack of consensual knowledge. As Hislop (2004) argues, an identity that is too strong can also form a problem, because CoPs tend to share less knowledge with other communities when they have a strong identity. This implies that a strong internal sense of identity can be destructive for CoPs.

Despite these drawbacks, CoPs are embraced in organizational environments. In the next section, the literature on virtual communities and technology in

CoPs will be discussed, because the communities under research in this study operated partly online. The question whether CoPs can exist in a virtual world is answered.

2.6 Virtual communities of practice

Because the communities under review in this study are, for some part, online communities, the question arises whether online (or virtual) communities can be considered as CoPs. To answer this question, the literature on virtual communities in relation to CoPs will be reviewed. In addition, the literature on how technology can support CoPs will be described.

Since the dawn of the Internet, technology has gone through major developments. The World Wide Web (WWW) enables people to experience a life online. The Internet has also introduced opportunities for distributed communities to flourish. The Internet consists of places where people gather and talk on specific topics. Research on traditional CoPs is mostly centred on local communities. However, internationalisation and globalisation of businesses make operations more geographically distributed (Hildreth, Kimble, and Wright, 2000). Thus, an important question arises whether CoPs can exist entirely (or partly) online.

As often, there are enthusiasts and critics of virtual communities. Enthusiasts, on the one hand, argue that virtual communities offer the potential for making connections without regard to race, creed, gender, or geography. Critics, on the other hand, argue that the Internet and virtual communities can never be meaningful because they lack the potential of inter-personal contact (Wellman and Gulia, 1999). Although focused on Usenet groups, Wellman and Gulia (1999) concluded that virtual communities can exist on the Internet.

Virtual communities use networked technology, especially the Internet, to establish collaboration across geographical barriers and time zones (Johnson, 2001). In contrast to traditional communities, virtual communities require less formal borders and norms do not dominate as much as in traditional communities, because members cannot see each other (Squire and Johnson, 2000 from Johnson, 2001). Johnson (2001) defines a virtual community as: *"... a group separated by space and time (i.e., geographic location and time zone), using networked technology in one form or another to collaborate and communicate."*

Johnson (2001) also considered virtual communities in light of the theory of CoPs. He argues that a virtual community is the *designed* community, whereas

the CoP is what *emerges* from the designed community. This implies that a virtual community can only be supportive of CoPs (instead of being a CoP), which implies that the technology that is used by a virtual community is only an artefact. He further argues that the best you can do is set up a design (e.g., a virtual community) and hope that the emerging CoP can achieve its objectives of learning and growth. In order to speak of virtual CoPs, it is important to consider whether virtual communities allow members to become full members by first participating in the peripherality. Another important question that must be considered is whether virtual communities can support the building of trust and identity (Hildreth et al., 2000).

The question whether CoPs can be set up, maintained and supported using Web-based applications is answered "yes" by Johnson (2001). Another case study, respectively conducted by Hildreth et al. (2000) and Kimble et al. (2000), supports the claim that CoPs can function in a distributed environment, although their studies were focused on CoPs situated in partly virtual environments. However, both Johnson (2001), Hildreth et al. (2000) and Kimble et al. (2000) state that face-to-face contact has proved to be an important factor in the development of a CoP. Bradshaw, Powell, and Terrel (2004) state that the development of distributed CoPs may take time and requires constant checking of objectives and working practices to keep the community working.

Although CoPs can exist online, there are limitations to virtual communities. In a case study on knowledge sharing, Dyer and Nobeoka (2000) argued that free riders form a serious problem. Free riders can be defined as *"members who enjoy the benefits of the collective good without contributing to its establishment"*. Free riders are also known as lurkers (Millen, Feinberg, and Kerr, 2005; Mclure Wasko and Faraj, 2005; Lueg, 2000). Although CoPs tolerate free riders in the form of peripheral members, they do form a threat. Peripheral members bring new insights into the community and negotiate new meaning. However, they have to grow into becoming full members in order for the community to survive. Free riders do not deliver this input and will not grow towards full members, which, in the end, may harm the community.

Another dilemma is motivating network members to participate in the community and to share valuable knowledge with each other openly (Dyer and Nobeoka, 2000). Without knowledge sharing, a CoP cannot negotiate meaning. Mclure Wasko and Faraj (2000) argue that knowledge sharing starts with considering knowledge as a public good, owned by the community, instead of considering knowledge as a private good, owned by the organization. When con-

sidered as a public good, participants will share because of a sense of moral duty. In addition, reciprocity, which means giving something in return for something else is an important reason for participation and knowledge sharing. Willingness to participate, keeping up with the community, and reputation are also important motivators for participation (Mclure Wasko and Faraj, 2000, 2005).

Fading back or withdrawing is another major problem in virtual communities (Johnson, 2001). Fading back means that people leave the community, which harms the CoP. Using a variety of communication technologies may overcome this barrier. Johnson (2001) also argues that asynchronous discussion may become poor and superficial without coaching and scaffolding. Web-based, asynchronous discussion may also become impersonal.

It can be argued that the services researched in this thesis can overcome many of these limitations, which make them suitable for supporting CoPs. This thought will be further elaborated in chapter 5 (p.53). Before that, some technological requirements of CoPs will be described.

2.7 Technology in communities of practice

Academic literature on technology in CoPs is scarce. However, there does exist some consensus of what functionalities technology should offer. Wenger (2001) offered a major contribution to this research area with his survey of community-oriented technologies. He defined eight dimensions, which are important to a community-based knowledge strategy. These eight dimensions each involve a tension between two requirements that a CoP should integrate (Wenger, 2001, p.43):

1. *social structuring of knowledge - groups vs. markets:* This tension describes the need for knowledge exchange across boundaries on the one hand, and the need for social structures (facilities for participation) on the other hand.
2. *the processes of sharing knowledge - interactions vs. documents:* This tension describes the need to interact and negotiate meaning in order to create and share knowledge among community members on the one hand, and the need to create a repository to store and keep documents on the other hand.
3. *contexts of learning - instruction vs. joint project:* This tension describes the need to carry out specific activities oriented at learning on the one

hand, and the need to have a context for working together on the other hand.

4. *The management of attention:* This tension describes the need to support long-term, ongoing management of attention on the one hand and the need to support synchronous interactions, which require short-term, but full attention on the other hand.

This survey also described some basic functionalities of technology in order to support CoPs (Wenger, 2001, p.5). These include a home page, a conversation space, a facility for floating questions, a directory of membership, a shared workspace, a document repository, a search engine, community management tools, and sub communities, subgroups or project teams.

Just recently, Wenger et al. (2005) produced a new report on technology for communities, which has taken the recent developments in information technology into account. An important question that is posed in this article is how technology can support sociability, identity and togetherness over time. The authors argue that the success of technology depends on whether the focus lies on the community. As in his earlier research, Wenger et al. (2005) position a number of technologies along different dimensions that are important in CoPs. These dimensions are: synchronised interactions, asynchronised interactions, publishing, individual participation and community cultivation.

This final section of this chapter described some broad requisites of technology to support CoPs. The next chapter further elaborates on the second main concept of this thesis, namely social software.

Chapter 3

Concept of social software

In this chapter, the basic concept of social software and the services that are under research in this thesis will be outlined. An introduction to the concept of social software is provided in §3.1 (p.23). In §3.2 (p.26), three important services that can be labeled as social software are positioned. In the last section of this chapter (§3.3, p.31), the thoughts on the relation between social software and CoPs are described.

3.1 Introduction to the concept of social software

The Internet is going through a major change now. Some people call it a hype (Shaw, 2005), but it is clear that the way we use the Internet is rapidly changing. In the last few years, many new services have been introduced that all have something in common: their focus is on their community, rather than on the service they provide. More services arise every day that offer full, rich, online user-experiences; services that are no longer inferior to offline applications. This new trend is often referred to as 'Web 2.0', but this term evokes more and more resistance. It is argued that Web 2.0 is no more than a buzzword; a slogan that is created to relive the Internet hype of the late nineties. The concepts, projects, and practices included in its scope are far more important (Alexander, 2006).

Because Web 2.0 is becoming such a buzzword, the term social software is preferred to describe the services that are under review in this thesis. Web 2.0 seems to be more popular in the Internet community, while social software seems

to get more attention in academic communities, mainly because social software moves the concept beyond merely the Web. For instance, a lot of research is being done to find out if, and if so how, social software can be applied within educational or organizational boundaries. This also takes the newness off the concept, which is important because Web 2.0 or social software, in essence, is not that new after all. Many of the services that we now label Web 2.0 were initiated long before Web 2.0 itself. For instance, it is said that the term weblog was first coined in 1997 by Jorn Barger (Blood, 2004).

Until recently, the Web has not been able to deliver other qualities than traditional media. It has been far from interactive and users rarely had a change to participate (Kolbitsch and Maurer, 2006). With the advent of Web 2.0 and social software, this is changing. The Internet is becoming an independent platform, which can offer tools and services that make the desktop applications almost obsolete. We see shifts from publisher-generated content, where one or a few publishers decide on what information is published on a website, to user-generated content, where the majority of the visitors decide on the information that is published on a website. We see shifts from offline, individual storing of bookmarks to online collective storing of bookmarks. We see shifts from category based information storage and retrieval by experts to tag (label) based information storage and retrieval by the community. We see shifts from information consumption to information creation and active participation by users. More than in 'traditional services', the focus lies on micro content (individual blog posts instead of pages) and openness. Social software responds more deeply to the inner feelings and characteristics of users than 'traditional' services (Alexander, 2006). People want their voice to be heard and want to share their opinion. In essence, a fundamental mind shift, supported or even enhanced by social software, is visible that encourages new people to take part in developing new structures and content (Kolbitsch and Maurer, 2006).

Because of the relatively newness of the concept and despite of the attention that social software gets lately, the term is not yet clearly defined. The few definitions that do exist are deliberately broad; in order to make sure that the concept is not narrowed down too much. While much research on this topic is still in an explorative phase, researchers make sure that they do not leave out important aspects of the concept. One broad definition of social software is coined by Gorissen (2006), which is followed in this thesis:

> *"... Social software is software that is aimed at simplifying the achieve-*

ment and enduring of networks among people."

Notice that the essence of this definition is on *networks among people*. This explains the major difference with traditional Internet software. Social software is about creating networks among people and thus, relies on active user contribution. Traditional software, on the other hand, relies more on one-way traffic from source to user. A few aspects in social software are particularly important. These aspects will be described in more detail below.

- *Network effects:* many social software services depend on content generated by their community. The service becomes more valuable the more people use it. This effect is also called a network effect (Varian, Farrell, and Shapiro, 2005, p.31).
- *Architecture of participation:* the content generated by the community requires that the community participates actively. Without user contribution, many of the services will fade into non-existence.

This change in using the Internet could have profound implications for the way we use the Internet, the way we do business, and the way we learn. Many concepts defined as social software are adopted in the enterprise and institutions and are changing the way we approach knowledge management and learning (see for instance Alexander, 2006; Downes, 2005; Gonzalez-Reinhardt, 2005; Downes, 2004; Lamb, 2004). The tools are often free and easy to install and use. Sharing of information is central. This is manifested in such things as open-source software, creative commons licences and open access to information (Downes, 2005). Thus, social software offers the ability to individuals and groups of people to start collaborating easily and to start sharing knowledge and information.

In the next section, three key services of social software, namely weblogs (blogs), wikis and social bookmarking will be described. Needless to say that these three services are not the only services that can be labeled as social software. For instance, Gorissen (2006) reviewed this concept and came up with many other services, like instant messaging, forums, podcasts, social networking services, collaborative real-time editing, and virtual worlds. This enumeration clearly shows that social software is a broad trend. However, not every service will be reviewed in this thesis. Rather, the focus will be on blogs, wikis, and social bookmarking, because it is believed that these services, in theory, offer great potential for individuals, organizational, and educational settings.

3.2 Key services of social software explained

In §3.1 (p.23), social software is defined and some basic characteristics of this concept are described. This section further elaborates on this concept by describing three major services, which will form an important aspect of this thesis:

- Wikis;
- Weblogs (or Blogs);
- Social bookmarking.

3.2.1 Weblogs

Recent developments of the Web enable people not only to write together, but also to post their own thoughts, information, and links. Tools as Blogger, founded in 1999, made online publishing extremely easy, thereby allowing every web user to publish their thoughts on the Internet. Blogging became extremely popular. The introduction of commenting, the possibility to write a response to postings, took this online discussion platform even further. This structure of posting and commenting has become known as part of weblogging or blogging (Blood, 2004).

Weblogs are online diaries where people can post their thoughts, information, links, or interests. Weblogs often differ in objectives and some offer functionalities that are not commonly used. However, there does exist some consensus on the basic functions of a weblog. What characterizes a blog is that it consists of several posts or distinct chunks of information per page, which are usually arranged in reverse chronological order; from the most recent post at the top to the oldest post at the bottom (Bar-Ilan, 2005). This is, of course, a more technical oriented description of weblogs. What really is interesting is the possibility for visitors to add comments to posts, likely resulting in lively discussions. Thus, blogs can function as a platform for conversations. The network of more or less interconnected weblogs is called the 'blogosphere' (Kolbitsch and Maurer, 2006; Poortman and Sloep, 2005).

Kelleher and Miller (2006) distinguish among different forms of blogs, for instance, blogs as personal diaries, organizational blogs, corporate blogs, and knowledge blogs. In essence, every type of blog has its own function, but knowledge blogs are the ones that come closest to learning. Knowledge blogs are described as the online equivalent of professional journals in which authors document new knowledge in their professional domains, including research progress,

references, observations, reflections, and communication (Kelleher and Miller, 2006).

Another important distinction can be made between individual and group blogs. In this thesis, the focus is on the latter, but this is an essential difference. Individual blogs, maintained by a single person, are often individually oriented, reflecting the thoughts of a single person. Discussion on these kinds of blogs is nice, but not essential. A group blog, a blog where multiple participants can post blog entries, is more focused on the interaction among participants. Commenting and discussion are much more important. In addition, these blogs reflect the thoughts of a group of people.

Discussion, or more specifically, posting and commenting, enable bloggers to communicate with their audience. This results in a form of interaction that was not feasible with traditional internet technology. This interaction gives rise to the formation of communities of people with similar interests and can create a lively blogosphere. Blogging is an easy tool for structuring thoughts, communication with others, and reflection on interesting things. Thus, it is no surprise that many prominent people use blogs for their communication and reflection[1]. Blogs are also more and more widely adopted in the enterprise, for instance, by knowledge workers to spread their knowledge internally or to communicate with their public (Kelleher and Miller, 2006).

Blogs do have some drawbacks (Poortman and Sloep, 2005). Firstly, communication is asynchronous, which implies that reactions on messages are not direct, but appear later. This could severely slow down interaction. Secondly, communication is text-based. This implies that non-verbal aspects of communication are not included. This implies that information is less rich and thus, it could be harder to transfer ideas or thoughts. Thirdly, discussion on a blog can become messy, because reactions and reactions on reactions can get disharmonious.

Despite these drawbacks, blogs do offer some important advantages (Poortman and Sloep, 2005). When people react on a blog, they are more careful in their wording and reflect more on what they are writing. Therefore, posts and reactions often have the form of a short argument. Another advantage is that blogging creates a readable and searchable report of a discussion. A discussion can be recalled whenever is needed. Thus, it can function as a shared repository, which is available to anyone at any time.

[1] for instance, see http://www.babsonknowledge.org, a weblog by Lauren Prusak, Dan Cohen, and Tom Davenport, also famous authors in the area of knowledge management.

Although we see that blogs are adopted more and more by individuals and educational and organizational institutions, relevant scientific literature on this topic is still scarce. Therefore, it is interesting to study this area more closely.

3.2.2 Wikis

Over the last few years, services have been developed that enable collaborative writing on the Internet. An important service that supports collaborative writing is a wiki. A wiki can be defined as *"a freely expandable collection of interlinked Web 'pages,' a hypertext system for storing and modifying information – a database, where each page is easily editable by any user with a forms-capable Web browser client"* (Leuf and Cunningham, 2001, p.14). The first wiki engine, WikiWikiWeb, was developed in 1995 by Ward Cunningham (Lamb, 2004). Wikis are often used as a tool for personal information management, knowledge management, team collaboration, and as a more flexible kind of weblog (Mattison, 2003).

A wiki invites every user or visitor to contribute by editing or adding pages within the website. Thus, every reader can become a writer instantly. It seeks to involve the visitor in an ongoing process of creation of content and collaboration. Wikis are also often used to organize and cross-link knowledge, by making it extremely easy to add or edit links and texts. Another important aspect of a wiki is that it is inherently democratic, which means that every user has the exact same rights and capabilities of every other user (Leuf and Cunningham, 2001). These characteristics make it very easy for a group of people to write collaboratively on a specific topic of interest. The most famous example of a wiki in action is Wikipedia[2], the online encyclopaedia (for instance, see Lih, 2004 for an analysis of Wikipedia)

Collaborative writing is the process in which at least two people work together in order to produce some text (Noel and Robert, 2003). Colen and Petelin (2004) describe various definitions of collaboration, but conclude that collaborative writing is inherently a social act. They define collaborative writing as writing-as-social-interaction. Advantages of collaborative writing are an increase in the number of ideas and viewpoints, assurance that various subsections are written by experts (Noel and Robert, 2003, 2004), increased motivation among participants, possibilities for less experienced writers to improve their skills, and higher levels of acceptance of the final product (Colen and Petelin,

[2] see http://www.wikipedia.org

2004). Noel and Robert (2004) also describe negative aspects of collaborative writing. For instance, collaborative writing makes the task more difficult, which includes having to reconcile different writing styles and longer time to produce a document. In addition, management aspects hamper the process of collaborative writing. For instance, a group has to deal with people's emotions. Group and social issues also play an important role during the writing process. For instance, the group has to deal with different abilities of participants and conflicts among participants.

Although the study of Noel and Robert (2004) showed that 83% of the participants of their study used traditional word processors (such as Microsoft Word), wikis become more and more popular as collaborative writing tools. Key characteristics of wikis are that it is an open system; anyone can read and edit the text, which means that every page has an "edit this" button, which allows anyone to alter the text. New pages are created whenever a link is created to a page that does not yet exist. Furthermore, syntax is extremely easy. For instance, pages are created with simple What You See Is What You Get editors (WYSIWYG editors) and easy mark-up syntax is used to create links between and within pages. Every edit of a wiki page is saved as a new entry, thus whenever the content of a page is destroyed, a previous version can be reactivated instantly (Lamb, 2004). This makes improper use almost useless, because the community is self-regulating and errors are corrected almost instantly.

Of course, wikis do have some disadvantages, which may affect the quality and effectiveness. For instance, large wikis sometimes deal with vandalism. People sometimes deliberately destroy the content of the wiki to affect the quality and reliability. Vandalism is considered a problem, but not an insuperable one, since previous versions of a wiki page can be easily restored.

Another problem is that the quality of the content cannot always be determined that easy. For instance, in the case of Wikipedia, it is sometimes hard to determine whether an article is accurate. Determining the accuracy of a page is a lot harder than determining a vandalised page. Therefore, it is possible that inaccurate information is published over a longer period. However, in terms of quality, Nature (see Giles, 2005) recently showed that the quality of Wikipedia is not inferior to the respected encyclopaedia Brittanica, which implies that a group of people can produce quality products and the content of a wiki can be accurate. As Kolbitsch and Maurer (2006) argue, the fundamental idea of a wiki is that errors will be found and corrected because a vast number of users

read and edit the content and over time, the document will become more and more complete.

Also, sometimes people argue that the anonymity of a wiki takes away a feeling of accountability, which could also damage the quality of the wiki (Kolbitsch and Maurer, 2006). However, this can also be easily avoided by requiring users to register before they can participate. Furthermore, sometimes large wikis have to deal with spam, automated scripts that edit pages and add commercial messages. Again, this can be easily avoided by requiring participants to register before they edit pages. However, this goes against the wiki principles.

It is clear that wikis meet certain needs, like easy authoring of web content, open access, and unrestricted collaboration, which are simply not being satisfied by 'traditional' IT strategies and tools. This, together with the low barriers and costs of starting a wiki and its efficiency (Jesdanun, 2004) explains the wide adoption of wikis worldwide (Lamb, 2004), and makes it interesting to study this phenomenon more closely.

3.2.3 Social bookmarking

The concept of Social bookmarking has just recently become popular with the advent of the service del.icio.us in 2003 (Alexander, 2006; Millen et al., 2005). Bookmarking enables web users to store interesting web pages, offline, on their computer, so they can easily retrieve these pages at a later stage. Browsers offer simple tools to manage bookmarks, like storing descriptions and sorting bookmarks in folders. Social bookmarking is the practice in which people store their bookmarks online, thereby making them accessible from anywhere, to anyone.

Social bookmarking systems share a number of common features (Millen et al., 2005). Firstly, users can create personal collections of bookmarks and they can share these bookmarks with others. Secondly, they use "tags" to classify bookmarks. Tags are freely chosen keywords that are assigned to a piece of information (a bookmark in the case of social bookmarking). With these tags, the bookmarks can be organized and displayed with meaningful labels. Tagging also enables people to store bookmarks in more than one category, which makes it non-hierarchical and inclusive (Golder and Huberman, 2006). Thirdly, social bookmarking services allow users to browse collections of bookmarks of other users and they require a certain participation to become successful. Social bookmarking differs from traditional search engines, in that the former supports

people in trying to find an answer for an existing question or need. The latter lets people stumble upon new and interesting sources and users. Thus, it has a more explorative character (Kolbitsch and Maurer, 2006).

Because tagging forms an important aspect of social bookmarking, it is useful to describe this phenomenon in more detail. According to Golder and Huberman (2006), tagging is essentially about sense making. They define sense making as *"the process in which information is categorized (enacted) and labeled, through which meaning emerges"*. Tagging can be used in multiple ways, for instance, to identify what or whom a piece of information is about, to identify what it is (an article or a book), to identify who owns it (for instance, tag links as mycomments), to refine categories, to identify qualities or characteristics (for instance, excellent or bad), as self reference or to organize tasks (for instance, toread) (Golder and Huberman, 2006).

Tagging has both advantages as well as disadvantages. An important advantage is described in the previous subparagraph: tagging is flexible, which implies that you can define your own use of the system. This is also a major drawback. For instance, there are no conventions, which means that every service implements its own approach to the concept. Some services require you to separate tags with commas, others with spaces, some offer multiple word tags, others let you combine tags by underscores. This could be confusing. Other problems lie in the use of synonyms and homonyms and singular and plural terms (for instance, see Golder and Huberman, 2006; Guy and Tonkin, 2006).

So far, the main characteristics of Social software and three services that can be classified as social software were introduced. Before that, the concepts of communities of practice and social learning theory were introduced. The next section continues with the thought that social software and social learning theory contain certain similarities, which makes it interesting to study the relation between both concepts.

3.3 Relation between social software and learning in practice

Considering the social learning theory and social software, it is obvious that there are a few important similarities between the two concepts. For instance, both are centred on people and require active participation and engagement to succeed. Next, both are often centred on a shared interest. Considering

the duality of participation and reification, social software offers facilities for participation (for instance, in the form of user contribution) as well as reification (for instance, in the form of stored stories). Next, as Wenger et al. (2005) argue, the success of technology depends on whether the focus lies on the community. Social software, in essence, is entirely focused on communities.

Also, considering the requirements of technology described in §2.7 (p.20), it can be argued that social software can offer many of the functionalities and can apply to many of the tensions described. For instance, social software can function as a conversation space as well as a document repository. It can deal with the tension of sharing knowledge on the one hand, and the need to create a repository on the other hand. It also offers more practical functionalities like search engines and facilities for question and answering.

Because of these similarities, it is interesting to study whether social software can support CoPs, and more specifically, the process of learning in practice that takes place within these communities. There does not exist much scientific literature on the relation between these two concepts. Especially literature on the relation between social software and the process of learning in practice is scarce. Furthermore, much research is still in a descriptive phase. Scientific literature that specifies the role of social software is lacking. Therefore, it is interesting to study this phenomenon more closely.

As argued in §2.4 (p.14), to support learning in CoPs, an architecture has to be in place that offers facilities that support engagement, imagination, and alignment. As Wenger (1998, p.239) argues, information technology can form (a part of) a learning architecture. This implies that social software can also function as (part of) a learning architecture.

The question arises whether, and if so how, social software is supportive of learning in practice. The first part of this question is trivial: social Software is always supportive of learning in practice, even if it is very little. A more interesting question therefore, is the second part of this question, namely how is social software supportive of learning in practice in CoPs? This question will be answered in this study.

As said, the question whether, and if so how, social software offers facilities that support learning in practice can be answered by investigating the question how social software offers facilities that support the work of engagement, imagination, and alignment. This thought results in the framework presented in table 3.1 (p.33). An important objective of this thesis is to develop a series of statements that can be placed in each box. The content of each box focuses on

	Engagement	**Imagination**	**Alignment**
Blogs			
Wikis			
Social Bookmarking			

Table 3.1: Conceptual framework

a specific service in relation to a specific mode of belonging. For instance, the upper-left box will describe the facilities that blogs offer to support engagement.

This section introduced the main rationale that underlies this thesis. In the next chapter, the research approach is described, which contains, among other things, the problem statement, the research questions and the research strategy.

Chapter 4

Research Approach

This section contains the research approach of my thesis. This chapter unfolds as follows: firstly, the problem statement (§4.1, p.35) is described, which consists of the research objective (§4.1.1, p.35), research framework (§4.1.2, p.36), research questions (§4.1.3, p.37), relevance (§4.1.4, p.38), and main definitions (§4.1.5, p.39). Secondly, the research method (§4.2, p.40) is formulated, which contains the research type (§4.2.1, p.40), the research strategy (§4.2.2, p.41), a justification of the chosen site (§4.2.3, p.48), and the data analysis (§4.2.4, p.50).

4.1 Problem statement

4.1.1 Research objective

The research objective is the goal that one wants to achieve with the research. An adequate research objective is useful, feasible, univocal, and information rich (Verschuren and Doorewaard, 2000, p.31). As described in the previous chapter, it is believed that social software supports learning in practice in CoPs, because it can offer facilities that support the work of engagement, imagination, and alignment. However, this only occurs under certain conditions (Pawson and Tilley, 1997). Thus, a much more crucial question is to what extent does social software support learning in practice in CoPs? These questions lead to the following research objective:

Research objective: *the objective of this study is to formulate a set of hy-*

potheses that explain how and to what extent social software offers facilities that support the process of learning in practice within communities of practice, by analyzing the effects of weblogs, wikis and social bookmarking on the work of engagement, imagination, and alignment.

4.1.2 Research model

The research model is a schematic representation of the research objective and visualizes the steps that have to be taken in order to reach this objective (Verschuren and Doorewaard, 2000, p.46). The research model in figure 4.1 (p.36) can be explained as follows: an analysis of the literature of the social learning theory and CoPs, the relation of CoPs with virtual communities, and the theory and concepts of social software will lead to theoretical insights that explain how and to what extent social software can be supportive of learning in practice in CoPs. These results are tested and further refined through a series of interviews with users of social software, which results in a refinement of the theoretical insights. These refinements are submitted to a group of experts on the topic in a focus group interview, which will result in further refinements on how social software can support learning in practice. These final insights form the basis for a set of hypotheses that explain how, and to what extent, social software offers facilities that support CoPs.

