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The Potential Role of Web 2.0 in Internal Collaboration

Master Thesis in Information System, Department of Informatics (15 ECTS)

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Abstract

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Abstract

This study has focused on how Web 2.0 tools may affect the company collaboration process. Those tools which are used internally by organizations for messaging, chatting, online meetings, weekly reports, online video lecture base, bugs/error reporting, working monthly hours reporting etc. are studied.

The employees have been studying organizations from the perspective of collaboration. We have interviewed experts who are professional developers and managers in leading IT-companies. This study tells us how work is made easier by using these collaborative tools and why managers are more satisfied now because of using these Web 2.0 technologies.

Web 2.0 helps in collaboration. Key potential benefits of implementing Web 2.0 include productivity and efficiency as well as, staff engagement and knowledge sharing. Key potential risks and concerns of implementing Web 2.0 include security, loss of control, information reliability, and productivity.

We found in our empirical research that web softwares may assist in improving collaboration. There are many advantages and disadvantages of Web 2.0. Some advantages are faster communication, quick feedback and effective collaboration. The most significant disadvantage found was the breach of secure data if wrong access is granted to the employee.

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1. Introduction

1.1 Background

Communication is very important in organizations to run the business activities. If communication within any organization is not satisfactory then the other processes in an organization such as decision making, knowledge sharing, creating a culture, creating motivation and so forth would fail (Jacobsen & Thorsvik, 2002). If communication is successful within an organization then all members of the organization will recognize their targets and work towards them together (Heide et al., 2005).

“If communication activity stops, the organization disappears. If the communication activity becomes confused, the organization begins to malfunction. These outcomes are unsurprising because the communication activity is the organization.” (Heide et al., 2005, pp.19, our translation from Swedish)

Web 2.0 helps in open communication and collaboration anytime using online applications which merge different sources of information and different technologies to review the data. So Web 2.0 can be understood as a platform of all technologies where users gather up and share information. It is very easy to build a new web based tool which fetches the information from different sources and merges it on a single platform (Ferretti et al., 2009).

Collaboration among coworkers is very important for company success (Naoum, 2003; Eriksson, 2008). Incorporating the change of technology in the organization is very important. Change in technology has paid off in terms of improved output. Organizations are employing Web 2.0 technologies like video sharing, podcasts and collaborative online softwares which have eased the life of workers by paying off in terms of output and collaboration (Jander, 2009).

1.2 Problem area and research questions

There has been a change in technology during the last decade. Companies are using World Wide Web and e-technologies. They can now have their ideas shared by many users all over the world by having online availability. In the past, companies typically created project plans in Microsoft Project or other standalone or semi-collaborative project management tools. Most small and medium-sized businesses managed projects using limited document tools like Excel or other tools within Outlook. Collaboration on projects was for this reason very limited.

Companies are today using web-based software service project management tools such as e-Project and Basecamp. There are also several online collaboration technologies like Google documents, Microsoft Share Point, Vignette Collabo and Alfresco that is highly used. Wikis, podcast, blogs etc have also shown to be of use for internal collaboration. We see that there are affects of these web technologies on the internal communication of the companies.

We think it is interesting to study this development and we will investigate companies and organizations which are working with forums and communities. Our research questions are the following:

1. How can Web 2.0 tools assist in internal collaboration?
2. What are the positive and negative effects of using such tools for the organization?

1.3 Purpose of Research

There is a need for organizations to be studied from a communication perspective with focus on how people use communication and how they become affected by it (Strid, 1999). The aim of this study is to see how Web 2.0 tools helps in internal collaboration, advantages which employees get when they use this in organizations and possible disadvantages using Web 2.0 tools.

1.4 Delimitation

We focused our study on impacts of internal collaboration using existing Web 2.0 tools in IT companies and discussed advantages and disadvantages. We considered Web 2.0 tools in general. We did not study the Web 2.0 tools used in any particular department of the companies. We did not investigate in which environments these tools can be used and what could be the possible merits and demerits in particular conditions.

2. Literature Survey

2.1 Collaboration

Communication is part of collaboration. Whenever there is collaboration, there is communication. Communication is defined as “the process of sending information to oneself or another entity, usually via a language.” Palta (2006, p1). Communication contains three major dimensions which are content, form, and destination. The content is like acts that perform the knowledge, experiences, advice or ask questions. Communication can be verbal, non-verbal, body language etc.

Min et al. (2005) suggests that collaboration should be defined as a firm’s culture of working together with other firms toward a common set of goals that bring mutual benefits to a partnering relationship. Organizations are gaining success by making the collaboration a basis for sharing, support, co-production using dispersed resources and skills (Hansen & Nohria, 2004; Gloor & Cooper, 2007). Lotia (2004, p. 58) stated that “learning and knowledge creation are important benefits of collaboration.” So collaboration results in innovation which leads to competitive advantage (O’Reilly, 2005; Tapscott & Williams, 2006).

Gray (1989) defines collaboration as “a process through which parties, who see different aspects of problem can explore constructively their differences and search for solutions that go beyond their own limited vision of what is possible”. Some other authors claim that collaboration allows individuals to combine human and material resources to achieve the objectives which are not possible to achieve alone individually (Kanter 1994; Wandersman, Goodman, and Butterfoss 1997; Zukerman, Kaluzny, and Ricketts 1995).

When the resources and skills of different partners (employees) are combined, the group creates something new and valuable together i.e. the output is far greater than the sum of individual outcomes (Shannon 1998; Taylor-Powell et al., 1998). Collaboration, online participation and quick transfer is the main benefit of Web 2.0 (Dearstyne, 2007; Tapscott & Williams, 2006). Through Web 2.0 people can participate in new product development and quick knowledge sharing (Tapscott & Williams, 2006).

2.2 Web 2.0 and Enterprise 2.0

O’Reilly (2005) defined the new Web or Web 2.0 as follows: “*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 experience.*”

The core competencies of Web 2.0 environment are (O’Reilly, 2005, p. 19):

1. Services, not packaged software, with cost-effective scalability.
2. Control over unique, hard-to-recreate data sources that get richer as more people use them.
3. Trusting users as co-developers.

4. Harnessing collective intelligence.
5. Leveraging the long tail through customer self service.
6. Software above the level of a single device.
7. Lightweight user interfaces, development models and business models.”

When the Web 2.0 techniques are used in an organization then it is called Enterprise 2.0 (MacAfee, 2006). The tools which are used for sharing of knowledge inside and outside the organization are called enterprise 2.0 (Yukihiro, 2007). MacAfee (2006, p. 23) has suggested the acronym SLATES to refer to six components underlying E 2.0.

