

Learning with Knowledge Sharing in Social Networks

Antti Katajainen, Master of Arts Thesis

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1. Introduction

Working in the digitally networked world has become more complex and dynamic. We need new ways of learning in order to adapt information and knowledge surrounding us. Our information seeking and media habits are relying heavily on web-supported services. Informal and networked work has become as important as the formal work. Social media has become the center of communities where projects, learning, collaboration, information sharing and training are created. Social media engages employees to capture and share knowledge in ways that has not been possible before with formal learning. Web has also become a learning environment where understanding is socially shared. The place where learning is shared also creates usually new knowledge. As Nonaka and Takeuchi (1995, pp. 6-7) state knowledge creation in organization can be seen as a continuous and dynamic process, where tacit knowledge is the most valuable competitive asset of an organization.

The first stages of information management attempted to manage and capture knowledge. Organizations have quickly realized that information and knowledge must be understood as separate identities. Rapidly changing working environment and the shift to storing information to digital networks have lead to constant reshaping of organizations. Creating and storing knowledge in online systems has increasingly changed the learning much towards online environments as well. This research aims to explore ways of sharing knowledge and learning in an organization of 2011. Social web enables new ways of learning and knowledge creation for the entire organization and future employee generations. The main goal of this research is to research how quality criteria of learning in social network is achieved and potentially adapted to organizations.

Learning in a company has shifted more towards situated learning where communication cannot be necessarily done physically between employees. The benefits of using online learning are for example increased access, more learner centered processes, better decision-making and cost-effectiveness. A significant difference can be seen between the old way of organization and the new approach. Pekka Ruohotie states that (2000, p.30) the differences can be described by the ways of motivating employees and organization of work. The new model highlights the ways that allow knowledge creation in organization by engaging and collaborative actions. Peter Senge (2006, p.14) describes new organization as highly networked, which is weakening traditional management hierarchies and potentially opening up new capacity for continual learning, innovation, and adaption. Knowledge sharing and interactions between co-workers rely more and more on web 2.0 tools. Can social network be a domain of organization learning, where tacit knowledge can be easily learned? It can surely be a place to share expertise, where employees, groups and organizations learn together and even create new

innovations. New technologies and the need for globalization are quickly making distributed communities of practice a standard practice of a learning organization. Online communities have become global and the physical distance between community learners is not that crucial anymore. Social networking is a very important part of our media habits and increasingly important for organizations and online learning. The significant shift from producers to more consumer-generated web is a crucial part of the collective learning as well. According to John Seely Brown (2000), blogs and the consumer-generated media are altering the sources of power and authority in our society. Sharing experiences and updates has become the most popular behavior on web (comScore 2010) and social media. Most of web 2.0 tools are meant to meet these social needs by allowing multiple ways of sharing and mash upping content. Online communities are used widely across different professions for supporting collaborative interactions and knowledge sharing.

The focus of this research is to find out how an organization uses social media in their internal learning purposes like keeping up to date with industry, organizational networking, team collaboration and social training. According to Etienne Wenger (2002, p.9) sharing tacit knowledge requires interaction and informal learning processes such as storytelling, conversation, coaching and apprenticeship of the kind that communities of practice provide. Mostly social networking enables different ways of participating in an online community where members can share ideas and experiences. Tony Bingham and Marci Corner describe social network as a community destination where people can share their ideas with others' viewpoints and publish them in preferable format (2010, p.112). Online communities with social networking can be seen as modern day communities of practice. Social networking provides multiple ways of collaborating in synchronous and asynchronous processes. It supports keeping information current, creates systems that support updates and sharing of collective perspectives. Emerging web technologies in communities allow us to create dialogues inside and outside the community.

Most of the commercial social networking tools are serving usually the need of a specific knowledge-sharing need in organizations. They are not usually creating a network system that supports variety of ways of learning with diversity of tools and a rich interface. Google+ social networking service is one of the few social networking services that support communications and potentially variety different learning ways. Google has been the most dominant player of the most popular Internet services. Google+ is a new social networking service, which provides a variety of tools for collaboration, good usability, and different connections methods with a social environment. It also builds a network where knowledge sharing is easily encouraged between users and groups of people. Google+ is a great example of service build from the needs of consumers from where it can be taken to practical use in professional life. The ways of how people communicate in their leisure time is reflected also in the ways people communicate and learn at work. Google+ can be seen as one of the main pacemakers of organizations' social networks.

The amount of information is overwhelming for individual learners to adopt and process. For information seeking, problem solving and understanding complexity we need collaborative tools to support our ways of learning. Lack of recognizing the change in learning and learning environments can lead to bad decisions and inefficient processes. Online learning can enable and make information spread effectively by recommendations, automatic preferences, community tools and information filters. All of the above help learners to focus on the most crucial and specified information needed for succeeding in every day work. Social networking for learning purposes and its internal organizational use has been used and researched limitedly. This research seeks to apply a conceptual framework of learning organization concept. After describing the concept I will qualitatively test Google + social network's suitability for supporting learning in organizational setting and draw an assessment based on these results. This thesis work is an interdisciplinary research representing theories and practices from pedagogy, psychology, sociology, economics and technology.

1.1 Primary Research Question

I will describe a conceptual design of an online community as a learning environment for an organization. I will apply qualitative assessment measuring quality of learning in Google+ social network. With the study I aim to answer the primary research question:

How suitable is a social network for supporting learning in organizations?

1.2 Secondary Research Questions

The secondary questions are related to communities of practices and knowledge sharing in social network Google+?

- Are the methods of communities of practice suitable for designing an online community?
- How is the nature of learning understood in organizations and social networking knowledge sharing activities?
- Does Google+ engage sharing tacit knowledge with your community?
- How well does Google+ support quality of learning with following criteria: usability, social features, networking and solving complexity, web 2.0 tools to support the higher order thinking skills.
- What is the potential of Google+ in collaborative knowledge sharing and learning in organizations?

1.3 Hypotheses

Online communities and social networks are places where different ways of learning are supported.

The base of organizational learning is in individual learning with the support of organizational culture.

It is expected that a social network supporting learning in organization needs the following success factors of learning in an online community:

- Socialization, support of communication and collaborative processes.
- Web 2.0 tools to support the higher order thinking skills.
- Networking and solving complexity.
- Usability, support ease of use.

The use of social media technologies in organizations has brought significant improvements in learning, knowledge sharing and communities of practices.

It is expected that social network Google+ is a suitable social network for a collaborative learning processes of an organization.

Google+'s suitability for the above mentioned criteria are based on the following assumptions:

- It allows multiple ways of collaboration and information sharing.
- It supports variety of web 2.0 tools that can be seen as part of higher order thinking skills and cognitive processes.
- It helps to keep content up-to-date and enables easy connecting and networking possibilities (Digital objects, Profiles, Groups).
- Usability and availability of different services (Documents, Search) are top rated and most popular among Internet users worldwide.

1.4 Research Methods

This thesis will be a qualitative study using social network as a case study to test quality criteria based on the background theories of community design, learning theories and social media.

The study will use the following methods in the research:

- Investigate how organizational learning and the learning of communities of practice complement each other.

- Interpret learning theories into online community learning.
- Describe the ways of learning in online, community and organizational settings.
- Create evaluation quality criteria of learning in social networking.
- Analyze the results based on the quality criteria and assessment degrees given on Google+.

2. A Knowledge-Creating Organization

Knowledge management has traditionally controlled humans and processes in organizations. The future of managing an organization is more about inspiring people to work, learn collaboratively and providing sophisticated tools for this. The most famous strategic approach for knowledge management is the Nonaka's and Takeuchi's (1995, p. 70) knowledge spiral-model. Based on their model organizational knowledge creation is a dynamic interaction between tacit and explicit knowledge. Knowledge creation is understood in the Japanese model with an emphasis on tacit knowledge, which can be seen as comparison to the western way of more explicit knowledge emphasis. Global economy and the networked world have shifted cultures closer together and the theories can be seen as complementary.

The importance of this section is to understand how knowledge is created in organization and how it can produce learning experiences. Despite of the dissimilarities or similarities on knowledge management and organizational learning theories, knowledge and learning go usually hand in hand. As other theorists like McAdam and McCreedy (1999, pp.101-110) describe learning processes as central of the knowledge management. Sharing social knowledge in an organization is about building relationships and with employees who can develop information and deepen their expertise in that manner. Traditional organizations are not necessary planned to support collective values, group motivation and individual learning ways that people are increasingly seeking. The new model of organization and communities of practices can be seen as a place where individual and social mind apply knowledge. Knowledge has become the key to success.

Tacit knowledge can be seen as the most valuable asset of an organization. Etienne Wenger (2002, p.9) defines that sharing tacit knowledge requires interaction and informal learning processes such as storytelling, conversation, coaching and apprenticeship of the kind that communities of practice provide.

A distinction between communities of practice and other structures can be seen. The main aspects of COP that differ from other structures are that it supports different (informal and formal) learning styles, voluntary commitment of members and group knowledge creation. According to Etienne Wenger (2002, p.18) teams and work groups can be seen as different groups as COP members. As teams and other structured groups deal with more strategized knowledge creation COP is more constantly looping knowledge for different departments. Short term and long-term values can be created from a COP for organization and the community members. Learning from others is one of the benefits that a COP provides. When learning is build together simultaneously it enhances learning. It also helps to shift to new organizational learning culture by allowing new ways of participation and deep engagements to knowledge. Peter Senge (2005) suggests that the first step of new deeper way of learning in organization is to be more attentive and genuinely curious about the cultures we live in and enact. He further on explains that by activating,

attending meetings and experimenting imagination with your colleagues you will start to feel as an active agent in enacting in the “organizational culture”. An expertise deep knowledge can be found from the deep interplay of tacit and explicit knowledge. Wenger (2002, p.16) sees that COP creates value in knowledge value projects or even as John Brown (2000) notes it can form collective intelligence.

This chapter describes the basis of these theories mentioned above and tries to make them complementary with each other. The chapter describes also the relationship between organizational learning and the learning of communities of practice. These theories will be used as the background of the thesis.

2.1 Knowledge Creation

According to the Nonaka's and Takeuchi's (1995, p.61) approach knowledge is divided as tacit and explicit knowledge. They describe tacit knowledge as highly personal and hard to formalize. Explicit knowledge is described as systematic and easy to formalize and communicate. Knowledge is created between interactions of these knowledge forms as a continuous process. The ability of organizations to learn especially the tacit knowledge and share it to specific group can be seen as most valuable asset of company, since tacit knowledge is difficult to copy. When an expert leaves a company his expertise will leave with him. There is a need for recording knowledge where tacit knowledge can be shared and learning can be done as well. Nonaka (1995, p.3) states that new knowledge can be created with the capability of a company as a whole disseminate it throughout the organization, and embody it in products, services, and systems.

Information and knowledge has to be understood in more detail. Nonaka and Takeuchi (1995, p.58) make distinguish information and knowledge with the following: Information is about meaning and action. Knowledge is a function of particular stance, perspectives, or invention. Nonaka and Takeuchi state (1995, p.58) that tacit knowledge can be made to explicit through different stages as; heavy reliance is placed on figurative language and symbolism, an individual personal knowledge has to be shared with others and new knowledge is born in the midst of ambiguity and reducancy.

Tacit knowledge (Subjective)	Explicit Knowledge (Objective)
Knowledge of experience (body)	Knowledge of rationality (mind)
Simultaneous knowledge (here and now)	Sequential knowledge (there and then)
Analog knowledge (practice)	Digital knowledge (theory)

Table 1- Two Types of Knowledge

Nonaka & Takeuchi (1995, p. 59) describe that the individual is the “creator” of knowledge and the organization is the “amplifier” of knowledge. A dynamic modern organization supports creative individuals and provides the context for them to create knowledge dynamically.

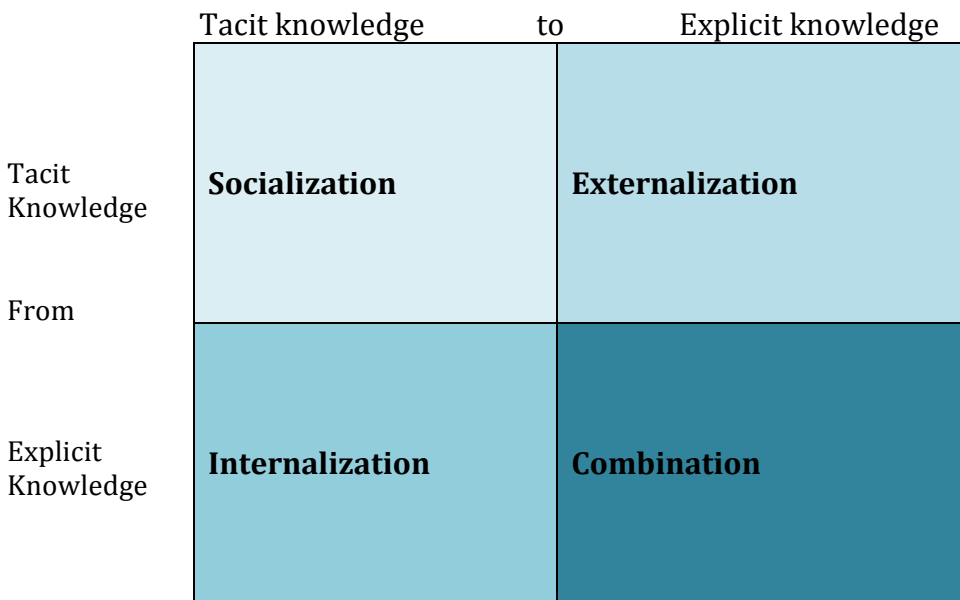


Figure 1 - Four Modes of Knowledge Conversion

Nonaka and Takeuchi (figure 1) see organizational knowledge creation as a dynamic interaction between tacit and explicit knowledge. Knowledge creation is understood in the Japanese model with emphasis on tacit. According to Nonaka and Takeuchi (1995, p. 231) tacit knowledge can be identified by following: hunches, perceptions, mental modes, beliefs and experiences of knowledge. Knowledge cannot be created by the organization by itself. Individuals are the basis of tacit knowledge creation.

From the knowledge creation process Nonaka and Takeuchi (1995, p.62) describe different modes of knowledge conversion as following:

- 1) From tacit knowledge to tacit knowledge, which we call socialization
- 2) From tacit knowledge to explicit knowledge, externalization
- 3) From Explicit knowledge to explicit knowledge, combination
- 4) From explicit knowledge to tacit knowledge, internalization

There can be a seen a connection between socialization and organizational culture. It orients the mindset and action of every employee (Nonaka and Takeuchi, 1995, p. 167). Chris Argyris and Peter Senge (2006, p.220) describe that setting employees towards a good energy level of social activities needs to concur certain defensive routines. By exceeding defensive obstacles make people more social with their own expertise. At same time they start to feel more committed to a group as well.

Nonaka and Takeuchi (1995, p. 71) present in the knowledge spiral (figure 2) that knowledge is formed by the shifts between different modes of knowledge conversion. They explain (Nonaka and Takeuchi, 1995, p.71) each conversion by following: socialization mode usually starts with building a “field” of interaction, externalization mode helps to make meaningful triggers from tacit knowledge to understandable explicit format, combination is triggered by “networking” new product or service ideas for organization usage and finally internalization triggers the practical implementation into processes.

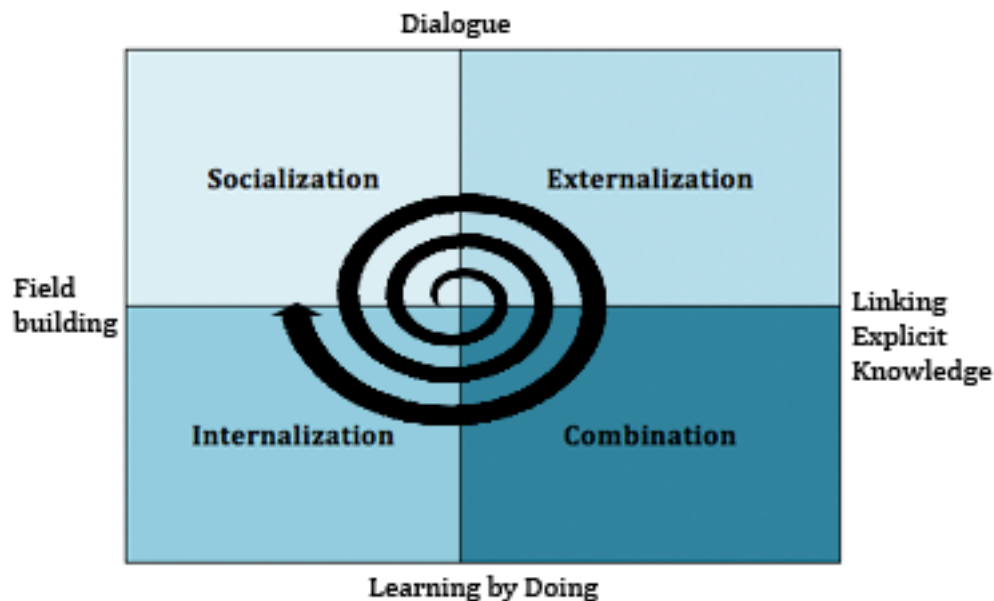


Figure 2- Knowledge Spiral model

As knowledge loops in the spiral it can become knowledge that crosses sectional, departmental, divisional, and organizational boundaries. The cooperative knowledge sharing loop can lead to collective, innovative and better products or services in the organization. The spiral model of knowledge creation is seen to support natural knowledge creation. It draws effectively frameworks also to management for relevant business processes.