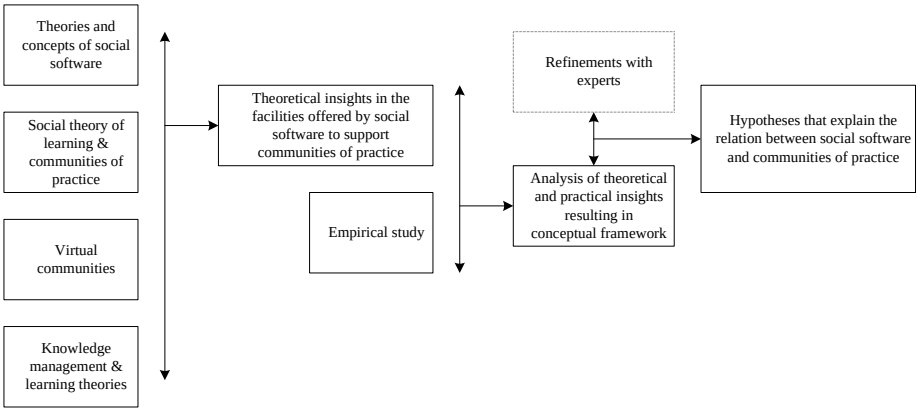

Figure 4.1: Research model (according to Verschuren and Doorewaard, 2000)

4.1.3 Research questions

This section contains a set of research questions that will be answered in this thesis (Verschuren and Doorewaard, 2000, p.65). The questions are derived from the main themes, the research objective, and the research framework. The main research question can be formulated as follows:

Main research question: *which hypotheses can be formulated that explain how, and to what extent, social software offers facilities that support the process of learning in practice in communities of practice?*

To answer this main research question, the following three sub questions can be formulated:

Sub question 1: *what theoretical insights can be derived from the literature that explain how information technology in general, and social software specifically, can be supportive of learning in practice in communities of practice?*

Which can be further specified in the following questions:

- How can communities of practice be explained?
- How does learning in practice in communities of practice take place?
- How can the role of information technology in the process of learning in practice in communities of practice be explained?
- How can learning in practice best be supported?
- What can be said about social software?

Sub question 2: *what practical insights can be derived from an empirical study?*

Which can be further specified in the following questions:

- Based on the earlier theoretical insights, what can be said about how and to what extent social software can support learning in practice?
- Which conditions can be derived from the empirical study that influence the extent to which social software can be supportive of learning in practice in CoPs?

Sub question 3: *what can be learned from an analysis and confrontation of the theoretical and practical insights obtained from the literature and the empirical study, in the view of the formulation of a set of hypotheses that explain to what*

extent social software is supportive of learning in practice in CoPs*?*

Which can be further specified in the following questions:

- What can be learned from a confrontation of the theoretical and practical insights?
- What can be learned from a discussion with a group of experts on the topic?
- Which conclusions can be drawn from the analysis of the theoretical and practical insights?
- Which hypotheses can be formulated based on these conclusions?

4.1.4 Relevance

In this section, the relevance of this thesis is described, which is divided in three parts, namely the social relevance, scientific relevance, and personal relevance.

Social Relevance
There is a lot of buzz going around on social software in the Internet community lately. Many new services arise every day and stories on what constitutes social software and how it could be successfully applied emerge almost daily. Most of this talk is descriptive and considers social software from a perspective in which it is used by individuals and where communities arise along the way. It is hard to say whether true successful approaches are available or not. This thesis places social software in a perspective where it is used in small, familiar groups of people. Thus, this study gives an idea on how social software could be successfully applied.

Scientific Relevance
As argued before, social software is a relative new phenomenon and not much scientific literature is available on this topic yet. Thus, this thesis contributes to the body of scientific literature on social software as well as CoPs.

From a CoPs perspective, this thesis tries to answer the question whether they can be supported with social software, which contributes to our understanding of how CoPs can be supported with information technology.

From a social software perspective, this thesis links social software to a well-grounded theoretical concept, namely CoPs. It tries to show whether social software can offer facilities that support the work of engagement, imagination, and alignment. Thus, it gives meaning to social software and therefore, con-

tributes to our understanding of the potential of social software.

The role of software in education is a research area that has received a lot of attention lately. There is some research on the use of social software in educational settings, but this research is mainly in an exploratory stage. Thus, this thesis can, considering the context in which the research was conducted, also contribute to our understanding of how social software can be applied in educational settings.

Personal Relevance
The personal relevance lies in different areas. Firstly, to quote a professor at the University of Amsterdam: *"as long as it is fun."* This definitely applies to me. I find the developments the World Wide Web goes through at the moment very interesting and I believe that it may have far reaching consequences (despite all the hype and buzz words). Secondly, my interest also lies in the theory of Wenger on CoPs, which I can combine with the developments of social software.

4.1.5 Definitions

This section contains the definitions of some important constructs in this thesis.

- *Community of practice (cop)*: group of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis (Wenger et al., 2002).
- *Blog*: see weblog.
- *Blogger*: someone who writes on a weblog.
- *Focus Group*: a group of people, recruited on the basis of similar demographics, psychographics, buying attitudes, or behaviour, who engage in a discussion, led by a trained moderator, of a particular topic (derived from Greenbaum, 2000).
- *Group blog*: a group blog is a weblog, which allows for multiple authors to write posts and to place comments.
- *Interview*: a conversation where the outcome is a co-production of the interviewer and the subject (derived from Kvale, 1996).
- *Social bookmarking*: the ability to create a transparent, personal collection of bookmarks online, to classify these bookmarks with freely chosen keywords, and to share them with others (derived from Millen et al., 2005).

- *Social software*: software that is aimed at simplifying the achievement and enduring of networks among people (derived from Gorissen, 2006).
- *Tagging*: a process in which individuals assign descriptors to objects, in the practice of collaborative categorization known as folksonomy.
- *Weblog*: a website in which journal entries are posted on a regular basis and displayed in reverse chronological order. A weblog comprises hypertext, images, and links (to other webpages and to video, audio and other files). Weblogs use a conversational style of documentation.
- *Wiki*: a freely expandable collection of interlinked Web 'pages,' a hypertext system for storing and modifying information – a database, where each page is easily editable by any user with a forms-capable Web browser client.

4.2 Research method

4.2.1 Research type

According to Verschuren and Doorewaard (2000), two types of research can be identified, namely theoretical-oriented studies or practical-oriented studies. Theoretical-oriented studies are focused on developing or testing theories, practical research is focused on developing, testing, and evaluating solutions for practical problems (Verschuren and Doorewaard, 2000).

This research can be primarily defined as a theoretical-oriented study. The ultimate objective is to develop a set of hypotheses that describe the extent to which social software is supportive of learning in practice from a CoPs perspective. This study can be further classified as a theory-developing study.

In this study, a realistic approach to research has been applied (Pawson and Tilley, 1997). According to Pawson and Tilley (1997), the main thought in a realistic approach to research is that researchers should be realists and research should be real and realistic. The method assumes that outcomes of a study, for instance outcomes of an experiment or interviews, are only applicable in the specific context and under the specific circumstances the study was conducted. In other words, results cannot be generalized that easy. It should be kept in mind that this study was conducted in a very specific context, namely a situation in which master students of Information Studies worked together on varying assignments and where they used social software to support this process. This limits the ability to generalize the results of this study to the level where

a similar context is in place (Pawson and Tilley, 1997; Miles and Huberman, 1994).

4.2.2 Research strategy

In general, two research strategies can be defined. Qualitative research strategies refer to the meanings, concepts, definitions, characteristics, metaphors, symbols, and descriptions of things. Quantitative research strategies refer to the counts and measures of things (Berg, 2004, p.3). Berg (2004) describes several qualitative research strategies, like interviewing, focus group interviews, ethnographic field studies, action research and case studies. Other research strategies, like a survey, are more suitable for quantitative research. There is an intense debate going on whether qualitative or quantitative research is better. Miles and Huberman (1994) argue that this should not be the question. The authors argue that both qualitative and quantitative research have their advantages and disadvantages.

Different strategies have specific characteristics and suit different types of research questions. For instance, a survey is more suitable for *how*, *what*, *where*, *how many* and *how much* questions, while a case study is more appropriate for *how* and *why* questions (Yin, 2002, p.5). In this study, a case study approach was chosen, where the case consisted of a group of students at the University of Amsterdam who use social software for educational purposes. Within this case study, interviews and a focus group interview were held. Although the main research question is formulated in terms of *what*, it can also be rephrased as *how can ... be explained*, which makes it a suitable question for case study research.

Thus, in this thesis, a qualitative research strategy was chosen to formulate a set of hypotheses. This strategy is considered more appropriate for the kind of study that is being done. From an interpretivist perspective, which is followed in this thesis, a qualitative research strategy is also more appropriate. Interpretivists believe that multiple realities exist and they consider the world as socially constructed (Vries, 2005). Interpretivists, as Vries (2005) argues, attempt to create an understanding of phenomena by analyzing the meanings that people assign to them. In this thesis, it is the meaning that people assign to the use of social software that is particularly interesting. Therefore, an interpretivistic approach is considered more suitable.

According to Yin (2002, p.13), a case study is an "empirical inquiry that

investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident." Furthermore, "the case study inquiry copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result benefits from the prior development of theoretical propositions to guide data collection and analysis." In this study, an embedded, single case design was chosen (Yin, 2002, p.40), which means that multiple units of analysis in a single context were examined. Results of a single case study are hard to generalize, because the results have not been tested within multiple contexts. In this case, this does not form a problem, because a realistic approach to research was chosen (Pawson and Tilley, 1997). A realistic approach to research also implies that findings are, in essence, only applicable within the specific context the study was conducted.

A case study design normally contains five components, which are especially important (Yin, 2002, p.21). The first component is the study's questions, which are outlined in §4.1.3 (p.37). The second component consists of the propositions, if any. In this study, propositions are not formulated beforehand, but the formulation of a set of hypotheses is part of the main objective (see §8.1, p.135). The third component is the unit of analysis, which is described in §4.2.3 (p.48). The fourth component describes the logic that links the data to the propositions, which is explained in §4.2.4 (p.50) and in the empirical results (chapter 6, p.75). Finally, the fifth component consists of the criteria for interpreting the findings, which are also partly described in the empirical results and the data analysis.

In total, ten interviews were held with end users, as well as a focus group interview was held to obtain qualitative data, thereby using multiple sources of evidence. In addition, the literature on the main themes has been reviewed. Unfortunately, due to the lack of quality papers on the relation between the two concepts in respective magazines as the Journal of Information Systems or Management Information Systems Quarterly, the majority of the articles used in the literature review had to be obtained from less respective magazines. This use of multiple lines of sight is also referred to as triangulation (Yin, 2002; Berg, 2004). In the remainder of this section, the interview process as well as the process of the focus group interview is described.

Interviews

One of the few books that describe the entire interview process is written by Kvale (1996). In this book, Kvale (1996) positions qualitative interviewing within a process of seven phases, namely thematizing, designing, interviewing, transcribing, analyzing, verifying, and reporting. This process was largely followed in this thesis. Kvale (1996) argues that thematizing and designing are the most essential phases of the process, because they are decisive for the rest of the process. During thematizing, the purpose of a research and the concept of the topics that will be examined are formulated. In this case, chapter 2 (p.5), chapter 3 (p.23), and chapter 4 (p.35) contain the results of this process of thematizing.

Kvale (1996) defines interviews as a conversation where the outcome is a co-production of the interviewer and the subject. He literally calls it an *inter view*. Interviews are well suited for situations where peoples' understanding of their meanings and experiences need to be examined (Kvale, 1996, p.105). Thus, it suits the interpretivistic approach of this study. In line with Berg (2004) and Yin (2002), Kvale (1996) distinguishes between structured and unstructured interviews, but mainly focuses on semi-structured interviews. Semi-structured interviews are interviews, which are centred on a set of predefined topics and questions, which are asked in a consistent and systematic order, but the interviewers are allowed to probe far beyond the answers to their prepared standardized questions (Berg, 2004, p.81).

According to Kvale (1996, p.101-103), six interviews should be enough to test a set of hypotheses, although he also states that in current interview studies, the number of interviews tends to be around ten to fifteen. In line with this proposition, ten students of the University of Amsterdam were interviewed separately. One-on-one interviews were chosen to make sure that the interviewees were able to talk freely and to obtain their unbiased opinions.

The interviewees were selected based on their accessibility as well as their background. The interviewees all had more or less experience with the services under research. This is also explained in more detail in §4.2.3 (p.48).

The central theme of the interviews was whether weblogs, social bookmarking services and wikis can support learning in practice and if so, to what extent are these services supportive? The theoretical framework described in chapter 5 (p.53) formed the basis of the interviews. Basically nine predefined questions were asked, which were enriched by questions that arose during the interviews. The nine interview questions are described in appendix B (p.155).

The interviews were recorded in MP3 format, so they could be easily ana-

lyzed on a computer. The students were asked if they agreed on the interviews being recorded, which they all did. The interviewees were promised that the data would be treated confidentially and that this interview would have no further consequences. The interviews were briefed beforehand, and debriefed afterwards. During the briefing, the main purpose of the interview and its position in the entire research were explained. The briefing also explained the design framework of Wenger (1998). An important advantage was that most of the interviewees where familiar with the framework, which made the task of explaining the context easier. The debriefing contained the following steps of the research. The interviewees received a transcript of the interviews for verification, which also offered them the possibility to add complaints, comments or additional information.

The interview questions were developed beforehand with two dimensions in mind: questions should be *thematic* as well as *dynamic* (Kvale, 1996). Thematic means that questions should relate to the topic of the interview, to the theoretical conceptions at the root of an investigation, and to the subsequent analysis. Dynamic means that the questions should promote a positive interaction; they should keep the flow of the conversation going and motivate the subjects to talk about their experiences and feelings.

The recordings of the interviews were transcribed almost *verbatim*. This approach was chosen to make sure no essential data would be lost in the transcription phase and to make sure that the opinions of the interviewees were represented as close as possible. Because the opinions and experiences of the interviewees were the most important, rather than their social, psychological situations, emotional aspects, such as "nervous laughter" or "giggling" were excluded from the transcript. Things as pauses and stop words such as "mm" were not included, despite the fact that this choice makes it impossible to include emotional aspects in the analysis. However, as Kvale (1996, p.166) argues, emotional aspects are most often relevant when psychological interpretations are needed. In this research, that was not the case.

The transcripts formed the basis of the analysis phase. Kvale (1996) distinguishes five methods of analysis: meaning condensation, meaning categorization, structuring meaning through narratives, interpretation of meaning, and ad hoc methods for generating meaning. Meaning condensations means that the meanings expressed by the interviewees are summarized in shorter formulations. Then, every statement is examined by asking the question: *what does this statement tell me about ...?*. Meaning categorization means coding the

transcript into categories, like occurrence - non-occurrence, a five-point scale, or another coding scheme. Categories can be obtained from the literature, or created during the analysis. Narrative structuring focuses on the stories told during an interview and works out their structures and plots. Meaning interpretation digs deeper into the transcript by describing more or less speculative interpretations. Ad hoc methods of generating meaning comprise a range of approaches like using commonsense, sophisticated textual or quantitative methods. A form of meaning categorization was chosen in this study (see §4.2.4, p.50).

Focus group interview

The empirical results of the focus group interview were, together with the theoretical results of the literature review, combined in the conceptual framework introduced in (table 3.1, p.33). This conceptual framework was discussed with a group of experts during a focus group interview.

Focus group interviews, according to (Berg, 2004, p.213), are either guided or unguided discussions addressing a particular topic of interest or relevance to the group and the researcher. They work extremely well in situations where a variety of interactions, and comprehensive and open discussions about certain topics or issues are required (Berg, 2004, p.129), which is the case in this research.

A handbook for carrying out focus group interviews was written by Greenbaum (1997). This approach is followed in this study. Greenbaum (1997, p.2) distinguishes among full groups, mini groups, and telephone groups. Full group interviews consist of a discussion of approximately 90 to 120 minutes, involving eight to ten persons who are recruited based on their common demographics, attitudes, or experiences germane to the topic. This discussion is led by a trained moderator. A mini group interview is essentially the same as a full group interview, except that it generally involves four to six people. A telephone group is a discussion in which individuals participate in a telephone conference call.

A mini group interview was chosen, because recruiting eight to ten people was not considered feasible given the available resources (mainly time). An additional advantage of a mini group, which also influenced the choice for this type of interview, is that the available time per participant is significantly larger than in a full group interview.

The participants of the focus group interview were selected based on their professional backgrounds. They are all somehow involved in the main concepts of this thesis. The participants were approached by e-mail and asked if they were

willing to participate in the focus group interview. No financial compensation was offered. Unfortunately, one participant was stuck in traffic, so eventually three people who were invited joined the discussion.

An introductory letter was sent to the participants beforehand. Although Greenbaum (1997) and Greenbaum (2000) do not talk at large about briefing participants, it was considered important that the participants were aware of the context in which the interview would take place. The theory of CoPs is an important part of this context, which was, presumably, not very familiar to the participants. In order to be able to discuss social software in the context of CoPs, it was considered a necessity that the concept was introduced beforehand. Therefore, the introductory letter explained the main reasoning of this thesis and the design framework of Wenger (1998). However, during the interview, the focus was on the services rather than the theory of CoPs.

The researcher acted as moderator in the focus group session. Normally, the moderator is an external, objective, and independent person, who is hired by a client to lead the focus group (Greenbaum, 2000, 1997). Although the results can be biased, because the moderator is also the main researcher, it is believed that the right choice was made. Firstly, the researcher is the most familiar with the material, both the theory as well as the practical aspects of the study, so the researcher was sufficiently capable of leading the discussion. Secondly, leading the focus group interview was considered a great learning experience. It was something that was never done by the researcher before and leading this kind of discussion was surely something that was interesting from a personal point of view.

According to Greenbaum (2000) and Greenbaum (1997) a focus group interview consists of multiple phases: "as a general rule, it is important that the flow of the discussion in focus groups proceed from the general to the specific throughout the session, with the material becoming more precise and directed to the topic areas the group processes." The interview starts with a warm-up session, in which a general discussion about the main topics is held. Additionally, the interview consists of multiple subsequent discussion sections, in which the subject matters are covered. The final section often is an "advice to the...", where the group is asked to give advice to a fictitious person, like the president of a company.

This scheme was followed during the focus group interview, except for the "advice to the..." section. This section was replaced by an overall discussion of the entire framework based on several statements. In addition, a closing section

was included where the session was briefly summarized, where the participants were asked if they had any questions, and where they were thanked for their participation. The interview took about two hours.

Because there was the potential risk of creating a bias towards the participants by giving away too much of the thoughts of this thesis, the tutor joined the session to guard the objectivity of the moderator's appearance. He also shared his insights from time to time. Further, in phrasing the statements and questions, the moderator watched his tone of voice and the way his statements and questions were worded, making sure statements and questions were expressed in an objective and neutral way (Greenbaum, 2000).

During the warm up session, an introductory presentation was held that outlined the context in which the research was conducted. After that, the interview was broken down in five blocks of approximately 20 to 25 minutes. The first block consisted of an introductory discussion where general opinions about the overall topic were discussed. The next three blocks were focused on a specific service within the context of CoPs. In each block, the participants were confronted with the main findings of the study. Then, three basic questions were asked, which were discussed per mode of belonging:

1. Do you *recognize* these findings? What do you recognize, what not? Could you explain?
2. Do you think these findings are *relevant*? Why do you think they are relevant? Why not? Could you explain?
3. Do you think these findings can be *generalized* (do you think they can be placed within broader perspective)? Why do you think these findings can be generalized? Why not? Could you explain?

By asking these three basic questions, the participants were not forced to give the answers that were expected. Rather, it was assured that the interviewees gave their unbiased opinions, as it was easy to question the findings.

The final section consisted of a closing discussion on the entire framework and the relation among the three services under research. This discussion was based on three propositions:

1. Social software works best when it is used in small groups of people, who already know and trust each other.
2. Blogs and wikis offer better facilities for supporting engagement than social bookmarking.

3. In terms of imagination, social bookmarking only offers facilities for exploration, while blogs and wikis only offer facilities for orientation and reflection.

During this discussion, participants were asked about their opinion on these propositions and whether they could support this view with examples and anecdotes. The statements were deliberately strongly worded with the intention to trigger the participants to react on it. Unfortunately, some part of the discussion was about the way the propositions were formulated instead of the participants' actual opinion about it.

To facilitate group dynamics, a write down exercise (Greenbaum, 2000) was used to force the participants to express their main thoughts about the subject in general. These thoughts formed the input for the preliminary discussion. As Greenbaum (2000) argues, these write down exercises offer two benefits. Firstly, people who write down what they are planning to say are more likely to state their opinion about a topic than those who are asked the question without having their thoughts written down. Secondly, individuals are more comfortable talking when they can refer to written stimuli.

As with the interviews, the focus group interview was transcribed almost verbatim and sent to the participants. The transcribed interview formed the basis of further data analysis (see §4.2.4, p.50).

4.2.3 Site selection

As said, scientific literature on social software is scarce. The literature that does exist is mainly about the characteristics and function of weblogs, wikis, and social bookmarking, and the ability to use these tools as personal reflection, discussion, or knowledge management systems.

Social software is considered extremely useful when applied in small groups, or CoPs. The ability to write blog posts together, to use wikis for project management and to use social bookmarking for information and link sharing among a small group of people is what can really make social software successful for education or organizations. Therefore, it was decided to focus on the use of social software within these small groups. However, the focus is also on the individual within these groups. Social software also offers facilities for the individual, which allows him or her to operate in multiple communities, which is an important requisite in CoPs (Wenger, 1998).

It was said earlier that CoPs, in their purest form, cannot be designed, and when groups are 'forced' to form a community, you cannot define them as such. This statement is loosely applied, because one group of people that participated in this study was, in essence, forced to adopt social software during a course. However, the group was developed out of a shared interest from the beginning, namely an interest in Information Studies and after a short while, the social software application was adopted by the community itself. It turned out that only the facilities (a platform, and user accounts) were offered and the community emerged naturally.

There are three units of analysis in this study. The first unit is a group of approximately 35 students Msc. Information Studies who used a weblog during a 14 week course of Management of Immaterial values [1]. The main objective of the blog was focused on meaning making on the central themes of the course. The second unit of analysis is a subset of the group of 35 students, namely a small group of students who used a wiki as a means for writing their final report of the course Information Management in Practice. The third unit of analysis is a small group of students (again a subset of the total group of 35 students) who used a social bookmarking service as a means for sharing educational related information, papers, and articles with each other[2].

Ten students who used blogs, wikis and social bookmarking in an educational setting were interviewed. The first reason for approaching these students is their familiarity with the two major concepts of this thesis, CoPs and social software. This enriched the discussion during the interviews, because it was possible to go a little deeper. The second reason for using these groups was their ease of accessibility.

It should be outlined why three services were examined, instead of just one. It is argued that it is not just the tools that make the difference, but it is how these tools are applied so they can support learning in practice. It can also be argued that there is not a 'one size fits all' solution. For instance, in some cases, weblogs are more appropriate, and in another situation, social bookmarking might be more appropriate. It is reasonable to argue that this also holds true for the three modes of belonging described earlier. Therefore, investigating a single service is considered as a limitation.

[1] see http://managementvanimmaterielewaarden.blogspot.com
[2] see http://watvindenwijover.nl/IMP

4.2.4 Data analysis

Coding was used to analyse the raw transcripts (Miles and Huberman, 1994). A coding scheme (see figure C, p.157) was developed and statements in the transcripts were labeled according to these codes. It was also noted whether the statement had a positive or negative tone. The codes are based on the operationalizations of the design framework and the three services under review.

Next, codes were filtered from the transcripts and placed in a spreadsheet, along with the name of the person who expressed the statement, a brief transcript of the statement itself, the page of the transcript where the statement can be found, and remarks on the statement.

This resulted in 805 statements, which could be easily grouped by code, mode of belonging, or service. Next, the statements were grouped by code and general patterns (Miles and Huberman, 1994) were identified from the statements. These formed the basis for the empirical results (see chapter 6, p.75). Of course, the results of the literature review were kept in mind.

With respect to the transcript of the focus group interview, a slightly different approach was followed. In this case, a conceptually clustered matrix (Miles and Huberman, 1994, p.127-131) was created to represent the data. A conceptually clustered matrix is a data display, which is ordered by concepts or variables. It has its rows and columns arranged so as to bring together items that belong together. According to Miles and Huberman (1994), this can happen in two ways: conceptually, where the researcher has some a priori ideas about the items, and empirically, where during analysis answers given by informants are tied together. Since a conceptually clustered matrix was used to visualize the statements of the interviewees expressed during the focus group interview, essentially an empirically clustered matrix (ECM) was created.

Because the filled in conceptual framework formed the basis of the focus group interview, this framework also formed the basis of the ECM. It was extended with the initials of the three participants. The fourth column contains statements of the tutor. Every statement that was expressed by a participant and that relates to a specific aspect of the conceptual framework was positioned in the respective box (see appendix E, p.163). In addition, statements expressed by the participants that were relevant to the subject, but could not be positioned in the ECM were extracted from the transcript.

4.2.5 Reliability and validity

Although an approach where research should be considered realistic, which implies that results cannot be generalized that easy, lies at the heart of this study, it is useful to address issues of reliability and validity, because it offers insight into the overall quality and approach of the work. To address issues of reliability and validity, a description of Yin (2002, p.34) (see table 4.1, p.51) is followed. Below, these aspects will be briefly described.

Construct validity deals with "establishing correct operational measures for the concepts being studied" (Yin, 2002, p.34). To increase the construct validity, multiple sources of evidence were used, in the form of both theoretical and empirical data as well as two sources of empirical data. Students were interviewed and a focus group interview with experts was held. To establish a chain of evidence, it is explained in detail how this study is conducted. In addition, data collection and analysis are described in depth, which makes it possible to replicate this study. Furthermore, some key informants (mainly fellow students and a few teachers at the University) reviewed drafts of this thesis.

Internal validity deals with "establishing a causal relationship, whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships" (Yin, 2002, p.34). To increase the internal validity, patterns were derived from the interview data. Statements were clustered by code and than described in the empirical results. Furthermore, an empirically clustered matrix was created from the focus group transcript. Rival explanations are included in the description of the empirical results.

External validity deals with "establishing the domain to which a study's

Tests	**Case study tactic**	**Phase of research in which tactic occurs**
Construct validity	· Use multiple sources of evidence	Data collection
	· Establish a chain of evidence	Data collection
	· Have key informants review draft case study report	Composition
Internal validity	· Do pattern matching	Data analysis
	· Do explanation-building	Data analysis
	· Address rival explanations	Data analysis
	· Use logic models	Data analysis
External validity	· Use theory *in single-case studies*	Research design
	· Use replication logic in *multiple-case studies*	Research design
Reliability	· Use *case study* protocol	Data collection
	· Develop *case study* database	Data collection

Table 4.1: Guarding reliability and validity, derived from Yin (2002)

findings can be generalized" (Yin, 2002, p.34). To address the external validity, literature on the main concepts was used to include theory (see chapter 5, p.53) to support this study and the empirical results. To improve the replication of this study, the research strategy is described in depth.

Reliability deals with "demonstrating that the operations of a study - such as the data collection procedures - can be repeated, with the same results" (Yin, 2002, p.34) To increase the reliability of the results, it is advised to use multiple interpreters (also called intercoder reliability) to code the transcripts (for instance, see Kvale, 1996, p.208-209 or Miles and Huberman, 1994, p.64). In this case however, using multiple interpreters is, given the available time and resources, impossible. Therefore, the process of analysis was explicated as thoroughly as possible. Another strategy to improve the reliability of the coding is to reread coded transcripts periodically to check whether one still agrees with the coding behaviour (Miles and Huberman, 1994) or not. In addition, to increase the reliability, the procedure that is followed is described in detail in this thesis.

In this chapter, the research approach was explicated. In the next chapter, the theoretical framework, based on the available literature on the main concepts of this study, is outlined.

Chapter 5

Theoretical Framework

This chapter describes, from a theoretical perspective, the relation among the components of the learning architecture defined by Wenger (1998), which are described in §2.4 (p.14), and the ingredients of social software described in §3.2 (p.26). These findings are enriched by the empirical results in the next chapter. This section evolves as follows: every mode of belonging is described in a separate paragraph. Every paragraph starts with a table that summarizes the results of that mode of belonging. Next, these paragraphs are divided into three segments, namely the three operationalizations developed by (Wenger, 1998). Next, these segments are again split up into three segments, namely blogs, wikis and social bookmarking. Thus, this level explains how the individual services can offer facilities that support the operationalizations of the learning architecture. In essence, the conceptual framework introduced in §3.3 (p.31) is enhanced and split into three separate framework.

A description of the three modes of belonging is provided in order to give an idea of the meaning of these concepts. Every mode of belonging consists of three operationalizations, which in turn can be further specified. In this thesis, the focus is on the first level of operationalizations, which implies that nine terms will form the basis for further investigation of the relation between social software and CoPs.