- S. Search: for searching the information in the database
- L. Links: links to important pages
- A. Authoring: collective authorship of the data which is available to all
- T. Tags: one word description of the information
- E. Extensions: finding the matching information to the one which person has searched for.
- S. Signals: to push the information to the users for which they have subscribed.

Dawson (2007) defines Web 2.0 as “Distributed technologies built to integrate, that collectively transform mass participation into valuable emergent outcomes.”

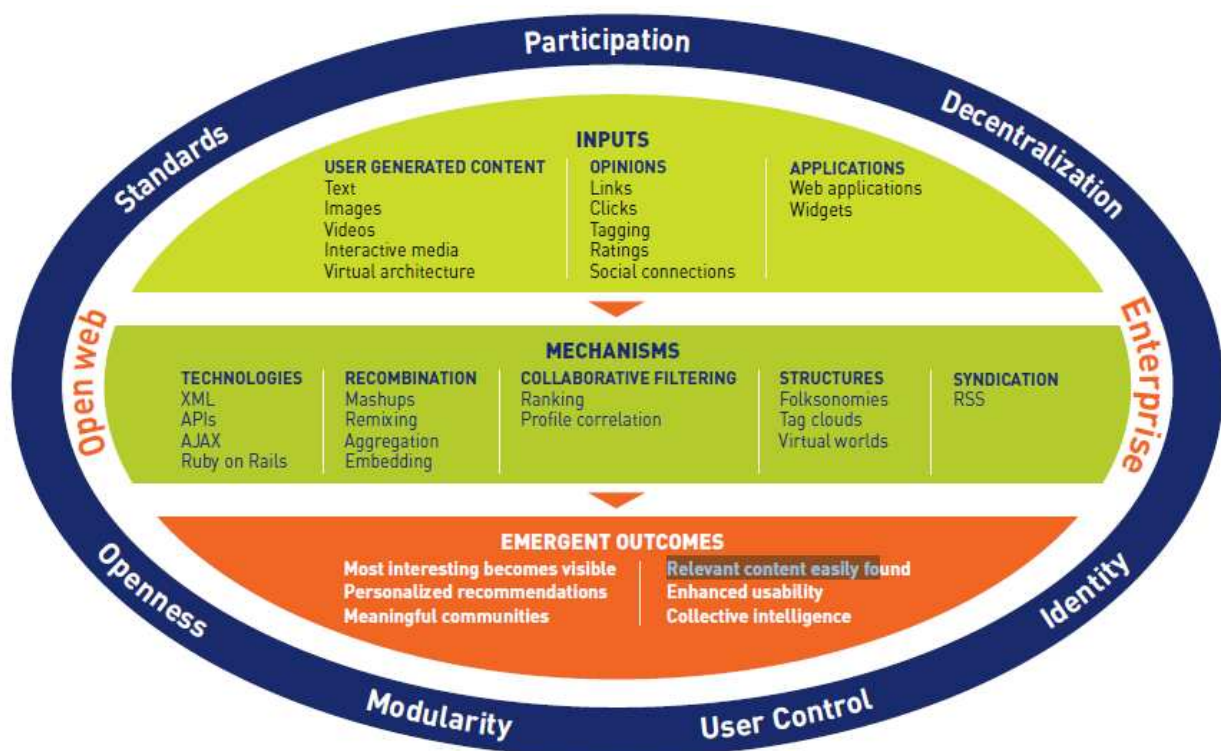


Figure 2.1: Web 2.0 framework , Dawson (2007)

Dawson (2007) explains that Web 2.0 is founded on identity, modularity, user control etc (figure 2.1). Web 2.0 may be divided into two key domains: the Open web, and the Enterprise. The core of Web 2.0 is to convert user inputs, their opinions and information nuggets, through a series of Mechanisms (Technologies, Recombination, Collaborative Filtering, Structures, and Syndication) to produce results which are beneficial for the enterprise 2.0 users. There are many famous enterprise 2.0 softwares which have been used for a number of years.

2.3 Web 2.0 help in internal collaboration

An intranet (a network inside organization) is accessible only to authorized employees (Buffa, 2006; Mader, 2007). Since Web 1.0 tool like simple web sites and portals are controlled centrally, it means that information will be only visible to the employees after it has been reported centrally on website. So this makes the process of updating very slow and hectic (Mader, 2006).

Buffa (2006) argues that collaboration gathers a large variety of information from employees quickly. Mader (2007) says that employees should be allowed to use large amounts of collaboration tools to effectively utilize the Web 2.0 resources.

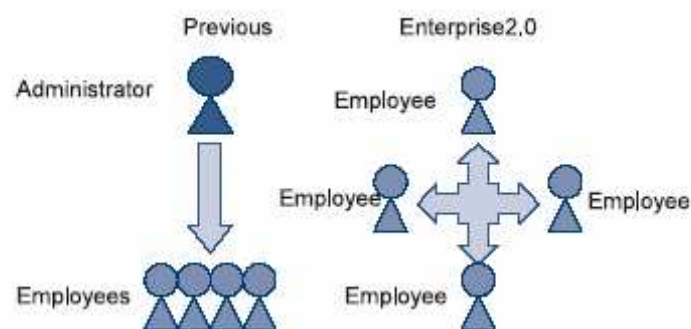


Figure 2.2: Differences from previous information sharing systems (Yukihiro, 2006, p. 2)

Figure 2.3 shows the centralized model and the collaborative model in Enterprise 2.0 that can be supported using Wikis. Employees collaborate using this model for keeping each other updated with the timely information.

Web 2.0 tools have overcome the flaws in Web 1.0. Take the example of email. For a long time email has been used for collaboration in companies (Tapscott & Williams, 2006). Email is the most used collaboration tool in the organizations (Hideo & Shinichi, 2007; McAfee, 2006; Mader, 2007).

Emails have flaws as the document will be dispersed, different versions of the documents will be with different persons, it's difficult to keep old email documents updated because of lack of accuracy and difficulty in the updates emails are time consuming (Hideo & Shinichi, 2007; Mader, 2007; Wood, 2005). But using Web 2.0 tools like wikis, blogs etc the time is saved and changes are communicated easily and effectively. Email documents are permanent and they cannot be changed interactively by listening to the output of the other person. Emails lack the clear collaboration perspective, the tone of expression and emotions (Whipple, 2006).

Web 2.0 tools can help build teams of employees which have same competence and they can communicate within different offices (Shuen, 2008). Companies need to make the maximum use of their internal and external capabilities, they should understand the skill set of every employees i.e. who knows what, and then mobilize the network using Web 2.0 tools when the problem occurs. (Doyle, 2008) suggests that unified communication has changed the life of

employees and companies by introducing the technologies like VoIP and IP telephony etc. They can log in on single platform and can access multiple web 2.0 technologies.