Socialization is seen as a limited form of knowledge creation in organization. Knowledge needs to become explicit before it can be used effectively in organization. Socialization and collaborative processes strongly foster externalization in knowledge sharing. Cognitive learning theorists Lorin W. Anderson and David R. Krathwohl (2001, p. 313) believe that knowledge is created by individuals mind by organizing and reorganizing a problem. There can be seen a connection between cognitive learning and mental models of individuals. Tacit knowledge can be seen as reflective of cognitive experience, which is reflected during a longer period of time as explicit knowledge. Over time it can be started calling professional competence in a certain expertise field. On section 3 I will go more in details of learning theories and principals.

Nonaka's and Takeuchi's spiral model is criticized since it is based on Japanese organization, where employees stay much longer in companies than in the western world. Japanese and Western knowledge creation theories can be seen as separate theories since of different emphasis on tacit and explicit knowledge. The most crucial part for today's companies for creating knowledge management systems is that they retrieve right information at the right time in right form.

2.2 Organizational Learning

Organizational learning theories are based on the assumptions that organizations are under constant change. Argyris (1999, p.1) describes that organizational learning is correction of mismatches and errors. The profound theorist of organizational learning, Peter Senge (2006 pp. 7-10) follows up by defining five disciplines to overcome learning disabilities: system thinking, personal mastery, mental models, shared vision and team learning. In a knowledge-insensitive organization there can often be seen also a willingness to learn new. Further on Senge explains meaning of "organizational learning" – an organization that is continually expanding its capacity to create its future. Nonaka (1995, p.45) builds similarities in knowledge creation and organizational learning theories in especially such terms as "mental modes" and "team learning". But later on he present that organizational theories basically lack the view that "the knowledge development constitutes learning". Organizations may have skills or new brilliant strategies that never see daylight. Peter Senge (2006, p.162) explains that new ideas or skills usually fail to get into practice because they might conflict with organization deeply held internal images. Senge also states (2006, p.162) that managing mental models

as- surfacing, testing and improving our internal pictures of how the world works- promises to be a major breakthrough for building a learning organization. Later on Bontis and Serenko (2009) state on their researches that managerial leadership is a key for successful organizational learning with and emphasize of knowledge management. Like Senge described also the personal commitment and enjoyment of work is also highlighted in Botnis and Serenko’s research.

An American profound theorist Peter Senge uses organizational learning (OL) term to define knowledge creation and learning. Peter Senge (2006 pp. 12-13) describes real learning by following: “ through learning we become able to do something we never were able to do”. Through learning we perceive the world and the relationship to it. OL is based on personal learning. Organization sets the abilities for individual learning by setting culture of knowledge sharing and providing sophisticated tools for this. Still without individual learning there will be no organizational learning. It is organizations’ mission to resource and support the kind of learning that helps employees to improve their working skills and prepare future performance requirements. Senge (2006, p. 53) describes a learning organization dividing it by generative learning and adaptive learning, which can be the sustainable sources of competitive advantage. Generative learning is about making structural explanations of behavior. In organization of the year 2011 people are dealing with overwhelming amounts of information. Organizations need to build real time computing systems with support collaborative processes around the adaptive surroundings. Organizational learning can be built on the base of learning infrastructure. According to Pekka Ruohotie (2000, p.69) OL can be developed through strategies of organizational, managerial and team strategies.

Organizational	Management	Team
Creating a Learning Infrastructure	Acting with a common vision	Training interactivities
Encouraging trying new ways	Managing uncertainty	Improving reflective skills
Allowing responsibilities For employees	Design learning	Change management

Table 2- Strategies for Development of a Learning Organization

Team strategies emphasize the importance of group knowledge creation and learning. Actions of individuals are not considered as important as team’s performance. We need co-operation and collective ways of creating knowledge. Peter Senge (2006 p 1) describe “learning organization as a place where people continually expand their capacity to create results they desire, where new and

expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together”. Argyris (1999, p 179) explains that organizational learning relies on the basis of individual’s actions, which are intentionally economic or human relationships, or both. Information and knowledge are context-specified and relational in that they depend on the situation and are created dynamically in social interaction among people. Teams or groups of people can be seen as fundamental units of a learning organization. In the figure 3 teams learning core-learning capabilities are shown as a stool. Senge (2006 p. 6) explains that the stool would not stand if any of the three were missing.

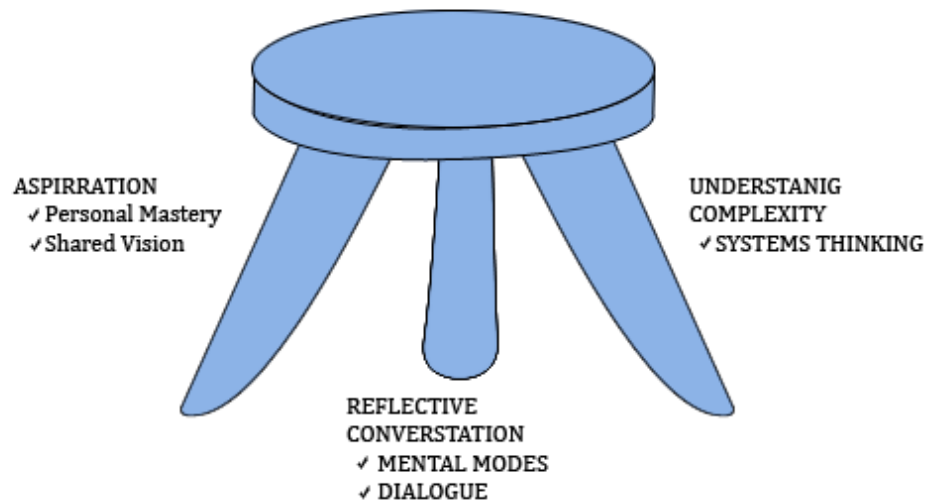


Figure 3- Core Learning Capabilities For Team

2.3 The Old and New Model of Organization

With the help of dynamic structure used in rapidly changing organization there can be driven solutions that can support transparent knowledge flow and learning with long term benefits. Nonaka and Takeuchi (1995, p.161) state that the old model of organization can be seen as highly formalized, specialized, centralized and largely dependent on the standardization of work processes for organizational coordination. It has been seen working as its best in stable conditions. The new model of organization can be seen in many perspectives as more encouraging to collaborative processes and organic structure.

	Old model	New model
Motivation	<ul style="list-style-type: none"> • Personal motivation • Individual believes • Competition • Short term effect 	<ul style="list-style-type: none"> • Group motivation • Collective values • Collaboration • Long term effect
Work structure	<ul style="list-style-type: none"> • Independent work • Quality based • Narrowly structured assignments • Limited on organization boundaries 	<ul style="list-style-type: none"> • Related work assignments • Process focus • Diversified knowledge creation • Crossing organizational boundaries

Table 3- Old and New Model of Motivation, Work Structure and Responsibilities

Motivation emphasizes person’s mental state and ability for learning new. However, in the new model of organization encouragement from colleagues or instructors are considered the most important factors for motivation. Nonaka and Takeuchi (1995, p. 161) describe the new model as flexible, adaptable, dynamic, and participative. People want to feel more autonomy in their work than before. Engaging is part of our self-directed ways of learning in organizations. Through social networking with collaboration and compromising behaviors individuals solve problems and conflicts better than in less social structures. According to Martin Kilduff and David Krackhardt (2008, pp.13-17) organizational behavior is understood through social networking. They explain that social networking emphasize relations between actors. It is highlighted in the modern social networking analysis that the importance of understanding is in the interactions between actors. The modern way of organization is also a reflection from the changes in our media habits and digitalization of the society. Henry Jenkins (2006, p.256) explains the changing media habits in his book about convergence cultures. He explains convergence by the following: “it represents a paradigm shift – a move from medium-specific content toward content that flows across multiple media channels, toward the increased interdependence of communications systems, toward multiple ways of accessing media content, and toward ever more complex relations between top-down corporate media and bottom-up participatory culture”. This particular shift is reflected everywhere in our society and especially in the collaborative processes of organizations.

2.3 Communities of Practice

Communities of practice (COP) are groups of people sharing information and knowledge on a common interest by collaboration. According to Wenger and other COP researchers as Laven engagement in COP is not a pedagogical technique or training method. It is rather an analytical approach for observing learning and way

of understanding conceptual ways. The place we call here as community can be described as in the central of cross operations in organizations. Etienne Wenger (2002, p.4) defines COP as group of people who share a concern, a set of problems, or passion about topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis. A COP has usually an objective and its focus is usually enhancing knowledge of the group. Sharing tacit knowledge starts from interactions between individuals. Nonaka and Takeuchi (1995, p 85) describe a typical field of interaction as self-organization team where members from various functional departments work together to achieve a common goal. From a business standpoint, the tacit aspects of knowledge are often the most valuable. Etienne Wenger (2006) has described the importance by following: “Communities of practice enable practitioners to take collective responsibility for managing the knowledge they need, recognizing that, given the proper structure, they are in the best position to do this”.

Nonaka and Takeuchi (1995, p 161) state that communities of practice have its limitations. They note that it has a temporary nature and new knowledge or know-how created is not easily transferred to the other members of the organization after the project is completed. Still they consider team as the central role in knowledge creation process. Knowledge is compound in the COP, where we start to share values and perspectives. That is when we create a community of practice.

Ileana Hamburg states that working collaboratively in COP (2010, p.413) can bring following positive aspects to organization:

- Improving the learning curve of new staff
- Supporting new ideas for products and service
- Reducing rework and preventing “reinvention of the wheel”
- Responding more rapidly to customer needs and inquiries.

The following distinction table 4 created by Etienne Wenger (2002, p.42) helps defining the COP and distinctions between other structures.

	What’s the purpose?	Who belongs?	How clear are the boundaries?	What holds them together?	How long do they last?
COP	To create, expand and exchange knowledge, and to develop individual capabilities	Self-selection base on expertise or passion for a topic	Fuzzy	Passion, commitment and identification with the group and its expertise	Intended to be permanent (but last until the next reorganization)
Formal departments	To deliver a product or service	Everyone who reports to the group’s manager	Clear	Job requirements and common goals	Intended to be permanent (but last until the next

					reorganization)
Operational Teams	To take care of an ongoing operation or process	Membership assigned by management	Clear	Shared responsibility for the operation	Intended to be ongoing (but last as long as the operation is needed)
Project Teams	To accomplish a specified task	People who have direct role in accomplishing the task	Clear	The project goals and milestones	Predetermined ending (when the project has been completed)
Communities of Interest	To be informed	Whoever is interested	Fuzzy	Access to information and sense of likemindedness	Evolve and end organically
Informal Networks	To receive and pass on information	Friends and business acquaintances, friends of friends	Undefined	Mutual need and relationships	Never really start or end (exist as long as people keep in touch or remember each other)

Table 4- Distinctions Between Communities of Practice and Other Structures

Learning in communities can be seen as a model of organizational learning. Successful team members will find ways to answer the needs of dynamic organization. At the same time the members will answer the needs of individuals and community's dynamical needs. Learning can be seen essentially as social. According to Nonaka and Takeuchi (1995, p 240) team provides a shared context in which individuals can interact with each other. Formal and structured knowledge creation in organization can be seen as a compilation of knowledge. Non-arguably the new model of organization and communities is an effective knowledge sharing and socialization practice. With right organizational culture, good design and right collaborative tools used in communities practice it can capture knowledge to be used in formal use of the entire organization. There can be build a strong relation in organizational and communities of practice learning. Many characteristics of learning COP deepen with multiple ways of social engagements and participation.

2.3.1 COP values and activities

Etienne Wenger (2002, p.20) states that relying explicitly on communities of practice fundamentally transforms the landscape of the organization. Domains of knowledge become focal points for connecting people in different units who are working on potentially related projects borderless medium. COP can be considered as one of primary contributors of knowledge. COP creates many types of values for an organization. The values it creates can be seen as short-and long-term value for organization and community members. I have edited a list of the values considered

as the most important for COP (Etienne Wenger 2002, pp. 14-21) in knowledge creation and organizational learning.

- It connects different professionals and expertise areas
- It enables members to take collective responsibility for managing knowledge they need
- It allows practitioners to address tacit knowledge and enables explicitly sharing of the knowledge
- It links and coordinates unconnected activities and initiatives addressing similar knowledge domain
- It can create a forum for “benchmarking” against the rest of the industry
- It can create sense of belonging and bring more fun aspects to the participants

In business perspective it can reduce time and costs, enhance resources for implementing strategies, improve decision-making quality and coordination of different units. Most importantly it is connecting a strategy of the organization by connecting the personal development and professional identities (Wenger 2002, p.17). Knowledge built together while simultaneously experimenting hand-on greatly enhances learning. COP can be seen as managing own knowledge and teams and groups as performing tasks. The same people who are performing tasks are still COP members. As organization structures teams and processes will change the COP remains by infinity looping around organization towards better learning. Organizational structure reflects how autonomic individuals can be and resources are allocated. It also affects the nature of individual and group relationships.

COP where its members are learning together face many activities. Inside community questions and debate around different topics can occur. Members of the community learn from each other on a daily basis. Outside the community expert views from other organizations can be included to internal views. Learning activities can be seen mostly as informal since fast commenting and questioning is often supported. Formal actions are often related to systematically catering knowledge or summarizing topics. The figure 4 shows all activities that community of practice engages with. Etienne Wenger (2009, p.6-12) categorizes the activities with differences in the engagements (1. Exchanges, 2. Productive inquiries, 3. Building shared understanding, 4. Producing assets, 5. Creating standards, 6. Formal Access to Knowledge, 7. Visits).

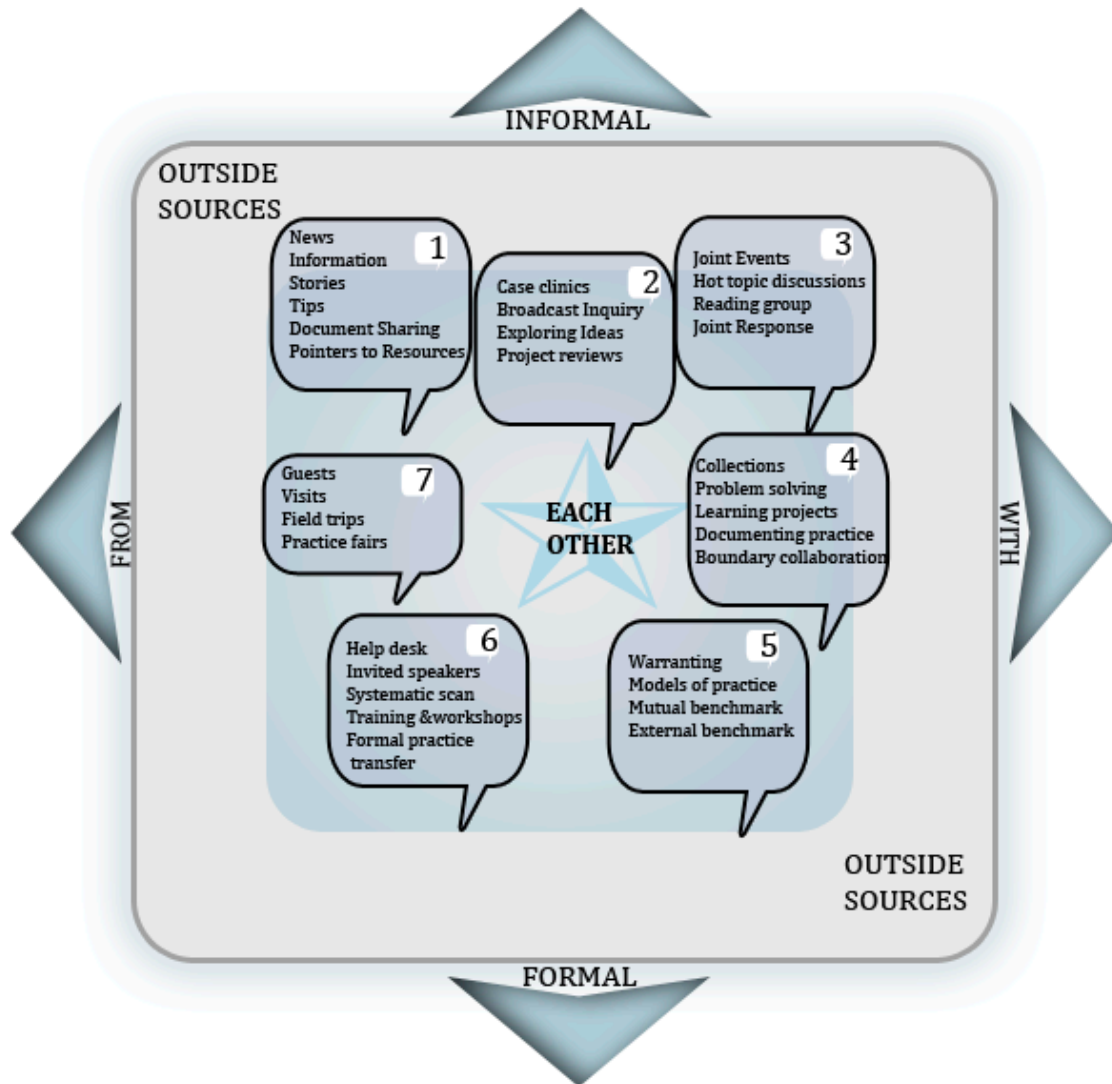


Figure 4-The Range of Activities in which Communities of Practice Engage.

Most of the activities are acts of participations in COP. Motivations for learning is often build on the desire to become a member of a COP. Our depth of knowing and learning relies in multiple ways of COP we participate and engage with. Learning is considered as a lifelong process and a natural part of us. COP becomes a place where informal processes are easy to shape into natural learning.

3. Learning Theories

Personal growth and deepening expertise of individuals can be seen as organizational strengthening as well. Individual learning is a premise to organizational learning. Learning can be closely associated with personal knowledge creation. According to the previous chapter and mentioned theories of Nonaka and Takeuchi (1995, p.76) "Original ideas are developed in individuals minds and developed further with a team after that becoming organizational ideas". The way organization can learn is dependent how it can move personal learning into organized structures and to understandably format it for future usage. The new model of organization emphasizes informal learning ways. The formal and authority-based learning does not work in an organization which is developing and operates innovatively. The new model of organization needs support from self-directed learning. The web allows new kinds of learning, since it allows multiple ways of intelligence with the use of various media and support of social learning.