	Engagement		
	Mutuality	Competence	Continuity
Blogs	· Functions as platform for establishing online communities · Functions as platform for developing relationships · Functions as platform for building trust · post thoughts, Information, and interests · participate in a-synchronous discussions by posting comments · negotiate meaning trough discussion · structure offers room for peripheral participation · Permalinks and trackbacking function as interactional facilities · RSS functions as interactional facility	· post thoughts, Information, and interests · judgement by commenting on posts · create long and serious treatments · as platform for structuring thoughts and reflect · As platform for conversational knowledge creation · Discussion facilitates development of shared repertoire · Peer reviewing · Enables structured argumentations	· Functions as shared knowledge repository · Functions as means for storing work, thoughts, and ideas, links, information, and free text · Retrieval through browsing history or search · Functions as means for storytelling · Open structures enable generational and cross-hierarchical confrontations.
Wikis	· As platform for collaborative writing · Creation of a team · As platform for conversational knowledge creation · Working on joint task in virtual surrounding · Negotiate meaning through collaboration · structure offers room for peripheral participation · Fosters trust among participants through signed entries · Hyperlinking between pages as interactional facility · Functions as platform for discussion · Anti-credentialism	· improve overall quality through experts contribution · low barriers of participation make instant error correction possible · result has high level of acceptance · negotiate enterprise through collaboration · participants are accountable for overall result · judgement by taking over control of parts of page · As platform for conversational knowledge creation · Knowledge creation through anarchy	· Functions as shared knowledge repository · Represents history of knowledge by keeping track of changes · Retrieval through browsing history or search · Functions as means for storytelling · Open structures enable generational and cross-hierarchical confrontations. · Triggers group memory, which enhances overall quality
Social Bookmarking	· Provides overview of current interests · Browse folksonomy of other users to create mutual relationships · Platform for asynchronous interaction and communication · Use of community specific tags to create 'personal' space · structure offers peripheral participation · RSS functions as interactional facility	· judgement through adopting or rejecting tags · negotiate meaning through adopting or rejecting tags · folksonomy represents enterprise of community · tags represent repertoire of community · steering community through introducing, adopting, or abandoning tags · using tags creates accountability for keeping community alive · quantity and quality of contributions distinguishes experts	· functions as outbound memory (a place to store, tags, opinions, and links) · Retrieval through browsing history or search · Searching through combination of tags. · Showing experts in fields · Browsing through experts in related fields of interests · Open structures enable generational and cross-hierarchical confrontations.

Table 5.1: Summary of the relation between social software and engagement.

5.1 Engagement and social software

Engagement, in terms of design, consists of three components, namely *mutuality*, *competence*, and *continuity*. Offering facilities for engagement actually means offering facilities for the formation of CoPs (Wenger, 1998, p.236). Table 5.1 (p.54) summarizes the relation between engagement and social software. This summary is explained in the remainder of this section.

5.1.1 Mutuality

Mutuality has to do with recognizing something of ourselves in each other and by recognizing each other as participants. It deals with the ability to negotiate meaning and the ability to establish relationships. It develops certain expectations about how to interact, how people treat each other, and how they work together. Offering facilities for mutuality means offering interactional facilities, joint tasks, and peripherality (Wenger, 1998, p.237).

Interactional facilities are defined as physical and virtual spaces, interactive technologies and communication facilities that extend mutual access in time and space. It also includes offering time for interaction and travel budgets. Joint tasks means the ability to do things together and being able to ask for help. Peripherality is defined as a way of participating in a community without having the obligations that full members have. It offers exposure to actual practice, by providing access to mutual engagement, to the negotiation of the enterprise, and to the repertoire in use. Peripheral members are often, but not exclusively, newcomers, who will become full members over time. Peripherality in terms of a learning architecture means offering things as boundary encounters, ways of belonging to various degrees, peripheral participation, entry points of a community, observation, casual encounters, and open houses.

Social software can offer facilities for mutuality by offering virtual spaces for people to interact. The emergence of social software turned the Web in being a conversational platform, in which content is created, shared, remixed, repurposed, and passed along. It enables and encourages participation through open applications and services (Downes, 2005) and it makes participants *part of* the event (Downes, 2004).

Blogs

Blogs are defined as platforms where people can post their thoughts, information and interests and where visitors can participate in the discussion by posting comments (Wenger et al., 2005; Downes, 2004). This way, asynchronous platforms are created where people meet on a regular basis and where online communities are established and maintained in time (Bar-Ilan, 2005; Cayzer, 2004). Efimova (2004) studied a case in which the introduction of a weblog led to an enhanced social network. This feeling can only arise when the medium is considered a platform where people are happy to come together and are happy to participate. Thus, in a sense, a blog supports a form of mutuality.

Some other important features that support interaction on blogs are *permalinks* and *trackbacking* (Bar-Ilan, 2005). Every post on a weblog has a permanent link (a permalink) so that every post has its unique Uniform Resource Identifier (URI). A permalink makes it easy to link directly to a specific post elsewhere on a blog (or another blog), which enhances interaction and communication among different parts of a blog or blogs and which eventually will result in emergent relationships (Coates, 2003). A trackback uses a permalink to keep account of the webpages and blogs that link to specific posts within or among blogs (Bar-Ilan, 2005). This way, relationships and communities emerge (Poortman and Sloep, 2005). Another important feature that enhances interaction among users on blogs is Really Simple Syndication (RSS). RSS is a technique that syndicates (part of) the content from blogs or social bookmarking sites. As a visitor, you can subscribe to a RSS feed so you get the content delivered to you instead of you having to visit the site to read the content. This way, it is easy to follow the stream of published information (Alexander, 2006; Roll, 2004) and whenever you feel like it, you can visit the source and participate in the discussion.

Roll (2003) studied the effects of blogging on the development of relationships among community members. He argues that blogging does have a positive effect on the development of relationships among participants. This claim is also supported by Godwin Jones (2003) and Efimova (2004). In a more recent paper, Roll (2004) argues that the use of weblogs and the relation among the participants builds a certain trust among them. It is the ease of participation that lowers these barriers of building trust and relationships.

Weblogs are also useful for fulfilling the joint task of negotiation of meaning, by offering facilities for discussion. The ability to communicate and to post comments on a blog also enables you to ask questions to the community, thereby creating a facility to support the ability to ask for help when needed.

Wikis

Wikis are also often considered as a platform where participants can write together. For instance, in the case of Wikipedia, participants rarely meet each other face-to-face and communication often goes entirely through the platform (in the discussion areas of the platform or on the pages) itself. However, the participants do consider their wiki as a platform for collaboration and group communication (Chen, Cannon, Gabrio, and Leifer, 2005). Wagner (2004) even defines wikis as tools for conversational knowledge creation and group collaboration. As Colen and Petelin (2004) argue, collaborative writing (which takes

place on a wiki) improves motivation and encouragement of participants, which improves the relationship among co-workers. The enhancement of social factors, like social support and the creation of a 'team' is also a positive result of collaborative writing (Noel and Robert, 2004).

In the case of wikis, mutual accountability implies that a certain trust among participants must be fostered. Davies (2004) argues that trust in the quality of the work, but also trust among participants is essential for the success of wikis. According to Davies (2004), the building of trust can be assisted through signing wiki entries.

Wikis are extremely useful for working on joint tasks in a virtual surrounding. People can collaboratively write a document where everyone uses his or her expertise to finish the task of collaborative writing (Noel and Robert, 2003, 2004). Of course, wikis are not suitable for every kind of tasks, but in terms of Wenger (1998), where many tasks are centred on meaning, meaning making and negotiation of meaning, wikis offer the possibility to negotiate meaning through writing a piece of text collaboratively. Lamb (2004) describes the use of wikis in education, where, according to him, it can be a great tool for collaboration and collaborative writing and for participants to improve their writing skills, which supports the statement that wikis offer facilities to support working on joint tasks.

Social bookmarking

Social bookmarking, including tagging, offers an overview of the current interests of a person or a community (in the case of group social bookmarking) (Hammond, Hanny, Lund, and Scott, 2005). Social bookmarking enables you to browse collections of tags, which can result in finding new interesting sources and users (Alexander, 2006; Mathes, 2004). Finding users with similar interests and tracking the behaviour of these users over a longer period can create mutual relationships among them (Golder and Huberman, 2006; Mejias, 2005). Although often classified as selfish, social bookmarking services can also function as a virtual space for indirect interaction and communication. An example where specific tags are used to relate bookmarks to a specific community is described by Hammond et al. (2005) and Lund, Hammond, Flack, and Hannay (2005). In their example, they used a specific tag to store bookmarks that were related to their article. Next, they asked their readers to add related articles and tag them with the predefined tags. People could join the conversation by adopting these predefined tags. This way, a form of interaction and communication

among authors and readers was created, which was defined as a shared space. Although this behaviour is sometimes defined as "nonsense tagging" (Guy and Tonkin, 2006), this nonsense tagging does enable a community to create a place of their own (Alexander, 2006).

RSS feeds also function as interaction facilities in social bookmarking services. For instance, a subscription to the most popular or newest contributions, contributions with a specific tag, or contributions of a specific user are all possible (Alexander, 2006). This way, a certain affinity with the community is created. Just as with weblogs, the site can be visited or contributions can be made whenever someone feels like it.

The open structure of blogs, wikis and social bookmarks enables a kind of peripheral participation that is essential for learning in practice. The enterprise and repertoire of an existing or emerging community is open to the public, so newcomers are able to read the wiki pages, blog posts or bookmarks and thereby, it offers room for new participants to join the community. This way, a certain engagement with the community without feeling obliged to give something in return can be created. For instance, Davies (2004) noted that wikis often have a "floating pool of peripheral members." The open structure also reflects a form of anti-credentialism, which means that you do not need certain credentials to participate.

Based on the previous description, it is argued that blogs, wikis, and social bookmarking indeed offer various facilities to support mutuality. A summary of the above treatise is given in the first column of table 5.1 (p.54). In the next section, the second operationalization of engagement, namely competence, will be described.

5.1.2 Competence

Competence literally means being able to do well. In terms of design, competence includes aspects like initiative and knowledgeability, accountability, and tools.

Initiative and knowledgeability include activities that bring about the knowledgeability of engagement. It should offer occasions for applying skills, devising solutions, and making decisions. Further, problems that engage energy, creativity and inventiveness should be within reach. Accountability defines what is important to a community. It explains why it is important and how a commu-

nity deals with it. In terms of design, accountability means offering facilities for exercising judgment and for mutual evaluation. It means offering a recognizable style and opportunities to negotiate a joint enterprise. Competence also means including tools that support competence, for instance offering a place for discourses, terms and concepts, or delegation facilities.

Blogs

Blogs offer tools to apply and demonstrate the knowledge a community member possesses. As Wagner (2004) argues, some people have become famous because of their weblog, so it offers a place to spread knowledge and to build a reputation. People with a significant information or knowledge advantage over others (e.g. experts) can function very well on weblogs (Wagner, 2005). Poortman and Sloep (2005) also argue that blogs are an ideal means for peer reviewing, the process of assessing each other's contributions. Peer reviewing can also be considered as a means to increase the quality of the work of a community.

The main function of a blog is often to write treatments on a subject. Further, a blog offers a place for reflection and the structuring of thoughts (Chen et al., 2005; Bartlett-Bragg, 2003). Blogs are also often used to post a body of knowledge, or a specific question, with the intention to encourage the community to start a discussion (Downes, 2004). This can all be considered as means that bring about the competence of the community. Through discussion, questions can be answered, new knowledge can be created or existing knowledge can be improved. Discussion can also steer the enterprise of a community, by introducing new, or abandoning old terms, concepts, or directions.

Although discussions are a-synchronous, it does not imply that discussions are useless. An experiment carried out by Ocker and Yaverbaum (1999) examined the differences between face-to-face and a-synchronous discussion. This study did not find any significant differences between face-to-face and a-synchronous discussions, on measures of learning and quality. Noteworthy is that in this study, a face-to-face meeting preceded the a-synchronous, online collaboration. Obviously, commenting functionality can also be a powerful tool for exercising judgment. For instance, one can respond to the post or comments written by others and correct them whenever they make a mistake.

Poortman and Sloep (2005) argue that blogging enables people to structure their thoughts before they write something down. This way, they can come up with a better argumentation, which forms, in a sense, a better reflection of the knowledgeability of the person. Therefore, discussions are more likely being

judged on the content instead of speed of discussion.

Wikis

The process of collaborative writing on a wiki enables the members of a community to improve the overall quality of their work, by offering the possibility to individual experts to write, from any place and on any time, on the subsections that lie within their expertise (Noel and Robert, 2003, 2004). Because of the ease of editing, the barrier to participate is low, so errors are corrected instantaneously and improvements can be written on the fly. This improves the overall quality and thus, the competence of the community. Because of this process of collaborative writing, the overall result will have a higher level of acceptance (Colen and Petelin, 2004), which improves the process of negotiating the enterprise. Collaborative writing on a wiki also creates a form of accountability, in that every participant is accountable for the overall result of the work. Producing bad articles may damage the reputation of the community, as well as the reputation of the individual who contributed the piece (recent 'attacks' on the quality of Wikipedia prove this statement). This forces people to give their best and to deliver a good result. Judgment can be exercised by commenting on wiki pages. In this case, judgment can also be exercised by taking control over the work through rewriting parts of the article.

The content of a wiki, gradually created by multiple participants over time, becomes a representation of the shared knowledge or beliefs of the contributors (Leuf and Cunningham, 2001, from Augar, Raitman, and Zhou, 2004). As Wagner (2004) argues, wikis support knowledge creation through anarchy, by allowing everyone to join the process of collaborative writing.

Social bookmarking

The collection of bookmarks and associated tags, often referred to as a folksonomy (Hammond et al., 2005; Millen et al., 2005; Mathes, 2004) offer insights into the current interests of a user or a community. These interests represent, in large part, the enterprise of the community. Introducing, adopting and abandoning tags causes the folksonomy of a community to evolve constantly, which can be seen as a form of steering the enterprise. Individuals have an emerging tag collection (Golder and Huberman, 2006) where tags are abandoned and new tags are introduced. Introducing new tags may result in bringing new keywords to the foreground, which can result in a different direction for the community. The same counts for abandoning tags. When tags are abandoned, they disap-

pear from the folksonomy, which can influence the focus and the enterprise of the community.

The examples of using specific community related tags show that a form of accountability is created in that using these specific tags can be seen as a way of keeping the community alive (Hammond et al., 2005). When tags are not used, this may eventually result in the community to fade into non-existence. Social bookmarking can also offer insight into the expertise of a community member. For instance, it is likely that a member, who tags many articles as "knowledge-management", does have a certain interest and knowledgeability about this topic. This can result in some form of participation in the community that is centred on this interest. However, it is important to consider the quality of posts that are submitted by the person, because quantity alone does not label someone as an expert. For instance, social bookmarking makes it possible to tag information as 'Web2.0'. When a tag is used often, the user will be marked as expert on this topic. However, it is possible that the links that are contributed do not relate to Web 2.0 at all. This is also labeled as tag spam. Tag spamming is sometimes used to generate traffic by using popular tags or showing related tags next to popular tags (Gardner, 2006).

Considering the previous description, it is argued that blogs, wikis, and social bookmarking indeed offer various facilities to support competence. A summary of the above description can be found in the second column of table 5.1 (p.54). In the next section, the third operationalization of engagement, namely continuity, will be described.

5.1.3 Continuity

Continuity is divided in the dual process of participation and reification. Wenger (2001, p.43) (see also §2.7, p.20) described this as a tension between interactions and documents. Continuity must be guaranteed in both respects, which means that facilities for creating and maintaining participative and reificative memory should be in place. Reificative memory means offering facilities for repositories of information, documentation, and tracking as well as retrieval mechanisms. Participative memory means offering facilities for generational encounters, apprenticeship systems, paradigmatic trajectories, and storytelling. Storytelling is essentially important, because it holds the context in which meaning and knowledge exist (Lesser and Storck, 2001; Seely Brown and Duguid, 2000). Stories allow, as Wenger (1998, p.203) argues, participants to experience an event as if

they were actually there.

Blogs

Wagner (2004) defines blogs as knowledge repositories, where every post functions as an individual repository. Blogs are also often seen as a means for storing work, thoughts and ideas (Downes, 2004; Efimova, 2004; Roll, 2004), thereby serving as a means for reificative memory. Roll (2004) defines blogs as (personal) filing cabinets, in which relevant links, information, and free text without forced file structure can be stored. Many weblogs also contain a search engine that allows you to search full text through the entire collection of posts. Next, blogs often offer archives to walk through the history of posts (Bar-Ilan, 2005).

In terms of participative memory, especially blogs suit well, because they can function as means for storytelling. A blogger can write a story or a best practice on a blog, which can form a part of the participative memory (Alexander, 2006; Wagner, 2005; Roll, 2004).

Wikis

Wikis contain a reificative memory by showing the current state of knowledge as well as a history of knowledge by keeping track of changes. Therefore, Wagner (2004) defines wikis as knowledge repositories. It is also defined as a place that holds group memory, as an online whiteboard, or a shared notebook (Jesdanun, 2004). The final result of a wiki article is the combination of pieces, chunks, and fragments of knowledge (Weiss, 2005), which can be easily shared, just by visiting the wiki page. This can be seen as a reified piece of knowledge, which is part of a shared knowledge repository (Godwin Jones, 2003). Wikis offer standard retrieval mechanisms, as a search engine and browsing hyperlinks, which introduces a way to search full text through the available wiki pages.

Mandviwalla, Clark II, and Sandoe (1995) argued that collaborative writing triggers the memory of the group and the individuals, thereby influencing the results of the writing process. They argue that the input of other group members influences the writing of individuals, which means that the group memory affects the overall result. This group memory is also created during the process of collaboration, thus offering a form of continuity for the community. In an experiment with Grade 4-6 students, Dsilets and Paquet (2005) showed that wikis can also function as means for storytelling.

Social bookmarking

Social bookmarking can function as a means for storing knowledge, in the form

of bookmarks, related tags, and meanings, which might otherwise be lost over time. This is what Alexander (2006) defines as "outbound memory". Social bookmarking offers, besides traditional search facilities, a different kind of retrieval mechanism, namely retrieval through browsing of tags. These services often offer related tags, which can direct your search. It offers refinements of search by combining tags (for instance, web 2.0 + blogs). It also shows experts in related search areas so other people who are contributing to a certain topic can be found (Golder and Huberman, 2006; Alexander, 2006; Millen et al., 2005).

Just as blogs, wikis and social bookmarking services function as open virtual spaces where people can meet. Of course, these spaces can also function as platforms where people of different generations or different levels in hierarchy can meet. However, participants can stay anonymous, thus they would have to identify themselves before generational encounters can really take place.

The summary of the above description is explicated in the third column of Table 5.1 (p.54). Based on these insights, it is argued that blogs, wikis, and social bookmarking offer facilities that support continuity. In the next section, the focus will be on the second mode of belonging, namely imagination.

5.2 Imagination and social software

Imagination is defined as the ability to create images of the world and seeing connections through time and space (Wenger, 1998). Imagination allows learning to encompass and deal with broader contexts. In terms of design, imagination means including facilities for —it orientation, *reflection*, and *exploration*.

table 5.2 (p.64) summarizes the relation between imagination and social software. This summary is explained in the remainder of this section.

5.2.1 Orientation

Orientation means the action of orientating oneself, where orientating oneself can be seen as establishing one's position in relation to one's surrounding or to make someone familiar with a situation. Orientation in terms of design means four things: Firstly, it means offering a location in space, which includes the reification of constellations (a constellation is the combination of factors that influence something or someone), maps, and other visualization tools, and

open spaces. Secondly, it means offering a location in time, for instance, long-term trajectories, lore, and museums. Thirdly, it means a location in meaning, including explanations, stories, and examples. Finally, it means a location in power, which could include organizational charts and process transparency.

Blogs

An important ingredient of facilities of imagination is the fact that open spaces should be created. Blogs can be considered as an open space, because in principle, everybody is allowed to read the posts and contribute through comments (Roll, 2004). Wikis can be considered as open spaces, because everyone is allowed to add, edit or delete contributions (Leuf and Cunningham, 2001). Social bookmarking can be considered as an open system because everyone is allowed to add bookmarks, but also to browse bookmarks of others (Alexander, 2006; Golder and Huberman, 2006).

Blogs, as mentioned earlier, are ideal means to place and develop stories. The main reason is that blog posts are written in a human voice (Roll, 2004). Through these stories, it is possible to orient oneself on the topics of the weblog. These stories can function as facility for imagination, by offering a location in meaning (Wenger, 1998). It is also the main function of a wiki to hold stories,

			Imagination
	Orientation	Reflection	Exploration
Blogs	· Functions as open space · Holds stories · Process is transparent	· Functions as tool for conversational knowledge management · As means for reflective monologues · As means for reflective dialogues · Enables deep learning	· Blogosphere and hyperlink culture enables exploration · Trackbacking and permalinks enable exploration · Comments can offer new insights and sources that can be explored · As means for experimenting new thoughts, philosophising on the future
Wikis	· Functions as open space · Hold stories · Process is transparent	· Functions as tool for conversational knowledge management · Encourages people to publish little, incomplete, erroneous, information, in order for the community to continue · Incremental knowledge creation as questioning and answering · Enables deep learning	· Hyperlinks are created instantly · New pages are created when links are created that do not lead anywhere · Hyperlinking enables exploration · As means for creating alternative scenarios
Social Bookmarking	· Folksonomy offers broader perspective than individual bookmarks · holds short descriptions · holds tags · Functions as transparent, open space	· Storing short comments with bookmarks offers ability to reflect · Folksonomy reflects representations and patterns of the community	· Exploration through browsing tags · Exploring new ideas in stead of answering existing questions · Introduces new terms and concepts

Table 5.2: Summary of the relation between social software and imagination.

examples and explanations.

Wikis
The process on a wiki is completely transparent. Everyone is allowed to add or edit text, thus power is distributed among the participants. On a blog, the power is located with the blogowner. Although it is not a normal thing to do (Bar-Ilan, 2005), because it goes against the philosophy of weblogs, owners of a blog can edit or delete comments.

Social bookmarking
Social bookmarking offers a good way for orientation, because a collection of bookmarks, represented by its tags offer new perspectives that are not immediately visible by examining one or several bookmarks (Alexander, 2006).This thought is also supported by Lund et al. (2005). The ability to post comments to bookmarks can function as a way of storing meaning in the form of a short description of the content of the bookmark (Hammond et al., 2005; Lund et al., 2005). Individual tags function as facilities for orientation, because they represent the bookmark to which they are linked (Golder and Huberman, 2006).

Based on this short description, it is argued that blogs, wikis, and social software do offer facilities that support orientation. The results are summarized in the first column of table 5.2 (p.64). The next section describes the second operationalization of imagination, namely reflection.

5.2.2 Reflection

Reflection can be defined from many different perspectives and therefore, it is useful to choose a definition that is closely related to the theory of social learning and CoPs. Daudeling (1996) defines reflection as "the process of stepping back from an experience to ponder, carefully and persistently, its meaning to the self through the development of inferences." She positions reflection in the context of learning, which she defines as "the creation of meaning from past or current events that serves as a guide for future behaviour." According to (Wenger, 1998), reflection in terms of design entails such things as models and representations of patterns, facilities for comparison with other practices, retreats, time off, conversations, sabbaticals, and other breaks in rhythm.

Of course, social software has little to do with reflection in terms of retreats, time off, and sabbaticals. However, considering the definition of reflection, social

software does offer other facilities for reflection.

Blogs

Wenger (1998) argues that reflection, in terms of design, entails conversations. Blogs enable you to reflect on certain topics while, at the same time, it allows you to reflect on comments posted by others. Reflection is among the main reasons why people blog and is described by numerous authors (for instance, see Bar-Ilan (2005); Downes (2004); Bartlett-Bragg (2003)). Bartlett-Bragg (2003) takes reflection even further by arguing that blogging enables deep learning by enriching the learning experience. Bar-Ilan (2005) and Downes (2004) also argue that blogs can be used to have conversations with participants, thus as Wagner (2005) argues, it functions as a means for conversational knowledge creation. Bartlett-Bragg (2003) also distinguishes between reflective monologues, where blogs are used as a reflective means for an individual, and reflective dialogues, where blogs are used as a reflective means for an individual and participants.

Wikis

Considering the articles of Wagner (2004) and Wagner (2005), it is argued that blogs and wikis are, among other technologies, ideal tools for conversational knowledge management. For instance, wikis support conversations because participants are encouraged to start an article with little, incomplete, and even erroneous information, in the hope that others will pick up the article and continue to improve it. This is what Wagner (2004) describes as "incremental knowledge creation as question answering". Chen et al. (2005) argue that wikis also enable a form of deeper learning. Deep learning, in contrast to surface learning, is focused on how learners stand back from an experience, seek out connections among concepts, and contextualize meanings. Surface learning, on the other hand, is defined as an approach to learning in which only the minimum content necessary to meet requirements is learned (from Rosie, 2000).

Social bookmarking

Considering social bookmarking, the ability to store short comments with bookmarks enable you to reflect on the bookmark that is being submitted (Millen et al., 2005). It offers you the possibility to step back from the bookmark you just contributed and it gives you the opportunity to post your thoughts on it. These reflections help you to enhance your understanding of what is posted. (Wenger, 1998, p.28) also argues that reflection entails models and representations of patterns. Navigation in social bookmarking is possible through tags

and tagclouds. Tagclouds can be considered a visualized representation of the current interests of the community (for instance, see Golder and Huberman, 2006; Hammond et al., 2005).

The above description is summarized in the second column of table 5.2 (p.64). In the next section, the third operationalization of imagination, namely exploration, is discussed.

5.2.3 Exploration

Exploration can be defined as thoroughly examining in order to test or to find out. In terms of design (Wenger, 1998), this includes offering opportunities and tools for trying things out, envisioning possible futures and possible trajectories, creating alternative scenarios, pushing boundaries, prototypes, and play and simulations.

Blogs

The hyperlink structure of the Internet is an ideal means for exploration. However, hyperlinking is as old as the web itself, so what does this mean for social software? Hyperlinking is an essential ingredient in the blogosphere. What differentiates hyperlinking in the blogosphere is that commenters can also post hyperlinks in their comments. This way, new links are introduced that were not posted by the original author. Now, exploring weblogs and comments becomes very interesting (Bar-Ilan, 2005). Trackbacks and permalinks were earlier described in the context of mutuality, but trackbacks and permalinks also function as ways for exploration, by offering new sources (Bartlett-Bragg, 2003).

Blogs generally have some sort of informal character. It is a place where people can push boundaries without damaging themselves. It is a place to reflect on topics, but also to experiment with new, and interesting thoughts (for instance, see Mortensen and Walker, 2002). For instance, researchers today often post their thoughts and test new ideas on a blog.

Wikis

Considering wikis, exploration is enabled through linking from and among pages. New links are created by placing words between brackets. When pages do not exist, they are created instantly. This lowers the barrier of creating links among pages and creates an easy way of navigating, or exploring wiki pages and thus, creates order in the apparent disorder (Lamb, 2004).

Wikis are also capable of functioning as means for pushing boundaries, en-

visioning possible features, and creating alternative scenarios. As long as it is a collaborative process, which is reified in a wikipage.

Social bookmarking
Especially in social bookmarking, exploring is essentially what browsing through social bookmarks is all about. The difference between a traditional search engine and browsing a collection of tags is that in using a search engine, you have to know what you are looking for. When browsing tags, you may stumble upon interesting resources, without knowing what to look for (Vuorikari, 2005). Traditional searches answer to existing ideas, while exploring tags on social bookmarks may offer new ideas and insights. Thus, exploring through browsing social bookmarks and related tags can be a fruitful activity. Browsing tags not only offers new potentially relevant sources, it can also introduce new terms and concepts that may be useful (Alexander, 2006).

This section described how blogs, wikis, and social bookmarking could offer facilities that support exploration. These results are summarized in the third column of table 5.2 (p.64). The next section describes the third mode of belonging, namely alignment.

5.3 Alignment and social software

Alignment is, as said, defined as coordinating activities and energy to fit within broader structures. Through this, we can learn to have effect and contribute to tasks that are defined beyond our engagement. Alignment, in terms of design, should include facilities for *convergence*, *coordination*, and *jurisdiction*.

Table 5.3 (p.69) summarizes the relation between engagement and social software. This summary is explained in the remainder of this section.

5.3.1 Convergence

Firstly, convergence is defined as offering facilities for having a common focus, sharing of a cause, or interest. It also means having a direction, a vision, shared understanding, creed, values and principles. Secondly, convergence means allegiance, leadership, offering sources of inspiration, and persuasion.