Online collaboration allows for fast and speedy communication. Companies which are successful and innovative are open to collaboration. But openness in technology requires lot of control and checks. Lahiri et al.,(2008) suggest that softwares which are used within the organization for open communication requires control from managers on information transfer, wireless communication tools and how to avoid and adapt to the change from external factors.

The innovative Web 2.0 tools when used within organization for information sharing require a lot of effort from managers and employees (Seybold, 2006). Knowledge management creates competitive advantage. Using best practices within the company brings information capture, idea generation, storage of information and information distribution (Hindle, 2008).

Ideas which employees come up with that help the company to gain competitive advantage and save money could be implemented (Hindle, 2008). Normally a company, on daily basis, generates lots of important information. But this information is just kept in files and documents without any potential use for the relevant employee. The way to solve this problem is that when an employee has an informative document he should find the target employee who will benefit from this. In this way the information will be rightly used and will not be just forgotten away (Pugh & Dixon, 2008).

2.4 Web 2.0 Collaborative tools and services

Web 2.0 tool are used for internal collaboration. Some employees are strong motivators for the usage of the new Web 2.0 technologies while some resist the change. So these motivated employees can collaborate with the managers to motivate other coworkers (Seybold, 2006).

Kolb and Wishaw (2005) argue that wikis help employees to learn new things quickly. They define learning as a process of doing, reflecting, understanding and applying information. The model (McPherson & Nunes, 2004) includes experiencing, publishing, processing, generalizing and, applying. The five phase model by McPherson & Nunes (2004) for learning is shown in figure 2.5. The user shares his experience when he takes part in an activity. When the user discusses with others, he is publishing his knowledge. When he receives feedbacks and outputs after discussing his competence with the colleges he learns. The model calls this “Generalizing”. When the user brainstorms, he then innovates and applies it.

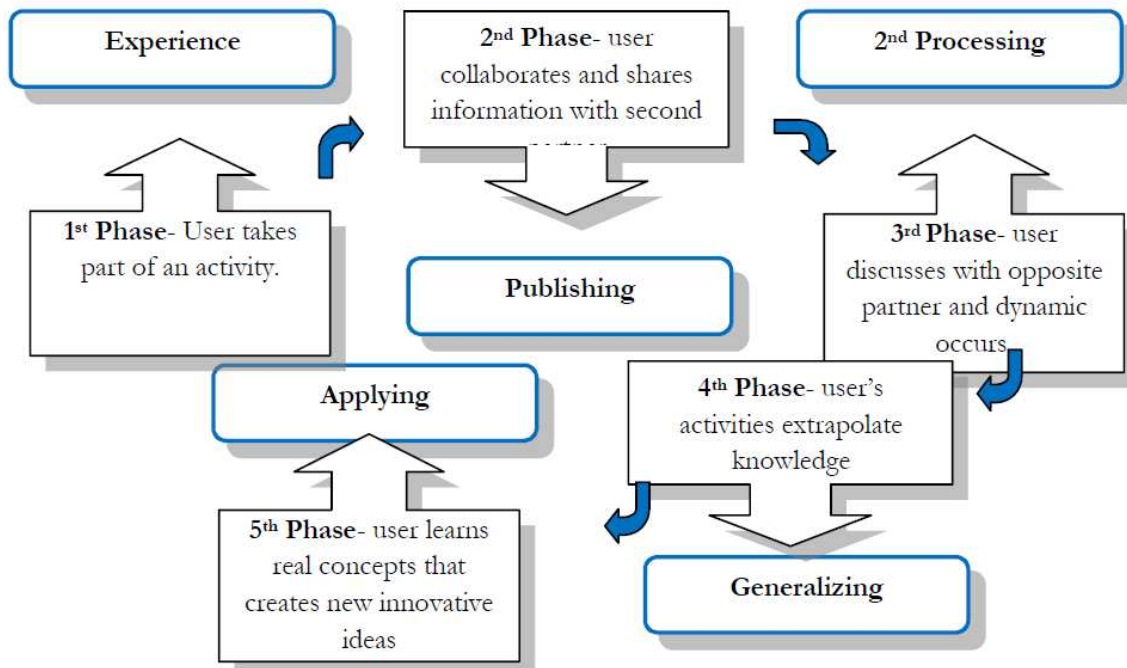


Figure 2.3: Five-Phase Model of Learning (McPherson & Nunes, 2004)

This application of experience and competence will create competitive advantage for the company. The above mentioned learning model can be best used if it is done using Web 2.0 tools. The outcome of deployment of this model in the company means that there will be “learning by doing” (McPherson & Nunes, 2004).

Learning by doing (Kolb and Wishaw, 2005) is one of two different approaches to implementing a new tool into the work and minds of employees. This learning strategy encourages employees to try new solutions, behaviors and, cognitive responses. New Web 2.0 tools can be chosen by the employees after trying it. The affect appears when a person connects with an activity, criticizes it, looks back at it and puts some useful insight into action (McPherson & Nunes, 2004).

Companies adopt the new Web 2.0 technologies to make use of intellectually prepared documents to advance their own business model (Chesbrough, 2003). Knowledge sharing methods when combined with open communication should be such that it should benefit the internal collaboration by information flow. Attitude change from employees and managers is needed for better collaboration using Web 2.0 for knowledge sharing and communication (McPherson & Nunes, 2004).

Woods and Thoeny (2007) claim that sharing experience information with others is unnatural, so when it comes to co-authorship of collaboration it’s unlikely that employees will fully collaborate. But when employees work on Web 2.0 tools like wikis and become co-authors of the articles that are read by many people then individualistic work behavior transforms into collective pride and they become part of a virtual intellectual community (Woods and Thoeny, 2007). It’s the task of management to place employees under relevant department managers who can make the best use of their competence (Seybold, 2006).

Managers when implementing a new Web 2.0 collaboration tool in the company need to take care that they are not imposing the new tool on the employees but explain them step by step

the benefits of the tools so that employees don't resist change as changing an employee's thought and behavior is not something that can happen over-night and a good leader can solve the employee differences of opinion efficiently (Seybold, 2006).

2.5 Benefits from Web 2.0 tools using in organizations

Web 2.0 tools provide fast, open communication and are easy to implement in the company. They also help in the innovation process since all employees collaborate effectively and timely (Vapola et. al., 2006).

West and West (2009) say Web 2.0 tools like wikis are best to use when all the employees are free to use in terms of putting content, edition, deleting it without any checks. Wiki offers the possibility to write documents collaboratively. Wiki is a Web 2.0 technology as it has the characteristics that it is participatory, decentralized, linked and emergent. Wikis content is dynamic and it is open for authorship.