Anderson and Elloumi (2008, p18) describe the dominant learning theories as behaviourism, cognitivism and constructivism. They will give theoretical frames to interpret the ways of learning in this research. Cognitive learning occurs inside individuals' mind and emphasizes the memory capacity of a person. Bloom's taxonomy (1956) theory of cognitive learning will be taken to deeper insight and analyze in the following section. According to Päivi Tynjälä (1999, p.37) constructivism theorists believe that knowledge is not an objective reflection of world and independent from the observer. It is always rather constructed by an individual or a community. Social constructivism is described as fourth learning theory. It is strongly aligned by the ways that learning occurs in communities. Päivi Tynjälä (1999, p.39) describes that social constructivism learning is created by social interaction and discussions. Also learning in authentic practical situation is highlighted in social learning. Learner still uses usually variety of pedagogical approaches and information sources when solving problems and learning. George Siemens (2004) wanted to create a learning theory for digital age. This pedagogical approach is called connectivism. It can be seen as the most important approach of learning in online communities. It is build based on the facts that amount of knowledge has doubled in the past ten years. It also attempts to build the link between individual and organizational learning. Common to all approaches on learning is that it cannot be seen in passive mode but rather in creative and constructive modes. According to Stubbé and Theunissen (2008, p.2) development in working communities grows out of the interaction of both internal/psychological events and external/social events and is based on change rather than on stability.

Wenger (2009, p4) describes learning as an involvement who we are, what we do, who we seek to connect with, and what we aspire to become. An active learner in an organization takes collaboratively part of sharing information and knowledge. Web and technology are important facilitators for communities and becoming more important for social learning as well. Terry Anderson and Fathi Elloumi (2008, p.53)

describe World Wide Web is extremely multifaceted technology that provides a large – and seemingly ever-growing – set of communication and information management tools, which can be harnessed for education provision.

There can be numerous advantages seen in online learning as cost-effectiveness and increasing amount interactions compared to the traditional lecturing mode.

3.1 Different Ways of Learning

Lorin W. Anderson and David R. Krathwohl (2001, p.3) state that learning is done by setting objectives, that are “ explicit formulations of the ways in which students are expected to be changed by the educative process”. They continue by describing the learning process by the relation on what objectives teacher/instructor selects for the learners and how teacher/instructor help the learner to achieve the objectives.

Learning is understood as change or as an opportunity of change. Learning can be seen as process, where a behavior changes according to an experience.

Although with more deeper analyze and broader look of the context we should feel more committed to the task.

Terry Anderson and Fathi Elloumi (2004, p.18) have described the most dominant learning theories by following:

- Behaviourism- Behaviorists claim that observable behaviour indicates whether or not the learner has learned something, and not what is going on in the learner’s head.
- Cognitivism-Cognitive theorists see learning as an internal process, and contend that the amount learned depends on the processing capacity of the learner.
- Constructivism-theorists claim that learners interpret the information and the world according to their personal reality, that they learn by observation, processing, and interpretation, and then personalize the information into personal knowledge.

Cognitivism, Social Constructivism and Constructivism are theories or approaches that are seen as the most important for this thesis. Memory and processing capacity is highlighted in cognitive learning and can be seen generally as the psychological enabler of learning. Social Constructivism supports the natural way of learning by socialization, which was emphasized in the COP learning ways discussed in chapter 2.3. Connectivism is relatively new approach build for digital world. Since the concentration of this thesis is on learning in online environments the approach can be seen as most suitable. Connectivism learning emphasizes learning by connecting the right people and information. This can be seen as important for organizational

learning as well. The following chapters will describe in more detail the learning theories and approaches mentioned above.

3.1.1 Cognitive Learning Theory

According Pekka Ruohotie (2000, p.110) and to the psychologists of cognitive learning say that the control of learning is in persons individual mind. Learning starts from organizing events in a way that the surrounding stimulus would make sense. The cognitive psychologists see that problem solving can happen suddenly and after that learning can occur by realization of the problem. By developing learning our senses become organized so that we can solve more complex problems. Some of the cognitive (Pekka Ruohotie, 2000, p.111) schema psychologist as Ulric Neisset notes that for learning it is most important to link information to an existing schema or presentation. Schank, Lyras and Soloway (2010, p.74) explain that storytelling is an important cognitive process and crucial for learning, since story can be memorable and retainable. They note also that indexing is a key managing knowledge in organization. This becomes natural with stories since they contain a lot of information and indices.

When we talk about classifying things hierarchically in science the most common noun for this is taxonomy. It helps experts to make sense and build relations between things. Benjamin Bloom (1956, p.2) created the original list of cognitive objective categories. It was created to motivate educators to a more holistic form of education. According to Bloom (1956,p.2) the objectives of the taxonomy are divided into following hierarchical categories: knowledge, comprehension, application, analysis, synthesis, and evaluation. The processes are divided as Higher Order Thinking Skills (HOTS) and Lower Order Thinking Skills (LOTS). Learning relies on the fact that applying higher level thinking skills needs first knowledge skills from the lower levels.

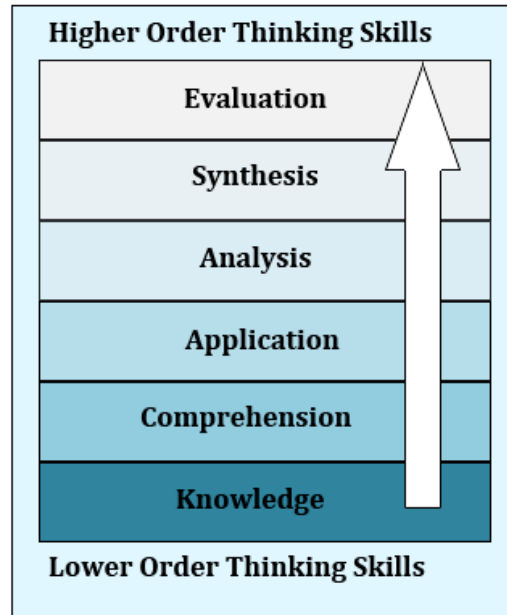


Figure 5, Bloom's Taxonomy

Traditional education relies on to the lower-order objectives, where emphasis is recalling before presented information. The concentration of this thesis in cognitive learning is later on revised with Bloom's taxonomy theories and HOTS discussed further on section 3.2.1. It is considered the most important for individual learners ability to direct his/her own learning. Constructing own problematic and searching new knowledge can do this.

3.1.2 Social Constructivism

Starting from the late 80's new pedagogical models have been raised besides the cognitive approaches where learning is seen primarily as social phenomenon. The basic claim of constructivism is according to Pekka Ruohotie (2000, p118) that learning is definition process of meanings. It is a question how people interpret their experiences. Social constructivists believe that knowledge is created when people collaborate on common problems and discuss them. Setting the meaning is now based on dialogue. According to Päivi Tynjälä (1999, p.57) social constructivism emphasizes that a meaning is dependent on context. It is not interested on the fact-based context, but the context that is formed by people's dialogue and relationships. Tony Bingham and Marci Corner (2010, pp. 10-11) define social constructivism as the theory of knowledge that seems to best describe how people learn together, whether in person or online. They also describe the 21st century mind as a collective mind where we access what we know in our friends' and colleagues brains. Together we can be smarter and can address even more challenging problems.

Päivi Tynjälä (1999, p.41) describes that there is also a combination for personal learning (cognitive) and observation of our surroundings (constructivism). According to her this interaction can be called as cognitive constructivism or radical constructivism. Found from this theory new observations and information are interpreted according to previous knowledge. Vygotsky (1978, pp.52-57) defines that all learning is done in two stages, first in social and then in psychological level. From learning and observing actions are changed to internal cognitive processes. Cognitive constructivism emphasizes personal changes of information and mental structures.

Päivi Tynjälä (1999, p.61-67) describes constructive pedagogical consequences by following:

1. Learners' activity and instructor/teachers' role has changed- teaching is seen more like directing the information constructing.
2. Learners previous knowledge as a base for learning new.
3. Developing meta cognitive processes is important- Learners are directed to independent management of learning.
4. Understanding is more important than remembering.
5. Considering different learning approaches by discussion.
6. From fact based learning towards problem solving.
7. Importance of situated learning.
8. Development of versatile representations.
9. Emphasis on social interactions.
10. Developing new assessment methods on learning.

Community learning is about acting in social activities and engagements with an environment and organization culture supporting these. A member of community actively takes part of discussions and can store specific experiences or content to personal usage. By the open collaboration a member of community constructs context and is learning socially. Groups can identify technologies according to their needs for learning. As Wenger (2009, p.189) pointed out that it is rather than finding technology for community, it is about finding community in technology.

3.1.3 Connectivism

George Siemens (2004, p.1) state that the above-mentioned theories are developed not to meet the technology impact of learning. He presents that there needs a new theory called connectivism, which includes technology and connection making. Networking and compelixity are one of the implications of connectivism. It can be seen as a theory that narrows the cap between people by connecting them at the right time in organizational knowledge management as well. George Siemens (2004, p.2) describes learning in digital age by following: " learners challenge is to recognize the patterns which appear to be hidden. Meaning-making and forming connections between specialized communities are important factors". In his theory

of connectivism learning is considered to happen outside of ourselves. In digital age it can mean learning is focused (George Siemens 2004, p.4) on connecting specialized information sets, and the connections that enable us to learn more are more important than our current state of knowing.

The importance of recognizing most relevant and important information can be seen as key abilities of the new digital way of learning. Ability also to recognize new information when it is available becomes also crucial. Connectivism can be seen as an approach that is exploring learning with ICT and web 2.0. It can also be seen as an answer to many challenges that companies face with knowledge management and web 2.0.

George Siemens lists **principles of connectivism** (George Siemens 2004, p.4):

- Learning and knowledge rests in diversity of opinions.
- Learning is a process of connecting specialized nodes or information sources.
- Learning may reside in non-human appliances.
- Capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.
- Ability to see connections between fields, ideas, and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist-learning activities.
- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality.

3.2 Learning in the Digital Age

Web and technology are important facilitators for communities and becoming more important for social learning as well. Autonomous and self directed learning has become crucial for an online learner. Anderson and Elloumi (2008, p3) describe distance education (of which online learning is a major subset) as discipline that subsumes the knowledge and practice of pedagogy, of psychology and sociology, of economics and business, of production and technology. Understanding the value of collaboration, sharing knowledge and experiences is a must for an online learner. Different terms of online learning like eLearning or distributed learning are nouns for to explain the nature of it. The terms have all in common the fact that learner is at distance from the teacher and there is technology used to support the learning experience. Terry Anderson and Fathi Elloumi (2008, p.18) explain that there are significant benefits for the learner and instructor/teacher to use online learning. For learners and instructors there are no time or place restrictions. Learning and

instructing can be done any time anywhere. Instructor or learner can update changes in materials immediately. John Dron and Terry Anderson (2009) describe the benefits for learner in online learning 2.0 by following: easier for learners to choose the paths that they follow and the people that they engage with on those paths, supports better instant, relevant individual and lifelong learning, filters can help to select resources and people of relevance. John Seely (2000) explains that because of the endless amount of information we are constantly discovering new things as we browse through the emergent digital “libraries.” Because of the amount of information learning has become more discovery based. Web not only enables the information flow but also facilitates social actions for knowledge sharing. John Seely (2000, p.13) presents in figure 6 shifts on learning ways from old towards the digital learning ways. Recommendations from friends and discovery have become more important for “the future learner”. John Seely (2000, p.14) states that learning has become situated in action; it has become as much social as cognitive, it is concrete rather than abstract.

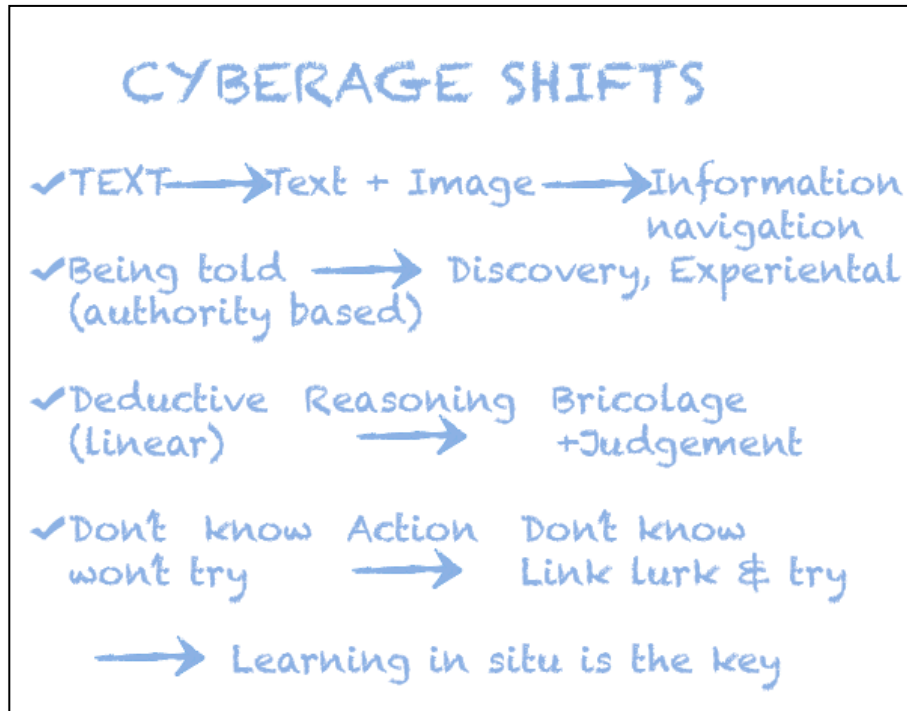


Figure 6- Cyberage shifts in Learning

Terry Anderson and Fathi Elloumi (2008, p. 19) state that online characteristics of learning strategies and online environments are crucial for learning. According to Anderson and Elloumi (2008, p. 19) strategies should be selected which motivate learners, facilitate deep processing, build the whole person, cater to individual differences, promote meaningful learning, encourage interaction, provide relevant feedback, facilitate contextual learning and provide support during the learning process.

3.2.1 Digital Levels of Learning

From the cognitive thinking there has been a revised taxonomy build by Lorin Anderson (2001) a former student of Benjamin Bloom. In the revised taxonomy the key is to use verbs instead of nouns of different levels of learning. According to Benjamin Bloom and Blooms taxonomy (Bloom 1956) and the further revised theories there are six levels of learning: remembering, understanding, applying, analyzing, evaluating and creating (Bloom, Anderson, Churcles 2008). The taxonomy was originally created to help teachers or instructors' ability to plan suitable learning ways and curriculums. It is also seen as a framework to put a common way of thinking into the communication around teaching administrations.

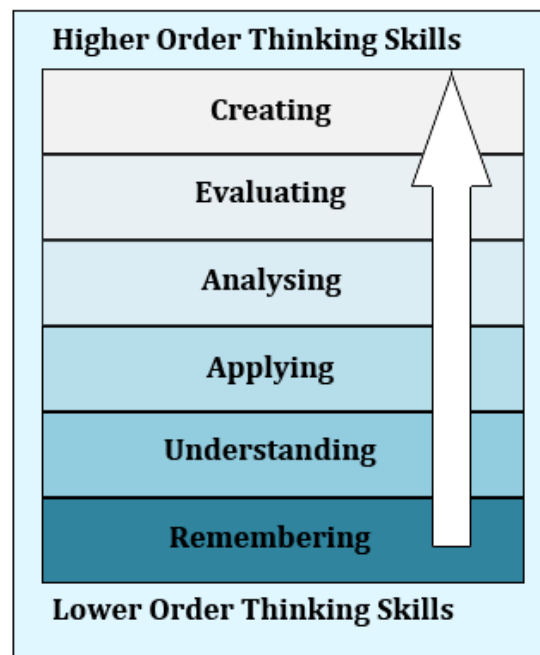


Figure 7, Revisited Bloom's Taxonomy

Lorin W. Anderson and David R. Krathwohl (2001, p.12) explain that the verbs listed on the thinking skills process describe the cognitive process. Further on they explain that cognitive process is the place of "behavior" and "knowledge" and is the place of "content".

In this thesis I will concentrate on the high order thinking skills set of analyzing, evaluating and creating. These skills are connected strongly to the learners ability to make connections between knowledge and activities. Lorin W. Anderson and David R. Krathwohl (2001, pp.79-84) give examples of each (HOTS) learning processes:

- Analyzing- It is involving breaking material into its constituent parts and determining how the parts are related to another and to an overall structure.
- Evaluating- It is about making judgments about whether a specific example fits within a category.

- Creating- Learner/student is making a new product by mentally reorganizing some elements or parts into a pattern or structure not clearly presented before.

Lorin W. Anderson and David R. Krathwohl (2001, p.109) also give good examples of knowledge needed of each (HOTS) example:

- Analyzing-Learner needs knowledge of the relationship of the materials used to rendering color.
- Evaluating- Learner needs knowledge of set of principles pertaining “appeals”.
- Creating- Learner needs sufficient knowledge of particular species so they can design a habitat to ensure their survival.

The verbs associated from higher order thinking skills to digital world are presented as following (Bloom, Anderson, Churches 2008):

- Analyzing- linking, mash uping, validating and tagging
- Evaluating- moderating, blog commenting, video posting
- Creating- blogging, wiki-ing, remixing and publishing

The revisited taxonomy for digital age and especially the above mentioned (HOTS) cognitive processes will be used in one of the quality criterias of the assessment in section 6.

Lower order thinking skills are considered less important for this thesis research.