Blogs
Bar-Ilan (2005) distinguishes between several types of blogs, namely associative, personal, self-expressive or topic-oriented blogs. Especially blogs, which are

			Alignment
	Convergence	Coordination	Jurisdiction
Blogs	· Blog centred on central topic · Blogosphere is known as typical culture, which is very open	· Functions as boundary facility · Offers means for renegotiation through commenting	· Can function as placeholder for rules, policies, and contracts · Authority is located at the level of blogowner
Wikis	· Every page consists of a single body of knowledge · Pages can be split or combined easily · Openness and share-a-like are main principles	· Natural conventions emerge from participation · Requisites, like syntax, have to be followed · Ease of editing pages and paragraphs make division of labour easy. · Functions as boundary facility	· Can function as placeholder for rules, policies, and contracts · Authority is located at the level of the participants
Social Bookmarking	· Experts on topics emerge naturally based on participation · Comply to way of using tags · Openness and share-a-like are main principles	· Service has its own conventions on using the service (like tag syntax) · Community develop their own way of using the service · Community related tags can separate the community from the mass. · Functions as boundary facility	· Authority is located at the level of the participants

Table 5.3: Summary of the relation between social software and alignment.

centred on a specific topic present a certain common focus, or interest of the participants, considering the audience that sometimes arises on a blog (Bar-Ilan, 2005; Blanchard, 2004). As described earlier, blogs can create a certain reputation among participants, which also paves the way for natural leaders to emerge.

Wikis

Wikis offer a form of convergence by offering the possibility to manage articles based on their content. Every wiki page should contain a single body of knowledge, on a specific topic. When a single topic is divided over multiple pages, these pages can be easily combined into one page. The same counts for single pages that contain multiple topics. These can easily be split into multiple pages (Wagner, 2004).

Values and principles exist in the world of wikis (some of the principles are described in §3.2.2, p.28), which are typical for CoPs and social software. For instance, content is open to anyone who feels like contributing. In traditional situations, it is likely that this would result in distrust, because it is not always appropriate to edit anybody's content. In the world of wikis, this is not a problem (Wagner, 2004).

Social bookmarking

Social bookmarking can also be centred on a common focus. Hammond et al.

(2005) describe a clear example of a group of people coming together with a shared interest. In this experiment, as mentioned, people adopted a specific tag to contribute to a certain community. Thus, participants who contributed had a similar interest. In addition, by contributing postings on the same or related topics a form of common focus among the participants is created.

This section described how blogs, wikis, and social bookmarking could offer facilities that support convergence. These results are summarized in the first column of table 5.3 (p.69). The next section describes the second operationalization, namely coordination.

5.3.2 Coordination

Firstly, coordination means offering facilities for standards and methods, like processes, procedures, plans, deadlines and schedules, division of labour, styles, and discourses. Secondly, coordination means offering facilities for communication, like information transmission, spread of novelty, and renegotiation. Thirdly, coordination means offering boundary facilities, like boundary practices, brokers (members who provide connections among communities and who can introduce elements of one practice into another (Wenger, 1998, p.105)), boundary objects (things as artefacts, documents, terms, concepts, and other forms of reification on, which CoPs can organize their interconnections (Wenger, 1998, p.105)), and support for multimembership. Fourthly, coordination means offering feedback facilities, like data collection, accounting, and measurements.

Blogs

Coordination requires boundary facilities. For instance, brokers can exist on wikis by participating in multiple sub communities who all have their own topic of interest. In social bookmarking, it is easy to browse and introduce tags (Vuorikari, 2005), or bookmarks from other communities in a group of people, thereby providing a link between both communities. On blogs, the entire blogosphere can be seen as a large community, but within this blogosphere, sub communities are centred on topics of interest. The ease of commenting on posts enables you to join a discussion of another community, thereby introducing new aspects of other groups. The hyperlink structure can create connections among different communities.

Other blogs, wikipages, and accounts or tags on a social bookmarking service can function as a boundary object. Every wikipages is a reified product, that is

open to the public, or at least, the community, thus can function as a boundary object for a community to organize their interconnections (Wagner, 2004). The same is true for a discussion on a blogpost, which can form a boundary object because of its permalink (Poortman and Sloep, 2005), or the bookmarks related to a specific tag (Alexander, 2006).

Wikis

Considering wikis, a form of coordination is the requisite to comply with syntax rules. In order to use the full function of the system, one has to be familiar with these kinds of prerequisites (see Augar et al., 2004; Lamb, 2004). For instance, links are often created by placing terms between brackets. Without complying with this kind of standards, the full functionality of a wiki cannot be used. Further, there are often certain conventions that every user has to obey in order for it to be published.

Next, division of labour on a wiki is easy, because every page is editable and can be written by the appropriate expert. More specifically, every part in a page can be edited by its appropriate expert, which improves the overall quality of the document (Noel and Robert, 2003). The open structure enables participants to decide for themselves what part(s) of a page they want to write.

Social bookmarking

Every community on a social bookmarking service can use the service in its own way. The example of Hammond et al. (2005) where a specific tag is used to join a community is a way of aligning with the community and coordinating your activities along with the community. It is impossible to join that specific community without adopting that specific tag. Another way of coordinating in social bookmarking is adopting a style of tagging. There is an intense debate on how to use tags and in practice, we see that various different styles of tagging are implemented. Some services allow spaces in tags; others require underscores to combine words. As Guy and Tonkin (2006) argue, some form of shared tag syntax should be adopted.

This section described a few facilities offered by blogs, wikis, and social bookmarking that support coordination. These results are summarized in the second column of table 5.3 (p.69). The next section describes the third operationalization of alignment, namely jurisdiction.

5.3.3 Jurisdiction

Jurisdiction is defined as the official power to make legal decisions and judgments about something. It is possible that different authorities have jurisdiction over what is produced by a community. This implies that jurisdiction over various aspects of an object may be distributed among the constituencies involved, and thus, this requires a process of coordination and translation between each form of partial jurisdiction. A learning architecture should foresee in this. In terms of design, it implies offering facilities for policies, contracts, due processes, mediation, arbitration, conflict resolution, enforcement, and distribution of authority.

Blogs

In the case of weblogs, jurisdiction mostly lies in the hands of the blogowner. For instance, he or she can decide whether to review comments before they are added to the site (Nardi, Schiano, and Gumbrecht, 2004). As Nardi et al. (2004) also argue, it seems that blogowners want their readers at an arm's length, meaning that they want to have some form of control over them. For instance, this can be expressed by editing or deleting comments posted by visitors.

Wikis

Wikis can be an ideal placeholder for policies, procedures, and contracts. For instance, there are known situations where company policies are written in a wiki page. The idea is that these policies are emergent, and open to the participants. It offers means for negotiating these policies on an ongoing basis. In terms of learning and education, wikis are ideal for communicating, assignments, terms, lecture notes, research reports and so on (Jesdanun, 2004). The same counts for weblogs. In education, weblogs are often used to post lecture notes, presentations, course details and so on. Blogs are ideal places for these types of information (Downes, 2004; Godwin Jones, 2003).

In terms of wikis, jurisdiction is in the hands of the participants. For instance, new pages are not revised before they are being published (Wagner, 2004) and whenever errors are spotted, they are corrected instantly by the participants. The fact that every participant can create and edit a wikipage is a sign that the authority lies with the participants. A wiki is in a sense, self-regulatory. This however, does not imply that there is no regulation at all. For instance, there are sysops that stand up against vandalism.

Social bookmarking

Social bookmarking services are also self-regulatory systems. Just as with wikis, anyone can contribute and browse the collection of other users (Hammond et al., 2005). There is no formal hierarchy or authority that controls the contributions. In a sense, the authority is also in the hands of the participants.

This section described a few facilities offered by blogs, wikis, and social bookmarking that support jurisdiction. These results are summarized in the third column of table 5.3 (p.69).

In this chapter, the literature on weblogs, wikis and social bookmarking was reviewed and a framework that places the characteristics of social software in relation to the modes of belonging of (Wenger, 1998) was developed. The next chapter will further elaborate on this framework, by combining insights and results from the empirical study.

Chapter 6

Empirical results

In the previous chapter, a theoretical framework was developed based on the literature on weblogs, wikis, and social bookmarking. This framework presented some broad descriptions of how social software could support the three modes of belonging of Wenger (1998). In this section, this framework is refined based on the results of the empirical study. This will also result in a description of how social software supports the three modes of belonging of Wenger (1998). This time, the descriptions are more closely related to the literature of Wenger (1998), which implies that the statements are formulated more in terms of the design framework.

The first section contains some general considerations derived from the interviews. In §6.2 (p.79), §6.3 (p.96), and §6.4 (p.107), the results of the interviews are described per mode of belonging. These descriptions also contain an interpretation and analysis of the data. Quotes from the interviews are indented in the text, and written in cursive. Each of these sections contain a table that summarises the results in a framework, a description of the content of each particular framework, and a confrontation with the theoretical equivalent (see chapter 5, p.53). This confrontation explains the main differences between the theoretical and empirical results. In §6.5 (p.119), a summarizing framework is introduced. In §6.6 (p.124), the results of the focus group interview are explicated. This summarizing framework, together with the description of the empirical results, and the insights from the focus group, will form the basis for the final chapter (p.135), in which the conclusions and hypotheses are formulated.

6.1 Some general considerations

The coding of the ten interviews resulted in an unstructured list of 805 potentially interesting statements. Of course, not every statement is unique. Many statements were expressed multiple times by the same interviewee or by different interviewees.

Overall, 669 statements were coded as positive, 66 as negative, and 70 statements described contextual variables. In total, 383 statements where linked to engagement, of which 346 positive and 37 negative. 187 Statements where linked to imagination, of which 14 negative and 173 positive. Finally, 165 statements where linked to alignment, of which 15 negative and 150 positive.

It is interesting to see that the opinions of the participants varied widely. For instance, many of the interviewees argued that the blog offered an essential contribution to the process of learning while other interviewees thought that without the blog, the results would have been the same. Another interesting observation is that the purpose of using a wiki also varied widely. For instance, one group used their wiki to solely write their report while another group almost used the wiki for their entire project, including to-do lists, appointments, and so on. This group also admitted that they hardly met each other in person anymore. In addition, the application of social bookmarking services varied widely. For instance, the application varied from a group-oriented perspective to an individual, more selfish perspective.

It is interesting to note that the interviews were held on different abstraction levels, which was mostly determined by the interviewees. The design framework of Wenger (1998) formed the basis for the interviews, but some interviewees were talking on a more abstract, sometimes philosophical, level, while other interviewees explained themselves more in terms of functionality. Ultimately, this was considered as an advantage, because it made it possible to recognize and describe facilities on different levels of abstraction.

There is also an important distinction between the potential results and actual results. With all three services, the interviewees were convinced that the services could offer tremendous benefits to their learning experience. In other words, they definitely saw the potential of social software. However, the actual results did not always live up to these expectations. What caused this? Maybe it has to do with the way the software was introduced and the context in which the software was used. As mentioned earlier, the participants of the blog were somewhat 'forced' to use it so people had to be convinced that it could be a

useful addition. The people who used wikis and social bookmarking did this because they wanted to. They seemed more open to the use of social software and it can be argued that they experienced a higher success rate.

Another important contextual factor is that the participants all knew each other. This implied that social software operated more as a platform for communication and interaction, instead of functioning as a necessity to get in contact in the first place. The interviewees seemed to prefer physical interaction to virtual interaction. This teaches us that the software alone is not beatific. As this section will show, social software does offer many facilities, in different ways, to support the process of learning in practice in CoPs. However, offering these tools alone is not nearly enough. The main issue is how these tools are applied to support the objectives of the learning process, and how they offer facilities that support the learning architecture (see also §3.3, p.31).

During the interviews, it became clear that there are a few essential contextual factors that influence the experiences of the interviewees with social software. As described in the previous paragraph, much of the success of social software is dedicated to the fact that the software is used in small groups where the people know each other, or where they can create a certain familiarity among each other rapidly. This is considered essential, because it strengthens the belief that social software offers great potential when it is used in small, familiar CoPs (like the one that were under investigation in this study).

Another contextual factor that is worth mentioning is that the interviewees were all master students, who used the software in an educational setting. Moreover, in the case of the weblog, the participants were somewhat 'forced' to use the blog. Sometimes, this resulted in people abandoning the blog, because they focused on other trajectories, or purely on the theory.

> *"You might skip certain topics on the blog because, at first, you focus purely on the theory of the book."*

However, while some interviewees experienced the blog as an obligation in the beginning, they were all clear that this matter did not influence their participation.

> *"The participants were intrinsically motivated to participate. Extrinsic motivation from the teachers did not play any part in that."*

The wiki users came up with an example where the small, familiar group influenced the way they used the wiki. They argued that they were able to speak

aloud and write without too much contemplation, because they knew who read the contributions they made, and therefore, they knew that the participants would not feel offended when their text was edited or words were interpreted differently. This seriously improved the process of collaborative writing on the wiki.

> *"Some sort of trust has to exist. You have to know each other to be able to have a discussion on a wiki, because written words often come through harder than spoken words."*

Another interesting positive point of using social software in a small group became apparent during the interviews with the social bookmarking users. They mentioned that they attach more value to bookmarks that were contributed by people they knew and who shared their interests. This is, as the interviewees said, a matter of trust.

Another explanation of why social software can work very well in small groups is because large communities, as del.icio.us for example, are often considered too big. The interviewees felt as if these kinds of services offer merely generic information on general topics, like web 2.0, Google or Microsoft, which is also reflected in the tagclouds. These services represent, and this is considered as one of the main pillars of Web 2.0, the collective intelligence of the entire community. These services are build on the assumption that when the entire community likes certain information, you probably like it to. However, this goes beyond the fact that the interests of an individual may not correspond with the interests of the entire community. In other words, social software should offer information that is focused on the individual's interests instead of the interests of the entire community.

> *"However, with del.icio.us, there is a change that a certain topic gets a lot of attention in a short period of time, because 10.000 people tag this topic. This topic shows up in my cloud of popular topics. Then I am starting to wonder whether this is interesting for me or not. Apparently, it is an interesting topic within the community, but does this also hold true for me?"*

Using social bookmarking in a small community allows you to focus on a niche of information, thereby allowing you to contribute and find more specific information that suits the needs of yourself and the community members involved:

> *"Del.icio.us is so big. At some point, that does not work anymore. While on uva.watvindenwijover.nl I found things that I would never find on del.icio.us."*

One group of people experienced the efficiency of using social bookmarking in a small community. They used a specific tag to filter out unwanted contributions and to share information among community members. They believed that it would be a lot more difficult to share the same information in a large community where other members are largely unknown and community specific information transmitted can be easily interfered by others.

> *"Considering our use of the tag "IMP", we have a shared interest, a common focus, namely meaning making and information exchange within the context of the course Information Management in Practice."*

In this section, some general observations and contextual factors that became apparent during the interviews were described. In the remainder of this chapter, the focus will be on the three modes of belonging.

6.2 Engagement and social software

Engagement includes, as explained in §5.1 (p.54), facilities for mutuality, competence, and continuity. Firstly, the findings with respect to the blog are described, next the wiki, and finally social bookmarking. The findings are summarized in table 6.1 (p.80).

6.2.1 Mutuality

Blogs

Generally, the interviewees considered the blog as a platform for interaction. The opinions on whether the participants considered themselves as an online community varied. Most interviewees did consider themselves as an online community, but they also stated that this was influenced by the fact that they met in class on a weekly basis. They also considered the entire group as a community, because they all followed the same master study and thus, met each other and interacted with each other regularly. It was difficult to point out whether

	Engagement		
	Mutuality	Competence	Continuity
Blogs	· Functions as platform for establishing online interaction · Offers facilities that extend mutual access in space and time · Raises a feeling of working together on joint tasks · Helping each other through posting and commenting (question and answering) · Peripheral participation by learning from the contributions on the blog · People can read, post, and comment in various degrees	· Posts and comments bring about the knowledgeability of individuals and the community · Answering questions through commenting is a way of applying skills · Discussion facilitates development of shared repertoire · Accountability for participation as in keeping up with the community and keeping the community alive · Negotiate enterprise through posting and commenting · Exercising judgement by commenting on posts	· Functions as shared knowledge repository · Functions as means for storing work, thoughts, and ideas, links, information, and free text · Retrieval through browsing history or search · Functions as means for storytelling · Open structures enable generational and cross-hierarchical confrontations.
Wikis	· As platform for collaborative writing · Offers facilities that extend mutual access in space and time · Fosters trust among participants through signed entries · Working on joint task in virtual surrounding · Help each other out by taking over pieces that have to be written · Open structure offers room for peripheral participation and ways of belonging to various degrees	· Platform for creating and gathering knowledge · Apply skills by editing pages and improve overall quality · result has high level of acceptance · judgement by taking over control of parts of page · negotiate enterprise through collaboration and discussion on wiki page · participants are accountable for overall result · Open structure makes one accountable to participate	· Functions as shared knowledge repository · Retrieval through browsing hyperlinks, history or search · Functions as means for storytelling · Open structures enable generational and cross-hierarchical confrontations.
Social Bookmarking	· Use of community specific tags to create virtual space · Offers facilities that extend mutual access in space and time · Browse folksonomy of other users to create mutual relationships and trust · Platform for asynchronous interaction and communication · Multiple members contributing on the same topic is a form of creating meaning together · Open structure offers room for peripheral participation, various degrees of belonging and multiple entry points	· Offers facilities for circulation of information · Core members define focus of community · Bookmark behaviour brings about the knowledgeability of community and members · Exercise judgement through adopting or rejecting tags or posting comments · negotiate the enterprise through adopting or rejecting tags or posting comments · Participating creates accountability for keeping community alive · Contributions of others trigger own accountability to contribute	· Functions as repository for information, tags, bookmarks, and users · Retrieval through browsing history or search · Monitor interesting users over longer period of time · Offers limited facilities for storytelling · Open structure enables discovery of generational and cross-hierarchical users, who can be contacted.

Table 6.1: Refinement of framework social software and engagement.

the blog had a substantial contribution to the development of a community. As one interviewee put it:

> *"The group itself is strong because of the fact that we are al doing the same study and work together the entire year. The weblog did not affect this very much. It did make the group stronger; it is just hard to quantify how much stronger..."*

The interviewees agreed on the fact that the weblog offered extra interactional facilities, besides the regular, four-hour class every week. The interviewees felt as if they were more engaged with the course and the group, because they

were motivated to visit the blog on a regular basis. Thus, the blog introduced extra opportunities to interact with each other besides class and in addition, it offered opportunities to interact on a broader variety of topics than during class itself. The fact that people could participate on the blog in their own time, whenever it suited them, was also considered a big advantage.

A major drawback, which was caused by the limited functionality of the blog, was that the blog itself was not very transparent. For instance, the absence of a notification functionality of new posts and comments forced participants to visit the blog to see whether new contributions were added. A simple RSS feed, which is often available at blogs, could have solved this shortcoming. Although the site used live bookmarks, it was not used often by the interviewees. Another shortcoming that hampered the interaction was the fact that lively discussions were always forced to the background when new posts were added. Participants had to search for these discussions, which often put an end to it. A simple list of most active posts could have solved this shortcoming.

In addition, the fact that conversations were text-based and a-synchronous was considered as a limitation for improving the interaction among participants. Some interviewees argued that the posts and comments were not nearly as rich enough to enable deep conversations. Next, they argued that discussions were not fluent, because you had to wait for other participants to respond, which could take several hours or even days. However, others said that the discussions on the blog contributed significantly to their understanding of the topics that were discussed. In the end, some discussions helped the participants to make meaning on certain topics, which implies that discussions did help them.

Various occasions can be pointed out where participants on the blog felt as if they were working together on a joint task. According to almost every interviewee, the main purpose of the blog was to make meaning together on the central topics of the course. They truly felt as if they were in it together:

> *"Blogging is quite fun! You create things together, you post things together."*

The participants also felt as if they could use the blog to ask fellow students for help. For instance, several interviewees described a case on two terms: 'positive feedback' and 'network effects'. The meaning of these terms was not quite clear after being discussed in class. Eventually, someone had the guts to post his ignorance on the blog and fellow students almost immediately joined the conversation by introducing new sources and own perspectives to the stated

question, which resulted in the construction of an answer to the posted question. Thus, the posting and commenting functionality enabled a form of question and answering, which was highly appreciated by the students.

> *"I remember that I learned about network effects almost entirely from the postings on the blog. The descriptions there were much clearer than the few lines in the book."*

The interviewees agreed that the blog offers a form of peripheral participation, and that the barriers to entry were low. The link to the blog was known to the participants and everyone with a Blogger account could join the conversation. Thus, people could post, comment, or just read the blog. Participants who called themselves peripheral members felt that they could still learn from the action that took place. As one interviewee argued:

> *"You do not have to post all the time, or comment on posts, to feel engaged with the community. But whenever the blog triggers you to start a conversation in class, it reaches its goal."*

The interviewees also felt as if there were ways of belonging to various degrees on the blog. This became clear through various examples. For instance, people who were less assertive in class felt as if they got a voice on the blog, because they had more time to contemplate and reflect on what they wanted to say without being interrupted by other students. This resulted in an increased willingness to join the conversation. The interviewees also noted that more assertive people, who talked much in class, fulfilled a primary role on the blog.

Various degrees of participation also became clear after a brief analysis of postings and comments on the blog. Some people posted a lot, others posted a lot less. Some people only commented on posts and others did not comment at all. There were also participants who just read the blog and did not contribute at all.

The fact that a simple registration for a Blogger account is sufficient to join the conversation tells a lot about the various entry points and low barriers of the medium. However, no outsider joined the conversation during the course. Why is that? One explanation might be that the blog was positioned as a medium for students of the course Management of Immaterial Values with a list of approximately thirty contributors on the front page, which may have raised barriers for others to participate. In addition, the central topic of the blog was very

specific, which did not invite outsiders who were not completely familiar with the topic to join the conversation. This is essentially what Wenger (1998) describes when he talks about communities, participation, and non-participation. A community working on a shared interest inevitably creates boundaries that are not easily penetrated by outsiders.

Within the group, the opinions on boundaries and entry points were divided. One interviewee believed that everyone can share his opinion on a blog, and thus the barriers to participate are low. However, others believed that within the community the barrier to participate was raised, because everyone posted long and almost philosophical discourses. This created certain expectations on what a good post should look like. The interviewee felt that when you could not live up to that norm, you should not contribute.

> *"It is striking to see that there is a high barrier to post something. For instance, a post should be a great, long, and preferably philosophical treatise. Otherwise it will be condemned."*

Although one can hardly disagree with this statement, it is characteristic for the context in which the blog is used. Although the blog itself has low technological barriers, it was the group who created these moral barriers and the blog did not affect this. It cannot be said whether it was characteristic for the blog that these barriers were created.

Based on the previous description, it is reasonable to argue that blogs offer various facilities that support mutuality.

Wikis

The interviewees agreed that a wiki functions as a social platform for interaction, which is accessible to everyone at any time. This is considered as a big advantage. The interviewees felt that interaction is intense, because participants are all involved in the process of writing together on pieces of text. An important observation is that the interviewees felt more engaged with the work of other participants, because they could see how pieces developed over time. With traditional documents, this was considered a lot harder. Now they could see exactly when someone edited a piece and what changes he made. Participants could now read small chunks of edited texts, instead of having to read entire pieces at once. This increased the willingness to read parts written by others.

One interviewee complained about the a-synchronous character of a wiki. As with blogs, you cannot expect an answer when you post a question on a wiki immediately. This could take a few hours, or even days. The interviewee sometimes started a discussion on a wiki by adding questions to the wiki page. Nevertheless, whenever he did that, he wanted an answer right away, because at the time of posting the question, the problem was urgent. As he argued:

> *"The topic matters to you at the moment you post your question. You want an answer right away, because maybe you cannot continue with your work. With a wiki you do not get an answer right away."*

Although discussion was slow at some times, the interviewees did feel as if they were 'in it' together. They felt as if they were fulfilling a joint task of writing together on a report, which is probably best exemplified by the next statement:

> *"Everything functioned as one big wiki page. Everybody was allowed to edit. There was no such thing as 'his wiki page'. We do not think like that. But with traditional Word documents, this feeling of ownership is much stronger."*

As one interviewee stated, he felt more willing to help out other members, because he felt that it was more obvious when someone was in need for help. In a way, a wiki enables a form of engagement that enables people to offer help; even at times it may not be necessary.

The interviewees agreed that different levels of participation can exist on a wiki, but they noted that they did not experience it themselves, because they used the wiki in a small group where every participant had an equal share. As one interviewee explained:

> *"you could start participating by doing some spell checking. And while reading and becoming engaged with the community, you can slowly adopt more tasks as, for instance, writing entire pieces... It is through conducting small changes yourself, through which you get that hands on feeling, that is necessary to become more engaged in a later stage."*

Thus, it is clear that ways of belonging to various degrees exist on a wiki. The same counts for peripheral participation. As core members exist, so do peripheral members. Again, the interviewees did not experience this in their

small groups, but they agreed that peripheral participation is possible. For instance, people can just read a wiki page, and use the things they read in their own practices. They can also introduce conflicting or accumulative insights into the community by simply editing a wiki page.

Social bookmarking

The interviewees considered the social bookmarking services as a virtual platform where they could interact. The use of community specific tags raised the feeling of creating a place of their own within a larger group of people. Although there is little direct interaction among members, there are facilities for communication through time and space. For instance, members can use the services whenever it suits them, and they can start a discussion by adding bookmarks or by adding comments to existing bookmarks.

One interviewee felt as if there was a form of (indirect) interaction among community members. For instance, he told a story where he contributed information that he thought would be interesting to other members of the community. These bookmarks triggered a series of contributions on the same topic, which implies that there was some interaction among participants. Thus, the members who joined the conversation fulfilled a joint task of meaning making. He also argued that interaction among members with shared interests creates some sort of bond among them. He was more likely to trust (the contributions of) members with shared interests than the contributions of members he did not know very well. This made the interviewee feel more engaged with the community.

> *"You create a bond with certain people. Trust is an important factor... You (the community members) made me feel more engaged to the community."*

Social bookmarking offers facilities for peripheral participation. New members can simply join the community by introducing new tags and bookmarks. The community can decide whether they think that the contributions are fruitful. This also implies that there is room for ways of belonging to various degrees. For instance, core members can be distinguished based on their activity. There is also room for participants to just read the contributions of others, without feeling the direct obligation to contribute themselves. The openness of social bookmarking offers these forms of different ways of participating and offers many entry points to join the community. For instance, adopting a community specific tag would suffice to join a group.

> *"As newcomer, you see that they are talking about a certain subject. When you are interested in this subject, you may be willing to register to the service and than you can start reading about the communities' interests. When, at some point, you feel like you can make fruitful contributions, you can join the community by adding your own bookmarks and tags."*

The fact that you could only share a small portion of information, namely bookmarks, is considered a drawback of social bookmarking. Although the specific service under review also offers facilities for discussion and conversation, it may not be always sufficient. As one interviewee argued:

> *"The problem is that you can only share a very specific piece of information: bookmarks. Whenever you want to speak to a person, you use the phone. When you want to share documents, you use a wiki, or e-mail."*

In summary, although there is little space for direct interaction and communication among members on a social bookmarking service, it does offer facilities for indirect interaction, conducting joint tasks and peripheral behaviour.

Based on the above description, it is reasonable to argue that blogs, wikis, and social software offer various facilities that support mutuality. These findings are summarized in the first column of table 6.1 (p.80).

6.2.2 Competence

Competence is centred on the initiative and knowledgeability of the community, creating a form of accountability, and tools that are used by a community.

Blogs
The interviewees agreed upon the fact that the blog was considered as a means for sharing knowledge and information among the participants. They often posted messages to inform and help other community members. The example described earlier, where the term 'positive feedback' was discussed, was seen as a way of applying their skills and knowledge to solve a problem. It was also considered as a way of deepening and broadening the knowledge of a community. As one interviewee put it:

> *"The blog has contributed to the development of a shared repertoire."*

Which overall, increases the knowledgeability of the community. The competence of the community can be determined by analyzing the blog, which was argued by one interviewee who said that the blog represented the competence of the community. They also argued that they often based their opinion about a certain participant on the contributions he or she made to the blog. When someone added many intelligent posts, they were eager to learn more from him. This implies that the blog offers means to position yourself, as well as the community as a whole, and that it represents the competence of the community.