Internal collaboration will help employees share their expertise and important information with each other (Chesbrough, 2003). Internal collaboration is often to gain a more open working climate for sharing knowledge. Good and strong relations in companies can itself be a potent source of competitive advantage (De Wit & Meyer, 2004). Using collaboration tools open communication will take place which will aid innovation and company will gain competitive advantage (Seybold, 2006)

Using Web 2.0 tools companies create federated network where they can receive feedback from stakeholders, customers and partners. Employees can report their competence on these softwares so they know which other employees in the company have the same competence level. Employee feels easy to make ad hoc groups with other employees who have the relevant knowledge in the field to help each other. Using Web 2.0 users can get comments, meeting time updates etc form there group members or seniors. (Farber, 2007).

According to Dawson (2009), the key benefits from implementing the Web 2.0 tools in companies can be divided into productivity & efficiency, staff engagement, knowledge and reputation (table 2.1).

Table 2.1: Major Benefits of Using Web tools in companies (Dawson, 2009)

Category	Benefit	Overview	Relevance
Productivity & efficiency	Increased productivity	People and teams work more effectively through quicker access to resources and easier collaboration.	Any knowledge-based work, especially in teams.
	Faster innovation and product development	Both early stage innovation and taking products through to launch is made more effective by fluid interaction.	Organizations driven by innovation or with short product cycles.
	More efficient project management	Enterprise 2.0 tools are extremely relevant to streamlining project management across all domains.	Any project teams, particularly those that are multi-location or cross organizations.
	Reduced email overload	Migrating some kinds of organizational communication outside email to create greater personal efficiency.	Where excessive email is impacting productivity.
	Improved team performance	Acceleration of team interaction and more rapid trust-building.	Any environment where teamwork is important.
Staff engagement	Better internal communication	More efficient dissemination of information to employees and communication across the organization.	Relevant to all organizations.
	Greater staff engagement	Improved ability to communicate with peers and participate in discussion can strongly enhance positive sentiment.	Where there is a desire and willingness to engage staff more.
	Enhanced collaborative behaviours	Providing tools and initiatives aimed to facilitate collaboration flows through to changed behaviors.	Knowledge-based work environments.
	More effective learning & development	Enterprise tools both provide easier access to content and better connectivity for shared learning.	As a complement to existing well-established learning programs.
Knowledge	Easier access to expertise and organizational capabilities	Making it easier to uncover and connect with relevant expertise, either in people or embedded in documents and processes.	Relevant expertise in the firm is hard to access.
	Enhanced search	Enabling search to quickly provide the most relevant information and resources for the individual.	Where research is a significant component of daily work.
Reputation	Attractiveness as an employer	Younger staff in particular judge potential employers by how innovative and open they are. Uptake of web technologies is often seen as an indicator of a progressive culture.	Organization competes for young, talented staff.
	Improved firm reputation	Innovative approaches create leadership position with an industry and with clients and business partners.	Where being an industry leader can impact perceptions.
	Increased visibility in marketplace	Web 2.0 technologies are highly effective in promoting thought leadership content and building visibility for the firm and key executives.	Where increased visibility and findability can support business outcomes.

2.6 Key concerns of using Web 2.0 tools in organization

Since Web 2.0 tools allow for open communication, company information can be abused as the data is available remotely to the employees outside of the company premises. Emails can transfer important company data like trade secrets and confidential data to the outside world. When the company shifts to Web 2.0 it becomes more vulnerable due to quickness, easier and fast data transfer tools (Laudon & Laudon, 2004).

Web 2.0 tools may produce unwanted and undesirable outcomes: it could reveal information which will affect company stakeholders as a wrong decision made by the manager or their incorrect implementation. Unpredictability can occur if the organization is not well prepared to cope with the information provided by the Web 2.0 tools. An additional issue is liability i.e. who shall be held responsible for bad decision which has put the company at a loss. If the wrong decision is made by the employees then this can also affect company's external contacts (Bonabeau, 2009).

Employee's collaboration leads to giving their own opinions quickly using Web 2.0 tools. The more people are involved in the group the more will be the chances of misbehaving. So to take control of people's behaviors, there should be guidelines and policies to be followed by every participating employee in the collaboration. Since in Web 2.0 collaboration participants are online so some people may not give their opinion as they are shy or they may feel that their decision may bring a negative effect on their image (Bonabeau, 2009).

Change is seldom easy, and that's definitely the case as IT managers struggle to deal with the influx of Web 2.0 tools into the workplace. But success with Web 2.0 is coming at a cost. IT managers have to balance all the collaboration and innovation emanating from these tools against new security risks as well as data access and management challenges. This means IT departments must find ways to get control over the use of these tools in the workplace where there are good and bad employees (Jande, 2009).

Improved levels of access to sensitive data for the employees in the company will definitely give better management. Business manager can be granted the right to allow the kind of access and level of access for the employee on the Web 2.0 software (Johnson, 2008).

It is very difficult to manage all the important information flow of the company because of Web 2.0. These tools can be thought of as the world's fastest copying machine which can copy and spread the digital information all around the world within minutes (Shapiro & Varian, 1999).

Sometimes company needs to share its important information with the employees to make important decisions. In such cases, there is a chance of breach of intellectual property. Particularly those that have kept close wraps on their intellectual property can provide more damage to the company name and fame. Similarly when a company needs and information from outside, it has to see which information it shall disclose (Bonabeau, 2009).

Dawson (2009) suggests that the risks of using Web 2.0 in terms of security, loss of control, use of resources and productivity etc Table 2.2.

Table 2.2: Key risks and concerns of using Web tools in companies (Dawson, 2009)

Category	Risk/ concern	Overview	Counterpoint/ Response
Security	Information loss	Confidential and competitive information can be leaked externally.	Information can already be deliberately leaked through a variety of means, including email. Safeguards and education can avoid inadvertent information leaks.
	Network security	Opening systems can make IT more vulnerable to malware.	There are essentially no additional IT security risks with Enterprise 2.0 – if existing security policies are rigorous there should be no concerns.
Loss of control	Loss of control of information flows	Executives can no longer control the flow of information in organizations.	Perception of current control over information flows are misguided. Healthy organizational cultures are correlated to high levels of unstructured internal communication.
	Negative internal comments	Individuals make negative or inappropriate comments on discussion forums or other public communication.	If desired, systems can be set up so that there are no options for anonymous communication.
Reputation	Negative external comments	Staff making comments on public Web 2.0 sites may make negative comments about the company or its clients.	This is a risk that transcends Web 2.0 tools and is unavoidable. Clearly communicated policies and training will minimize this risk.
	Inappropriate staff behaviour	Online tools can make questionable comments more visible.	Staff generally self regulate and will adhere to normal social behaviour.
Reliability	Information unreliable or incorrectly used	Staff posting incorrect information or unclear or misleading instructions.	Information is given greater scrutiny by wider community.
Productivity	Reduced staff productivity	Staff spend too much time using internal or external social networking tools that don't support business outcomes.	Policies appropriate for the position in the organization can be established, and usage monitored. Making these tools inaccessible could prohibit activities that are useful to the business.
Resources	Bandwidth overused	Overuse of video sharing sites or other tools can result in additional bandwidth costs.	Policies and parameters can be set to guide bandwidth-intensive applications. If warranted for business reasons additional bandwidth can be purchased.