Lorin W. Anderson and David R. Krathwohl (2001, pp.66-77) give examples of each (LOTS) learning processes:

- Remembering – Learner needs recall task/knowledge from the under conditions very similar to those in which he or she learned in the material.
- Understanding – Learner is constructing meaning of instructional messages. This could be in example a computer simulation through an art museum.
- Applying - There is a task for which student must locate a procedure to solve the problem.

The verbs associated from lower order thinking skills to digital world could be for example following.

- Remembering -bullet pointing, searching and highlighting
- Understanding- classifying webpage addresses or subscribing a newsletter
- Applying- editing texts, playing games or sharing documents

These (LOTS) cognitive processes will remain untouched in the assessment, since these features are considered more as default than optional features of an online social network. That is why they do not have importance in the assessment criteria defined in section 6.

Andrew Churches (2008) draws a connection between the revisited Bloom's taxonomy cognitive processes towards digital world.

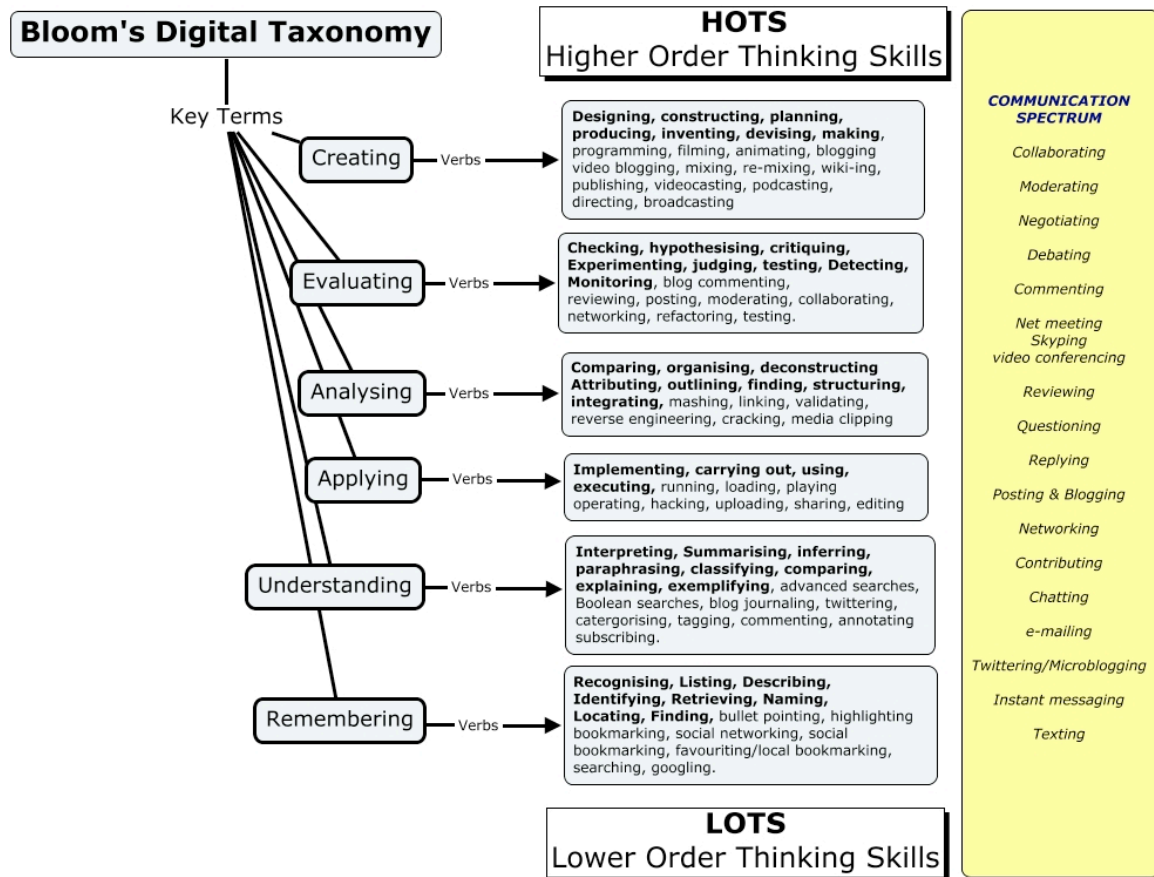


Figure 8- Bloom's Revisited Digital Taxonomy

In the digital taxonomy the increasing ability to use collaborative tools in learning with digital media are highlighted. According to Bloom's original theory learning cannot be created without relying to lower hierarchical thinking level. But especially in the digital revised theories as shown above there is strong believe that cognitive stages and learning can be found from separate stages without applying other stages. This belief stands in the philosophy of learner having individual freedom how to learn. Digital networks and applications have improved the ways of learning to solve more complex cognitive processes. Certainly organizing content making notes around themes into relevant concepts has become easier than before. The importance of taxonomy of learning objects can be seen as instructors/teachers ability guide or contract the right type knowledge to get the best learning results.

4. Learning Collaboratively Online

Organizational learning with learning collaboratively online elaborates and researches the new ways of organizational, personal and collective learning, which is created through social networking. Social learning in organizations can be described or called as collaborative learning. Online learning enables working simulations where mistakes and failure is allowed. When working in teams in online environment you can discuss with your community members and help is usually available easily. Fun can be a motivator and social networking can bring more entertaining features available for the trainer than before. Social learning in communities of practice is learning by observing and questioning. Organization that uses this kind of learning or setting is organically structured. Knowledge is primarily questioned from experts to share with other employees. In a developing collaboration learning is created by active dialogue, where knowledge and skills are interpreted constantly. With the help of social networking the rapidly changing organization can drive solutions that can support transparent knowledge flow and learning with long term effects. Tony Bingham and Marci Corner (2010, p17) define in their book "The New Social Learning" that emerging technologies enable a new kind of knowledge-building ecosystem with people at its core.

World wide web reached its commercial popularity in the beginning of 90's. Web 2.0 has been around for only six years. Commercial social software applications have existed approximately less than five years. Social media has become the second most used web service right after search services (Comscore 2010). Still social networking and learning in organizations is taking its first steps to realize its true value of collaborative learning environment. Tony Bingham and Marci Corner (2010, p.5) describe social learning as "leveraging how we have always worked, but now with new tools to accelerate and broaden and organizational reach". Web 2.0 technologies perceive the need of the changed structure of new organization. It allows a learner decide the most convenient learning way for him or her.

People and organizations' mission must have an essential part of the context to make it a relevant place for communications. Problem solving and amount of content has become more complex than ever before. There needs to be shared tools so that the complexity can be understood more collaboratively and solved better. According to latest McKinsley report 40 % companies use social media and 70 % sees it beneficial for the business (McKinsley 2010). Andrew McAfee (2009, p2) describes social media 2.0 tools addressing the following organization challenges; creating gathering, and sharing knowledge; increasing rates of innovation; locating answers and expertise; and identifying and solving problems more quickly. Online communities are generally described as a place, where group of individuals share a common interest detached from the physical place and time. Social media represents a class of applications, which support social information retrieval, personalized aggregation and monitoring, easy and joint publishing, sharing and interaction, as well as establishing and maintaining connections (Terje Våljataga and

Sebastian Fiedler, 2008, p.58). With social networks people are able foster and maintain knowledge flow with additional learning modes.

Creating advance in the knowledge creation spiral (Nonaka and Takeuchi, 1996, p 82) is enabled partly by maximizing variety of information with combining information differently, flexibly, and quickly. This is where collaborative tools and social software can take part and enhance the learning and the knowledge creation in organization. The focus of this thesis is to find out how knowledge sharing can create learning in an online community.

4.1 Networked Society Towards Web 2.0 Technologies

The first recognized information network Arpanet was developed originally to the US defense department in 1969. For large communication purposes and World Wide Web there was need for more transmission capacity. An invention known as TCP/IP was made in 1983. It enabled computers to communicate and encode decode data packages traveling at high speed in the Internet networks (Manuel Castells, p. 352). A decade after TCP/IP invention was invented web pages/sites started to appear in various interests around the World Wide Web (WWW). These sites usually allowed access for everyone and they were created mainly from text and images. In the year 1994 the World Wide Web had reached 21 700 public domains around the world (Manuel Castells, p. 352). Soon WWW started to be recognized as a media. The most significant thing was that it could be used for interactive communication. John Seely (2000) notes that Web media differs from the more traditional media (tv, print) in the way that it enables two-way push and pull combination of communication. More traditional medias allow only one-way communication.

Groupware software came into organizational use in late 90's, but soon these kind software like Notes where not seen suitable for finding and sharing knowledge. Other groupware technologies as Knowledge Management (KM) systems came after the first software. Andrew McAfee (2009, p 42) states that KM and groupware tools were not really recognized as collaboration tools, since they did not able creating and sharing knowledge as a community. Since the millennium interactive communications and multimedia systems have become a part of our everyday life. Internet reached mass media status by 2010 with totally new shift for the user-generated content enabled techniques. The techniques and web's "new" social approach was called web 2.0.

Tim O'Reilly (2005) defines **Web 2.0 as**

“the network as platform, spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual

users, while providing their own data and services in a form that allows remixing by others, creating network effects through an “architecture of participation,” and going beyond the page metaphor of Web 1.0 to deliver rich user experiences”.

One of the most popular trends in web 2.0 in recent years has been a significant growth of using social networking. There interactive communication is gathered around common interest or purpose. Social networking developing towards learning ecologic in our society is taking its early steps of adoptions. Terry Anderson and Fathi Elloumi (2008, p.2) describe that already around 2005 educational web has taken adoptions from semantic web with autonomous agents and intelligence databases supporting rich and effective learning experiences.

4.2 Collaborative Learning Organization

Virtual communities where people co-operate and learn informally have become important types of communities for organizations. Easy access of knowledge, good information flow, effective way of sharing knowledge and ease of communication are one of the benefits that an online community can provide. Nonaka and Takeuchi (1995, p.85) draw a link between tacit and explicit knowledge where mental modes are formed as concepts to crystallize the meaning and deep understanding to be shared in an understandable format. Web 2.0 tools enables a variety use of graphics, collaborative mapping tools and fast access to linked contexts. These tools can be easily used, accessed and shared in social software environments to support the sharing of tacit knowledge. Etienne Wegner, (2002) state that community-driven, collaborative content creation online; produsage communities are building significant new creative and informational resources and in doing so are being challenge to the established industries in their fields.

Martin Yuecheng Yu, Karl R Lang, Nanda Kumar (2009) present that virtual communities promote collaborative work among professionals by following:

- Besides off-line communities of practice online communities allow broader collaboration between already familiar colleagues and contacts.
- They can disseminate time-sensitive information regarding various off-line activities.
- It allows opportunities for users to extend collaborative activities beyond face-to-face meetings.
- It increases voluntary engagement in various problem and knowledge exchanges.
- Self-motivated collaborations can transcend both geographical boundaries and the constraints of specific knowledge domains.
- They forge a sense of professional kinship and also nurture global team

building.

There is an enormous potential of the web to support efficiently communities. The pedagogy framework of Siemens' connectivism discussed in chapter 3.2 is well supported in web 2.0 and community concept. A well build virtual community efficiently enriches ways of learning in organization by using a distributed network of people, delivering diversity of opinions at one place. It is also adaptable for the specific needs and goals for different organizational settings and goals. It also helps to keep information/knowledge up-to-date, which is also highlighted in George Siemens' connectivism approach. Ileana Hamburg (2010) explains in his article of eLearning and knowledge improvement in companies, that "managing knowledge is a conscious strategy of getting the right people at the right time and helping people share and put information into action in ways that will improve organization performance". The new approach in virtual learning environments make the learning more easily accessed by taking colleagues and participants learn together online. Different type of users of communities as managers, moderators, members, authors and so on communicate and interact according to their needs and organizational needs. Tony Bingham and Marci Corner (2010, p.19) define learning in organization as the transformative process of taking information that, when internalized and mixed with what we have experienced, changes what we know and builds on what we can do. It's based on input, process, and reflection.

Nonaka and Takeuchi call a new organization structure as "hypertext" organization. This relates in to the everyday knowledge creation with new tools with it. The "hypertext" word builds a link also between online learning organizations, since hypertext can be seen as a basic form of web page or better know as HTML (hyper text markup language) page. Wenger (2009 p. 25) identifies persons in online communities that are becoming also important for organization learning. They are people with enough experience of the working of a community to understand its technology needs, and enough experience with or interest in technology to take leadership in addressing those needs. Jay Cross (1999) points out also that around 80% of individuals' learning is informal. Informal learning can be described as learning where learner sets his or her own learning objectives. Formal learning can be seen as opposite to this, where someone else like teacher or instructor sets the objective. With virtual community there is a lack of real life face-to-face contact which is one of the weaknesses of collaborating online in a COP. Trust can be very difficult to build online between people. Usually balancing the virtual and real life connections leads to best results when building trust and active community. Virtual communities usually involve highly self-directed learning, which is very desirable. However the practice shows that encouraging the learner to activities of participation is recommendable. New technologies are becoming and the need of globalization is making virtual COP standard way of learning in organizations (Etienne Wenger 2002, p.25).

4.3 Social Media Tools for Communities

Social media is one important facilitator for co-creative and collaborative work. Pirjo Näkki and others (2011, p. 20-21) notes that one of the first social media applications, Wikipedia, is an example of this self-organizing, collaborative work that is possible in social media. Replacing of the existing processes with social tools as Wikipedia, which can replace the shared folder and work documents. For sending emails back and forth you can use blogging instead of emailing. Instead keeping your browser tagging for yourself only you share them as social bookmarking service like delicious (Toni & Marci p.120). Communities refer to the opportunities for people to communicate, network and collaborate. WWW is full of open source and commercial tools for social media; these tools can also be used for educational purposes. Generally open source is a better solution for a smaller organization. With open source you probably need a specialist knowing programming, since modifying and installing can require programming skills. In larger organizations it is sufficient to use the commercial version to get the highest possible service needed to support fully the needs of an organization.

The advantages of social media are its accessibility for everybody, building relationships, and communities of common interest. Actions that of social media enable are for example: micro sharing, social bookmarking, file sharing, blogging, podcasting and rss feeding. Services supporting these social actions can be listed as following: Wikispaces, Facebook, Twitter, Delicious, Youtube, Wordpress, Google docs and Skype. The tools require no advanced computer skills and can benefit both individual and group learning in an organization. Different types of synchronous and asynchronous communication technologies are used to support the various media of online communities. Martin Yuecheng Yu, Karl R Lang, Nanda Kumar (2009) give good examples of these technologies. Synchronous technologies include instant messaging, white boards, and text chats. Asynchronous technologies include bulletin boards, discussion forums, Web-logs, mailing lists (e.g., listserv), and newsgroups. Mailing lists in particular are popular in online communities as a medium through which to support basic functions such as announcements, information sharing, querying, and discussion. Social media tools that can be used for learning and working together can be very effective for bringing ideas together. Publishing becomes easy and the content can be revised over and over with social media. Tony Bingham and Marci Corner point out on their book "The New Social Learning"(2010, p112), that for learning and working purpose the success of a social network can measured by following: vibrancy, socialness and relevance. They describe vibrancy as community's valuable and energetic place to be. Socialness and interactions amplifies individual's contributions. When choosing the most suitable social media tools the following features must be taken in great consideration: modularity, flexibility and openness of a tool. Since the large variety of different tools available it is important to think the community's needs as whole and not as separate social events.

learning and collaborative learning. I will go into more detail in social software in section 5.2.

Social media tools can be used for a variety of different kind of communities. Social media tools can be used for example in arranging meetings, sharing documents and marketing. I will focus on describing typical tools for serving content of a community, since social engagements/sharing content with other members can be considered as the most important factor for building a valuable and meaningful community. Etienne Wenger (2009, p.95) has listed the most important activities and tools for a community sharing content in table 5.

Activities	Tools
Uploading and sharing document files	<ul style="list-style-type: none"> • Separate document repositories • Attachment to discussions
Commenting on, annotating, and discussing content	<ul style="list-style-type: none"> • Discussion forums • Wikis for annotation • Blogs with comment features • Web page annotation tools
Publishing self generated content	<ul style="list-style-type: none"> • File sharing • Blogs • Web pages • Wikis • Screen casts
Publishing structured objects	<ul style="list-style-type: none"> • Content management systems • Meta-data features
Centralized editorial control (for example organizing, approving, editing)	<ul style="list-style-type: none"> • Editor functions to show changes, version control • Manual editing and approval for public posting • Access controls • Workflow for routing material
Distributed editorial capabilities	<ul style="list-style-type: none"> • Tagging • Rating • Commenting
Rating contributions	<ul style="list-style-type: none"> • Rating Mechanism • Activity tracking • Metrics and reporting • Tagging
Accessing internal and external content	<ul style="list-style-type: none"> • Search engines • Tagging tools • Subscriptions/alerts • Aggregators and newsreaders with features such as RSS, trackbacks, and Pinging
Archiving	<ul style="list-style-type: none"> • Time sensitive notices • Automated archiving

Table 5 – Activities and tools for community for sharing content.

Organizing content in valuable meanings makes it easy to share expertise and new members feel motivated to join the community. The need of sophisticated tool for handling the amount of information is crucial for learning. Also the discovery based learning and following other members' learning paths by sharing categorized content are seen as the most important factors of learning in community. The relationship and social networking tools have great importance in content sharing for a community. With tools like friend listings or group establishing features relationships can be built more easily. Expertise groups can develop collective learning and explicit knowledge in a single repository with different social media tools. Knowledge can then easily be shared with the future employees and other stake holders.

5. Community Design and Social Networks

Learning in an online community involves a personal and group way of learning. A person can learn in isolation or collaborate with colleagues in a COP of an organization. Etienne Wenger (2009, p.178) describes the dynamic community as a new geography of identity that is both quite social and at the same time very individualized. Technical architecture of a community is meant to support the collaborative and communicational processes. The engaging processes of a community is essential for building relationships, learning and knowledge sharing between members and the whole organization. The focus of this section is to describe a typical design of a community. This model can be used potentially for online environment as well. Designing can be described as a challenging task – whether it is complex information system or a simple product design.