The interviewees agreed that there are multiple forms of accountability on the blog. Firstly, a form of accountability is created beforehand by the teachers, by 'forcing' the participants to use the blog. Although this is true, few interviewees considered this as a motivation to participate. Another form of accountability is the fact that people felt accountable for commenting on posts contributed by others.

> *"It is nice when others comment on your posts. You spent some time on creating a good post, but when no one reacts to it, and all you see is some views, you start thinking: why do I post at all?"*

This is an interesting phenomenon, because it implies that there is a certain accountability to comment on other contributions, which also motivated others to contribute more. Others said that they commented on posts, because they would appreciate it when others commented on their posts. This implies a certain accountability to the community.

A third form of accountability is that some interviewees felt that they had to participate on the blog, because they noticed that many discussions in class were based on contributions made online. This implies that when you do not participate on the blog, you are not aware of the contributions that are posted there, and you cannot participate in physical meetings.

The discussions that were going on were often focused on making meaning on a certain topic or concept. Most of the time, people introduced their own information and points of view to discuss a specific topic, which can be considered as a form of negotiation the meaning of things. Again, the example of positive feedback shows how the group negotiates the meaning of this particular concept.

The ability to comment on posts can also be considered as a means for exercising judgment. The reaction of community members on the 'nonsense posts', simple news facts that were not directly related to the course material

and which were merely copies of the original messages, represent a nice example of how the community exercised judgment. Although not everyone disliked these kinds of posts, the community made it clear through the comments that these kinds of contributions were not appreciated and that the community preferred posts that reflected a little more knowledgeability.

Wikis

The wiki is considered as a place where people create and gather knowledge together. The content of the wiki, in a sense, represents the competence of the community, because the central topics of interests are discussed there. The open structure of wikis, the fact that every member can add and edit text, can be seen as a possibility for applying skills. For instance, one interviewee argued that he felt as if he had to help out other members, because he had more knowledge about a certain subject. The open structure of the wiki allowed him to apply his knowledge, so the overall result got better. Thus, people can get involved in pieces of which they have the required knowledge to complete them.

Another important feature of the wiki is that it shows loose ends of documents. The interviewees all agreed that they created a sort of template of what their final products would look like. The fact that wikis create new pages the moment new hyperlinks are created offers insight into the parts that are yet to be written. As one interviewee said:

> *"... these loose ends motivate you to participate in the production of the document. "*

The open structure of wikis also offers facilities for exercising judgment. For instance, by editing or even deleting text you can show that you do not agree with what is written by others.

> *"Whenever I disagreed with someone I could just edit his text. It was one big wiki and everybody had the right to edit it."*

The interviewees also agreed that because they had the ability to add text to the wiki pages, they could also comment on pieces written by other members and share their opinion about certain pieces.

> *"An advantage of the wiki is that because we wrote the results of our brainstorm sessions there, you could also get comments from others. For instance, on what parts are good or bad."*

Thus, the interviewees consider the possibility to add comments as a way of discussing the central topics. Other interviewees also agreed that they used the discussion facilities of the wiki to negotiate on the central topics.

One interviewee argued that he felt as if during the process, individuals were responsible for the pieces they wrote. However, in the end they felt more accountable to the overall result as a group, because they all worked on overlapping pieces. The fact that every member participated in every piece made him or her feel more engaged and accountable to the overall product. A wiki can show who worked on what piece at what time, which also makes people accountable for individual parts. Another interviewee argued that the fact that the wiki showed who worked on what piece at what time also made him feel accountable to work on the wiki, because he could see when and how often others participated.

> *"It motivates me to work on the document when another group member worked on it."*

Thus, this statement shows that people felt more accountable when others participated actively. This leads to the conclusion that wikis offer multiple facilities for supporting competence.

Social bookmarking

Social bookmarking is ideal for circulating information within the community. As one interviewee argued:

> *"Social bookmarking has a positive effect on the circulation of information, and thus, learning. By sharing and browsing bookmarks, a form of exchange of information is stimulated."*

Core members play an important part in a social bookmarking community. As one interviewee argued, they define the focus of the community. They have the knowledgeability and status to steer the community. The knowledgeability of the community can be derived from the tags, but also from the types of bookmarks, opinions, and comments that are added to the site. Browsing a certain tag makes you more confident about the knowledgeability of a certain person, because you know that you stumbled upon that person because he shares a certain interest. When you browse certain user profiles, you also see bookmarks that are not related to your interests, which can (negatively) influence your image of the specific user.

The interviewees also shared the opinion that social bookmarking offers means for negotiating the enterprise:

> *"It is easy to adopt or abandon terms. If it does not fit into the community, you simply ignore these new tags."*

Thus, it is possible that in a short period, a movement from topics as knowledge management to learning, web 2.0, and back to knowledge management is perceptible. This can be achieved by simply introducing, adopting, or abandoning tags and can be described as a way of negotiating the enterprise. Another form of negotiation, which was less visible in the service under review, is negotiation through posting comments on bookmarks. There were a few discussions, but one interviewee felt that these discussions where not as rich and focused as the discussions he saw on weblogs.

The community also has the power to exercise judgment by ignoring topics or tags that are introduced in the community. For instance, one interviewee told how he introduced a bookmark about Suriname, which was not followed up by any contributions of other members. Clearly, this bookmark did not correspond to the general interests of the community, and was therefore ignored. Another way for exercising judgment, which is specific to the service under review, is the ability to exercise judgment through adding comments to the bookmarks. For instance, useless contributions can be commented with "not useful". This way, the community can make clear that certain topics are not appreciated. However, this form of exercising judgment was hardly used in practice.

The interviewees felt a certain accountability for the social bookmarking service. They described two types of accountability. Firstly, they felt that they were accountable for keeping the community as a whole, alive:

> *"When we look at the service, there are 1.000 regularly returning visitors, 400 registered users and 20 to 30 people who actually contribute on a regular basis. When these 20 people, of which I am one, stop contributing to the service, the community as a whole will fade into non-existence."*

However, this is a form of accountability that applies to the entire community. On a more detailed level, the interviewees felt they had to contribute because others in their CoP contributed. For instance, the group that used social bookmarking to share learning theories used a specific tag to distinguish them

from the rest of the community. This way, it was also visible when some member of the community contributed. One interviewee felt that he had to contribute when other members contributed, because it showed that you participated and that you were involved.

Considering the above treatise, it is reasonable to argue that blogs, wikis, and social software offer various facilities that support competence. These findings are summarized in the second column of table 6.1 (p.80).

6.2.3 Continuity

Blogs
Continuity is about, as argued, facilitating both reificative and participative memory. It is evident that a blog functions as a reificative memory. This thought was supported by the interviewees. One interviewee mentioned that he used information from the blog in his thesis, which proves that it functions as a repository of information. The information is stored in a central place where everyone has access to. It contains information that enables participants to join discussions and to learn on topics, without having to sort everything out for themselves.

> *"For me, the blog definitely functioned as a reference book. Thanks to the blog I did not had to sort out several things myself."*

Another interesting function of the blog is that, by some interviewees, it was considered as a repository for information related to their specific interests. Instead of browsing several other websites, forums, and weblogs, they felt as if interesting messages were now centralised in one blog. Others thought that the blog functioned as a link dump, which they did not quite appreciate. But the fact remains that a blog can fulfil this function.

The interviewees also argued that they saw the blog as a means for storing several types of information. Not only stories where posted to the blog, but also links to other articles and websites, college notes, and reflections on colleges were added. Sometimes a proposition was introduced to provoke a discussion. This shows the diversity of possible functions a blog can fulfil. Further, the archive- and search functionality allows you to browse the content of the blog easily.

In terms of participative memory, the blog, as argued by the interviewees, can function as a means for storytelling. The blog was often considered as an informal instrument where people could post thoughts, information and (short) stories.

> *"Yes, of course you can use a blog as means to contemplate. When you tell a story, you share your opinion. You present something that you have been thinking about."*

Wenger (1998) argues that participative memory consists of other aspects, like enabling generational encounters and apprenticeship systems. A blog, because it is an open and accessible system, offers opportunities for generational encounters. People can interact through posting and commenting, irrespective of age, location, and time.

Wikis

As the interviewees agreed, wikis function as repositories of information. Many interviewees used other wikis informally, like Wikipedia, to learn about topics they stumbled upon. More specifically, the interviewees also agreed that the wikis they used during their course functioned as repositories of information.

> *"We generated so much information: messages, e-mails, reports and so on. We wanted this information to be stored online, so that anyone could access it. We used a wiki to realize this."*

In addition, other interviewees argued that they saw the wiki as a place where they stored their reified results of other processes, like interviews and brainstorm sessions. One group argued that they only considered the wiki as a replacement for static documents.

Wikis also offer retrieval mechanisms, which were considered very useful. The link structure of wikis makes it extremely easy to navigate through the collection of pages. In addition, wikis contain full text search engines by default.

In terms of participative memory, the role of the wiki is less clear. The interviewees agreed that the wiki could function as a place where people could tell a story, but that was about it. Of course, the open structure makes a wiki available to everyone, so people could meet each other online. For instance, the discussion room offers facilities to start a conversation, but in the groups that were involved in this study, discussion was limited to the people involved in the community.

Social bookmarking
As with blogs and wikis, it is almost needless to say that social bookmarking services function as a reificative memory: places where people can store their bookmarks and where they can retrieve these bookmarks at any time. As one interviewee put it simply:

> *"To me, social bookmarking services function as repositories of information."*

Retrieval is possible through browsing tags, user profiles or by searching tags or full text messages. For some interviewees, social bookmarking literally functioned as a portal to new information, resources and users. Some interviewees mentioned that they had a certain ritual on the social bookmarking service. Part of this ritual was that they browsed several profiles of users they thought were interesting to monitor. This can be considered as a form of participative memory, whereby people follow other users over a longer period.

As the interviewees agreed, social bookmarking does offer facilities for telling stories and discourses. However, in practice, this functionality is hardly used. In the case of the service under review, only a few members share a useful opinion, and even fewer share an opinion that looks anything like a story.

What can be considered as a disadvantage is that, as direct interaction among people is limited, visual encounters among members is problematic on a social bookmarking service. Participants can create an image of other members, about who they are, and what their main interests are, but they cannot virtually meet. As mentioned earlier, users can stumble upon interesting members, but they have to use other services to get in touch with them. This is partly resolved by a function that is implemented in the bookmarking service under review, which offers the ability to send e-mails to other community members, but that, of course, has little to do with social bookmarking.

The above treatise is summarized in the third column of table 6.1 (p.80). In the next section, the differences with the theoretical framework of engagement (see §5.1, p.54) are discussed.

6.2.4 Confrontation with theoretical framework

Blogs
When considering blogs, in terms of mutuality, the interviewees did not agree

whether the blog created an online community, although they did mention that it functioned as a platform for interaction. Statements about building trust and relations are absent in the empirical results, because these statements were not explicated by the interviewees. In the empirical results, the focus is more on collaboration, like working on joint tasks and helping each other out. This was not derived from the literature. In addition, the interviewees did not mention other technological features that were described in the theoretical framework, like trackbacking, permalinks, and RSS. This is due to the fact that the interviews were held on a somewhat abstract level. Thus, these statements are not described in the empirical framework. This however, does not imply that these functionalities do not contribute to the development of engagement.

When considering competence, the empirical results were more closely related to the theory of Wenger (1998) than the theoretical results. For instance, the fact that the blog represents the knowledgeability of the community was explicitly mentioned by the interviewees. The empirical results showed different forms of accountability. For instance, a form of accountability for the blog and the community was mentioned by the interviewees, which was not derived from the literature. The accountability may be influenced by the fact that the blog was used within an existing community, which may cause moral barriers to participate.

In terms of continuity, no discrepancies were discovered between the theoretical and empirical results.

Wikis

When considering wikis, in terms of mutuality, the empirical results did not show that a team is created during the process. This can be explained by the fact that the interviewees already felt as if they were a team, mainly because they knew each other beforehand and because they worked together previously. The hyperlink structure was not considered as an interactional facility by the interviewees and they did not mention the importance of anti-credentialism explicitly. This can be explained by the fact that they worked in small groups of equal users. Thus, credentialism in these groups was not an issue at all. Although it can be argued the interviewees used the wiki to create and gather knowledge, the interviewees did not mention it explicitly. Thus, this statement was also removed from the empirical framework. As with blogs, the focus was on interaction, helping each other and carrying out joint tasks.

In terms of competence, the empirical results told more about knowledge

creation and the application of skills than the theoretical results. The instant error correction that is often mentioned in literature was not mentioned by the interviewees. This can be explained by the fact that the process in these small groups was more centred on the creation of a final report. Direct error correction had less priority than guarding the overall quality. Accountability, which became clear in the literature, was expanded by the interviewees. They felt that they were not only accountable for the overall result, but also for the specific parts they contributed. The latter was not derived from the literature.

In terms of continuity, the history of knowledge on a wiki, as mentioned in the theoretical results, was not mentioned by the interviewees. The empirical results showed that the content of the wiki could function as means for orientation (see §6.3, p.96). The fact that wikis can trigger group memory, which improves the overall result was not derived from the empirical data. Maybe this is due to the fact that the groups were too small.

Social bookmarking

When considering social bookmarking, in terms of mutuality, the empirical results did show that the social bookmarking service created a form of relationships and trust among participants. The latter was not explicitly mentioned in the literature. The data also showed explicitly that the interviewees considered their behaviour as a process of collaborative meaning making. This differs somewhat from the literature, where social bookmarking is mostly positioned from an individual perspective. Specific functionalities like RSS, which are often mentioned in literature, where not explicated by the interviewees. In other words, it seems as if they do not find these kinds of functionalities decisive for the success of the service. Again, this can be explained by the fact that most of the interviews took place on a more abstract level.

When considering competence, the focus of the interviewees was more on the collaborative use of the service, for instance, as means for circulating information, the role of core members, and the knowledgeability of the community, which is reflected by their behaviour. As with blogs, social bookmarking creates a form of accountability that is not explicitly mentioned in literature, namely the fact that contributions of participants trigger others to contribute as well. This can be a result of the group perspective that is chosen in this study.

In terms of continuity, the empirical results showed that the interviewees followed interesting users over a longer period. This way, they stayed in contact with their community. Thus, tracking user behaviour is an important function

	Imagination		
	Orientation	Reflection	Exploration
Blogs	· Offers insight in interests of individual- and community members. · Location in time through time stamped contributions and archive · Posts and comments linked to participants, thus visualizes the community · Holds stories · Process is transparent	· Posts hold ones own contemplation · Functions as tool for conversational knowledge management · As means for reflective monologues · As means for reflective dialogues · Different types of posts break the rhythm of the community	· From the individuals perspective to introduce new insights in the community · From a community perspective to explore new insights and connections · As means for experimenting new thoughts, philosophising on the future · Creating alternative scenarios through posting and commenting · Variety of type of posts introduces pleasant breaks of rhythm and play
Wikis	· Content represent what the community is about · Content and activity shows who is involved and how · Content shows how the community functions · History gains insight in development over time · Process is transparent	· Offers facilities for asynchronous conversations · Offers facilities for comparisons with other practices · Can hold the reified results of reflection processes · Can function as source for reflection	· New page function as means for exploration to other members · Hyperlinking enables exploration · Pages can be used to introduce and try out new and interesting things · Contributions of others can offer new insights
Social Bookmarking	· Folksonomy offers broader perspective than individual bookmarks · Create image of community · holds short descriptions · Functions as transparent, open space · Location in time through time stamped contributions	· Storing short opinions with bookmarks offers ability to reflect · Folksonomy reflects representations and patterns of the community · Comment on bookmarks offer facility for conversation	· Exploration through browsing tags or user profiles in stead of answering existing questions · Introduces new terms and concepts · Pushing boundaries by discovering new insights

Table 6.2: Refinement of framework social software and imagination.

when social bookmarking is used in small groups. Although not explicitly mentioned in the literature, the interviewees did feel as if they could tell short stories with their bookmarks. This differs from traditional approaches of bookmarking, where bookmarking is often fast and more selfishly oriented.

6.3 Imagination and social software

Imagination is necessary to deal with broader contexts. In terms of design, imagination includes, as discussed in §5.2 (p.63), facilities of orientation, reflection, and exploration.

6.3.1 Orientation

Blogs

As the interviewees argued, the blog offers various ways for orientation. One

interviewee argued that the blog offered insight into the topics of interest of other community members and that it showed what was going on within the community. The collection of posts gave insight into the focus of the community:

> *"Yes, I have been able to form a clearer picture of the course. The blog has helped me in creating this picture."*

However, the structure of the blog (postings where in reversed chronological order) was sometimes considered as a drawback, because for some interviewees, it made it more difficult to position the community. Nevertheless, the time stamped contributions do enable a form of orientation in time, because there is a possibility to go back to the beginning of the blog, browse the archive of the blog, and analyze how the topics developed over time.

The blog also offered insight into the composition of the community. Posts and comments where linked to a participant, so you could see who contributed what at what time. This allows you to form a picture of active and passive members. However, although you can see who adds posts and comments, you could not see who read the posts and comments. So, when no comments where added to a post, you had no idea whether anyone did anything with the post. This was also considered as a drawback.

As argued earlier, the blog was considered as a means for storytelling. This implies that the blog also holds stories. As the example of the positive feedback case shows, the blog was also used to hold explanations and examples. Therefore, the blog can also be used as a way to locate the meaning of the community.

The interviewees argued that a big advantage was that the process of the blog was extremely transparent (although the blog itself was considered less transparent). In terms of Wenger (1998), this means that it is easy to locate the power in the community. In this case, there were approximately thirty members who all had equal rights, they all could post and comment. Traditionally, the hierarchy is somewhat stricter with blogs. Often, one person or a few persons have the ability to post messages, while many people have the ability to post comments. This is in essence the only process that takes place on a blog.

> *"In blogging, the process is, in fact, simple. Someone posts a message, others respond through comments. And others just read..."*

Wikis

According to the interviewees, a wiki is an ideal means to position a community

and to decide on where it is heading. It offers facilities to orient how the community developed over time, by keeping a list of 'recent changes' that were made over time. In addition, the 'history' option keeps a copy of every version of the wiki page. A new version is created every time a page is edited, whereby browsing the history of a page can show how an area developed over time.

> *"The history of pages that is created offers insight into the process that has taken place on the wiki, and within the group."*

The wiki pages itself were considered to be a good representation of the focus of the community. The groups used the wiki to store nearly anything, from documents, to stories, examples, explanations, interview results, links, articles, reflections and so on. As one interviewee argued, he felt as if they could use the wiki as a means to position themselves within the broader context of the course in which they were involved. They wanted to create a platform where other students could see who they were and what they were doing with their project. In a sense, they used the wiki as a means for others to orient themselves on the project of the interviewee. He felt as if the content of the wiki could create a sufficient picture of what was the main purpose of the community, who was involved, who was active and who was not.

> *"We wanted to use the wiki to give others the opportunity to participate in and comment on our project en to position ourselves within a broader context."*

The participants also felt as if they were more engaged, and better informed with their own projects than when they used traditional media. Because there was an online discussion platform, they felt that they could better understand each other's thoughts, or at least they felt that it was easier to gain insight into ones thoughts. According to one interviewee, the visibility of loose ends, recent changes and pages itself enable participants to get acquainted with the project very fast. The transparency of the wiki and the process that takes place was considered an advantage to the interviewees to feel more engaged to the community.

Social bookmarking

One important facility for orientation in social bookmarking is the tag cloud, because bookmarks are categorized in main categories. Although there is a lot to say about whether tagging is accurate or not (which is discussed in §3.2.3,

p.30), the interviewees felt that a tag cloud offers a great insight into the main topics of interests of the community. Furthermore, when browsing specific tags, the suggestion of related experts and related tags offer further refinement to give meaning on what is happening in the community:

> *"In social bookmarking, it is easy to determine the location of the community, by simply analyzing the cloud of information."*

As one interviewee mentioned, the functionality that suggests related members when you browse a tag or other profile, offers insight into the way the community is put together. For instance, you can distinguish between main contributors, experts, and more passive members.

Although not well developed, it is possible to orient on the development of the community. Contributions are stored with a date and time, thus in theory, it should be possible to visualize how a community has developed over time. It would be better if, for instance, tag clouds could be generated that represent the state of the community six months ago, one month ago, and today. This way, you could track the development of interests of the community over time.

The transparency and openness of the process of social bookmarking is also something that was highly appreciated by the interviewees. Simply adding a bookmark, writing a short opinion, or adding some tags is sufficient to join the community. This process transparency lowers the barrier to participate and offers insight into the way the community functions.

A drawback mentioned by the interviewees is that social bookmarking does not offer very good facilities for holding stories. Firstly, the interface does not always invite you to write full stories on a bookmark. Social bookmarking is, in essence, about storing and sharing interesting bookmarks online, thus people do not take the time to write long reflections or stories about their contributions. Thus, social bookmarking is more often used to store and share stories that were written elsewhere. Another point worth mentioning is that one interviewee felt as if he was constantly sharing someone else's story instead of sharing his own.

The above treatise describes facilities of blogs, wikis, and social bookmarking that support orientation. This treatise is summarized in the first column of table 6.2 (p.96).

6.3.2 Reflection

Blogs

When considering reflection in more general terms, it seems obvious to say that blogs offer facilities for reflection. This statement is widely supported by various interviewees. The story that someone posts on a blog often represents ones own contemplation, something that Bartlett-Bragg (2003) calls a reflective monologue. It offers the ability to structure your thoughts, and to wait for others to comment on it:

> *"The value of a blog lies in the fact that I can post my thoughts. Although I am not always sure how I should capture these thoughts, I just write them down and wait for others to react on it."*

A blog also offers the possibility to contemplate on the development of the entire group. In this case, the blog represented the reflections of the entire community, thus it also offers the facilities to step back and look at what we are doing, as an individual as well as a community. The process of meaning making, what is described in the example of 'positive feedback', can be seen as a reflective dialogue (Bartlett-Bragg, 2003), where multiple participants reflect on the meaning of the term and where they try to create a shared meaning through reflective posting and commenting.

> *"You can learn from a blog, because someone has a picture of a subject in his mind and you have a picture of the same subject in your mind. When these pictures do not match, you can start a discussion to see where both pictures collide. Then, you can create a shared picture through discussion."*

The definition of reflection of Wenger (1998) also entails things as models and representations of patterns, facilities for comparisons with other practices, and conversations. As written before, the interviewees thought that the blog, although a-synchronous and maybe not as rich as face-to-face communication, offered facilities for discussion and conversations. It is also reasonable to state that blogs offer facilities for comparison with other practices, for instance, by starting a discussion on a topic that was first posted on another blog.

> *"When someone posts a link to another article, including a summary, and then starts a discussion, then it becomes interesting."*

When talking about reflection, Wenger (1998) also talks about breaks in rhythm. In some way, this was also visible on the blog. Not every interviewee agreed on the value of these posts, but many 'nonsense' posts, light posts that were short and introduced a funny story or short news item, where posted together with the more weightier posts. These posts functioned as a form of entertainment and resulted, according to some interviewees, in more activity on the blog.

> *"I think the 'posting for the posting' is quite positive. Some nonsense every now and then creates a great diversity. "*

Wikis

When considering reflection as a means to step back from what is going on and to contemplate on what is happening, a wiki offers facilities to document the results of this reflection process. In a sense, a wiki functions as a platform for reflection, as mentioned by several interviewees. However, one interviewee also argued that, in his opinion, reflection on a wiki does not differ from any other kind of reflection. It is just a place for storing the results of the reflection process. An advantage is that the results of this process are directly accessible to every other participant, which means that the content of a wiki can also deliver the input for the reflection process of other members. As one interviewee stated:

> *"The wiki functions, in terms of reflection, as the source of other reflection processes... We also write down things we have read and what we think about it. You could say that that is a form of reflection."*

As one group argued, they used the wiki sandbox (a place where you can test the functionality of the wiki and where you can try things out) to share information related to their project. They also introduced information from other projects, which implies that a wiki could offer facilities for comparison with other practices.

The discussion section on the wiki, or the discussions that some participants held at the bottom of the wiki pages, can be seen as a form of asynchronous conversations.

> *"On a wiki, you can brainstorm about a subject, and you can get reactions on it."*

Social bookmarking
Social bookmarking offers facilities for reflection in that it offers facilities for seeing patterns between users or subjects. For instance, as one interviewee argued:

> *"For instance, when I am interested in knowledge management, I browse these related tags. For me, it offers new perspectives when someone adds a bookmark tagged with both 'knowledge management' and 'learning'. It makes me wonder if there is maybe a connection between both terms."*

By adding your opinion to a bookmark, there is a possibility to reflect on the bookmark you contribute. However, as this is not the main function of social bookmarking, reflections are often short. As one interviewee stated:

> *"Writing an extensive opinion about a bookmark is a form of reflecting on the contribution you make. This can be very interesting. However, these extensive opinions must be given, which does not happen too often."*

Something that is specific for the service under review is that there is a possibility to comment on bookmarks. As in weblogs, adding comments triggers discussion, which can be seen as a-synchronous conversations. Overall, we should conclude that social bookmarking offers few facilities for reflection. The above treatise is summarized in the second column of table 6.2 (p.96).

6.3.3 Exploration

Blogs
The interviewees shared the thought that blogs are an ideal means for including and posting things you have heard or seen, and to share these with others. Thus, this is a form of exploration where, for the poster, information that he or she stumbles upon outside the community is related to the subjects in the community and introduced through a posting on the blog. For the other community members, this new information offers new insights that might not have been visible beforehand. Thus, this might introduce new concepts of which you might not have thought of yourself, introducing connections you otherwise would not have seen.

> *"There were many posts that were not directly related to the course. A form of mind expanding, yes... New things that were posted on the blog could shed new light on subjects, introducing connections you might not have been aware of before."*

A diversity of subjects and community members stimulates this process, as argued by one of the interviewees.

One interviewee saw the blog as a means for philosophising on possible features, to see where things were heading, and what his vision was. Not many interviewees thought of the blog this way, but what they did share is that they saw a blog as a means for creating alternative scenarios. For instance, the case of positive feedback was considered as a serious discussion where people openly doubted others opinions, and where they asked whether it could have different meanings than the one suggested. Thus, the process of introducing alternative sources and opinions can be seen as a form of creating alternative scenarios.

Another interesting point is that the interviewees attached much value to informal processes. For instance, a visit to a social entrepreneur was reviewed on the blog with pictures of the event. Besides weighty posts, some lighter posts were added to introduce a little play in the community. This phenomenon was also described in the part on reflection, where it was argued that these posts resulted in pleasant breaks of rhythm. As one interviewee put it:

> *"For one part, you want education, for the other part, you want entertainment. Our blog offered both."*

This is an important observation, because it becomes clear that not everyone wants to be taught all the time. Some lighter subjects, a little entertainment is necessary to keep the community motivated. As the interviewees argued, the blog ensured this.

Wikis

The opinions about exploration, in terms of wikis, were diverse. For instance, the functionality to introduce new pages by simply adding links to the page was considered as a means for exploration by some interviewees, while another interviewee called this a form of constriction. As the interviewee argued, creating a new page would be constriction for the individual who created the link, because he has a vision of how the end product should look like and by creating a new page, he narrows down towards this objective. On the other hand, creating a

new page can also be seen as introducing a new, uncultivated area. A new page introduces a new part of the wiki that has to be filled. For other members, this new page could function as a means for exploration, because it might bring them new insights of which they did not think before.

> *"When you write something down, or create a new page, that does not contribute to the exploration process of the one writing it down. On the other hand, it may contribute to the exploration of the other members of the community."*

One group also thought of the wiki sandbox as a place for exploration. They used this separate part of the wiki as a place where they could introduce new topics, new interesting articles and to try out other things. This offered new insights for other members, as well as the possibility for others to think about their project from different perspectives. In a way, this really contributed to their exploration process.