2.7 Help in internal collaboration by well-known Web 2.0 technologies

Well-known internet based technologies in the companies (Holtz, 2006) are mentioned below. All of these are themselves big research topics. Many pages can be written on these technologies. We are just touching them in accordance with our bare minimum requirement to answer the research question.

2.7.1 Wikis and Blogs in internal collaboration

Bean and Hott (2005) say wikis may help to create documents by user collaboration. Wikis allow multiple users to post their data as compared to the blogs which only allow one user to control the information content. Wikis are updateable and editable by many users. Social text is an organization wiki provider (<http://www.socialtext.com>). Using these, employees can keep track of different versions of the documents. Employees can go back to earlier versions, can track changes and can receive email in their inbox when someone changes the content of the wikis. The administrative tool allows administrator to control the view of information in the wiki in different ways. The other leader in organization wiki is JotSpot Inc (<http://jot.com>). It was launched in February, 2005. As collaborators use forms, wiki collaborators can track old documents according to the data, can sort them and search information in them.

Other than these wikis, there are some other wikis available in the market which don't require installation like XWiki.com etc which are used in the organizations for collaboration.

There are many advantages from wikis some of them are following.

1. Wikis can asynchronously keep the opinion given by experts, professional and all employees. Wikis can be used for training of employees. It saves cost and time. HR departments use wikis for workgroup management, electronic learning, distance learning, making use of employees having certain expertise for other departments. They also create human resource specific directories of employees in wikis, who are a special resource and asset for the organization (Bean and Hott, 2005).
2. If wikis and blogs are used together then this helps to link different information together by highlighting the important information nuggets from both sources. This helps in better R&D development (Bean and Hott, 2005).
3. Wikis promote discussion in teams of small groups. Blogs can be considered as blank canvas of wikis, they are structured and have far more innovative environment and thus help in the project knowledge base development (Mattison, 2003).
4. Wikis change the corporate culture and affect it as they change the thinking processes of employees. Employees read the thoughts of others from blogs and wikis and then they create their own understanding which leads to change in how he thinks of work and life. In short, wikis allows all kinds of opinions to be heard (Bean and Hott, 2005).

5. Those documents which need to have changes immediately and these changes must be shown to the employees within limited time, wikis are the best to be used in such situations: Wikis provide efficiency as sending email updates back and forth to the employees are no longer needed (Bean and Hott, 2005).

There are few disadvantages from wikis which are following.

1. Some employees think that editing wiki documents is very difficult since they lack the comfort and structure which users require. If the administrators try to install complex wikis like TWiki, then it will require lot of settings and a web server to be installed first. But the companies like Social-text and JotSpot have offered easier solutions by providing online hosting. Human nature is to resist change. Like any other new technology, IT managers can reject the use and deployment of wikis in the organizations if they think that wikis are patchy. Wikis require a lot of maintenance to continue remain effective for the employees (Bean and Hott, 2005).
2. Since wikis are open for all then it is very difficult to manage the hierarchy and to have accountability. Privacy issues, reputation, security and legal liabilities must be considered. Large organizations like Sun Microsystems are also facing issues with the brand leakage so now they have special approval procedures for the wikis to be implemented. There has to be an allowance of free collaboration but with controls. Socialtext has now provided maximum security and minimum control needed by administration for the wikis (Jesdanun, 2004).
3. On the wikis some employees may have a static mind and post their personal viewpoint which could be controversial as on Wikipedia, abortion article was considered 143 times as “murder” article (Jesdanun, 2004).
4. Some may think that wikis are not reliable as in the case when no one is expert in a particular field and they tend to post the data. There is then no guarantee that the data posted is accurate, compact, consistent and balanced (Bean and Hott, 2005).
5. Wikis require access control for workgroups within the organizations and read write access for different employees who can post the data and remove it (Bean and Hott, 2005).
6. Wikis don't follow serial documents or versions of documents instead they are cumulative. Some problems can be solved through cumulative editing in wikis but backtracking is not possible. The flow of progress cannot be measured. Thus, the content in the wikis might show the data which was the intellectual contribution from the last employee (Bean and Hott, 2005).

2.7.2 Podcasts in internal collaboration

Podcasts (Holtz, 2005) are audio mp3 files. Podcasts are used for subscribing to any audio before it is actually posted. So whenever a new file is posted, podcasts allows sending a copy to that particular computer. The way delivery is done is the same as RSS works which we have explained below. Applications like windows media player or apple iTunes can queue up the audio available in mp3 which are received from podcasts. The question is how can

podcasting be used in internal communication? Managers can use this to post day to day issues or the employees can do RSS with the lectures or speeches given by managers and executives management. Podcasts can be used for receiving departmental updates and important information. Podcasts can be used for company news, information about the investors. It can be used for product announcements, for announcing vacancies for employee recruitment and for training employees. They can be used for helping geographically dispersed employees to remain in touch with head office (Holtz, 2005).

2.7.3 Social tagging in internal collaboration

Holtz (2006) claims that people choose keywords and collaboratively store the information on a shared resource using the keywords. The content in that stored information can be tagged. When the users tag the information, it becomes easy for others to find the information. Now the question is how can social tagging be used in internal communication? It can be used to help the employees in finding the content they need. When any employee adds the content to the intranet using content management system or puts it in the internal blog, he can put some tags also. He could tag the information according to what he thinks could be important keywords using which others employees will try to find some information on the intranet.

2.7.4 RSS in internal collaboration

Holtz (2006) argues RSS is used to save information online in such a way that users can download and use the information. An RSS “feed” is used for subscribing to the updates in that particular webpage when any new information is posted. Now the question is how can RSS be used in internal communication? People subscribe to “blogs” using RSS. Employees can subscribe using RSS feed to the internal news and important updates. In this way the important messages for example from managers can be quickly communicated to every employee.

Employees struggle to read a lot of work related documents online and from intranet resources. An organization RSS can be suitable for employees to feed the required information. RSS readers can be used such as bloglines to see the latest news available on any company internal blog. Companies are trying to implement the RSS because RSS are much effective and precise way to get information. Main disadvantages of RSS are security and users support (Carlos, 2007).