Design can start by defining the key synergy points that a community connects. A community is described as organically structured. Commitment, trust and various communication ways structure the community's "soul" in its lifecycle. Events and different levels of participation help to create a rhythm for the community. Etienne Wenger (2002, p.64) describes the design of a COP as an approach to design community that redefines itself. When designing a community the purpose of it becomes crucial. Communities can drive following purposes (Cambridge, Kaplan and Sutter, 2005): develop relationships, learn and develop practices, carry out tasks and projects and create new knowledge. COP can be seen as a part of a knowledge management system. COP supports the informal and unstructured processes more than the standardized ways of organization.

Designing a community on web has to take social and technology factors like usability into consideration. Jenny Preece's (2006, p.210) community centered development process can be seen as one of the models where social and technological design is combined. Usually for organization's internal learning there

is a need for personal software for the collaboration. Challenge of organizational learning relays on the actual knowledge in point where it can be easily shared. This point can be described as an application or as a software tool. Social software can be seen as the tool that is supporting community's communications in different variations. It is a tool that is meant to support for example the following: relationships, identities and conversations. Social softwares are available in open source licensees and commercial versions. I will introduce an open source social software Elgg, which is used widely for educational purposes.

Social network is probably a more common term than the social software for to the public to describe a community, which shares a common interest and acts around it in an online environment. There are many popular social networking consumer services as Facebook, Myspace, Google+(G+), LinkedIn, Twitter and etc. Usually the most popular social networking is supporting the ways of group centered networking. Social network services in organizations are used limitedly for learning with knowledge sharing. Usually social network's data of knowledge is stored under the company's servers. The idea of sharing tacit knowledge of an organization through a public domain network is not suitable for competitive markets. G+ is new social networking service, which presumably supports the different ways of learning and soon offers the service under the domain of an organization. That is how organizations can enjoy the remarkable development done in the public social networking service and use it for learning in internal communications. Tim O'Reilly (2005) described that a web 2.0 service gets better the more people use it. According to Paul Allen (23.9.2011) G+ has currently approximately over 43 million users. The popularity of the networking service and the support of Google's multiple collaboration applications makes it one of the most promising social networks for public and business sector.

COP will be seen as an important part of a collaborative information system. It will crucially help a company to reach its objectives to success. The design base of this community will be built on the base of Etienne Wenger's communities of practice and international e-collaboration journals (2009) theories.

5.1 Designing Community of Practice Online

Jane Hart (2011, p65) explains that smart organizations strategy to implement a social learning to organization would be a supportive bottom-up approach. This all is based on the idea that a group of people with a common idea and objective that they voluntary want to collaboratively solve. A more traditional approach would be to set a strategy from top down approach with for example the management setting objectives and controlling them. Rather than setting any objectives more important would be to encourage the ones that already use social learning tools and make

them influence others as well. In the bottom up approach decisions and communication are made in the grass root level of an organization. In the top-down approach the top management makes decisions to the masses.

Planning a community design is about finding the connections that drive development. Etienne Wenger (2002, pp.27-29) describe that the design must start by defining the synergy points between a domain of knowledge, a community and practice:

- The domain creates common ground and sense of common identity.
- The community creates the social fabric of learning.
- The practice is a set of frameworks, ideas, tools, information, styles, language, stories and document that community member's share.

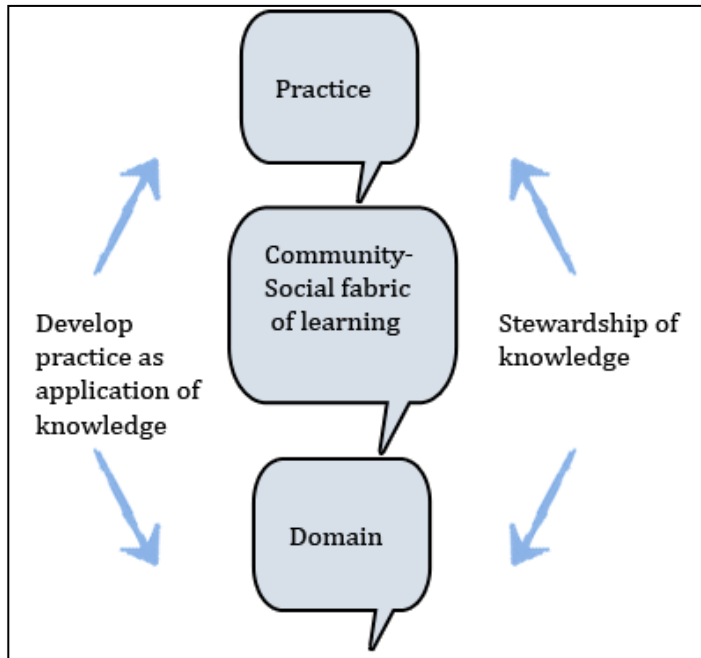


Figure 10 - Domain, Practice and Community.

The design of COP can start by definition process. It is created in order to find out for example the most crucial development areas, roles of different members and definition of the expertise that is practiced. The key of dynamic and developing community is to keep interest on the right level for new and active COP members. This means creating different levels of participation and events. Also encouraging people to share their opinions freely with an open organizational culture can be considered as crucial for successful learning in a community.

Etienne Wenger describes (2002, p.51-63) seven principals for designing a

successful COP.

1. Design evolution – help community to develop from its dynamic nature.
2. Open dialogue between inside and outside perspectives-It is about bringing information from outside the community into the dialogue what the community could achieve.
3. Invite different levels of participation- Provide (coordinate) value for connections and opportunity to improve skills.
4. Develop both public and private community space- Establishing public events for all members or private events for specialized persons.
5. Focus on value- Create events, activities, and relationships that help potential value emerge and enable discovery of new ways to harvest it.
6. Combine familiarity and excitement- Have enough interesting and varied events to keep new ideas and new people cycling into the community.
7. Create a rhythm for the community-Community projects give residents an opportunity to assemble, converse, share opinions, spout off and have fun together.

The design of community cannot be generalized to fit in every case. The community is always considered as a unique situation/practice. The definitions and guides help to clarify different elements and their connections. The design approach can be considered as a practical approach for corporations, nonprofit organizations, associations and educational organizations. For virtual communities connections and relationships can be established with synchronous and asynchronous processes. Cambridge, Kaplan and Suter (2005, p.2) describe a lifecycle of a community with the following: Community life cycles emerge, they grow and they have life spans. The authors also note that a community can become successful through growth of energy, commitment and visibility. Over time community can become a core part of the organization.

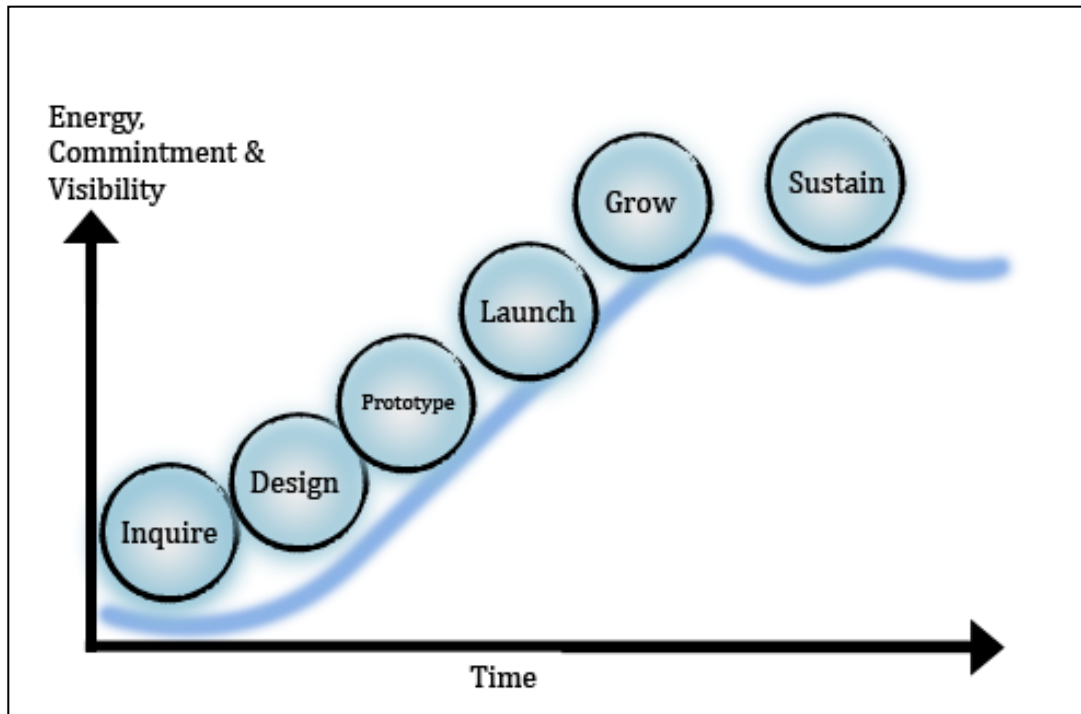


Figure 11 - Lifecycle of a community

Wenger's definition phase questions can be seen as related to the inquire phase in Cambridge, Kaplan and Suter's (2005, p.2) lifecycle phases, which they describe with the following:

- Inquire: Through a process of exploration and inquiry, identify the audience, purpose, goals, and vision for the community.
- Design: Define the activities, technologies, group processes, and roles that will support the community's goals.
- Prototype: Pilot the community with a select group of key stakeholders to gain commitment, test assumptions, refine the strategy, and establish a success story.
- Launch: Roll out the community to a broader audience over a period of time in ways that engage newcomers and deliver immediate benefits.
- Grow: Engage members in collaborative learning and knowledge sharing activities, group projects, and networking events that meet individual, group, and organizational goals while creating an increasing cycle of participation and contribution.

- Sustain: Cultivate and assess the knowledge and “products” created by the community to inform new strategies, goals, activities, roles, technologies, and business models for the future.

Practicing in a community is usually voluntary. However, there needs to be interaction and invites to keep the community livable. From the leading eLearning company in Finland Prewise LTD suggests the following practical guides to sustain and maintain an online community:

- Open honest discussions.
- Remember that acting in a community should also be fun.
- Pricing models for activations.
- Activation plan.
- Managers engagement and support encourages to interact.
- Campaign base structure (launch peak, events or possible ending).

Material from Prewise LTD Seminar on Digital learning environments supporting the organizational change 8.3.2011

The community members create community’s language and terminology. However there can be instructed events, which should be based also on the known language and style, practiced in the community. Everybody does not usually understand especially pedagogical terminology in workplace training. Cambridge, Kaplan and Suter (2005, p.2) present that purposes of community are most crucial when designing. They see purposes as terms of benefits to the community and the organization needs through community.

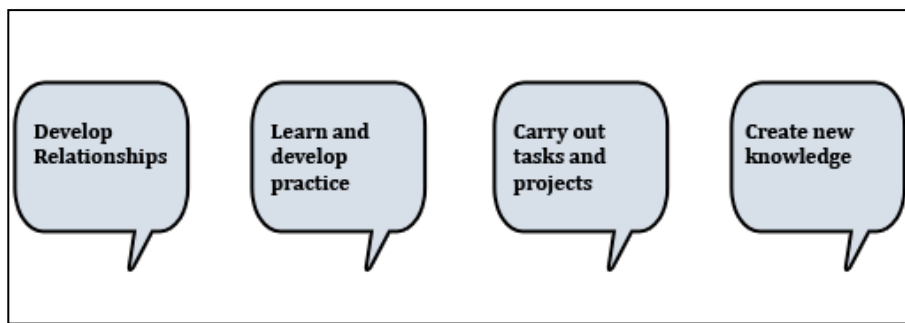


Figure 12 - Community’s purposes.

By creating questions and answers for the purposes of community a clearer picture can be drawn where the community should develop. Since communities of practices are usually self-directed and spontaneous in nature the design of one cannot be driven through strict structures or management. A typical key question describing relationship development could be asked for example by following: How often do the members interact and meet? After the community has been launched and interaction is already taking place it becomes crucial to build a deeper level of

discussion. To build stronger relationships and trust usually takes quite a lot of time. Usually a combination of live face-to-face meetings and online meetings are the best for building trust in a longer period of time. The community creates the social fabric of learning. Etienne Wenger (2002, p. 28) states that a strong community fosters interactions and relationships based on mutual respect and trust. From internal or external reflections new knowledge and relationships can be build. After communities have been active for while it is time to keep the community activating and livable. Wenger (2002, p.96) calls this stage as sustaining stage of a community of Practice. He also notes that keeping a COP truly viable needs development on following processes: maturing, stewardship and transformation (2002, pp.96-111):

- Maturing is about clarifying the community's focus, role, and boundaries.
- Stewardship is maintaining the community's energy through natural shifts in its practice, members, technology and relationship to the organization.
- Transformation deals with the ending or lost of sense of stewarding practice

Over time a successful COP can become a permanent part of an organization's structure. A time can be seen where a COP truly supports life long learning of individuals, group members and organizations.

5.1.2 Integrating Technology into Community

After a design on the purposes of a community there is a need for designing technological and user interface aspects. A community that is supporting organization's mission needs also a platform where all the processes can be easily used and shared. Jenny Preece (2006, p.210) describes community-centered development by its social aspects and also takes technological steps into great importance. In the figure 12 Jenny Preece describes the community-centered development by clockwise processes starting from the top of the star figure. Similar to definition stage of Wenger and Inquire stage of Cambridge, Kaplan and Suter mentioned in the above chapter Preece starts defining the needs of the community.



Figure 13 - Community-Centered Development

Developers, programmers, web specialists and programmers can start creating the technological features of community by following:

- **Technology decisions-** this is a stage where the community needs to decide about technology used to facilitate the community. Usually for a virtual community the decision is done between a software solution as SAAS (Software as a service) or open source software (usually tailored programmed for one usage).
- **Testing the system and interface-** with the selected/implemented technology user interface can be tested with different user groups. Testing is done usually with more than one prototype.
- **Usability testing-**Usability must be tested through the system/platform in various actions it provides. Usability can be seen as a design of navigation, tools, feedback possibilities, user profile representation and etc.
- **Defining a help system of the community.** This stage can involve monitoring the software in use and providing help when technical difficulties occur.

People from various fields are needed in the community development process. Usually there is a need for sociologists, programmers, instructors, project managers and technology experts.

5.2 Social Software

A well-designed social software at community's center supports social interactions and builds a sophisticated platform around user operations. Features of a social software that are likely to facilitate learning are for example indexing, case base reasoning and reminding. Social software is meant to facilitate the communications

and bring people together with networks. Most importantly social software should filter, index and organize knowledge for a learner into right form. It should be available just when the learner needs it. Social software can be described as personal learning environment; since it allows the learner to choose what learning paths and contexts she wants follow. This can be controlled in a single center environment. Individual learner can also construct the environment according to his needs and supporting own mental processes. Collaboration can be done in an appropriate context and right situated methods. Schank, Lyras and Soloway (2010, p.201) state that a software system, which qualifies and indices knowledge is a key for succeeding for future decision-making. It is also seen as improving the overall competitiveness of an organization.

When talking about software it is important to mention also the importance of usability and how it relates to the social behaviors. Jenny Preece (2006, p.208) describes well the relation between usability and sociability in the following figure. She highlights that both are key components of the successful online communities.

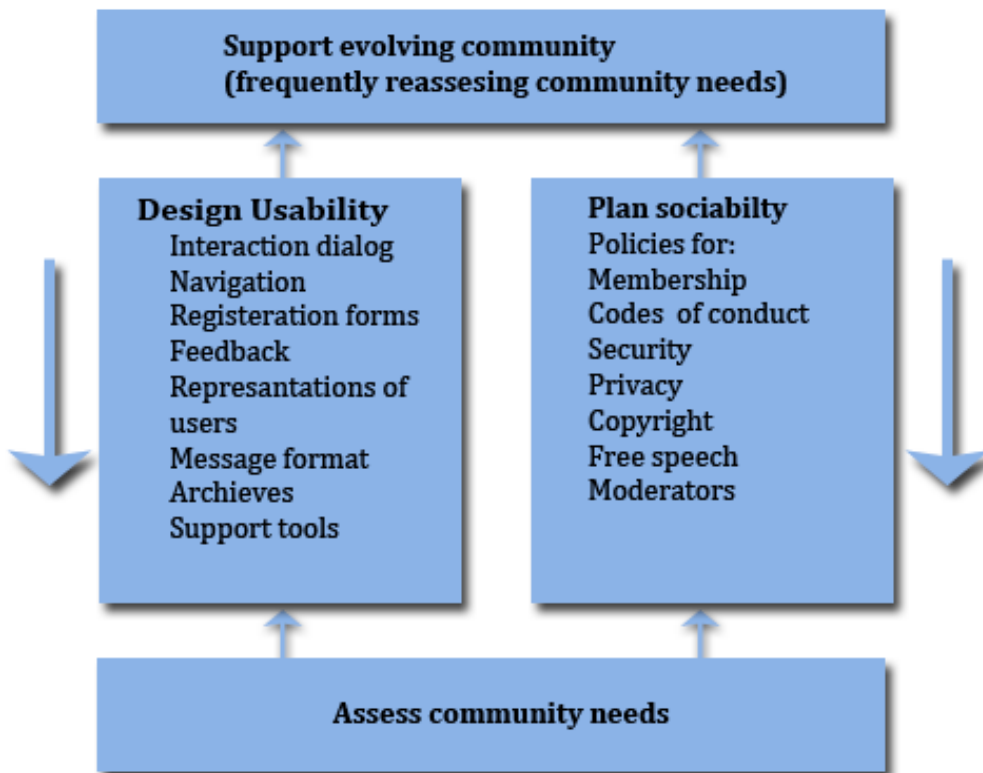


Figure 14 - Design of Usability and sociability.