> *"The wiki sandbox functions as a free wheel tool to post and share things you stumble upon."*

It needs to be said, however, that this explorative character is deeply rooted in the mentality of the group members. As the interviewee said:

> *"Actually, we are constantly trying to make this project as fun and as challenging as possible. We are constantly trying to find new and interesting things we could use."*

Social bookmarking

As most of the interviewees argued, exploration is one of the main functions of social bookmarking. Exploring can be achieved by browsing other user profiles, or by browsing other tags. The main difference with traditional search engines is that you do not have to have an initial question before you can start exploring. When someone uses Google, he has to have a preliminary question, or idea, that needs to be answered. With social bookmarking, you can start exploring by simply clicking a tag, without any preliminary question or idea in mind. This is an important difference with traditional search, which, at the same time, is a major strength of social bookmarking.

> *"In stead of searching with Google, I just browse tags and profiles of users that share the same interests as I do."*

In fact, social bookmarking offers bi-directional exploration. Firstly, individual users can introduce information for other users to explore. Secondly, individual users can browse profiles of other users and tags to discover new interesting sources. This way, exploration can introduce new terms and insights and can offer a way for pushing boundaries, by exploring beyond existing boundaries.

> *"You can push or go beyond your existing boundaries because other members introduce new insights. You visit sources you would normally never visit."*

The above treatise is summarized in the third column of table 6.2 (p.96). In the next section, the differences with the theoretical framework of imagination (see §5.2, p.63) are discussed.

6.3.4 Confrontation with theoretical framework

Blogs

When considering blogs, in terms of orientation, the empirical data showed that the structure of blogs makes orientation not only possible, but also easy. For instance, existing literature does not mention the use of archives as a means for deciding on the location of the community in time. However, the interviewees felt as if a blog archive can function as such. In addition, the ability to relate posts and comments to users offers facilities to orient on the composition of the community. These aspects are not explicitly mentioned in the literature.

In terms of reflection, the results from the theoretical and empirical analysis did not differ much. One important additive is that the interviewees considered the use of various types of blog posts (from serious posts to more entertaining contributions) as a means for breaking rhythm. Whether blogs enable deep learning is hard to say based on the empirical data. The opinions of the participants differ whether the blog contributed to their learning experience or not. However, it can be argued that the fact that blogs support reflective monologues and dialogues also enables a form of deep learning. Thus, the statement about deep learning is removed from the empirical results, but the ones on reflective monologues and dialogues are preserved.

The empirical data showed a distinction between two approaches of exploration, namely from an individual perspective to introduce new insights and

from a community perspective to explore new insights. This distinction was not clearly visible in the literature, but it also relates to the specific context in which the study was conducted. Again, technical functions were not mentioned explicitly by the interviewees, thus the role of permalinks and trackbacking was removed from the empirical results. The empirical data did show the thought that blogging introduced play to the community in that the interviewees could introduce interesting, contradicting, and funny stories to the blog. For some interviewees, this had a positive outcome to their overall experience.

Wikis

When considering wikis, in terms of orientation, the empirical results showed that orientation is possible on wikis. Various functions like recent changes, history, and signed entries offer insight into the composition, history, and development of the community. This was not explicated in the literature, but can be related to the fact that wikis were used in small groups.

In terms of reflection, the wiki principle that people are encouraged to publish little, erroneous, or incomplete information, was not experienced by the interviewees. This can be explained by the fact that wikis were used in small groups with a clear objective. The fact that interviewees did not feel encouraged to do so does not imply that they did not post incomplete information. In fact, every time they added a small piece to their wiki, they posted a little bracket of information, which was not always complete. The process of incremental knowledge creation through question and answering was not always reflected in the empirical results, although the interviewees did argue that a form of discussion was possible on the wiki pages. In addition, enabling deep learning was not reflected in the empirical results. This can be explained by the fact that the participants used the wiki to write a specific report. This does not differ much from writing a report in a more 'traditional' format. However, the wiki did enhance a feeling of engagement.

In terms of exploration, the empirical results showed that exploration was mainly triggered by the contributions of other members. In addition, specific pages can be used to try new things out. These aspects were not much explicated in literature.

Social bookmarking

When considering social bookmarking, in terms of orientation, the similarities between the theoretical and empirical results can be found in the use of the

folksonomy. The folksonomy offers insight in the composition, development, and goal of the community. The empirical results also showed that the time stamps with contributions could function as means for orientation in time, which was not explicated in the literature.

In terms of reflection, the only distinction between the theoretical and empirical results is the fact that the empirical results showed that the ability to comment on bookmarks introduced facilities for reflective dialogues. However, this is only applicable to the specific service under research, because this service implemented a blog-like functionality. It can be questioned whether this is characterising for social bookmarking.

In terms of exploration, the main difference between the empirical and theoretical results is that the empirical results showed that the participants used social bookmarking explicitly to introduce new terms and concepts. This can also be related to the fact that the service is used in a small group of people, who bookmark for each other.

6.4 Alignment and social software

Alignment, as discussed in §5.3 (p.68), consists of facilities of convergence, coordination, and jurisdiction.

6.4.1 Convergence

Blogs

Just as in the 'normal' blogosphere, the interviewees experienced as if they shared a common focus on the blog. Some interviewees even argued that the main objective of the blog was to create a common focus among the participants. The interviewees thought that the participants had a shared interest on the blog. They shared an interest for information technology, which is also the reason why they choose to follow the masters program and why they ended up in the same class using a blog in the first place. The interviewees also argued that the objective of a discussion on a blog was often to come to a shared understanding on a certain subject:

> *"On the blog, you see that people post a question and that others are continually trying to work towards an answer. Most of the time, the*

			Alignment
	Convergence	Coordination	Jurisdiction
Blogs	· Participants create common focus during use · Create shared understanding on subjects · Quantity and quality of peoples behaviour can push one in natural leadership roles · Is source of inspiration for offline interaction	· Functions as boundary object · Offers means for renegotiation through commenting · Participating on multiple blogs enables brokering and multimembership	· Can function as placeholder for rules, policies, and contracts · Authority is located at the level of blogowner(s) · Community regulates itself by approving or disapproving certain types of posts
Wikis	· Participants share common focus, and interest · Natural leaders can emerge from the community · Openness and share-a-like are main principles · Can offer new sources of inspiration · Comply to conventions created by the group	· Process is very straight forward · Offers means for spreading information within community · Offers means for coordinating internal processes · Ease of editing pages and paragraphs make division of labour easy. · Functions as boundary object · Participating on multiple wiki(pages) enables brokering and multimembership · Wiki sandbox can function as place for data collection	· Can function as placeholder for rules, policies, and contracts · Enables people to participate in the creation of policies, contracts and other types of documents · Requires less management, and authority · Authority is distributed to the level of the participants
Social Bookmarking	· Community develops common focus · Bookmarks can function as source of inspiration · Allegiance to the community, to share what might be of interest to community members · Experts on topics emerge naturally based on participation · Openness and share-a-like are main principles	· Service has its own conventions on using the service (like tag syntax) · Spreads novelty and transmits information · Community develop their own way of using the service to separate from the rest · Functions as boundary object · Participating on multiple services or through using multiple community specific tags enables brokering and multimembership	· Steer community by introducing, adopting, or ignoring tags, topics, or users · Place comment with bookmarks to determine appropriateness or quality · Authority is located at the level of the community

Table 6.3: Refinement of framework social software and alignment.

> *teachers ended the discussion with a final statement or answer, with which everyone was satisfied."*

However, this statement was not supported by every interviewee. One interviewee had the feeling that not a single discussion ever reaches a conclusion. This conflicts with what other interviewees said about the discussions.

Not every interviewee shared the opinion that the participants on the blog shared a common focus. Some argued that the focus was quite abstract, in terms of meaning making on the central theories. However, the subjects on the blog itself were quite broad, which made some participants think that the blog consisted of much information that was irrelevant to them.

> *"In a community, there is a central topic of interest. I did not feel as if we had a central topic of interest. In part yes, but not entirely."*

An interviewee considered the common focus that the participants shared as very strong. As he argues:

> *"Well, you could try to introduce your own ideas, but in the end, it is the blog that holds the central topic."*

Thus, the blog, in this opinion, held the central topic of the course. This is also supported by the argument that the blog was considered as a real source of inspiration for the discussions during class, which implies that the content of the blog was leading the community.

The interviewees also shared the opinion that the blog played a part in the creation of status among members. For instance, intelligent posts or active behaviour created a form of hierarchy among the members and pushed some members in a natural leadership role. One interviewee also stated that he thought that such natural leader could determine the direction of the community by introducing contradicting subjects. A person with less status would not accomplish that. One interviewee also argued that people, who fulfilled a sort of leadership role in class would probably fulfil such role online as well.

Wikis

Convergence, in terms of wikis, is expressed by the common goal that participants on a wiki often share. As the interviewees argued, they felt as if they were working together on a shared interest. As one interviewee stated:

> *"I think you could definitely speak of convergence in our case. We are working towards a shared goal: finish the final report."*

The interviewees felt as if the entire wiki was their responsibility. It allowed them to work with multiple people on the same objective. This creates a certain common focus among the participants. The interviewees shared a concrete goal, but on other wikis, the aim is often a little more abstract. For instance, in the case of Wikipedia, the purpose can be described as creating the best online encyclopaedia, or in case of a single page, to create the best description of a single subject as possible. In this sense, the objective is never reached. Wikis are, in a sense, always emergent. The people who participate in the wiki share a set of values, principles and interests. This was also supported by one of the interviewees, who felt that the wiki culture required a different set of principles and values than other means of collaboration. As he stated:

> *"You should be open to the way wikis functions. That is a certain culture. You should be open to the fact that anyone can edit, or even delete your text, without feeling weighed down about it."*

Although the interviewees felt as if they were all equal in their surroundings, they did feel as if natural leaders could emerge from wikis. For instance, one interviewee considered himself as the leader, because he was the site admin, had a little more rights than others, and had set up the wiki. In a way, he decided on the way the wiki should be used. As he argued, the other participants complied with this standard instantly. They also felt that by the intensity of participation, leaders could emerge from the community.

As described in terms of exploration, peoples' contributions to the wiki can offer new insights for other members. In a way, these contributions could function as sources of inspiration for the community.

Social bookmarking

Especially when social bookmarking is used within small groups, a clear common focus or interest is developed that is visible in the tag cloud of the social bookmarking service. This became clear in the interviews. For instance, the group that used the tag 'IMP' had a clear common focus, which was visualized in the tag cloud. They wanted to learn about learning theories:

> *"Take, for example, 'IMP'. We said we wanted to talk about learning theories and we use social bookmarking to store and share Information about learning theories."*

On the level of the entire community, interviewees felt as if there was some form of community forming. The interviewees felt as if there was some form of common focus and shared interest among participants. An interesting discussion emerged from one of the interviews, which resulted in the conclusion that the interviewee contributed to the community out of a community interest, instead of self-interest. In fact, he felt a form of allegiance to the community. Normally, social bookmarking is defined as selfish (Shaw, 2005), but for the first time, he felt that he contributed because he wanted to share something with other members:

> *"I stumbled upon an article and I literally thought: "this is something for him". So I added it to the service and shared it with the rest of the community."*

One interviewee also argued that the community on the social bookmarking service that is under review in this thesis formed a source of inspiration for him to join the community. As he argued, he thought the central subject was interesting, so he decided to join the group. He also argued that the existing community would most likely grow with people who share the same interests. People visiting the community today will notice that the central topics include things as knowledge management and web 2.0, and the change that people join the community that do not share this repertoire, is small. Again, boundaries are visible that were created by the community.

Another source of inspiration forms the frequency in which the same bookmarks are added. As one interviewee argued:

> *"Social bookmarking inspires in a way that you stumble upon new interesting sources, which you would not see otherwise. For instance, when 2 or 3 people shared the same bookmark that corresponds to my interests, I am more willing to visit the link."*

The specific social bookmarking service under review also offers special functionalities to identify leaders, or experts on a certain topic. Browsing the tag 'IMP' proves that this works[1]. The three people that were in the community of IMP are all classified as experts in this area. As one interviewee argued, social bookmarking also involves natural leaders, based on their bookmarking behaviour.

> *"When I browse tags and I stumble upon users, I am more likely to trust the quality of the posts, because the contributions are filtered by tag... I am more likely to trust people I stumbled upon this way, because I know they share my interests. The next time I visit the service, I am more likely to browse this user profile to see if interesting posts are added."*

This implies that social bookmarking offers facilities for convergence. Inspiration, leadership, and common focus are aspects that are supported. The openness and share-a-like mentality, which is central to Web 2.0 and social software, is also supported by social bookmarking.

This section described the facilities offered by blogs, wikis, and social bookmarking that support convergence. These findings are summarized in the first column of table 6.3 (p.108).

[1] Checked http://watvindenwijover.nl/IMP at 29-05-2006, 10.00 am.

6.4.2 Coordination

Blogs

Coordination, in respect to the blog, can be described as the blog introducing a standard method for interaction. The process on the blog was transparent. People post potentially interesting information, others comment on these posts and others read the posts. As described in terms of exploration, the blog was used to transmit information and to spread new information within the community. It also functioned as a means to renegotiate meaning within the community. The blog, in a sense, had a very informal character, without many rules and procedures, or hierarchical constraints.

One interviewee argued that he thought that coordination on the blog was problematic, because posts were forced to the background quickly, and it was hard to monitor active and interesting discussions:

> *"I think that discussion was not very good on the blog, because when you did not visit the blog for a few days, you had to read through many new posts to get up-to-date. This does not work very well."*

The blog can function as a boundary object, in that it contains reified information that can be used by multiple communities. A blog also offers support for multimembership, because it is easy for other members to subscribe and join the conversation. Blogs may also function as a platform for brokers, in that it is possible for brokers to join multiple communities and introduce aspects of one practice in another practice. It does not require that much imagination to see that a blog can support these facilities. However, this was not visible on the MIW blog.

Wikis

The interviewees agreed that the main reason why they choose to use a wiki, was because they wanted more control over the entire process, because they did not want trouble with version history, and because they wanted to spread information within the community easily. These can all be considered as facilities of coordination. An important advantage is that the process is considered a lot faster and more efficient, because people do not have to wait on others to finish their parts. The latest version is always online. Even when people did not finish their parts entirely, people could start working on their own pieces. Thus,

the process is efficient and extremely straightforward. This makes coordination easier.

> *"You can always start working on your pieces instantly. To most up-to-date version is always online. You can even start when others only finished half of their part."*

As some interviewees argued, they also used wikis to coordinate their internal processes. For instance, they created to-do lists in a wiki page, so that everybody could see what had to be done. The fact that everyone could edit every page was also used to divide labour among participants. Although one interviewee argued that they worked on every single piece of the wiki together, others said that they could easily assign paragraphs or pages to people who were most capable of writing those pieces. This way, division of labour becomes very easy.

The interviewees agreed that the wiki could also function as a boundary object. One interviewee was thinking of keeping their wiki online after they finished their project so they could share the content with other communities. This way, the wiki could be used by other practices, and thus, could function as a boundary object.

> *"Yes, the wiki could function as a boundary object. We are dealing with many different communities now. We are thinking of introducing the wiki in those communities to."*

Although the interviewees did not experience situations where brokers were active, or multi-membership was visible, they do agree that wikis offer facilities for brokering and multimembership. For instance, in the case of Wikipedia, it is clear that some users are active in various subject areas. They are, in a sense, part of multiple communities. It also possible to introduce aspects of one community into another community, thereby operating as a broker among multiple communities. The wiki sandbox was a great example of how one group used the wiki to create a central place where they could collect and store data about their project.

Social bookmarking

In terms of coordination, the collection of bookmarks on a social bookmarking service can function as a boundary object for other communities. The collection functions as a reification of the communities' interests, which can be viewed by

browsing the collection of bookmarks. By introducing new interesting bookmarks and tags into the community, the service can also function as a means for spreading novelty and for transmitting information within the community.

Purely technically speaking, there are a few conventions that apply when using bookmarks. For instance, as a community, you should determine how you use tags. One interviewee explained how they used a certain tag 'IMP' to store and share information with other project members. For starters, to join the community, you should negotiate the tag IMP. Secondly, within the community you have to negotiate how you tag specific information. For instance, bookmarks that are tagged as *social_cohesion* and *social-cohesion* are separated, and thus not easily retrievable. Although these conventions should be negotiated, the result is that a univocal way of storing bookmarks is created, which lowers the barrier to participate and makes the process of bookmarking transparent.

One interviewee also told about a specific user who was eager to create multiple communities within the social bookmarking service. He shared bookmarks on multiple subjects, which can be seen as participating in multiple communities. Simply adopting and using specific tags of various communities can be seen as a way of joining multiple communities. This implies that social bookmarking offers facilities for multimembership. Another observation from this interviewee was that the same person tried to introduce new members and topics in the community. Considering this behaviour, this person can also be classified as a broker.

> *"I would say I classify him as a broker. He is eager to create multiple communities within the service and tries to introduce new subjects in existing communities."*

This section described the empirical results of the relation between blogs, wikis, and social bookmarking and coordination. These results are summarized in the second column of table 6.3 (p.108).

6.4.3 Jurisdiction

Blogs

Considering the diversity of types of posts that can be added to a blog, it is obvious to say that a blog could be a placeholder for policies, contracts, and due processes. The comment functionality also allows for discussion on these

subjects. In practice, it showed that the blog was used for a variety of topics, like discussion, reflections, college notes, books, and articles.

An important observation that was shared by most of the interviewees was that the blog regulated itself in time. At first, many 'nonsense' posts, although which proved their value to some participants, where posted, but the community made it clear that these posts were not much appreciated.

> *"The number of 'nonsense' posts decreased over time. The group made it very clear that this behaviour was not accepted. Thus, the group decided that these posts were not appreciated. Thus, the group steered the community."*

It was interesting to see that many interviewees shared this observation, and they acted towards the assumption that nonsense posts were not appreciated. The blog and the behaviour of the community somewhat forced the other members to post more quality posts.

Although the community largely stipulated the types of posts that were added to the blog, the blog itself was considered as non-hierarchical, where the authority was distributed among the participants. As one interviewee put it:

> *"On a blog, everyone has a voice. People cannot interrupt in the middle of your argumentation. You can just share your opinion."*

Wikis

Wikis can function as place where policies, contracts and other types of documents can be created and stored. An example is a company where the organizational policies are stored in a wiki, and where employees can participate in the development of these policies. The possibility to check what has been edited and by whom can prevent misuse of this functionality. As one interviewee argued:

> *"The strength of a wiki is that, whenever you want to find out what happened and what choices were made at what time, you can always browse the history of pages to find out."*

Another interesting story was brought up by another interviewee. He had functioned as project leader in several projects and ever since he started to use wikis, he felt as if he did not have to manage the projects that much anymore. He feels as if the projects have become much more of an interplay between the

project members, and everybody is a lot more engaged than before. People seem more willing to participate, to create their parts and to finish their to-do lists. Of course, he does have to stand up as project leader occasionally, but it is much less than it used to be. The participants also felt as if authority was delegated to the participants. They felt as if every participant had equal rights on the wiki: they could add pages, add text and edit the work of others. As the interviewees stated, this increased the overall quality of the work, and the engagement of the participants. They also felt as if the overall result of their work was more an entirety.

Social bookmarking

It can be argued that social bookmarking does not offer many facilities for jurisdiction, when considered from its purest definition of Wenger (1998). For instance, it does not offer facilities for contracts, policies, and the like, except that it offers a way to link to and spread the location of these facilities. However, social bookmarking does offer other forms of jurisdiction, mediation, and arbitration. For instance, a social bookmark community can steer the community by introducing or adopting new tags or topics in the community or by abandoning old and obsolete tags or topics. A community also has the power to ignore tags that do not comply with the norms or interests of the community.

Further, the community has the power to decide whether contributions of other members are useful or not. As one interviewee said, when someone contributes irrelevant posts, spam or other useless bookmarks, he undermines his own authority. He explained by sketching a situation in which he browsed several user profiles on a social bookmarking site, but stopped browsing the profile of one user because, in his opinion, this user started adding too much irrelevant bookmarks.

> *"It is easy to adopt or abandon tags. When a tag does not suit the community, you simply ignore it. When users add to much irrelevant posts, their undermining their own authority."*

One interviewee gave another example of a community regulating itself. He argued that a community that used a specific tag to separate from the rest could easily adopt a new tag to represent the community when the original tag is too polluted. When members notice that the community continues under a different tag, they could simply join the community again by adopting the new tag.

The social bookmarking service that was used in this study offered another

functionality besides adding bookmarks. Users can add comments to bookmarks. One interviewee argued that the community could judge on the quality of a post by simply posting a comment to the bookmark. When a bookmark was considered as spam, a simple comment 'spam' would ensure that others would avoid the link (and maybe in the end, when it happens more often for a single user, avoid the user at all).

> *"When I read something and I consider it as spam, I simply comment with: "this is spam". Someone else who reads my comment would think twice before visiting the bookmark. It offers an indication to avoid the post."*

Overall, it is clear that every participant in social bookmarking has equal rights. Instead of with blogs, where the authority lies at the level of the blogowner(s), in social bookmarking, authority lies at the level of the community.

The above treatise is summarized in the third column of table 6.3 (p.108). In the next section, the differences with the theoretical framework of alignment (see §5.3, p.68) are discussed.

6.4.4 Confrontation with theoretical framework

Blogs

When considering blogs, in terms of convergence, the difference between the theoretical and empirical results lies in the fact that the interviewees considered the blog as a source of inspiration in offline surroundings, like discussions during class. This was not explicated in literature, but is characteristic for the context in which this study is conducted. In addition, the empirical results showed that the interviewees felt that quantity and quality of contributions could place participants in leadership roles. This is also characteristic for the context, because leaders can only emerge from a group when a certain group exists, which was the case in this study. Thus, the empirical framework was extended with these findings.

In terms of coordination, the theoretical and empirical results are equally like. However, the facilities for brokering and multimembership are not explicated in the literature, but were recognized in the empirical data. Again, this can be explained by the specific context in which this study was conducted.

When considering jurisdiction, the empirical results explicated that the community is able to steer itself by approving or rejecting contributions made by

others. This was the case in the group under research, but not quite explicated in the literature. Thus, this facility was added to the empirical framework.

Wikis

When considering wikis, in terms of convergence, the similarities between the theoretical and empirical frameworks are scarce. The first two statements about the application of the pages were, although explicitly mentioned in the literature, not mentioned by the interviewees and thus, removed from the empirical framework. Some more generic statements with respect to convergence were derived from the empirical data, for instance, the emergence of natural leaders and the wiki functioning as source of inspiration.

When considering coordination, the focus in the empirical results is on boundary facilities, as boundary objects, brokering, and multimembership. These functions of the wiki were not explicitly derived from the literature. The statements about the importance of syntax and conventions were not derived from the empirical results. The empirical results on the other hand, did offer insight into the facilities for spreading information and coordination of internal processes. The interviewees emphasised the importance of such things as the wiki sandbox, where they could try things out and introduce new things. This was not explicitly derived from the literature.

In terms of jurisdiction, an important observation is that the interviewees argued that wikis require less management than traditional project management tools. Although experienced as such by several wiki users, this was not derived from the literature. An example showed that the wiki could function as a means for creating such things as policies, procedures, and contracts, which was not mentioned in the literature.

Social bookmarking

When considering social bookmarking, in terms of convergence, the empirical results enhanced the theoretical results. The interviewees supported the claim that social bookmarking could function as source of inspiration; especially within an existing community and where a form of allegiance is created towards the community. This can be explained by the context in which this study is conducted.

In terms of coordination, the interviewees explicitly mentioned that the content of a social bookmarking service could function as boundary object and that multimembership and brokering is possible. This was not derived from

the literature. This could be explained, again, by considering the context in which this study was carried out. In addition, the interviewees thought that social bookmarking is ideal for spreading novelty and information within the community. This was also not very much explicated in literature.

When considering jurisdiction, the empirical results show that a community can be steered by adopting, approving, or rejecting tags. This was not derived from the literature, mainly because of the fact that social bookmarking is not often described from a communities' perspective. The interviewees felt that they could determine appropriateness and quality by the meanings or comments that were stored with bookmarks. This was also not derived from the literature.

6.5 Building a final conceptual framework

The previous sections contain an exhaustive description of the relation between social software and the design framework of Wenger (1998), from the perspective of the interviewees as well as an analysis of these insights. This section describes the conceptual framework that was introduced with table 3.1 (p.33), which contains generic statements on how blogs, wikis, and social bookmarking offer facilities that support the work of engagement, imagination, and alignment. On first hand, the entries in the framework might look similar, but it is important to realize that there are slight differences in how the services function. This framework (see table 6.4, p.120) is explained in the remainder of this section.

This framework was created by taking the entries of the previous frameworks and by formulating a statement that represented the essence of the relation between the specific service and mode of belonging. Three statements are formulated per service and mode of belonging, each relating to a specific operationalization of the design framework.

6.5.1 Blogs

Blogs offer facilities for mutuality in that they can function as a platform where people can interact through posting, commenting, and mere reading. The structure enables different levels of participation, which is an important prerequisite for the success of CoPs. The ability to position yourself as an individual and as a community as well as the content of a blog can provide insight into the knowledgeability of a community, given the opinions of the interviewees that they learned from the blog instead of the required material. Being in a group

	Engagement	**Imagination**	**Alignment**
Blogs	· It is different levels of interaction and participation enabled by posting and commenting that leads to mutuality. · It is through personal 'profiling' and discussion *(or posting and commenting)* that the competence of the individual and the community emerges. · It is the retrievable, reified contributions and ability to exchange stories and to meet participants that contributes to the continuity of the community.	· It is the reversed chronologically and user specific posts and comments that enables orientation on *(or: the meaning, composition, and development of)* the community. · It is posting various types of posts and commenting that leads to reflection, from an individual as well as a group perspective. · It is the introduction of new and interesting posts and comments that leads to exploration.	· It is the inspirational source and shared common focus, reflected in the posts and comments, and the natural leaders that emerge from participation through which convergence is supported. · It is the transparent process, and the offering of boundary facilities through which coordination is supported. · It is through distribution of authority in the hands of the poster(s), but indirectly exercised by approving or disapproving posts, that jurisdiction is supported.
Wikis	· It is different levels of interaction and participation enabled by collaborative writing that leads to mutuality. · It is through collaborative writing and active participation that the competence of the community emerges. · It is the retrievable, reified contributions and ability to exchange stories and to meet participants that contributes to the continuity of the community.	· It is the (meta)content, such as pages, history, user contributions, and recent changes, that enables orientation on *(or: the meaning, composition, and development of)* the community. · It is the process of collaborative writing that leads to reflection, from an individual as well as a group perspective. · It is the introduction of new pages and content, as well as the wiki sandbox, that leads to exploration.	· It is creating a shared focus by writing collaboratively, and acceptance of open source values, through which convergence is supported. · It is the transparent process of collaborative writing, which makes division of labour possible, and the offering of boundary facilities, through which coordination is supported. · It is through an equal distribution of authority in the hands of the participants and directly exercised by adding, editing, or deleting contributions, that jurisdiction is supported.
Social Bookmarking	· It is different levels of interaction and collaborative meaning making enabled by sharing of bookmarks that leads to mutuality. · It is through collaborative sharing of bookmarks and active participation that the competence of the community emerges *(and it is through the folksonomy and associated opinions that the competence is represented).* · It is the retrievable, reified contributions and ability to exchange information and to find interesting participants that contributes to the continuity of the community.	· It is the folksonomy of tags and user specific contributions that enables orientation on *(or: the meaning, composition, and development of)* the community. · It is the process of storing an opinion with a bookmark as well as the ability to comment on others opinions that leads to reflection. · It is the introduction of new users and bookmarks as well as the browsing of collections of tags and other user profiles that leads to exploration.	· It is the inspirational source and shared common focus, reflected in the bookmarks and associated opinions, the natural leaders that emerge from participation, and acceptance of open source values, through which convergence is supported. · It is the transparent process that supports the spread of novelty and the offering of boundary facilities, through which coordination is supported. · It is through an equal distribution of authority in the hands of the participants and indirectly exercised through adopting or rejecting tags and topics, that jurisdiction is supported.

Table 6.4: Final conceptual framework

also creates a certain accountability among participants, because participation is made visible. Thus, people feel obliged to read and contribute for two reasons. Firstly, to keep the community alive and to keep up with the group and secondly, because they like it when others react on their contributions. People often put a lot of effort in a contribution, thus it is appreciated when others respond to it. Blogs also offer facilities for continuity in that it functions as a shared knowledge repository and as a platform where people can meet and

interact.