2.8 Conclusion of Literature review

The first research question was how can web 2.0 tools assist in internal collaboration? In this chapter collaboration, what is meant by collaboration in terms of Web 2.0, how MacAfee defines Web 2.0 is explained. Then we presented some Web 2.0 softwares like wikis, blogs, podcasts, social networks and RSS. Web 2.0 companies build teams of employees which have same competence and they can communicate within different offices. Unified communication has changed the life of employees and companies by introducing technologies like VoIP and IP telephony. Important information nuggets are quickly spread to the relevant department using Web 2.0 tools

The second research question was what are the positive and negative effects of using such tools for the organization? Web 2.0 saves time and provides quick updating of information. Tools like wikis help employees to learn quickly. Wikis also allow for coauthor ship and thus to share the fame which results from a well written information on the wiki. Web 2.0 tools allow enhanced search so employees get quicker results. It provides better internal communication and greater staff engagement. If Web 2.0 tools are mishandled then they create security issues like loss of confidential and competitive information, loss of control could occur if participants make negative or inappropriate comments on discussion forums. Reliability issues can arise if staff posts incorrect information on Web 2.0 websites.

3. Methodology

The method is a way to create solutions to problems and to gain new knowledge (Lekwall & Wahlbin, 2001). There are numerous factors that can be important for the result of the study and there are a number of method choices that can be made. Depending upon the situations, different methods can be selected during the research. We have studied the options and then made conscious choice to avoid wrong method choice that could affect our result negatively.

For conducting research, our aim was to select multinational companies from Sweden and Pakistan to have a broader view. To achieve our goal, we made a list of multinational companies. We found the contact numbers of management and help desk from their websites. We called the management departments to ask whether they are using Web 2.0 softwares. Most of them were using web tools. Then we made a request for interviews related to our research question. Seven companies agreed to give us time for interviews but we have chosen two in Sweden and one in Pakistan. We told management about the criteria for the appropriately skilled person for our interview. They gave us the feedback for the kind of person they think is suitable for our research from their company. The time and place was arranged with the interviewees in the company meeting rooms.

The company names and the employee names are kept hidden according to their wishes. This situation created concern for the confidentiality of the research which implies that private data about subjects won't be disclosed (Kvale, 1996). In that way no information that could identify this participant was disclosed. We have referred to the companies according to their business area e.g. (Company X is referred to as a software house in Stockholm which deals with latest technologies).The employees will be referred according to their position held in the companies as shown in the table 3.1. We did one interview in company X, three in company Y in Sweden and one in Company Z in Pakistan. The employees chosen have an experience of using Web 2.0 and IT technologies and they keep themselves updated with the latest technology. They call themselves computer scientists and IT revolutionist. Even the people who are at the management level which were interviewed are technical managers with strong programming skills and vast experience of management of technical employees.

3.1 Data Collection

We have conducted expert interviews in order to collect data. As our research is about how IT-departments believe employees may gain benefits from web technologies in the companies. In this case, interviews are mostly useful. The interviewers can pursue in-depth information about the concerned research topic through interviews. (Kvale, 1996).

We conducted semi-structured interviews because it helps us to easily interact with our participants and to provide a flexible way of asking and answering the questions. The interviewees have the option to give details about the central factors in the topics in their opinion and allowed to speak without moderation during the interview. We gave the interviewees this possibility but made sure that the topics were followed. Semi-structured interview is the combination of both unstructured and structured interview which has basic interview guideline to follow (Kvale, 1996).

We have sent the interview guide (Appendix A) by e-mail in advance to interviewees before conducting the face to face interviews so that they can feel comfortable. Furthermore, it

allowed the interviewees to prepare in advance according to interview questions if they felt necessary.

We conducted face to face interviews in the companies. The direct benefit was that we could observe the behaviors of the subjects during the interview, thus looking at the hidden emotions in the replies to the questions. The interviewees were briefed with the purpose of research to gain their confidence for the interview. The language of interviews was English. Each interview took around 40 minutes to 120 minutes. We have interviewed each interviewee according to questions that we have formulated. The interviews have been recorded after the permission of the interviewees which helped us to relisten at home when analyzing data.

Table 3.1: Interviewees Record

Interviewee	Designation	Company Name	Date	Time
A	System Developer	X	April 2009	50 Min
B	System Developer	Y	April 2009	55 Min
C	Software Designer	Y	May 2009	70 Min
D	R&D Manager	Y	May 2009	40 Min
E	Team Leader	Z	June 2009	120 Min

The managers perspective gave us insight on how the use of Web 2.0 technologies will help companies as they have detailed knowledge of the overall company/department objective and goals. To understand how productive can be the Web 2.0 applications for the company, its employees and for the management, we choose to interview professionals with different job related activities. It's an asset to have an interview from professional developers and managers who are ruling IT world.

We have made interview questions in a way that will gather the background information about the company, about the interviewees i.e. their job title and department they work in, the technologies which they are using for collaboration which they consider as being provided by Web 2.0 and how they see the future of their work as a collaboration base between different branches of the company in different regions of the world.

Table 3.2: Interview Questions

Background
Q1 Please tells us; what is your professional background in terms of education and current job experience.
Web 2.0 help in collaboration
Q2 Have you previously dealt or dealing with Web 2.0 technologies? Please mention the names?
Q3 What do you understand by internal collaboration?
Q4 Can you please name the collaboration softwares which your team is using? Why do you think that each one of these enhance the effectiveness when used regularly.
Q5 Do you have any federated network used for connecting people to have shared interests within company's different offices?
Q6 Role-playing games and simulations are used by many companies as learning tools, this new approach permits employees to immerse themselves in a digital realm where learning, collaborating and play are all part of the work environment ? Explain please?

Advantages of Web 2.0
Q7 What is the benefit of using the Web 2.0 tools? Do you think that the companies which do not embrace Web 2.0 and its facilities will get left behind by the competitors? Explain? Q8 Do you think Web 2.0 technology used is the best for future? What are the ways of receiving feedback for better future by the use of deployed technology? Q9 Web 2.0 can help new employees to learn quickly. Do you think this is true? Q10 How can the use of Web 2.0 tools improve internal collaboration? Q 11 Do you have timely, accurate, open two-way communication with your employees? When and how?
Disadvantage of Web 2.0
Q12: What can be the disadvantages to your company from Web 2.0? Please tell us in detail.

Background questions are used as warm up questions (Kvale, 1996; Oates, 2006) in order to acquire personal contact with the interviewee before starting to the research area. They are asked to get some familiarity with the interviews and to start a friendly discussion environment. Second group of questions were related to the research question that how Web 2.0 do tools help employees on collaboration. In the third category we asked that what are the advantages and then in fourth category we asked what the disadvantages of using Web 2.0 are. The interviewees answered these questions based on their experience gained over the number of years while using these softwares.