McAfee (2009, pp 130-142) has defined benefits that a social software can increase collaborative in organizations. The most suitable ones are described in the following:

- Group editing, which means a single repository where people can collaborate.
- Network formation and maintenance, feature that allows identifying quickly helpful and valuable colleagues.
- Collective intelligence, wisdom crowds that make recommendations.
- Self- organization is the ability of users to build valuable communities and recourses and shape them over times.

Jon Dron and Terry Anderson (2009) explain distinction between social software tools (Originally presented by Stutzman (2007)) and suites that are focused upon objects (object-centric) and upon people (ego-centric). They describe the differences by following: “Object-centric sites allow users to share, comment up on, and display a wide range of digital media, such as photos, music, books owned or read, citations, or music recordings. Ego-centric sites usually contain profiles, personal diary spaces (blogs), lists of friends, community discussions, and other tools that allow users to locate, work, and play with each other”. Actually successful software for learning supports both social networking ways. Learning in a community needs both features of creating objects (links, news, tag clouds, pictures) and also social human relationship objects. The meaningful contextual relations with strong relationship capabilities make social software a very powerful community tool. In addition to support of personal space social software supports usually forms of many. Jon Dron and Terry Anderson (2009) identify three distinct kinds of the many: the Group, the Network and the Collective. Figure 14 shows the relationships between them.

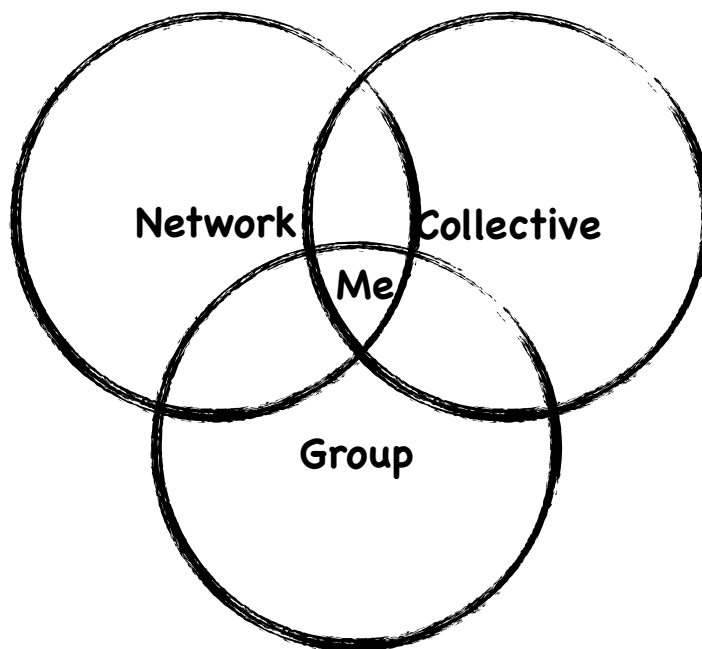


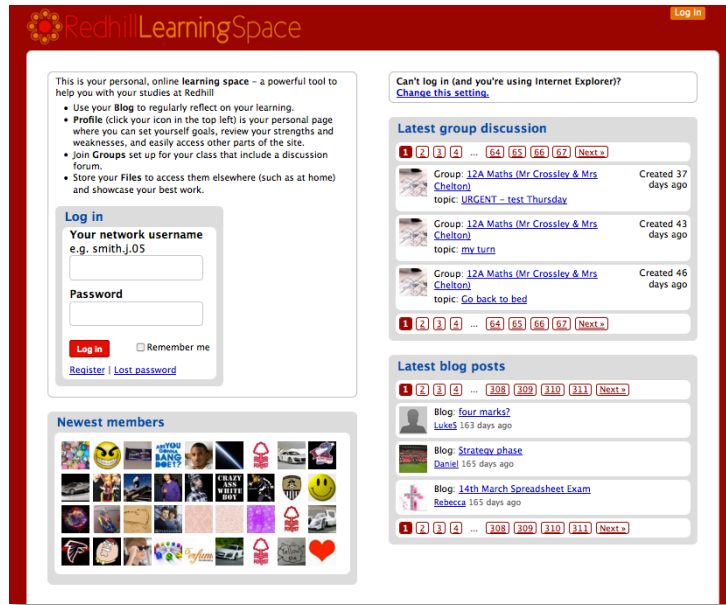
Figure 15 - The relationship between groups, networks and collectives.

Group is related in organizational setting as a specialized group where the knowledge shared is not necessarily shared with the whole other community. It usually has a clear purpose and usually membership is needed to participate in the group. **Networks** enable ad-hoc creation of group networking. With software it can bring similar interests together by recommendations and filters in the community. This makes it easy to join them anytime. Jon Dron and Terry Anderson (2009) define **collectives** characterized by software-mediated aggregation: they are not about connections, but instead are formed by grouping people and their largely independent activities into sets. Tag clouds are good examples of collectives where individually created information/link cloud leads us to a larger network of collectively created resources.

Advantages of using social software in community learning can be defined as following:

- Open structure enables creation of different groups and projects.
- Offers usually personal and public sections.
- All the functionalities can be controlled from the same interface.
- Reporting for various sources becomes easier.
- Tag cloud support.
- Presence Tools.
- Notification.
- Cooperative learning is supported.
- Profile Modeling.
- Introducing learners to each other.
- Helping others becomes easier.
- Documenting and sharing of constructed objects

There are few open source platforms available for social software: Elgg, BudyPress, Dolphin, BarnRaiser, Liferay and Sakai. Jane Hart (2011, p.59) lists the most known commercial software as following: Microsoft Sharepoint, Connectbeam, Socialtext, Jive, Cornerstone OnDemand and Google Apps.



Picture 1 – Social networking system for Redhill Academy, Nottingham, UK based on Elgg.

Social software- Elgg

Elgg (Elgg 2011) is a social networking framework. It provides the necessary functionality to allow you to run your own social networking site, whether publicly (like Facebook) or internally on a networked intranet (like Microsoft Sharepoint). In 2007 the most common setting for organizing courses and student courses were the use of software tools like Moodle or Blackboard. Elgg's biggest difference from these tools is the ability to structure around connections between people, self-learning ways, dialogue and story telling. Most of the other tools were more or less considered as content management or course management systems. Jon Dron and Terry Anderson (2007) researched an Elgg installation for educational purposes at the University of Brighton. The system has been rolled out at an institutional level with over 30,000 users in total at University of Brighton (UoB). Jon Dron and Terry Anderson (2007) researched how well the ideas of learning forms of many (groups, collectives and networks) were supported in the Elgg system and educational setting. The most important assumptions of the research are listed below (Jon Dron and Terry Anderson, 2009):

Positive outcomes:

- Students generally enjoyed the informal approach.
- Significant self-control on the learning form and content creation was considered highly motivating.
- Other people's blogs and posts were considered helpful for learning.

Negative outcomes:

- Shifting context between personal, course, university and public spheres was considered difficult and confusing.
- Learner-centric constructivist model is unsuitable for teacher-centric forms.
- We need a new way of constructing environments out of other tools.



Picture 2 – Social networking system for University of Brighton based on Elgg.

The reason taking the educational example here is that the pedagogical ways are always the same in spite of the learning setting (educational or organizational). It is a matter of building the right tools and ways for the unique situations. One reason for difficulties in shifting the context areas could be the result of having another learning management system (Black Board) running simultaneously with Elgg. Despite the critics that Anderson and Dron found from the first educational research on Elgg it can be considered as one of the first revolutionary tools for learning with social networking. At 2011 Elgg has been widely by found by a large range of organizations and Universities like (Elgg 2011) The World Bank, UNESCO, NASA, Hill and Knowlton, Aerospace, Wiley Publishing, Harvard University Extension School and United Nations Development Programme. Jon Dron and Terry Anderson (2009) describe that a so-called 1.5 web tool created for both learners and teachers could be a solution for satisfying social networking needs for learning in educational setting. The greatness about open source software is that they can be developed towards your own needs with a help of a strong development community

(<http://elgg.org/developers.php>), good design and programming skills. By now a setting of 1.5 developed for educational purposes from Elgg is certainly already out there in the www.

5.3 Social Network Google +



Picture 3 – Google social network

The Google (2011) gives a brief explanation of the basic idea of Google+:
“Google+ makes connecting on the web more like connecting in the real world. Share your thoughts, links and photos with the right circles. Use easy, spontaneous video chat to strike up conversations with as many as nine people at once. Get everyone on the same page with fast, simple group chat.” Google+ social network is based on the natural need of being part of a community and easy access of information in a social environment. Consumers are relying in well-developed services where recommendations from others have a great importance. They also like easy access of information and ease of use. As the leading company of consumer web services (Search, Email, Maps) Google will be a natural pacemaker where consumer and also organizational communicational tools should be standing and developing.

Google (2011) defines the main features of the network by following: **Circles** are meant for organizing connections as groups to which you can communicate separately or as a whole. The idea is to be able to communicate in a separate

audience for example of circle group of co-workers, family and friends. **Hangouts** enable ad hoc group discussion with video and audio broadcasting. With a shared screen of people attending in the hangout you can start collaborating as you were attending in a real world meeting. **Games** Section is entertaining feature of G+, where a user of the community can enjoy a variety of games and share results with friends. **Search** feature brings updates of your circles, news from around the web and public posts with simple search functions. This means a quick and easy access of information inside the community and outside of it (see page 18. Picture 4 – Range of activities in COP).

Google+ service was launched for public usage on September 2011. Before the actual launch the service was used with limited group of people and invitations. According to Paul Allen (2011) from Google the service has reached over 40 million users in less than 3 months and has grown 10 faster than any other social networking site.

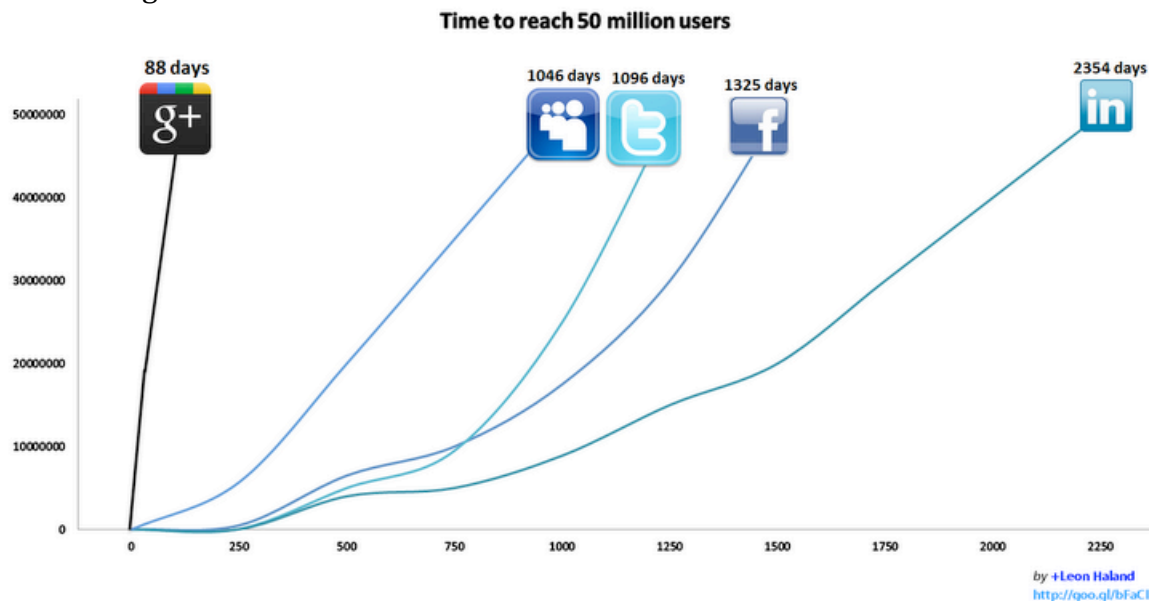


Figure 16 – Google+ popularity growth compared to other social networks

5.3.1 Google+ and Knowledge Sharing Organization

According to John Seely Brown (2000), blogs and the consumer-generated media are altering the sources of power and authority in our society. Sharing experiences and updates has become the most popular behavior on web (comScore 2010) and social media. The authority of consumers and the popularity of social media reflect and give examples how people want to communicate, share opinions and knowledge and use new ways of learning in work and education as well. This reflection is slowly also changing the traditionally personal and sometimes closed ways of internal organizational communications. Organizations want to increase their productivity by social processes. They also want to enrich the ways of learning to

make sharing of knowledge more easy and natural. Collaborative knowledge sharing in social networks is usually built around certain digital objects (profile, documents, links, tags). Google+ as a social network enables individuals' own preferred sharing ways and also supports collaborating around different digital objects with multiple sophisticated tools.

Google+ has similarities to the most dominant social network Facebook. According to Double Click statistics (2011) Facebook had over 880 million users in July 2011. Both Facebook and Google+ have a same profile structure and groups combined with favoring recommended content from others in your network. Google+ emphasizes a structure of dividing your group of people into circles of friends. G+ believes in the philosophy that meaningful opinions are mostly coming from your trusted sources. The origin of these sources can be for example a friend, trusted colleague or group that shares a common interest (COP). Google+ can be seen more suitable for collaborative knowledge sharing in organizations than the Facebook social network. This is based on the fact that the structure communications in G+ network is based on the circle structure with more closed groups than Facebook's more open structure. According to Google+ Wikipedia (2011) the service integrates services of profiles and buzz with new features as circles and hangouts. Also the other features of Google account such as Calendar, Documents, Photos and Chat are enabling greater collaborative and socializing than any other social network with single user interface (Google account with Google+). Also an easy access for all information is in great importance of quality criteria of an online community (see 6.1 for the detailed list).

Google has not launched a Google Apps version of the Google+ service, which could be seen suitable commercial solution for bigger companies and enterprises. According to Google app Wikipedia page (2011) Google Apps is a service providing independently customizable versions of several Google products under a custom domain name. Currently it supports for example following applications: Gmail, Google Groups, Google Calendar, Talk, Docs and Sites. Main reason of using Google+ through apps service is that companies want the full control of the services and information that they are sharing and using. This is especially important in companies where data sensitivity is high. According Google + (2011) public announcement Google+ will be available in the near future for commercial (Google Apps) usage as well. It might be the future enterprise solution for social networking. Employees do not have to learn to use a new social network and there is no need of implementing, building or buying any third party applications from scratch. Google holds also an active development community (<http://code.google.com/>) and there is also an application-programming interface (API) available for the G+ apps future development. Anyone can join and take part of the development of Google+ apps.

6. Assessment of the Quality of Learning in Google+

Reaching a level in a community where members are committed and learn together can be seen as a result of good community design and certain level of quality criteria reached. The quality criteria of online community can be built from general quality principals of learning theories/approaches, communities of practices and usability. In educational context learning can usually be divided in objective or subjective quality criteria. According to Hulkari (2006, p. 54) nowadays quality researches of education have shifted more towards subjective approaches. On the subjective approach quality can be described only from the perspective of individual's experiences. In the objective approach it is usual that the quality criteria are found from the educations ability to reach certain objectives. When we are talking about quality of learning in organizational environment abilities to transfer learned knowledge into practice becomes crucial. Learning in virtual communities cannot be seen mostly as the main object of a knowledge sharing community. Discussions with managers from different social community spaces gave me a more clear picture of the nature of learning. Intunex's (a startup company specialized in social software development and consulting) CEO Janne Ruohisto commented the nature of learning in an organizational community by the following: " The nature of learning in a virtual community is often considered as side effect of knowledge sharing". This and other discussions for example with Nokia's Competence Manager Sami Leppänen led me to consider the learning approach as more like a supportive or side result of the collaborative processes. Learning is considered here as an abstract concept, which is not usually done as a conscious process. That is why quality of learning is approached with the situated knowledge sharing activities that eventually can lead to learning results.

The list of companies using web 2.0 inside the community processes is still relatively small. When we are talking about learning processes and web 2.0 organizations we are really talking about taking baby steps. After talking with both local and multinational corporate representatives from several companies (Intunex, Nokia, Outotec, Cenno oy) of human development processes I realized that almost everybody is aware that social networking is needed for their internal communications. The availability of different social networking tools is also high. Still the industry in Finland is planning the next step of developing their social networking for knowledge sharing and learning purposes. The current status of the industry led me to the conclusion that the best social network for the research is coming from the open application communities or popular consumer service. After investigating several choices of different social networking softwares as Social Cast, Sharepoint, Elgg and X-Tune I realized that the best available social network for the research would be Google+. This is mainly because of the structure, features and tools of the network potentially meet the level of the quality criteria of learning very highly. Also the future development plans of Google+ for the needs of enterprise markets makes it also a potential suitable solution for a common organizational setting.

In the next sections I will explain the quality criteria in more detail and draw an assessment on Google+ social network.

I have divided the quality criteria of virtual community that support learning into to the following categories:

- Socialization, support of communication and collaborative processes.
- Web 2.0 tools to support the higher order thinking skills.
- Networking and solving complexity.
- Usability, support the ease of use.

For **socialization** category I will apply mixed theories and knowledge found from Wenger's COP (2002), Preece's community centered development (2006, pp. 206-211) and the research of a qualitative study of "Web-Based Knowledge communities Examining the Success Factors" by Hui Lin, Weiguo Fan and Zhongju Zhang (2009). The success of an online community must be defined among users, since the knowledge acquisition and creation is created among users. Hui Lin, Weiguo Fan and Zhongju Zhang (2009, p.41) state that web knowledge communities' (WKC) success is dependent on existing members activeness and/or attracting new members and building their loyalty to a WKC. Hui Lin, Weiguo Fan and Zhongju Zhang (2009, p.39) divide the success factors by the following: information quality, system quality, community governance, and pro-sharing norms. Information quality refers to the overall usefulness or value of the information system. Quality refers to how well a web site and software tools perform their responsibilities. Community governance, pro-sharing norms and sense of community are the social factors that influence WKC success. Hui Lin, Weiguo Fan and Zhongju Zhang (2009) research results show that the technical and social factors together affect a WKC's success. According to the authors the degree of quality can be measured by satisfaction, sense of community, and use of the system among the users.