Participants thought that a blog gives insight into the meaning, composition, and development of the community, by showing who is involved, by relating contributions to participants, and by keeping track of contributions. The process of posting and commenting is also considered as a means for reflective monologues and dialogues, thus a way for people to reflect on topics, to share their thoughts, and to interact with each other. The fact that different kinds of posts can be added can be considered as a means for breaking rhythm. As some interviewees argued, they appreciated the 'small talk', mixed with weightier contributions on the blog. For some part, one wants to learn and for another part, one wants to be entertained. A blog offers facilities for both. The contributions of others, in the form of posts and comments, also introduces new and interesting insights, thus a blog also offers facilities for exploration.

A blog is centred on a shared, common focus or interest, which was particularly visible on the blog under research. Participants feel that natural leaders can flourish on a blog, by making useful contributions. The participants also feel that natural leaders are more likely to steer the community, because they have more preponderance. The content of a blog can also function as a source of inspiration. A blog can function as a boundary object, in that the content can be used in multiple communities, or that content from other blogs can be introduced in other communities. It also offers a place for members to participate in multiple communities by participating on different blogs, enabling a form of multimembership and brokering. Participants feel that authority is located at the level of the poster, but as the interviewees made clear, participants can have a great influence in the development of a blog, for instance, by introducing new concepts, or by approving or disapproving contributions through derogatory posts or comments.

Considering the content of the framework, it can be argued that blogs offer facilities for engagement, imagination, and alignment, particularly by providing a platform where people can meet and interact in a way that best suites their needs, where participants have equal rights, although posters are the initiators of discussions, and where the content is stored so that others can get acquainted with the community rapidly.

6.5.2 Wikis

Wikis offer facilities for mutuality in that they can function as a platform where people can interact on various levels through collaborative writing and discussion. As with blogs, people can read, edit or add content and they can take the role that best suits them. Wikis also provide insight into the knowledgeability of the community, but more important is the fact that participants feel that wikis create a sort of accountability that is greater than with 'traditional' documents. Thus, wikis create a form of accountability for both process and product. As with blogs, a wiki also functions as a shared knowledge repository, where participants can meet and exchange stories.

The (meta) content of a wiki provides insight into the composition, objectives, and development of a community. Meta information, is literally information about information, such as contributors, date and time stamps, history, and recent changes. The participants also thought that a wiki offers facilities for both reflective monologues as well as dialogues, through collaborative writing. The participants used specific wiki functions, as the wiki sandbox for exploring new ideas and insights, and complied with the basic principle of a wiki to try new things out and to introduce new and interesting sources along the way.

The participants felt that a wiki is centred on a shared interest and focus. It is also noted that adopting the main wiki principles of openness, willingness to participate and contribute, information sharing, and editing and adding of text, which was summarized by a participant of the focus group as the open source values, is essential for the wiki to succeed. Participants also felt that a wiki makes division of labour easy, because everyone can edit the parts that best suit their capabilities. The process of collaborative writing also needs less management, because the entire process is transparent, which means that it is visible who contributed what at what time and that everyone feels accountable for the result. As with blogs, wikis can also function as a boundary object, where multi-membership and brokering is possible. With wikis, authority is located at the level of the participants, which leads to a flatter hierarchy than with blogs. Authority can also be exercised more directly, because participants can instantly add, edit, or delete content, thereby having a great influence on the community.

Again, considering the content of the framework, it can be argued that wikis offer facilities for engagement, imagination, and alignment. It also functions as platform where people can meet and interact and where knowledge is stored for

later use.

6.5.3 Social bookmarking

Although it is argued that social bookmarking services offer fewer facilities for mutuality than blogs and wikis, there does exist some form of indirect interaction. Participants argued that they sometimes contribute on behalf of the community and that they were particularly interested in the contributions of specific users. Participants also argued that they use social bookmarking to work together on joint tasks of meaning making. Social bookmarking also offers facilities for participation on various degrees. Participants argued that the collection of bookmarks and folksonomies represent the competence of the community, in that it offers insight into the main objectives and topic of interests of the community. A social bookmarking service functions as a shared information repository where members can explore topics and other participants. The difference between blogs and wikis is that the content of social bookmarking is less rich than the content of blogs and wikis. The real 'knowledge' often lies in the blogs or wikipages that are stored on a social bookmarking service.

As with blogs and wikis, the (meta) content of a social bookmarking service offers insight into the composition and development of the community over time. The main topics of interest are visualized through the folksonomy and the user contributions provide insight into the members of a group. A social bookmarking service itself offers facilities for reflection, and the introduction of a comment system also introduces facilities for reflective dialogues. In practice, participants recognized the possibility, but did not use it as such, mainly because social bookmarking is a fast process, which does not invite you to reflect extensively on a topic. Blogs and wikis offer better means for this. Social bookmarking does offer facilities for exploration, which is one of the main functions. Browsing collections of tags and users provide insight into other topics and interesting members. This process is more natural than with blogs and wikis.

In social bookmarking, the participants argued that the community centres on a shared interest. The group that was studied in this thesis used social bookmarking to gather and spread information about learning theories. Natural leaders arise from the group by participating more extensively than others and by adding thoughtful contributions. Again, acceptance of the open source values was considered a prerequisite for success.

The structure of social bookmarking is ideal to support the spread of infor-

mation and novelty, whereby it can function as a boundary object, because tags and bookmarks can be used by multiple communities. Members can participate in multiple communities by adopting multiple community specific tags, thereby offering facilities for multi-membership and brokering. As with wikis, authority is located at the level of the participants, and they can steer the community with their behaviour. As the participants argued, they can indirectly express their authority by introducing, abandoning, or adopting tags. However, this influence is less direct than with wikis, where participants can interfere directly by editing or deleting content.

As with blogs, and wikis, it is argued that social bookmarking services can offer facilities that support engagement, imagination, and alignment, again through offering a platform where people can interact and store information and where people can orientate, reflect and explore. However, an important difference with blogs and wikis is that interaction is more indirect, and that the content of a social bookmarking service is less rich than the content of blogs and wikis.

6.6 Results from the focus group interview

The results from the focus group interview, where the conceptual framework explicated in §6.5 (p.119) formed the primary input, is summarized in an empirically clustered framework (see appendix E, p.163). In this section, the results of this interview are described.

The most important conclusion of the focus group interview is that the participants unanimously agreed on the content of the conceptual framework. At the same time, they also argued that they considered it an abstract, theoretical summary of facilities and thus, placed their objections. As they argued, they were more intrigued by the underlying dynamics and values of people and communities that are at work in social software:

> *"What you have written down is correct, but I think it will also be interesting to consider the real drives and values of people. This (social software) will not work in a bank, although what you write is still correct. You can interact directly with people on a blog, but no one responds to that talking suit. So I think that there is a difference between functional and technological side effects on the one hand and the social dynamics of the group and the individuals on the other hand,*

which decide whether it becomes a success or not."

This is an interesting thought, which shows that the conceptual framework is supported by the group of experts. At the same time, it places a heavy reliance on contextual factors and the values and principles of the participants. This statement shows the importance of a realistic approach to research, as argued by Pawson and Tilley (1997), because it proves that although study results can be valid in a given context, it cannot automatically be assumed that these findings can be generalized to broader contexts.

The focus of this study was on providing a framework that explains the facilities offered by blogs, wikis, and social bookmarking that support learning in practice of a CoP in an educational setting. Possibly, the educational context in which this research was conducted accelerated the success of the use of the services. For the most part, the participants were open minded, eager to learn, willing to share information, and willing to contribute to the services. Therefore, the theoretical description of this conceptual framework is a good representation of how social software could work in a given situation. As the participants of the focus group interview argued, it is true that this framework is likely to hold in a different context, but the question remains whether the application of the services will be just as a success as in the educational context in which this study was conducted. According to one interviewee, an important key to success are the underlying values and principles of the participants.

> *"What is it that triggers the enthusiasm of users when it comes to Web 2.0 and social software? I believe this has to do with personal values. The essence is that we are all trapped in a system of top-down corporations and so forth. I believe that we are slowly crossing a line where larger groups of people want different things. The enlightenment has finally begun."*

Although an interesting thought, it is not further elaborated in this study. However, it is described in terms of further research (see §8.3, p.143). This thesis dealt with the question whether blogs, wikis, and social bookmarking could offer, technically speaking, the facilities to cover the entire design framework of Wenger (1998).

To support the claim that the focus group participants agreed with the conceptual framework, several other indications given by the participants are described. These are explicated in the empirically clustered matrix (see appendix E, p.163) .

For instance, when considering engagement, the participants agreed on the fact that blogs, wikis, and social bookmarking offer various facilities that support mutuality. They agreed on the statement that wikis offer facilities for direct interaction and that it supports different levels of participation. More generally, the also thought that this holds true for social software. In fact, as one interviewee put it:

> *"As far as I can recall, people who operate at the boundaries of a community are extremely important. People who do not share everything and do not participate extensively, but instead, introduce new and interesting ideas. I think that social software is ideal for that."*

In addition, one participant felt as if the main functions of a blog, wiki, and a social bookmark service are a place to find information and a place to meet other people. The former can be interpreted as a function of reificative memory, while the latter can be interpreted as a function of participative memory, which implies that, according to the participant, blogs, wikis, and social bookmarking offer facilities for continuity.

When considering imagination, blogs were mostly talked about in terms of reflection. The interviewees argued that writing something down on a blog forces them to reflect on what they write. The difference with traditional ways of structuring thoughts is that blogs have an audience that can participate. One interviewee felt as if she had here name at stake and thus, had to deliver qualitative articles.

Social bookmarking was mostly talked about in terms of exploration. In fact, the interviewees sometimes felt as an explorer when using social bookmarking, browsing other user profiles and tags. Social bookmarking was also considered in terms of orientation, where the use of social tags was considered an important advantage in orienting on someone's interests.

When considering alignment, the interviewees talked at length about the acceptance of the open source values and principles, as openly sharing of information and collaboration, as the key to success. This is an important prerequisite, because when people are not open to the fact that anyone can comment on their posts on a blog or edit their text in a wiki, the services are not likely to become a success. This is also related to the fact that people should have a certain shared focus on a blog, wiki, or social bookmarking. The interviewees felt as if a shared interest exists on these services, especially when considered in small groups. As one interviewee put it:

> *"For me, social software means shared passion and a source of inspiration."*

In terms of jurisdiction, one interviewee argued that social software in general, and wikis specifically were self-regulating:

> *"They regulate themselves, those two hundred active users."*

This is an interesting thought, because in some way, it stipulates the importance of a community being able to control itself and it stipulates the possibilities of social software supporting this. According to Wenger (1998) it is important that a community can regulate itself and with this statement, the interviewee argues that social software can support this. At the same time, an example was given of a blogger who actively manages its community for four hours a day. It can be argued whether this is a CoP, or just a blog community. Next, the question arose whether social software itself could offer sufficient facilities that make community management nearly unnecessary. This thought deserves further research (see §8.3, p.143).

The participants were asked to reflect on three propositions during the last part of the focus group (see §4.2.2, p.41). The first proposition was derived from the approach of this study, namely social software works best when applied in small groups of people who are already familiar with each other. This proposition was deliberately strong formulated. This approach was quite an intriguing one for the participants of the focus group, because although they recognized the potential of social software applied in small groups, a few also mentioned that using social software in such a context was not how they used it the most:

> *"I believe that social software can offer additional value when used in small groups of people who know each other. For instance, the people we e-mail the most are the people that are around us: colleagues from the same hallway or department, with whom we have the most to discuss."*

The derogatory view of the participants towards the positioning of the main constructs resulted in some interesting insights. For instance, the participants stated that social software could be very useful in small groups of people who know each other and work together, because these groups rely on the interaction among participants. The participants argued that knowing what other

colleagues read, what they share through their bookmarks, or what they are doing by reading their blog or wiki, can enhance the feeling of engagement.

The participants envisioned, rather than envisioning social software from a communities' perspective, a sort of emergence of CoPs supported by social software. They argued that the various services under research could support CoPs in different phases of their lifecycle. For instance, they could imagine that someone starts with social bookmarking and then gets in contact with people with similar interests. These people feel the need to create a place for their own where they can interact with each other, thus they create a group blog. Then, they want to hold and formalize their knowledge and make it available to others in a consistent manner, so they start using a wiki. This is an interesting thought, which seems relevant, especially when considered in the light of an article written by Congla and Rizzuto (2001).

In this paper, Congla and Rizzuto (2001) described enabling technologies for different phases in community development. They argued that in the early stages of development, the focus should be on services that facilitate interaction and meeting points. In addition, identification of the individual is important, which is possible with social bookmarking. Social bookmarking could support the process of meeting potentially interesting community members. In later stages, the focus moves from meeting each other and interaction (which although, is still important so social bookmarking also stays relevant) to facilities that build and store explicit knowledge, which is possible with blogs and wikis. Thus, in a way, it can be argued that the various services are best suited to support different phases in the community lifecycle.

When considering this thought within the context that is used in this thesis, it can be argued that supporting existing communities with social software does not represent the entire picture. Namely, this would imply that existing communities could not be expanded, or could only be expanded through physical meetings. This seems illogical, thus, social software can also be used to introduce new and interesting sources and participants, in every phase of the lifecycle and though every service, in the community. This thought, however, should be further examined (see §8.3, p.143).

The second proposition focused on the degree of engagement that is associated with the three services. The participants agreed on the statement that blogs and wikis offer better facilities that support engagement than social bookmarking. Social bookmarking does not require a lot of effort and can be done without

much participation in the community. This implies that it does not result in much engagement. As one interviewee put it:

> *"I think this proposition is correct, uploading a few bookmarks and than going back to bed does not really result in much engagement."*

While with blogs and wikis, people put a lot more effort in their contributions and are required to think and reflect more. People feel appreciated when others respond to their contributions. This creates a form of engagement among the participants that is stronger than with social bookmarking.

The third proposition focused on the support of imagination, whereby it was argued that social bookmarking only offers facilities for exploration, while blogs and wikis offer facilities for orientation and reflection. The participants agreed with the accents, but thought that the statement was formulated too sharp. They also argued that, in their view, both blogs and wikis also offer facilities for exploration. However, the point is that that social bookmarking offers better facilities for exploration, because exploration is one of the main functions of the service, while the main functions of blogs is more focused on reflection and negotiation, and the main functions of wikis are more focused on knowledge creation and collaboration. The participants agreed to this statement.

In this section, the empirical results of the focus group interview were described. The main conclusion is that the participants support the conceptual framework that was presented to them, but that they doubt whether it applies to every context. This doubt is recognized and dealt with by the realistic approach of this study (see §4.2.1, p.40). In the next chapter, a broad discussion on lessons learned is initiated. In the final chapter of this thesis, the main conclusions of the overall research are described and the hypotheses are formulated.

Chapter 7

Lessons learned - Discussion

This chapter describes the most important lessons learned during this thesis. At the same time, these lessons also describe the three most important points that can be memorized after reading this thesis.

Lesson $_1$*: Context of social software*
It seems that in the past, social software has often been studied from an individual perspective, where social software was applied by individuals and communities emerged out of this individual use. Most often, these were large-scale communities.

Many articles are about the potential use of social software, and the emerging communities that arise with this use. In e-learning literature, social software is sometimes approached from a group perspective. A question that arises is how can social bookmarking be applied within a group of people, to find and share interesting thoughts? Or in terms of wikis, how can wikis be applied to work collaboratively on group projects? Blogs on the other hand, are most often illuminated from an individual perspective. For instance, how can a collection of individual blogs contribute to group learning? Group blogs as examined in this thesis, are hardly ever described. Thus, this study has taken a somewhat different approach than existing literature and showed that this approach worked out well. This thought introduces the first lesson learned from this study:

Social software, or more specifically blogs, wikis, and social bookmarking, can also be successfully applied in existing CoPs*, consisting of people, who already know each other and work together. In fact, it is argued that social software can*

only be supportive of learning, in terms of Wenger (1998), when it is applied within CoPs*, because it is when social software is applied within a* CoP *that the facilities that support the work of engagement, imagination, and alignment are shown to full advantage. Thus, as* CoPs *are considered the approach to knowledge management of the future, it can also be argued that social software offers the ingredients for the knowledge portal of the future.*

Lesson $_{\mathbf{2}}$*: Support for communities of practice*
This thesis focused on the question whether social software offers the facilities that are required to support CoPs. Based on an analysis of the literature, the interviews with several users and the results of the focus group interview, this question can be answered yes. However, it is also argued that the technique alone is no guarantee for success. Other important contextual factors have a considerable influence. Thus, this leads to the second lesson learned from this study:

Technically speaking, social software, in particular blogs, wikis, and social bookmarking, offers the potential to support CoPs *in a way that may not be realized with traditional software, by offering facilities that support the work of engagement, imagination, and alignment. However, the success of the application of social software depends on other (cultural) factors, as for instance, acceptance of open source values like willingness to participate, contribute, and share.*

Lesson $_{\mathbf{3}}$*: Differences between and combination of services*
In the literature on social software, many services are described as if they are all part of the same main concept, offering overlapping functionalities. This is true, but after conducting this study, it also became clear that every service has its own area of expertise, and thus, supports CoPs in a different way. This also implies that a combination of these services offer an accumulation of facilities that is potentially greater than the facilities of every individual service. This results in the third lesson that is learned from this study:

Social bookmarking focuses on informal information sharing and the creation of a shared repertoire, blogs focus on meaning making, and wikis focus on knowledge creation and collaboration. In other words: social bookmarking focuses on informal information sharing, weblogs focus on informal socializing (e.g. interaction and discussion), and wikis focus on formal knowledge creation and collaboration.

Thus, in order to fully support CoPs*, a combination of blogs, wikis, and social bookmarking should be implemented, because every service has its own area of expertise and thus, a combination of these services offers potentially more facilities that support the work of engagement, imagination, and alignment than every service individually.*

This chapter described the three most important lessons that were learned during this study. In the final chapter of this thesis, the conclusions, limitations, and suggestions for further research are described.

Chapter 8

Conclusions and further research

In the final chapter of this thesis, the main research question (see also §4.1.3, p.37) is reintroduced and answered. Next, as the main research question requires, hypotheses are formulated (see §4.1.1, p.35). In §8.2 (p.142), the main limitations of this study are described and finally, in §8.3 (p.143) suggestions for further research are introduced.

8.1 Conclusions

The main research question was stated as follows:

Which hypotheses can be formulated that explain how, and to what extent, social software offers facilities that support the process of learning in practice in communities of practice?

In the remainder of this section, a set of hypotheses is developed that answers this question.

It is argued that, based on the theoretical and empirical results, social software offers many facilities, spread through the entire design framework of Wenger (1998), that support learning in practice and therefore, that it could be considered a useful concept for CoPs. However, it is no surprise that cultural aspects as openness and willingness to participate play an important role in the success of the services. In other words: the tools offer the facilities to

support learning in practice in CoPs, but it is how these tools are applied and how members participate that is decisive for the success.

It became clear during the study that it was an extensive task to compare three different services in perspective of the design framework. However, comparing three services allowed me to state that the combination of the three services cover the design framework well. This leads to the first hypothesis:

H_1: *by implementing a combination of blogs, wikis, and social bookmarking an architecture is created that offers facilities that cover the entire design framework of Wenger (1998).*

In essence, this first hypothesis states that social software offers the facilities that support learning in practice in CoPs, because it offers the facilities that support the design framework. This framework deals with the facilities required to support the work of engagement, imagination, and alignment, which are in turn important prerequisites to support CoPs and thus, to support learning in practice.

Because learning is, according to Wenger (1998), inherently a social act, which requires participation, engagement, negotiation, and contributions to the practice of a community (see also §2.1, p.5), it can be argued that social software can only be supportive of learning when it is applied within a context in which this is possible. Thus, when considered in terms of Wenger (1998), as learning cannot fully take place when we are not part of a CoP, social software cannot be supportive of learning when it is not applied within a CoP. In other words: without the specific context of a CoP, there is no form of mutual engagement, no understanding and tuning of the enterprise, and no development of a shared repertoire. In addition, when social software is not applied in a CoP, the work of engagement, imagination, and alignment is not fully supported. Then, a blog is 'no more' than an individual tool where stories and information can be archived and where others can share their opinion, a wiki is 'no more' than an individual text editor, and a social bookmarking service is 'no more' than an individual repository of information where bookmarks of others can be found. Although this is not a bad thing, it cannot be, in terms of Wenger (1998), considered as learning. This results in the following hypothesis:

H_{2a}: *social software can only be supportive of learning when it is applied as*

platform for CoPs*, which means that a form of mutual engagement, an understanding and tuning of an enterprise, and the development of an enterprise can be identified, because it is when social software is applied within a* CoP *that the facilities that support the work of engagement, imagination, and alignment are shown to full advantage.*

Logically, the opposite also holds true:

H_{2b}: *when not applied in a* CoP*, social software cannot support learning in terms of Wenger (1998).*

Although hypothesis H_{2a} might seem trivial at first, it is important to understand that it implies that any other way of applying social software does not result, in terms of Wenger (1998), in learning. For instance, adding your interesting links to a social bookmarking service can hardly be considered learning. The so-called collective intelligence (which is also briefly discussed in §6.1, p.76) might not correspond to your individual interests and intelligence, if it can be considered as intelligence at all (for an interesting plea against collective intelligence, see Maes, 2006). In addition, a collection of blogs can hardly be considered as wisdom. It is argued that when applied within the context of CoPs, social software can become truly supportive of learning.

Hypothesis H_{2a} contains the three processes of learning in practice, which are introduced in §2.3 (p.12). To support learning, it is not only important to offer facilities that support the work of engagement, imagination, and alignment, it is also important to support the processes of learning in practice. The empirical findings show that social software supports these processes of learning in practice. For instance, the findings show that users of social software feel as if a certain engagement among participants can be identified, that a common focus can be pursued, and that a repertoire can be developed. This leads to the following hypothesis:

H_{2c}: *the application of social software supports the process of learning in practice, because it supports the evolvement of mutual engagement, the understanding and tuning of an enterprise, and the development of a shared repertoire.*

By formulating hypothesis H_{2a}, it is not argued that the application of social software cannot result in cultivating CoPs. As the participants of the group blog mentioned, they did get more and more feeling with the blog, the subject,

and the participants as the time went by. The participants of the focus group mentioned that a certain logical sequence could be identified in the application of social software in cultivating CoPs. They could imagine that individuals would start with social bookmarking for fun and that a CoP could emerge out of that initially individual behaviour. This can be reformulated in the following hypothesis:

H_{2d}: *the application of social software can result in cultivating CoPs, which in turn, can result in learning.*

H_{2a} suggests that social software can only be supportive of learning when it is applied within CoPs. The following three hypotheses (H_{3a}, H_{3b}, and H_{3c}) elaborate on this thought by zooming in on the three services individually.

Broadly speaking, the theoretical and empirical results show that three different intentions underlie the use of social software. These intentions can be described as follows:

1. Social software can be used from a purely individual, selfish perspective.
2. Social software can be used to show yourself and to position yourself within a group and thus, to distinguish yourself from the rest.
3. For 'the greater good', thus from a social, community-minded, holistic viewpoint.

'The greater good' can also be explained in terms of the open source values, which were introduced during the focus group interview (§6.6, p.124). Open source values, as openness, willingness to participate and to contribute are considered essential for the success of social software as well as for the success of CoPs. When considering individual blogs, it is argued that the focus is most often on an individual, selfish application of blogs. For instance, for reflection or contemplation. Individual blogs can also be used to position yourself among the visitors of the blog. The same holds true for commenters on an individual blog. They often respond to blogs to position themselves and their opinions. Pure group blogs, as the one under review in this study, are more focused on the positioning of the individual within a group or on 'the greater good'.

From this perspective, it is argued that blogs that are focused on an individual, selfish use do not contribute to learning, in terms of Wenger (1998). Group blogs however, introduce characteristics as mutual engagement, peripherality, common focus, and natural leadership that occur by definition in CoPs

(Wenger, 1998). Therefore, it is reasonable to argue that group blogs are necessary to support learning with blogs. This leads to the following hypothesis:

H_{3a}: *Learning, in terms of Wenger (1998), can only be supported by blogs when the blog is implemented as a group blog.*

It need not to be discussed that wikis are essentially about collaboration. When wikis are used from an individual, selfish perspective, it is hardly any more than a good tool to manage your documentation online. Purely speaking in terms of a wiki page, positioning yourself is difficult, because on the page it is hard to see who contributed what. This is only visible in the discussion section per page. It is such things as the collaborative nature of wikis, the shared principles, the equally divided authority, and the 'greater good' perspective that give wikis that extra that make them supportive of learning. This leads to the following hypothesis:

H_{3b}: *as wikis are designed for collaboration where open source values are shared among participants and participation, engagement, and a shared common focus is self-evident, they function as a natural platform for* CoPs*, which implies that they can also be supportive of learning.*

As with blogs, social bookmarking can also have a selfish character (for instance, see Shaw, 2005). From an individual perspective, social bookmarking is mainly focused on storing interesting bookmarks and on browsing other tags and profiles. It is argued that this, when considered in terms of Wenger (1998), does not contribute to learning. However, the empirical results showed that the interviewees did consider social bookmarking as supportive of cultivating CoPs, which implies that social bookmarking can become supportive of learning. It is argued that this is caused by the presence of social networking aspects in the social bookmarking service under review (besides the fact that the participants were familiar with each other and considered themselves as a CoP), which made it possible to designate interests, users, and CoPs. This leads to the following hypothesis:

H_{3c}: *social bookmarking can be supportive of learning when it is combined with aspects of social networking, like presence of user profiles, places to introduce yourself and to describe your interests and mechanisms that designate users, interests, and* CoPs*, because then it offers facilities that support the work of*

engagement, imagination, and alignment.

Introducing such aspects can shift the focus from an individual, selfish use of the service towards a more social, holistic use of the service, which is required to support learning.

In line with the thought of H_{2d} and based on the presumptions of the participants of the focus group, the following hypothesis can be formulated that deals with the sequence in which social software should be applied in the lifecycle of a CoP:

H_4: *to cultivate CoPs it is best to start with social bookmarking. Next it is best to adopt group blogging and then to start a wiki. This results in a CoP that uses every service in conjunction.*

An important observation is that when social software (especially blogs and wikis, but also social bookmarking, although to a lesser extent) is applied in groups, issues of accountability and natural barriers are raised. The presence of a CoP results in a form of social pressure that leads to an increased feeling of accountability. Social pressure is a result of the fact that other participants can exercise judgment, which is an important prerequisite in the work of engagement (Wenger, 1998). The participants of the group blog clearly stated that the community demanded long and philosophical posts, the wiki users stated that they felt an increased accountability for the quality of their contributions, because others could see what they were doing, and finally, the social bookmarking participants argued that contributions of others resulted in an increased willingness to make useful contributions themselves.

When a contribution could not live up to the expectations, the community would express their opinion towards the contributor. Explicitly, by posting comments (in the case of the group blog) or by altering contributions (in the case of the wiki), or more implicitly, by ignoring contributions (in the case of social bookmarking).