In the literature review, we studied about web softwares and its advantages and disadvantages. In literature review, we have searched number of Journals, articles and books from ELIN (Lunds university article database) to review the work previously done related to our research questions. Literature review allowed us to obtain deep knowledge of area in which we are making research. In Empirical findings and Discussion, we have got results from the interviewees. Then we have discussed the results with relevance of literature review to find answer of our research questions.

3.2 Data Analysis

After empirical data has been gathered, the next step in any given research is to analyze it. We made transcriptions of the interviews. There are no standard answers in whether to transcribe an interview word for word or summarized (Kvale, 1996). We chose to produce the transcriptions of the most import part of answer from the recordings in a summarized form. Transcriptions are a lengthy process and contain mistakes when transcribed. The reduction are applied to data when it was being transcribed i.e. the transcriptions were done by omitting non- relevant information, gossips, fun making sentences, greeting words, thinking moments etc.

We had applied data reduction to our final interview questions and we have also rewritten those many times to make them shorter and easier to understand. As our data collection proceeded, further data reduction occurred by writing summaries, making clusters, and making partitions of the empirical material. This analysis process helped us to keep ourselves to the point and find the relevant information which answers the questions being asked.

3.3 Ethical Quality of Research

To conduct a good research record keeping plays a careful role. It helps to have the track of what activities have been done during the research. We have saved the records from the interviews into audio recorder and made sure that only the authors have access to the tape recorder. We have also put stress on appropriateness and fairness of actions to our research subjects and companies involving in our research process along with focus on knowledge being produced (Miles & Huberman, 1994). All the interviewees have affirmed that they want to keep their own, and the company name unspecified, since they think that it can leak out important information related to them and company to others. We agreed with them in advance that what information can be used openly and what cannot during the research process (Israel & Hay, 2006). We told them that this research is to learn about Web 2.0 software usage in the company and not to test the skills and behavior of the interviewees in using these softwares. We told them that this research wants to gain knowledge from the interviewees experience in using Web 2.0 tools. These steps helped us to maintain quality and avoid ethical issues which could possibly occur during such kind of research where we are making expert interviews (Kvale, 1996).

When conducting the interviews we need to take into consideration about the ethical constraints related to human sensitivity and to have pleasant interview environment. We had following ethical practices when we conducted interviews (Kvale, 1996).

Informed consent: The interviewees before participating in the research knew the subject and purpose of the research and how their answers will be used. They were given an information sheet explaining the purpose of research and they were also briefed about it verbally. They were also told that they could stop the interview anytime and could hide any information which could directly affect the company's policy. The interviews are in recorded form. We told them that the interviews will be recorded on tape recorder.

Confidentiality: Since there is a lot of information which is very sensitive to the company Kvale (1996), we assured the interviewees that whatever information we receive will be taken in with full responsibility and will not be used against them in any case. Any notes taken will be removed after the research is complete. Any information which they give us will be kept between the authors for the research purposes only. This helped us to build trust and interviewees spoke freely.

4. Empirical Findings and Discussion

We conducted five expert interviews in three companies. We asked about the Web 2.0 software help, its advantage and disadvantages, the results are reported here in this chapter. This chapter contains the information gained from all the interviews in four themes which are softwares used by the interviewee, help which these tools have provided, their advantage and the disadvantages of using these softwares in organizations. We report the key points in tabular form. A discussion is provided for every theme. The discussion finds what literature has to say about the particular theme and how our interviewees have described their experience. We also provide the word to word quotations from our interviewee's thoughts about the research theme.

The company X is a famous software technology house in Stockholm, Sweden. They have strong alliance with market leaders and all of this was made possible by service-minded attitude of staff. They select people who are team players, people who can read the unwritten and hear what goes unsaid. Their employees are the people with intuition, with insight and instinct.

Company Y is a world-leading supplier in the telecommunications and data communications industry, offering advanced communications solutions for mobile and fixed networks, and consumer products. They are undisputed global leaders in mobile systems. The company is currently providing innovative solutions in more than 140 countries and is helping to create some of the most powerful communications companies in the world. Company Y has benefited a lot from Web 2.0.

Company Z is an IT company founded in Pakistan in 2005. It has many offices in different cities of Pakistan. It is project based and most of the clients belong to Pakistan and U.S.A. Company currently works in Microsoft technologies and always tries to adapt to new technologies. It has delivered projects in .NET 2.0, Silver light, SQL Server 2005/2008, Microsoft Commerce Sever. Company encourages its employees to learn and enhance skill set with new technologies. At the same time, it also encourages/educates its clients to adapt to new technologies.

4.1 Web 2.0 Software used

The table below tells what softwares are being used by the employees in the company. Different companies are using different softwares. There are so many softwares that are the same within the companies which employees are using and some of the employees are using different. These softwares are compared with those mentioned in the literature survey.

Table 4.1: Web 2.0 software used

System developer interview (A)	System developer interview (B)	Software designer interview(C)	R&D project manager interview(D)	Team Leader (E)
Blog Facebook Microsoft Outlook Skype Twitter Wiki Yahoo Chat	CDM CFT COO Facebook File2ws IBM- Sametime Msn Orkut	Blog CPI Store CSR Online DEC register Facebook GORDON IBM Sametime Msn Twitter	Anatomy Drawings (Find-Out) Chat forums Conferencing Document archives (CDM) Eri-Coll Financial systems (SAP,ONE) IBM Sametime Connect Interactive training Mail groups RT Request handling, towards BETE (Company Test Environment) Wiki	Fog bugs Google Talk MS Exchange Server Outlook Express Skype

There are many softwares used inside organizations are called internal Web 2.0 softwares. One of the interviewees claims that

“Due to nature of our development model; teams’ personnel are often from different offices. By using these tools we are sort of in a real time contact with other members and often such situation arises where we need to talk in person or a group chat, these tools comes into play and have proved to be very handy.” (Interviewee E)

Different companies use different softwares according to their requirements. We cannot specify which software is used in all companies. The most common softwares as mentioned above have characteristics of sending mp3 files, broadcasting messages, sending videos, having informative content, voice chat, video chat, sending email and support for messages which are small and informative. So if we keep this is mind we see that almost all the companies interviewed had such softwares (having different names but) support these features.

4.2 Web 2.0 help for internal collaboration

Our interviewees provided these answers about the use of Web 2.0 softwares in supporting activities in the company.