For Web 2.0 tools to support the higher order learning skills I have used criteria found from Bloom's edited digital taxonomy by Churcles (2008). I will apply mostly the higher order thinking skills associated with the digital verbs/ activities that can occur for supporting the learning. These theories were defined more specifically in section 3.2.1

Technology can be seen as a part of the usability criteria and setting new challenges for learning tools of web 2.0. Defining the quality criteria of **usability** are based mainly on Lin, Weiguo Fan and Zhongju Zhang's (2009) research on the system quality. They define system quality in the following categories: accessibility, ease of search, ease of communication, navigation and screen design. Also Preece's community usability design (described in section 5.2) is taken into consideration in this category.

In Networking and Solving Complexity category I will use the George Siemens' (2005) learning approach created for digital age. This approach will fill the gap between learning and the use of technology tools. Connectivism approach highlights capabilities to learn new and make new connections between people and context by networking actions. Connectivism approach was discussed more in detail in section 3.2 (p.22).

There can be seen a link between relationship building and improving business performance through online communities. Chieh and Burn (2009, p.27) state in their research of virtual community that working in virtual community help improve personal and business objectives. According to their research following conclusions were made (Chieh and Burn, p.27):

"The degree of intimacy between virtual team members feel a certain degree of intimacy, they are able to feel they are working like a team, and they can sense the bonds between members and believe others would play their roles well and finish their own jobs. Performance is affected by cohesion and trust, which means if the team member feel they are working like a team and they feel bonds between members, the performance would be better. The higher performance leads to a higher extent of satisfaction."

Succeeding in business performance can be considered as the most important quality factor in a virtual community build for business objectives. However learning in an organization that enables sharing of tacit knowledge can still be considered as the most valuable asset of an organization (Nonaka and Takeuchi, 1995, pp.6-7). That is why it also seen here as the most important quality factor of organizations' virtual community. Dialogue and communication through events are important ways of transferring knowledge. Also the way knowledge is applied in cognitive mind is seen as one of the most important quality factors in this research. In this qualitative research the focus is in quality of learning with knowledge sharing. The main question what the study aims to answer is:

How suitable is social network Google+ for supporting quality learning in organizations?

I have used a qualitative approach instead of a quantitative research for the research. This is based on the belief that the quality of learning is an abstract and immaterial concept. Learning in communities is mainly created by different social participations.

6.1 The Quality Criteria of an Online Community

The following quality statements are divided into categories of **usability, socialness, networking and solving complexity and web 2.0 tools to support**

higher order thinking skills. Quality of learning is evaluated according to the following statements.

USABILITY	How easy and comfortable it is to use the software.
Accessibility	The level of information access is relatively low.
Search	Search functions are easy to use, easily accessed and provide meaningful results with relatively low effort.
Interactive Features	Interactive features (chat, commenting, video streaming) are presented well in the user interface.
Explicit Presentation	The system provides collaborative presentations and document editing.
Profile Presentation	Different profiles and groups are presented well and thoroughly to the whole system.
Feedback	It is easy to find feedback possibilities in the system.
Navigation	The navigation is effective and easy to use.
SOCIALNESS	How the community supports communications and group processes. Is the system open to commenting and feedback?
Knowledge Sharing	The system supports interactions and sharing functions with other members.
Free Speech	The system is open for free posts, reviews and commenting.
Guidance and Help	Named guides are available or there is a high degree of everybody giving guidance for each other.
Information Flow	Information flow between members, groups and community is easy to follow.
Recommendations	The community allows recommendations by thumbing or rating content.
NETWORKING AND SOLVING COMPLEXITY	How well does the system support different ways of networking and complexity?
Variety of opinions	Diversity of opinions are supported well in the community.
Connectivity	Connecting with different kinds of information and sources are encouraged to solve complexity.
Connections	The community highlights the importance of

	connections.
Decision learning	The system supports self-directed paths for learning.
WEB 2.0 TOOLS TO SUPPORT THE HIGHER ORDER THINKING SKILLS	Cognitive learning occurs inside individuals mind and emphasizes the memory capacity of a person. How well are the system's web 2.0 tools supporting the cognitive processes?
Creating	The system supports different kind of creating (blogging and wiki-ing) with web 2.0 tools.
Evaluating	Evaluating such as commenting and reviewing are well supported in the community.
Analyzing	Tools that ease the comparison, validating and organizing content are effective and well available.

Table 6 – Quality Criteria Table.

6.2 Methods and Evaluation Criterias

I will give a degree on each of the quality criteria. The degree will be given according to the following scale:

- 5- Totally agree, that the software meets the criteria
- 4- Partially agree
- 3- Neither agree or disagree
- 2- Partially disagree
- 1- Totally disagree

6.3 Assessment of Google+

Assessments are done with under default setting of Google account with following application enabled besides Google+ Gmail, Calendar, Documents, Photos, Sites, Web, Groups, Reader, Images, Videos, Maps, Translate, Books, Scholar and Blogs. The assessment is done with Firefox 6.0.2 Internet browser and MAC computer and

OS X 10.6.8 operating system. Assessment results are divided in the quality criteria categories of learning. Every category and subcategory of the results is analyzed. The evaluations of the statements are based on a practical test scenario where G+ is used for organizational settings. There are outside sources of articles, blogs, guides and discussion forums used to support the assessment situation and analyze. Total results are also analyzed. I will evaluate G+ according to the total results and the basis of theoretical background. In the evaluation I will also analyze the potential of G+ to support the quality of learning in an organizational setting.

6.3.1 Usability

Usability category aims to answer the following question: How easy and comfortable it is to use Google+?

Accessibility

Statement: The level of information access is relatively low.

Information access inside and outside Google+ community is in a very good level although building direct links from application are not available. Stream page with latest posts/streams appear on preferred network or circles. Stream posts also show to whom streams are targeted. Shorting information stream with most recent/most popular is only available through search function. Google + gets 4 for the degree of information accessibility.

Search

Statement: Search functions are easy to use easily accessed and provide meaningful results with relatively low effort.

Google is the most used and leading company in Internet search tools and many other services. They have managed to build nice features inside Google+ where you can use advanced options of search. Search functions are very easy to use and available everywhere in Google apps as well. For posts G+ provides also best of/most recent shorting. Saved search also enables to follow exact posts and discussions with low effort. There is a possibility to run live searches in stream topics. G+ gets absolutely the highest possible degree 5 out of search.

Interactive features

Statement: Interactive features (chat, commenting, video streaming) are presented well in the user interface.

G+ enables chat between two people or a group discussion. Besides text chat there is a video and voice chat available. Chat can be used as separate popup window wherever you are in your Google account. It is also available in most of the essential

apps. Commenting is allowed everywhere in G+ and Google applications according to publishing settings and G+ circle settings. G+ allows video upload on stream/posts to share with selected circles or public crowd. Hangouts allow group chat, live video streaming and voice chatting. YouTube video sharing is integrated in the hangout feature. On search function of post streams G+ allows search that can be made also in real-time. Has tags (#) are also available to categorize group of stream posts. Both of these last mentioned features are extremely important in fast interactions and also with streams that are causing a lot of buzz. G+ scores a strong degree of 5 from the interactive features.

Explicit presentation

Statement: The system provides collaborative presentations and document editing.

Collaborative features as chat and commenting are widely available around document and presentation editing. They are also easy to use and access. To include the collaborative feature with document directly accessed with G+ connection circles would even make the bar lower for group collaborative editing in documents. A nice ad for the tool applications would be a concept-mapping tool. This could enable visual explicit and collaborative presentations on more complex tasks. The degree on explicit presentation is 3.

Profile presentation

Statement: Different profiles and groups are presented well and thoroughly to the whole system. The system allows modifications on the profile feature appearance.

G+ home page/stream page shows profile identifier as name and picture very clearly. Circles are not shown from home page as groups with visual identifiers. There is a list of connections profiles or you can access connections by the circles. A better visual presentation of the connections on home page would make the usability better. Under the user profile following information is displayed: messages/streams, information, photos, videos, recommendations/+1's. There are possibilities to limit profile information by settings but it is limited to modification of the profile visual presentation. G+ circle groups are not displayed under other applications (Documents, Sites, Calendar) around Google account. This would ease the connection making between G+ Circles and profiles with different applications. On profile presentation G+ will have a degree of 3.

Feedback

Statement: It is easy to find feedback possibilities in the system.

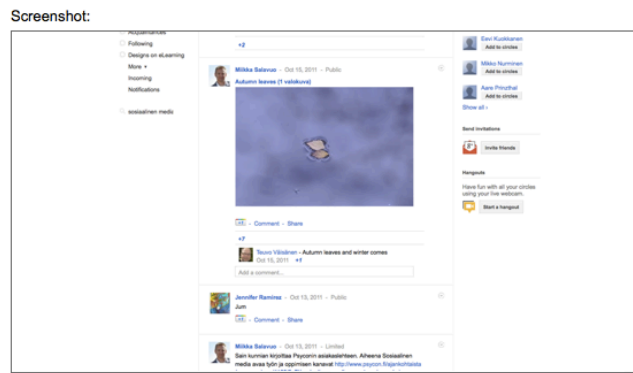
Feedback possibility is available in every section of G+. It is very easily accessed on the right bottom corner of the pages. There is also a very nice feature in the

feedback which enables automatic screenshot and technical specification included in the feedback.



Preview and Send Feedback to Google

Description: Hi, Is there any possibility to use G+ circles inside other applications as documents. So that a document could be shared with a targeted circle or certain profiles under G+?	Additional information: Page Information Browser Information Product Information Page Structure
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The description, screenshot, additional information, selected suggestion and your email address will be sent to Google. See the Google Feedback [Terms of Service](#). By submitting this content you are granting to Google the right to use it to improve our products and services. See our [Privacy Policy](#).

Picture 4 – Google+ Feedback form

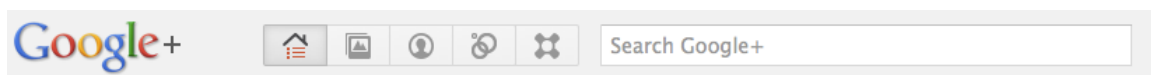
After sending the feedback following respond message appeared:

Thank you for your feedback! We value every piece of feedback we receive. We cannot respond individually to every one, but we will use your comments as we strive to improve your Google experience.

Personal feedback seems to be asked too much for a service used by over 40 million people. When using G+ in an organization the feedback possibilities become crucial for individual users. The availability and features of feedback as consumer service G+ scores 4 but as thinking it as for organizational setting it scores 2. The final score will be then in the middle as a degree of 3.

Navigation

Statement: The navigation is effective and easy to use.



Picture 5- G+ main navigation

Main navigation is available easily and is simple to use. The visual identifiers are easily recognized and there is also a text rollover identifier after the mouse rolls over. Other applications in the navigation are displayed top of the G+ main navigation. This does not provide any visual identifiers but is easy and simple to use. There can be misunderstandings in G+ settings and overall Google account settings. The G+ setting is a little bit hidden and displayed at another place than the main navigation settings. With including more identifiers (as the settings) in the main navigation would ease the usability of the navigation. Also some changes to the overall look on the Google account navigation would make the overall user satisfaction better. From the navigation Google will score an overall degree of 3.

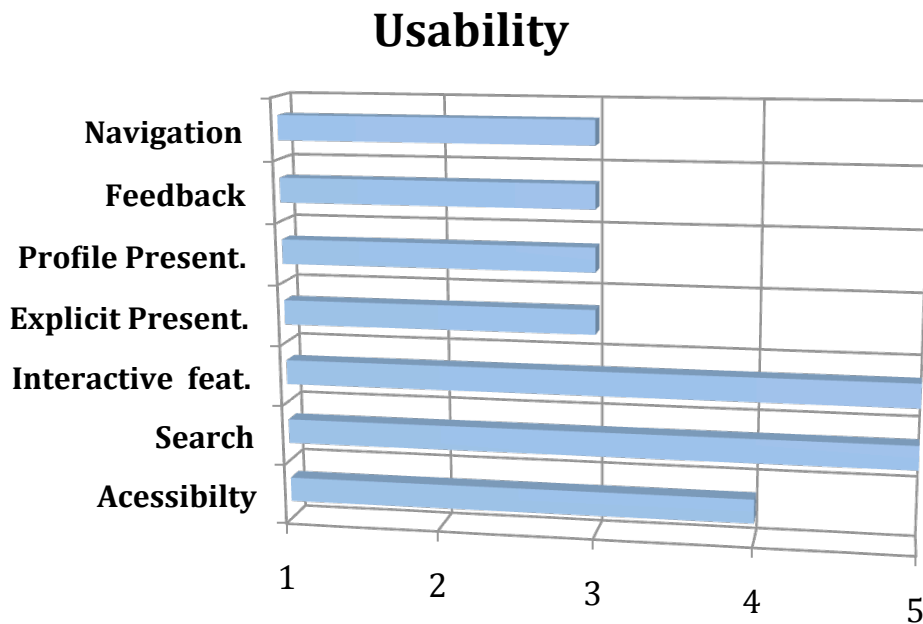


Figure 16- Usability Degrees Total

For Usability category G+ represents a relatively usable tool. The parts of feedback and navigation usability lower the degrees. Search and interactive features support very high order usability. With more simple navigation, settings and more adoptable visual presentation on profiles and applications the overall degree on usability would be close to 5.

6.3.2 Socialness

Socialness category aims to answer the following question: How the community supports communications and group processes. Is the system open to commenting and feedback?

Knowledge sharing

Statement: The system supports knowledge sharing functions with other members.

The knowledge sharing is supported well for different types of communications. Knowledge sharing can be created through quick stream posts, videos, hangouts, documents and other features. Profile enables basic information about the user with networking functions. However sharing and identifying profile employer specific knowledge is not really recognized by the system. Knowledge gathered from other Google applications are not gathered in the profile knowledge information. G+ builds links between outside social network sources such as Twitter and Facebook. For knowledge sharing G+ will get a degree of 3.

Free Speech

Statement: The system is open for free posts, reviews and commenting.

The network supports overall settings for privacy and account sharing functions. With single streams you can control to whom the post is shared. People, who are included in a targeted stream posts will be able to comment, recommend or share the stream posts further to a selected network/networks. You can also restrict posts being shared forward. Reviews can be done by commenting or recommending by 1+ function. The system can be set to very closed to totally open with information share. The control of shared posts, reviews and commenting is up to users. As a default the system is open for any digital information sharing like public publications. With sophisticated user settings users can restrict it more towards small circles collaboration or totally free sharing. The degree of free speech will be as 5.

Guidance and Help

Statement: Named guides are available or there is a high degree of everybody giving guidance for each other.

There are multiple sources of guidance on documents, articles, posts and videos that you find on guidance Google+. There is also help center available for G+ at address: <http://www.google.com/support/plus/?hl=en> . There are named Community managers for the main areas of G+. On discussion areas you can start discussion on FAQ, Google tips and tricks, Meet G+ community managers, Report issues, suggest a feature, or send feedback. As a relatively new popular network there are amazingly good availability of guidance and a high degree of helping each other. The guidance help is very much relying on the idea that a community is providing the guidance with each other of the community members. The test case of contacting Google showed that contacting an active discussion forum (<https://groups.google.com/a/googleproductforums.com/forum/#!forum/google-plus-discuss>) you have a good chance of getting guidance. But guidance from named

guides (for example community managers) is very difficult. The overall degree of guidance will be then 4.

Information Flow

Statement: Information flow between members, groups and community is easy to follow.

The overall information flow is good with a group of people as long as there is common understanding on sharing setting and privacy settings. Following different information flows with different settings might cause lack of understanding of the information sources. Sending a private message to a selected person from your circle should be available for private messaging as a default feature. Now it seems that most the user settings for sending private messages have been disabled it by default settings. For information flow G+ gets a degree of 3.

Recommendations

Statement: The community allows recommendations by thumbing or rating content.

G+ allows recommendations by +1 function, which is available easily in all features. Also many outside web sources supports +1 recommendations so that you can easily include outside recommendation sources in your stream. Under the profile you can see users recommendations. On the stream you can also categorize the streams by recommendations, popularity or most recent. Finding the most recommended streams from circle seems is not available in the service. This would be nice way to sort recommendations coming from certain group of people. Using 1+ multiple times is available when recommending streams. The way Google+ has enabled multiple recommendations from same source is not clear. For recommendations G+ gets a degree of 3.