Thus, the presence of a CoP and the social pressure that goes along with it raises moral barriers, because participants feel that they have to compete against certain expectations. Broadly speaking, the presence of social pressure may result in an increased quality of contributions or in participants abandoning the service. When taking the continuation of the community of the group blog (who recently revived on a different blog) in consideration, it is argued that the former will prevail. It is argued that the presence of social pressure increases

the effectiveness and quality of contributions made to the service, which in turn has a positive effect on the knowledgeability and competence of the community. This leads to the following hypothesis:

H_5: *the application of social software in a* CoP *causes social pressure, which results in an increased feeling of accountability for the quality of contributions as a result of which the quality of contributions increases, the overall knowledgeability of the community increases and the quality of learning increases.*

It is possible to identify the three intentions described earlier on a social software service at the same time. Especially social bookmarking seems to allow for an individual, selfish use along with the ability to position yourself and to participate for the greater good. The result is that all three forms are represented on a service at the same time. The low technological barriers to participate on a social bookmarking service are (partly) responsible for that. Low technological barriers can be considered as an advantage as well as a disadvantage. When placed in the light of H_{2a}, low technological barriers attract more participants who contribute to the existing collective intelligence. Because the collective intelligence does not have to correspond with the community's intelligence or the individual intelligence, this is not necessarily a good thing. When considered in terms of CoPs, low technological barriers can be considered as an advantage, because the introduction of new members means that new potentially interesting community members become involved. In terms of Wenger (1998) this phenomenon can be defined as legitimate peripheral participation (see also §2.2, p.8). This leads to the following hypothesis:

H_6: *social software supports an important prerequisite of* CoP*s, namely legitimate peripheral participation, because users can participate in a way that best suits their needs, without being obliged to become core community members who participate for the greater good.*

It is argued that when a CoP is sufficiently developed to combine the use of the three services (see also H_4), not every part of the design framework is supported equally well. For instance, engagement and imagination are better supported than alignment. This is important, because it offers insights into the aspects of the design framework that should be extra supported by other means than social software. This leads to the following hypothesis:

H_7: *the combination of blogs, wikis, and social bookmarking offers the most facilities that support engagement, the second most facilities that support imagination, and finally, the third most facilities that support alignment.*

Considering every service separately, it became clear that blogs and wikis support the work of engagement better than social bookmarking, because interaction is more direct. Social bookmarking is an ideal tool for exploration, while blogs and wikis offer better facilities that support orientation and reflection. Finally, wikis and social bookmarking offer better facilities for convergence than blogs, because with the former, authority is located at the level of the participants, while with the latter, authority is located at the level of the blog owner(s) and poster. This leads to the following hypotheses:

H_8: *blogs and wikis offer facilities that better support the work of engagement than social bookmarking.*

H_9: *social bookmarking offers facilities that better support the work of exploration, while blogs and wikis offer facilities that better support the work of orientation and reflection.*

H_{10}: *wikis and social bookmarking offer facilities that better support the work of alignment than blogs.*

This section introduced a set of hypotheses that are formulated based on the theoretical and empirical results of this study. These hypotheses should be studied further (see also §8.3, p.143). In the next section, the limitations of this study are explained.

8.2 Limitations

An important limitation may be that values and principles of participants were not taken into account in this study. This study resulted in a theoretical description of how social software offers facilities that support CoPs, which was also the main objective. However, it cannot be argued that the results can be generalized to a broader context. The realistic approach that underlies this study states that research findings are only applicable in the specific context the research was carried out. It cannot be said that the same results will be achieved when the findings are applied in a different context (Pawson and Tilley, 1997).

Maybe more than 10 people had to be interviewed. Because of the diversity of the services under research, and the diversity of the experiences of the interviewees with the services, it happened that a few interviewees were only familiar with one or two services. This limited the number of people that could be interviewed per service.

A limitation in the focus group is that the researcher also acted as moderator of the group. Not only was he relatively inexperienced, it can also be argued that the researcher is biased, because the topic of the focus group is its own research. The main reason why this approach was chosen is because moderating a focus group interview is a great learning experience. To guard the moderator from becoming too biased, the tutor joined the interview.

The inexperience of the moderator can also be considered a limitation, because the moderator had trouble keeping the discussion in line with the moderator guide. The discussion sometimes wondered of. This also introduced room for small talk, which theoretically, should be avoided. In the end, not every aspect of the moderator guide was discussed in depth. However, this also introduced new and interesting insights, which otherwise would not have been brought to light.

A final limitation can be derived from the focus group. Because social software is a relatively new concept, it is hard to find any experts on the subject who are also willing to participate in a focus group interview. Being able to mobilize these four participants was already a relieve. Although the participants of the focus group interview can all be classified as experts on social software, it can be argued that they had less experience with the application of social software within the specific context of this thesis, namely social software applied in existing CoPs. This may have affected the overall results of the focus group.

8.3 Further research

This section describes some suggestions for further research. Firstly, the hypotheses that are formulated in the previous chapter (p.135) should be tested. This thesis was purely focused on developing a set of broad hypotheses.

Secondly, this research is focused on if, and if so how, social software could offer facilities that support CoPs. The result is a theoretical description that answers this question. In a sense, the results represent an ideal situation although interviewees were responsible for the majority of the answers. During the focus

group interview, it became clear that there are more and maybe more powerful forces at work. As one participant stated:

> *"In a way, this seems like a summary of functionalities per area. I would like to know more about underlying values and principles. How does social software relate to various kinds of values and principles? In this light, the theory of Spiral Dynamics can be a nice starting point."*

Thus, it could be interesting, now that we know that social software can offer a broad range of facilities that support CoPs, to study how communities that use social software relate to the values and principles of for instance, the theory of Spiral Dynamics (see Beck and Cowan, 1996).

Thirdly, another interesting question is whether social software can function as an architecture that offers facilities that support the work of engagement, imagination, and alignment *without* further interference of other managerial tasks or people. In other words, does social software offer, without facilitating it any further, an architecture that supports CoPs? This question is not answered in this study, so it could be an interesting question to study more closely.

Fourthly, another intriguing question was derived from the main question of this thesis. In this study, the question whether social software can be supportive of CoPs is answered. It is also interesting to study whether social software can improve, stimulate, or make communities more effective. In this light, it could be interesting, for instance, to study how social software relates to effectiveness theory (for instance, see Quinn and Rohrbough, 1983).

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Appendix A

Dutch summary

Deze scriptie behandelt de vraag in hoeverre social software faciliteiten biedt die het leerproces in communities of practice (CoP) ondersteunen. Het doel is hypothesen te formuleren die de relatie tussen beide concepten beschrijven. De context van de studie kan worden gekarakteriseerd als social software toegepast in kleine, bestaande communities, waar deelnemers elkaar reeds kennen en met elkaar samenwerken. Deze aanpak onderscheidt zich van het merendeel van de bestaande literatuur over social software, daar deze literatuur social software voornamelijk vanuit het perspectief van het individu, waarbij communities zich na verloop van tijd ontwikkelen, benadert.

Verschillende stappen zijn doorlopen om het onderzoeksdoel te bereiken. Ten eerste is een literatuuronderzoek uitgevoerd naar CoPs. CoPs zijn groepen van mensen die een probleem of een passie voor een onderwerp met elkaar delen en die hun kennis en expertise op dit gebied verdiepen door continu met elkaar te interacteren (Wenger et al., 2002). Leren, betekenisgeving, participatie en betrokkenheid zijn de voornaamste doelen. Leren in de praktijk bestaat uit drie hoofdprocessen, namelijk zich ontwikkelende vormen van wederzijdse betrokkenheid, het begrijpen en verbeteren van het initiatief van een community en het ontwikkelen van een gedeeld repertoire. Om CoPs te ondersteunen, is het belangrijk dat een architectuur beschikbaar is die het werk van betrokkenheid, verbeelding en afstemming ondersteunt.

Ten tweede is een literatuurstudie naar social software uitgevoerd. Social software kan worden gedefinieerd als software die tot doel heeft het tot stand brengen en houden van netwerken tussen mensen te vereenvoudigen (Gorissen, 2006). In deze studie zijn drie social software diensten onderzocht, namelijk

weblogs (blogs), wikis en social bookmarking. Social software en CoPs delen verschillende belangrijke karakteristieken, wat het interessant maakt om de relatie tussen beide concepten nader te onderzoeken.

Ten derde is een literatuuronderzoek uitgevoerd naar de relatie tussen communities (of practice). Deze theoretische studie resulteerde in een beschrijving van de faciliteiten, geboden door blogs, wikis en social bookmarking, die het werk van betrokkenheid, verbeelding en afstemming ondersteunen.

Ten vierde is een empirische studie uitgevoerd. Deze empirische studie bestond uit twee delen. Tien interviews zijn gehouden met studenten van de Universiteit van Amsterdam die allen bekend waren met zowel social software als de theorie van CoPs. Deze interviews hebben geresulteerd in een verfijning van de eerder genoemde theoretische beschrijving, welke de faciliteiten, geboden door blogs, wikis en social bookmarking, beschrijft die het werk van betrokkenheid, verbeelding en afstemming ondersteunen. Deze inzichten zijn samengevat in een conceptueel framework, welke in een focus groep interview is voorgelegd aan een groep van experts op het gebied van social software en communities of practice. De deelnemers valideerden het conceptuele framework, maar brachten tegelijkertijd interessante contextuele voorwaarden aan het licht.

Verschillende lessen kunnen worden afgeleid uit deze empirische studie. Ten eerste toont dit onderzoek aan dat social software eveneens kan worden toegepast in kleine groepen van mensen (bestaande CoPs). Ten tweede toont dit onderzoek aan dat social software de faciliteiten biedt die het werk van betrokkenheid, verbeelding en afstemming ondersteunen. Sterker nog, er wordt beargumenteerd dat social software slechts ondersteund is aan leren wanneer het wordt toepast binnen CoPs. Echter, contextuele factoren, zoals acceptatie van open source waarden en de bereidheid te participeren zijn de sleutel tot succes. Ten derde toont dit onderzoek aan dat iedere dienst haar eigen unieke bijdrage levert aan het design framework. Dit betekent dat een combinatie van de drie diensten faciliteiten biedt om CoPs te ondersteunen die meer zijn dan de som der delen.

Om de hoofdvraag te beantwoorden zijn tien hypothesen ontwikkeld die ingaan op de relatie tussen social software en CoPs. Tot slot zijn de limitaties beschreven en worden suggesties voor verder onderzoek gedaan.

Appendix B

Main interview questions

In this appendix, the main interview questions are described.

- How would you say does social software (blogs, wikis, and social bookmarking - whichever is applicable) relate to the construct of mutuality, in terms of Wenger (1998). Could you explain?
- When you think of competence, in terms of Wenger (1998), would you say that social software can hold and reflect the competence of a community? Could you explain?
- In terms of continuity, how would you describe the role of social software? Could you explain?
- How would you say that, in terms of Wenger (1998), social software relate to orientation? Could you explain?
- Would you say that, in terms of Wenger (1998) social software offers facilities for reflection? Could you explain?
- When you think of exploration, in terms of Wenger (1998), how would you describe the role of social software in this? Could you explain?
- How would you describe the relation between convergence, in terms of Wenger (1998) and social software? Could you explain?
- What can you say about the relation between coordination, in terms of Wenger (1998) and social software? Could you explain?
- Considering social software, what can be said about jurisdiction, in terms of Wenger (1998). Did you notice any of this in the use of the services? Could you explain?

Appendix C

Coding scheme

ENGAGEMENT		EN
EN:	Mutuality	EN-MUT
EN-MUT	Weblog	EN-MUT-WB
EN-MUT	Wiki	EN-MUT-WI
EN-MUT	Social bookmarking	EN-MUT-SB
EN:	Competence	EN-COM
EN-COM	Weblog	EN-COM-WB
EN-COM	Wiki	EN-COM-WI
EN-COM	Social bookmarking	EN-COM-SB
EN:	Continuity	EN-CON
EN-CON	Weblog	EN-CON-WB
EN-CON	Wiki	EN-CON-WI
EN-CON	Social bookmarking	EN-CON-SB
IMAGINATION		EN
IM:	Orientation	IM-ORI
IM-ORI	Weblog	IM-ORI-WB
IM-ORI	Wiki	IM-ORI-WI
IM-ORI	Social bookmarking	IM-ORI-SB
IM:	Reflection	IM-REF

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IM-REF	Weblog	IM-REF-WB
IM-REF	Wiki	IM-REF-WI
IM-REF	Social bookmarking	IM-REF-SB
IM:	Exploration	IM-EXP
IM-EXP	Weblog	IM-EXP-WB
IM-EXP	Wiki	IM-EXP-WI
IM-EXP	Social bookmarking	IM-EXP-SB
ALIGNMENT		EN
AL:	Convergence	AL-CON
AL-CON	Weblog	AL-CON-WB
AL-CON	Wiki	AL-CON-WI
AL-CON	Social bookmarking	AL-CON-SB
AL:	Coordination	AL-COO
AL- COO	Weblog	AL-COO-WB
AL-COO	Wiki	AL-COO-WI
AL-COO	Social bookmarking	AL-COO-SB
AL:	Jurisdiction	AL-JUR
AL-JUR	Weblog	AL-JUR-WB
AL-JUR	Wiki	AL-JUR-WI
AL-JUR	Social bookmarking	AL-JUR-SB

Table C.1: Coding scheme used for data analysis

Appendix D

Moderator guide

This appendix contains (a summarized version of) the moderator guide, which was used during the focus group interview.

Focus groep interview - 14 juni 2006 - 16.00 tot 18.00 uur

1. **Introductie max 5 minuten (Rene)**
   - Welkom heten, bedankt dat iedereen is gekomen
   - Introduceert zichzelf
   - Introduceert mij (Martin)
   - Toestemming vragen voor geluidsapparatuur
   - Vertrouwelijkheid
   - Introductie van deelnemers
   - Opzet bijeenkomst
     - Nadruk ligt op discussie tussen participanten onderling. Zie het niet zozeer als vraag antwoord richting moderator, maar reageer vooral (open en eerlijk!) op elkaar. Rol moderator is begeleidend in discussie: niet leidend
     - een paar regels
     - * Geeft over aan Martin *
   - Doel van de bijeenkomst
     - Het testen / verfijnen van een theoretisch framework omtrent social software / Communities of Practice
     - Verkrijgen van inzichten en uitspraken van een groep van experts aangaande dit onderwerp teneinde een mogelijke aanzet tot hypothesen te verzamelen.
     - Facilitator houdt tijd en voortgang in de gaten
   - Planning van de bijeenkomst 1 blok van 20 minuten, 4 blokken van +/- 25 minuten, geen pauze
     - Blok 1: introductie, setting the scne, vragen tot dusver
     - Blok 2: weblogs en modes of belonging steeds per blok:
       - 3 minuten setting the scne, sheet toelichten
       - 20 minuten discussie over inhoud sheet. Bespreken per mode of belonging:
         - Herkenbaarheid van statements
         - Relevantie van statements
         - Generaliseerbaarheid van statements
       - 3 minuten reflectie van deelnemers op post-its

  - Blok 3: wikis en modes of belonging
  - Blok 5: Afsluitende discussie ahv aantal stellingen over onderlinge verhoudingen / verschillen van diensten
    * Ongeveer 3 stellingen: ongeveer 5 minuten per stelling
  - Afsluiting 10 minuten. Samenvatting, dankwoord en verdere voortgang

2. **Blok 1 - Warm-up: (introductie) - setting the scne - initiële discussie 15 - 20 minuten**
   - Introductie (reeds aan bod geweest)
   - Setting the scene
     - Hoe gekomen tot social software?
     - Deze diensten binnen Social software. Heel kort. Mijn kijk op social software
     - CONTEXT: Eigenlijk nadruk op gebruik van diensten binnen context waarin mensen met elkaar samenwerken.
     - Gevoel dat software echt ondersteunend kan zijn aan het gezamenlijk leren. Dat is interessant om nader te onderzoeken. Maar hoe?
     - Communities of Practice / social learning theorie neerzetten.
     - Relatie social software / communities of practice.
     - Faciliteiten die geboden moeten worden om leren te ondersteunen
     - Matrix introduceren 3 x 3. Wat voor een faciliteiten (kan) een blog nu bied(t)(en) om betrokkenheid / verbeelding / afstemming te ondersteunen?
     - In de discussie willen we nu dus praten over hoe social software nu in feite werkt, met dit framework als leidraad. Maar we redeneren vanuit de techniek dit keer. En essentieel daarin zijn de kernwoorden, betrokkenheid, verbeelding en afstemming.
   - Vragen tot dusver?
   - Write down exercise. Vraag naar ervaringen, belangrijkste kenmerken per dienst
     - Discussie naar aanleiding van datgene dat is opgeschreven
3. **Blok 2 - Key section 1 - Blogs en modes of belonging - 25 minuten**
   - Resume. Waar hebben we het tot op heden over gehad.
   - Bespreken nu afzonderlijk de drie diensten. De invulling van het framework staat op sheet.
   - Beschrijft waar volgens mij een belangrijke waarde / faciliteit ligt.
   - In termen van *engagement* gaat het om
     - Posten en reageren creëert een platform voor interactie waarbinnen mensen op verschillende niveaus kunnen participeren.
     - Inhoud en proces van interactie creëert verantwoordelijkheid en stimuleert kennis en initiatief
     - Blog zelf fungeert als toegankelijke, gedeelde kennis repository, waar mensen elkaar ook nog eens kunnen ontmoeten en verhalen kunnen uitwisselen
   - In termen van *imagination* gaat het om
     - Archief, gebruikersspecifieke toevoegingen en inhoud biedt inzicht in betekenis, bijdragen, ontwikkeling en samenstelling van community
     - Posten en reageren biedt mogelijkheden voor reflectieve monologen en dialogen
     - Bijdragen dienen als middel om nieuwe dingen te introduceren en te ontdekken
   - In termen van *alignment* gaat het om
     - Gedeelde focus centraal, waarbij blog kan dienen als bron van inspiratie en waar natuurlijke leiders zich kunnen ontwikkelen
     - Kan als boundary object fungeren voor andere communities, waar tevens brokering en multi-membership mogelijk is (brokering en multi-membership toelichten)
     - Autoriteit is in handen van de poster(s), maar de community reguleert zichzelf door middel van het geven van commentaren
   - PER MODE OF BELONGING
     - ik denk dat het zo is
     - Herkennen jullie je in deze bevindingen? Wat is het in deze bevindingen dat jullie herkennen? Wat herkennen jullie er niet aan? Kun je daar een voorbeeld

van geven?
  - Zijn deze bevindingen volgens jullie relevant? Waarom zijn ze relevant? Waarom denk je dat ze niet relevant zijn? Welke wel / welke niet? Indien niet, wat zouden wel relevante bevindingen zijn volgens jullie?
  - Zijn deze bevindingen generaliseerbaar (met andere woorden, geldt deze in iedere context)? Waarom denk je dat deze bevindingen generaliseerbaar zijn? Waarom denk je van niet? Welke wel / Welke niet?

4. **Blok 3 - Key section 2 - Wikis en modes of belonging - 25 minuten**
   - In termen van *engagement* gaat het om
     - Platform waar door collaboratief schrijven en samenwerken interactie mogelijk wordt en waar tevens verschillende niveaus van participatie mogelijk zijn
     - Ondersteund de competentie van de community door gezamenlijke kenniscreatie en creert tegelijkertijd verantwoordelijkheid voor het product en het proces
     - Opereert als gedeelde kennis repository, waar betrokken elkaar kunnen ontmoeten en verhalen kunnen uitwisselen
   - In termen van *imagination* gaat het om
     - (meta)content (zoals wie post wat en wanneer, recent changes) biedt inzicht in doel, samenstelling en ontwikkeling van community over tijd
     - Proces van collaboratief schrijven biedt middelen voor reflectieve monologen en dialogen
     - Wiki sandbox kan als middel voor exploratie dienen alsmede het introduceren van nieuwe paginas biedt een vorm van exploratie
   - In termen van *alignment* gaat het om
     - Wikis zijn geconcentreerd rondom een gedeelde focus, interesse, waarbij de wiki principes (openheid en deel maar raak) belangrijke en essentile principes zijn voor het welslagen.
     - Eenvoudig proces maakt cordinatie van interne processen (binnen wikis) en verdeling van werk mogelijk, alsmede biedt het boundary faciliteiten, als boundary objects, brokering en multi-membership
     - Authoriteit in handen van de deelnemers, welke de community (direct) reguleren door teksten toe te voegen, te wijzigen of te verwijderen.
   - PER MODE OF BELONGING
     - Zie voorgaande
5. **Blok 4 - Key section 3 - Social bookmarking en modes of belonging - 25 minuten**
   - In termen van *engagement* gaat het om
     - Platform waar een community gemeenschappelijk betekenis kan geven aan een onderwerp en waar verschillende niveaus van participatie mogelijk zijn
     - Folksonomy representeert de competentie van de community en creert een vorm van verantwoordelijkheid onder de betrokkenen
     - Fungeert als een gedeelde informatie repository, waar deelnemers kennis kunnen maken met de interesses van andere betrokkenen, maar moeilijk met elkaar in contact kunnen treden
   - In termen van *imagination* gaat het om
     - Folksonomy van gebruikers en tags bieden inzicht in de betekenis en samenstelling van de community waarbij op datum toegevoegde contributies inzicht geven in de ontwikkeling van de community over tijd
     - Een mening toevoegen bij een bookmark biedt middelen voor reflectieve monologen. De commentaar functionaliteit in bookmarking biedt middelen voor reflectieve dialogen. (Of als mensen dezelfde bookmark toevoegen met hun eigen mening. Dan is dat ook een vorm van dialoog, maar indirect en misschien niet altijd zo bedoeld)
     - Browsen van gebruikersprofielen en tags biedt middelen voor exploratie om nieuwe en interessante inzichten te ontdekken.
   - In termen van *alignment* gaat het om
     - Deelnemers delen een focus, interesse welke ook ontstaat vanuit de participatie

    - Eenvoudig proces ondersteunt de verspreiding van nieuwigheden en informatie, waarnaast het tevens fungeert als boundary object welke brokering en multi-membership mogelijk maakt
    - Autoriteit in handen van de deelnemers, welke de community (indirect) kunnen reguleren door tags, informatie of onderwerpen te adopteren of af te stoten (cq. te negeren)
  - PER MODE OF BELONGING
    - zie voorgaande
6. **Blok 5 - Key section 4 - Totale framework, onderlinge relaties - 25 minuten**
  - Resume. Waar hebben we het tot op heden over gehad.
  - Drie stelling behandelen in het laatste deel.
    - *Stelling 1*: Social software komt pas echt goed tot zijn recht wanneer het gebruikt wordt in (relatief) kleine groepen van mensen, die elkaar kennen en vertrouwen.
    - *Stelling 2*: Blogs en wikis bieden betere faciliteiten voor het creren van betrokkenheid dan social bookmarking, omdat er in de eerst genoemde diensten meer sprake is van directe interactie tussen de betrokkenen.
    - *Stelling 3*: In termen van verbeelding leent social bookmarking zich alleen voor het faciliteren van exploratie, terwijl blogs en wikis zich alleen lenen voor het faciliteren van orintatie en reflectie.
7. **Samenvatting**
8. **Afsluiting**

Appendix E

Empirically Clustered Matrix

This appendix contains the empirically clustered matrix, which was created based on the data of the focus group interview. Content is in Dutch.

Deelnemers / Variabelen	SB	JF	MV	RJ
BLOGS	"Ik zie dit; onverbiedig, als een oplepeling van functionaliteiten. Dit klopt, maar ik denk dat het een twist krijgt van wat de ware drives van die mensen zijn"	"Ik vind het allemaal herkenbaar, maar erg theoretisch"		
Engagement	Wederkerigheid: "Je vindt soms wel gelijkgestemden" Wederkerigheid: "Enorme sociale is bijeffect, gaat meer om persoonlijke zelfverheerlijking" Wederkerigheid: "Ja op een blog kan je direct interacteren (maar niemand reageert op dat pratende pak)"	Wederkerigheid: "sommige mensen willen er helemaal niets mee doen. Die willen lezen" Competentie: "Maakt het het onderhandelingsproces niet expliciteter, laagdrempeliger? Net als met mailen, voor je het weet floep je er iets uit. Kan me voorstellen dat dat nu ook zo is" Continuïteit: "het is een vindplaats en een ontmoetingsplaats"	Wederkerigheid: bevestigt opmerking van SB over zelfverheerlijking Wederkerigheid: "je krijgt interactie met andere mensen, netwerken" Wederkerigheid: "Ik snap dat niet, kan iemand mij dat uitleggen (gedeelde taken). Dat zie ik wel ja" Competentie: "het dwingt je een paar slagen extra te maken voordat je het online zet" *verantwoordelijkheid* Competentie: "Ik heb wel een naam hoog te houden" Competentie: "reacties van mensen scherpen mij aan" Competentie: "waar doe je het voor, naamsbekend. Misschien ook" Competentie: "Ik vraag me af of blogs het onderhandelingsproces niet impliciteer maken, dat je gewoon maar begint met posten en niet zegt waar gaan we het over hebben"	Wederkerigheid: "daardoor krijg je ook weer reacties van andere mensen" Wederkerigheid: "dat is ook een van de karakteristieken, dat je verschillende niveaus van participatie hebt. En dat het ook goed is" Competentie: "het dwingt je om heel goed te formuleren"
Imagination	Reflectie: "terwijl als je een gebied hebt afgesloten, of in een community bent ondergedoken, dat je dan meer gaat reflecteren."		Reflectie: "om dingen op te schrijven, dat dwingt mij tot reflectie"	Reflectie: "... en vervolgens gebruik je de blog of blogpost om jouw reflectie op dat verhaal te geven"
Alignment	Convergentie: acceptatie van open source Values bepalend voor succes	Convergentie: "passie voor hetzelfde" Convergentie: "inspireren"	Convergentie: (leiderschap voorbeeld marketing(facts) "op een bepaalde manier is het ook wel weer een eer als je door hem gevraagd wordt daar op te bloggen"	Convergentie: "inspiratie, gedeelde passie"
WIKIS				
Engagement	Wederkerigheid: "het klopt dat een wiki interactie faciliteert en verschillende niveaus van participatie mogelijk maakt" Competentie: "uiteindelijke effect is wel, we weten alles met elkaar"	Wederkerigheid: "wij zijn het, we zijn het zelf" Competentie: "samen weten we alles, of in ieder geval heel veel" Continuïteit: "het is een vindplaats en een ontmoetingsplaats"	Wederkerigheid: "samen iets neerzetten, die trots dat herken ik wel"	

Figure E.1: Conceptually clustered matrix

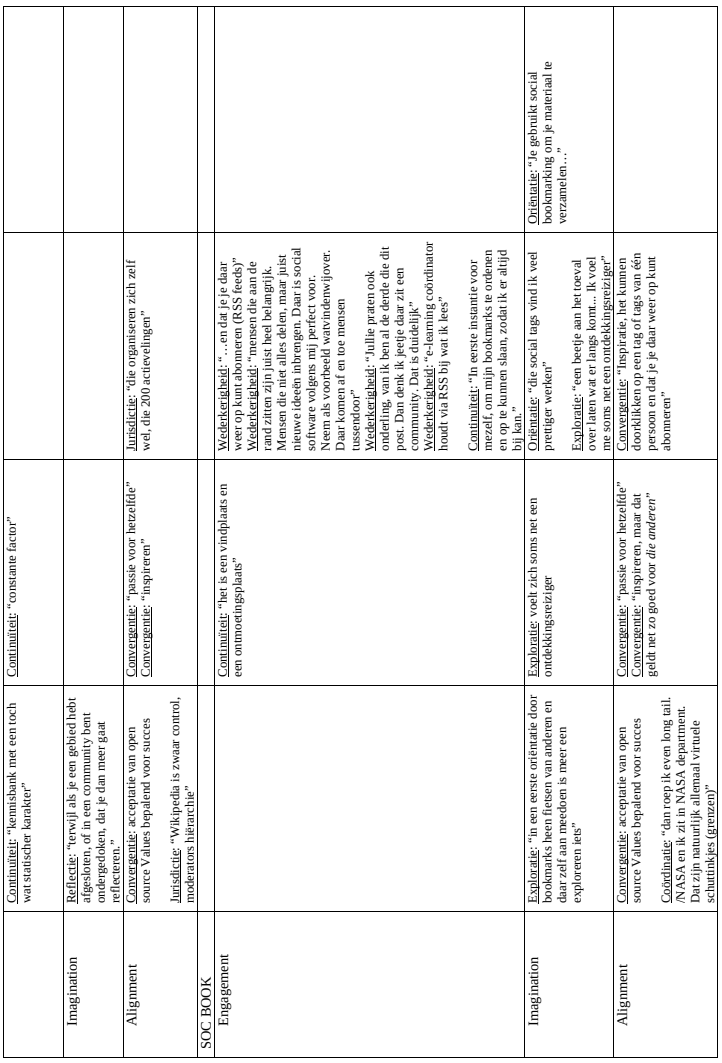

Figure E.1 (Conceptually clustered matrix, continued)

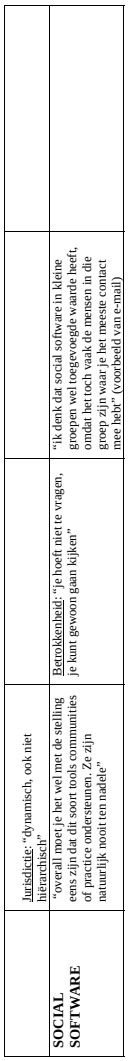

Figure E.1 (Conceptually clustered matrix, continued)