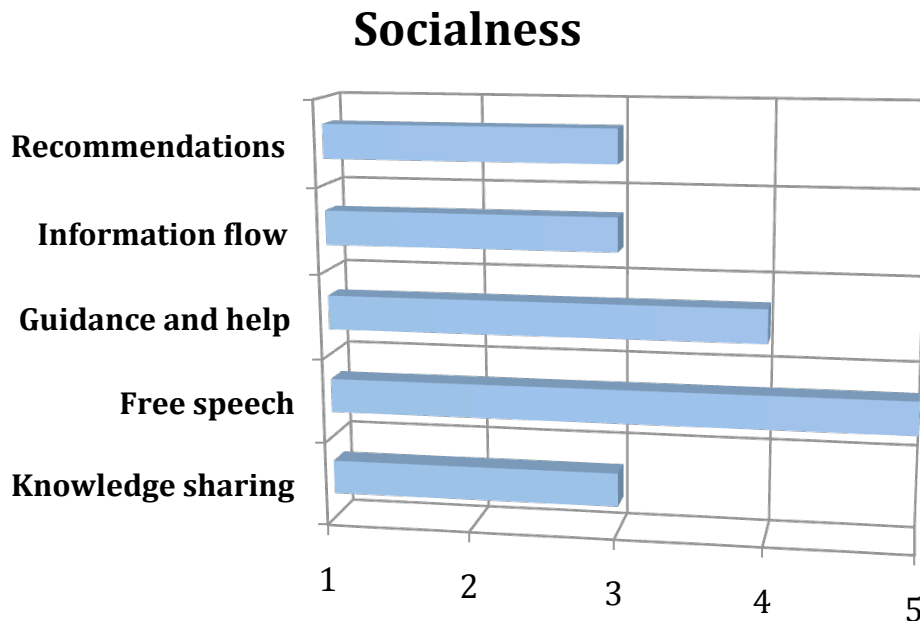


Figure 17- Usability Degrees Total

Overall socialness functions supporting learning in G+ is in an okay level. Quite complex Google and G+ account settings on privacy and sharing functions lowers the degrees in information flow and knowledge sharing. Guidance and help degree 4 is mainly based on the high willingness of people giving guidance to each others.

6.3.3 Networking and Solving Complexity

Networking and solving complexity category aims to answer the following question: How well does the system support different ways of networking and complexity?

Variety of opinions

Statement: Diversity of opinions is supported well in the community.

G+ caters opinions on various places in the form of streams, comments, blog posts, around documents and etc. Functions that allow gathering diversity of opinions in one place to certain project or circle are not well supported. Only the stream feature can be build around a diversity of opinions at one place. G+ scores 3 for the support of diversity of opinions.

Connectivity

Statement: Connecting with different kinds of information and sources are encouraged to solve complexity.

Some parts of the G+ system supports solving complexity. For example with search function you can do advanced searches on streams and certain topics. Building connections between the circles and other apps be would one way of solving complex issues. This however is still lacking from the system at the moment. The score from connectivity will be then 2.

Connections

Statement: The community highlights the importance of connections.

Connections are displayed in the matter of how many circles you are belonging to. Organizing circle contacts allows easy drag and drop visual feature with well functioning visual design. Participation level of a person in circles is difficult to see from the profile. Highlighting the activities in circles would help to figure out the most important connections that a user is participating in. The system does not support building bridges between circle contacts. It is easy to add someone into a circle but relationships and relevancies between connections are not supported. For connections supporting learning G+ will get 2.

Decision learning

Statement: The system supports self-directed paths for learning.

Most importantly the system is allows self-experiment with well functioning search or possibly browsing variety of circles by interest areas. Also more formal ways as creating a presentation is supported. Outside sources from the network are mainly supported by links. More sophisticated ways, as software-aggregated tagging clouds would build a better understanding for a learner when using self directed learning ways. For YouTube videos G+ builds a connection from the YouTube account appearing in G+. This helps to display self-exploration results from outside source into G+'s user interface. For supporting self directed paths for learning G+ will score 3.

Networking and Solving Complexity

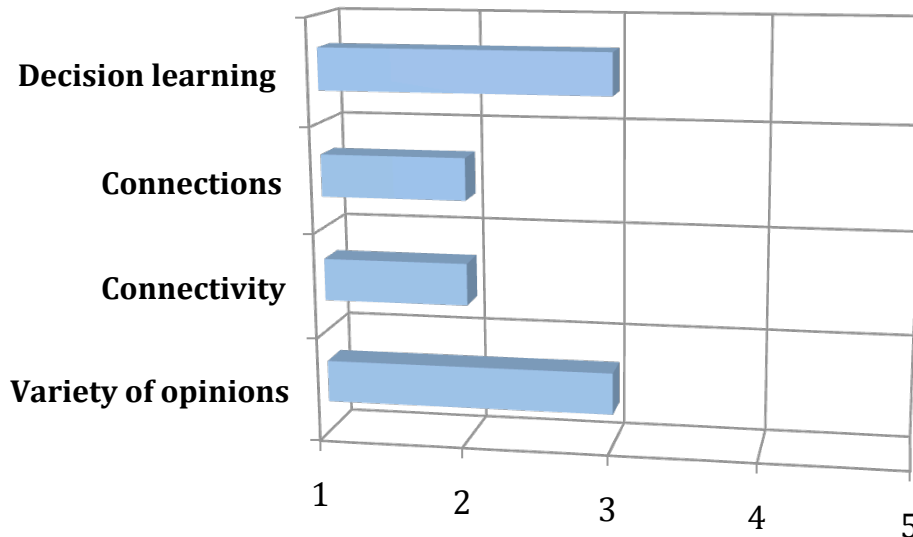


Figure 18- Networking and Solving Complexity Degrees Total

Partially G+ does not meet the networking and solving complexity criteria. The biggest lack is in building connections between applications, circles and profiles. G+ supports partly outside sources included in circles or streams. But more sophisticated tools for solving complexity would also be needed.

6.3.4 Web 2.0 Tools To Support The Higher Order Thinking Skills

Web 2.0 tools to support the higher order thinking skills category aims to answer the following question: Cognitive learning occurs inside individuals mind and emphasizes the memory capacity of a person. How well are the system's web 2.0 tools supporting the cognitive processes?

Creating

Statement: The system supports different kind of creating (blogging and wiki-ing) with web 2.0 tools.

Bloggng and wiki-ing are supported well with an easy use interface. Varieties of different applications templates are available for bloggng and wiki-ing. Templates are related in business, design and educational purposes with well working design. The connections between sites (bloggng and wiki-ing) and G+ are not yet available which lowers the degree to 3.

Evaluating

Statement: Evaluating such as commenting and reviewing are well supported in the community.

By commenting and recommending (+1) you can easily evaluate different content types. Allowing other ways such as polls or indexes based on popularity would allow more versatile evaluation features. The score from evaluating is 3.

Analyzing

Statement: Tools that ease the comparison, validating and organizing content are effective and well available.

Organizing content in meaningful results is supported poorly in G+. Also comparison and validating support is partly missing. Search function allows organizing streams around different topics and some categorizing features. By using specific circles around categorized content topics allows a quick access to certain topics. Otherwise organizing content is only partially supported. G+ scores a degree of 2 of analyzing support.

Web 2.0 Tools To Support The Higher Order Thinking Skills

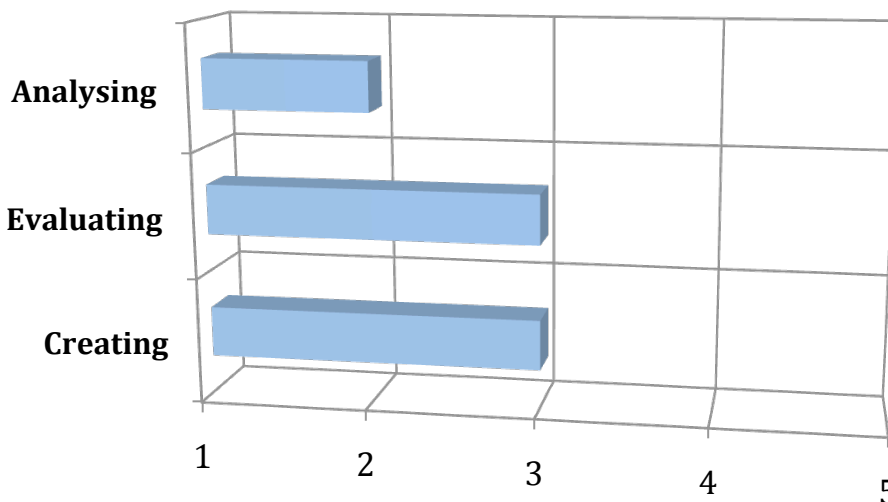


Figure 19- Web 2.0 Tools Degrees Total

Overall web 2.0 tools supporting the higher order thinking skills provide good tools for creating web content. However building connections between tools/apps and G+ lowers the degrees in evaluating and creating. Analyzing content is only supported partly by G+.

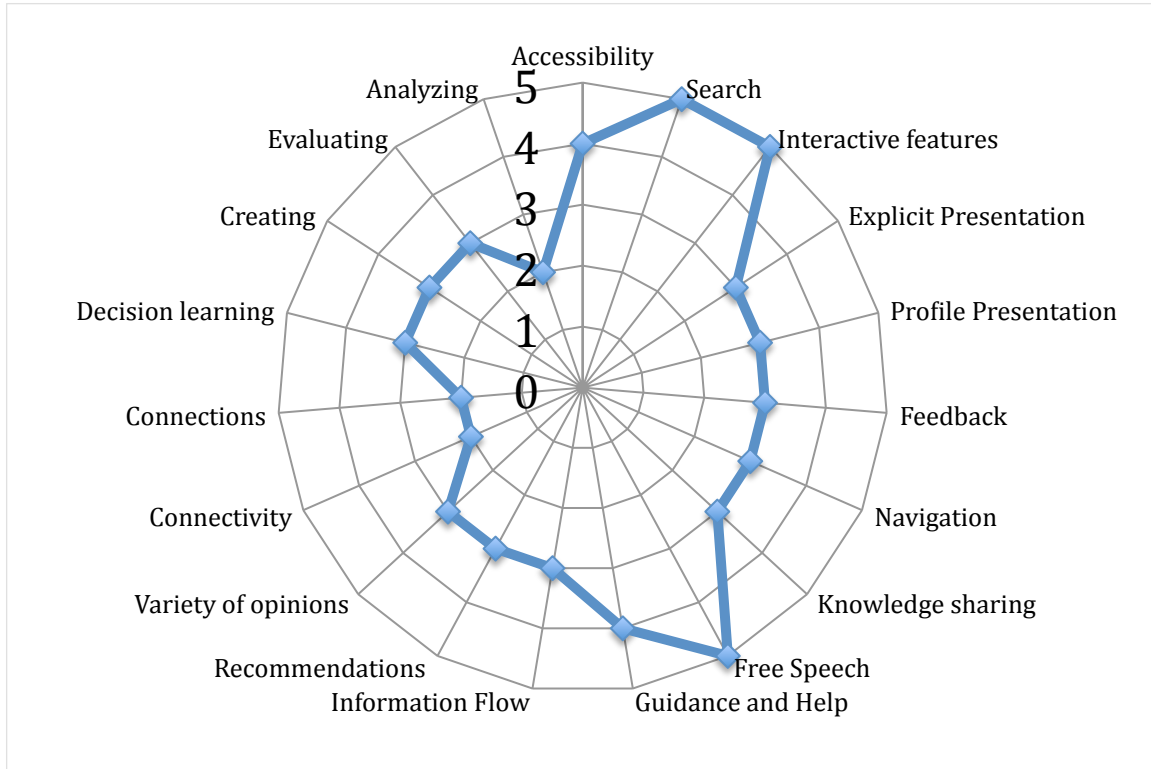


Figure 20: Total Degrees on Assessment Results

6.4 Evaluation

The total assessment degrees on G+ show that the system supports learning in organizational settings quite well. It provides a social network platform with many suitable tools for supporting different ways of learning. G+ allows a free access to the tool and it can be seen as a suitable tool for various collaborative processes. Synchronous and asynchronous processes support multiple ways of collaboration. With G+ information can be filtered as the most up dated and current. Collective perspectives are partly supported by collaborative functions as in document editing. The community developing G+ is active and seeks increasingly new ways to improve the system quality and applications. It also provides guidance by feedback in the discussions. At this stage of G+ development of the overall structure can be seen as quite suitable and certainly one of the most promising social networks for supporting learning with knowledge sharing. Search and interactive features of G+ are considered as very suitable for collaborative learning purposes. When using the system in a collaborative learning environment it becomes crucial to have consistent agreement on privacy settings and sharing functions since G+ can be modified to a totally publically open network or totally closed network. There is a strong feeling of the user being totally in control of sharing information. This also supports the idea of learner having the control of the way he learns with sharing knowledge.

Different applications are easily available and ready to be used in Google account. However the current development phase in G+ integration to Google apps limited the evaluation results by its current state. This also lowered the degrees especially when trying to build connections between Google applications and G+ network. Gross functions between G+ and apps content are most lacking feature and crucial for organizational settings. Also features that allow visual modifications on profile and other main areas would be crucial to have even stronger control feeling for the learner. Settings between Google account and G+ are at some point misleading and quite complex. Different settings in privacy may disturb the actual knowledge sharing and information flow at some points.

7. Conclusions

The objective was to describe an organization setting and define social networks' suitability to support learning with knowledge sharing. At the starting point of this thesis I was exploring different aspects of online communities in different designs and work process suitable for thesis context. Looking at community development processes in companies, which are traditionally kept secret from the public crowd I soon realized that Henry Jenkins' (2006, p.256) bottom up participatory cultures exist widely in our society and more increasingly in corporate world as well. Social networks can be seen as one of the most popular participatory cultures existing in our society. They are researched widely for example in marketing and business purposes. However learning in organizations with social networking is an almost untouched research field. Learning in organizations is deeply related in the knowledge sharing activities. The newest approaches of learning highlights the importance of social and connection making, which are strongly related to knowledge sharing activities. The importance of learning in organization is easily understood with the statements of Nonaka and Takeuchi (1995, pp. 6-7), where tacit knowledge is the most valuable competitive asset of an organization. In order to adopt tacit knowledge in various ways different ways of learning must be supported. Everybody does not necessarily want the information and knowledge to be freely spread around the organization. Organization may have difficulties to adapt the new organical structures. With a social network that supports learning the control of the sharing and participating can be easily managed according to its need. That is what makes it unique and suitable in many different objectives and modifications. It also makes social networks as G+ suitable in the needs of constantly developing and reshaping modern organizations.

Discussions with different companies and their employees representing fields of ICT, HR and Collaborative applications gave me an even clearer picture how learning must be understood in the organizations. The nature of learning is mostly associated by knowledge sharing activities and the supportiveness of these activities. Learning is also highlighted as a situated process in the learning

approaches of John Seely (2000) and George Siemens' connectivism (2004, p.1). The theories of organizational learning were used as background theories to define the modern organizational setting and the assumption that organizations are under constant change. The results of the assessment are not suitable for analyzing learning in a scale of entire organizational learning. However assumptions made by Argyris (1999, p.179) that organizational learning relies on the basis of individuals' actions can be seen as a strong reflection to the entire organization.

When looking at the design of community and the question of COP design process being suitable for online environment the assumption can be made that online and organizational setting are build from a slightly different design. The design of a community is described well by Näkki and others (2011, p.98): "The strict division between users and designers no longer holds; the services must be designed in collaboration and through use. Designers are becoming more like facilitators who support the user community in forming the service, producing content and creating the community". The practical cases of communities used for companies show that there is mostly a bottom up approach used with a facilitator/instructor/community manager creating planned activations. That is why Etienne Wenger's COP models and theories are not fully adoptable for designing virtual communities in organizations. Etienne Wenger describes (2002, p.64) the design of community as an approach to design community that redefines itself. The power of a community is definitely drawn from the activations of community members, but using it in an organizational setting means that the community is more or less usually "semi controlled" by a facilitator or similar. Most important values of COP are partly supported by social network Google+. With G+ the best suitability for COP values are related of the easiness of sharing information and using tacit knowledge into explicit shared presentations. The most lacking features in G+ and important values of COP are related to connecting different knowledge and expertise areas. Automated features like in connecting domain of knowledge and filtering information would be necessary improvements to build G+ closer to the important values of COP.

Social networks are meeting largely the needs of learning with knowledge sharing in a modern organization. In a community of a social network there are usually no management hierarchies and they are well capable of continual learning, innovation and adaption. The assessment on G+ social network clearly show that a publically available tool which is free for everybody can be a suitable for supporting learning in variety of collaborative ways. When looking at the current state of social networks in organizations in Finland social networks are usually aimed to narrowly specified communications of knowledge. Most of collaborative applications that were investigated in organizational setting were quite old fashioned or still in a planning phase of implementation. There is a strong demand to develop more specialized people and the processes in social networks, which support learning. This would encourage and ease the collaborative learning in organizations, and educational institutes. It would also lead to greater a participatory culture in our society.

The nature of learning and latest approaches made the assessment based mainly on the degrees of functions that support the learning quality statements. Achieving relatively good degrees on the quality criteria of learning with social network G+ cannot be generalized in other similar networks. By setting similar settings and assessing a variety of available networks would gain deeper understanding of the opportunities and variety of different references. For future usage the research assessment approach could be used for a larger test group using or piloting social networking tool in a company. Also there would be a need of deeper analyze build from the results of have human social factors included in the degrees. These could be measured for example in degrees of sense of community belonging and trust building. These naturally would need to be done in a longer assessment period of time and in a variety of communities to be able to produce relevant results.

With Google+ hopefully there will be a full implementation of organizational adaption in the near future. Collaborative tools like highly popular and publically accepted Google + is certainly one of the pacemakers for the designers, developers and managers of collaborative learning processes in social networks. It has full potential to be recognized as the leading social network that supports highly different ways of learning in organizations. New learning approaches can be easily recognized as supported in social networks. The limitedness of researches available in the field makes comparison of other results difficult. The different ways of learning are strongly associated with knowledge sharing activities in the new medium of social networking. This allows us to participate more and above all learning is situated more in our natural way.

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Figure 17 by Antti Katajainen.

Figure 18 by Antti Katajainen.

Figure 19 by Antti Katajainen.

Figure 20 by Antti Katajainen.

Pictures

Picture 1: <http://www.redhilllearningspace.org.uk/> screenshot by Antti Katajainen

Picture 2: <https://community.brighton.ac.uk/> screenshot by Antti Katajainen

Picture 3: <http://plus.google.com/> screenshot by Antti Katajainen

Picture 4: Google+ Feedback form <http://plus.google.com> screenshot by Antti Katajainen.

Picture 5: Google+ Navigation <http://plus.google.com> screenshot by Antti Katajainen.