Table 4.2: Web 2.0 help for internal collaboration

Interviewees	Web 2.0 help for internal collaboration
System developer interview (A)	Effective collaboration. Timely and accurate collaboration It helps to give feedback to other employee and update the status for each other. New employees get quick help to use internal documents, whitepapers and technology. Company has a virtual appearance like other companies thus becomes global Employees remain updated about the company internal news in the weekly online journal
System developer interview (B)	Effective and efficient collaboration Timely and accurate collaboration Quick updates about companywide events Easy to locate any employee Tasks are stored in internal softwares as SPRINTS Employees report and update each other about SPRINTS tasks New employees get quick help and become familiarized easily in the working environment
Software designer interview(C)	Regular collaboration increase reliability and saves time Easy feedback leaving for offline employees Meeting/talking everyday virtually without need of face to face meetings New employees quickly get used to the internal environment
R&D project manager interview(D)	Better feedback, immediate meetings Ad hoc processing of data Internal files access by VPN (Virtual Private Network) from anywhere in the world using company softwares.
Team Leader (E)	Effective and efficient collaboration Timely and accurate collaboration Collaboration is a key factor to improve the company productivity. Easy and quick to share knowledge with other employees using Web 2.0 as compare to E-mail New employees get quick help using out-of-the-box tools.

Use of wikis in the organization is very beneficial to have quick information. In the literature we saw benefits of wikis, that they asynchronously keep the opinion given by experts, professional and all employees. They are used by HR management; they keep information nuggets in them. Blogs are considered static as compared to the wikis which are dynamic in terms of information update and editing the content (Yukhiro, 2006). Employees use wikis for keeping each other updated with the timely info. One of the interviewees mentions

“The company has built some projects around 2.0 or under development wikis, RSS Syndication and Blogging. They are quite beneficial and are easily accessible” (Interviewee E)

Getting feedback is very important for the company. Web 2.0 allows employees try to connect with other employees and participate in activities. They will brainstorm and generate results. Data like feedback, comments, quotes and preferences are incorporated in Web 2.0 easily. One interviewee told us that they have used Web 2.0 products for receiving feedbacks.

“It certainly does e.g. a project to be successful; collaboration at all level is key factor not only within teams, but also with external stakeholders. If the organization processes are transparent and gives each stakeholder a real time update on ongoing activities through collaboration tools, it will enable an early feedback from relevant stakeholders which can be

beneficial rather than knowing down line the road. It will help to chop with the changes as early as possible.”(Interview E)

Web 2.0 tools can be used to get quick feedback as one of the interviewee suggests

“Putting a message board on the web site can help the users leave their feedbacks there to be read by supervisors and managers.” (Interviewee A)

Web 2.0 tools help a lot in communication. They have facilitated communication. Our research question asked that what assistance Web 2.0 provides employees. Literature mentions that email is the most used collaboration tool in the organization (Hideo & Shinichi, 2007; McAfee, 2006; Mader, 2007). Web 2.0 technologies like VoIP and IP telephony have changed the lives of employees by providing unified communication (Doyle Jon , 2008). One interviewee says that it is the web which has actually changed the lives of employees, their working styles and their ways to collaborate with each other

“The web without any doubt is a key factor (a base technology) on employee collaboration across the organization regardless how the content delivery works and on which device; Atom like processor are now working in devices, Android 3 or iPhone 5.0. Organizations will tend to make such solutions which are easily searchable without requiring too much power from relational systems, solutions which are self-contained” (Interviewee D)

4.3 Advantages in internal collaboration

Here we present the key points which our interviewees put forward on the advantages in internal collaboration gained by using Web 2.0 in the organizations. The benefits identified by our interviews are compared with those mentioned in the literature survey to see how important the use of Web 2.0 in any organization.

Table 4.3: Advantages in internal collaboration

Interviewees	Advantages in internal collaboration
System developer interview (A)	ESS (Executive Support System) at the top level increases collaboration. More collaboration relates to happier and productive environment. Collaboration boosts employee confidence and morale.
System developer interview (B)	Time and resources are saved thus internal collaboration increases Profits are increased Feedback process becomes efficient Better interaction between HR and customers
Software designer interview(C)	Increase sales and profitability Increase in employee level productivity that is equal to company level productivity
R&D project manager interview(D)	Employee satisfaction and happiness Employee empowerment, support and future technology seminars. Interactive training. Employees get quick answers to their questions. Easier to find company internal information anytime using Web 2.0 tools.
Team Leader (E)	Time and resources are saved Real time and quick collaboration at geographically disperse location. Feedback with stakeholders becomes efficient then it directly affects company to grow. Business operations will be improved by offering mobility and RIA. Organizational process becomes transparent and stakeholder has a solid control over the information and output.

So we can say that the resources are saved, less energy is required to maintain the flow of work, less control is needed and the processes help management to get easy reports. Softwares like Executive Support System (ESS) help management to learn more about the parameters which can increase the productivity. One of the interviewee said that

“Executive Support Systems and DSS help top management to see the result in a graphical form which is easier to understand. This helps to take the measures according to the company performance thus effecting the growth and productivity of the company.” (Interviewee A)

Wikis help to create documents by user collaboration (Bean & Hott, 2005). Wikis allows multiple users to posts their data as compared to the blogs which only allows one user to control the information content. Wikis are updateable and editable by many users. Our interviewees at Company Y use softwares like wikis, SAP and mail groups. They also use an internally developed IBM Sametime. They have used other softwares also

“I have used Wiki sites for information sharing and collaboration in projects, Mail groups, Chat forums, Outlook, SMS/MMS, Trouble Report handling systems (like MHS.....), Anatomy Drawings (Find-Out), Document archives (CDM,...), Financial systems (SAP, ONE...), Sametime Connect conferencing and Clear Case ” (Interviewee D)

“We have timely, accurate open two ways communication with peers using IBM Sametime connect software.” (Interviewee C)

Another interviewee told us that they use internal forums for working on tasks

“Discussion Forum is an online tool for collaborative discussions. Our team uses Discussion Forum to create an open or restricted discussion on the Web for any project or temporary tasks.” (Interviewee C)

Web 2.0 tools like wikis are the best example of participatory decentralized and latest technology which helps in internal collaboration (West & West, 2009). According to (Holtz,2005) audio through podcasts can be used by VP of sales to inform 100's of sales representatives who are all around in the country and spending lot of time in the cars In one of the companies they are using softwares like Skype and Google talk to communicate with employees when they are far away.

“Due to distributed development environment there is always use of Skype, Google talk. In a context this is more helpful since it's interactive – share pictures instantly if needed and if you e-mail then it may be you are getting response late”(Interviewee E)

Interviewee D argues that reliability increases in work due to effective and timely collaboration and when reporting is needed for sending the updates to partners and manger. Interviewee E mentions that business operations will be improved by offering mobility and Rich Internet Applications (RIA). Buffa (2006) says that collaboration helps getting lot of information in quick time. (Shuen, 2008) claims that Web 2.0 tools help communicate within different offices and it helps building teams of employees. Employee feels easy to make ad hoc groups with other employees who have the relevant knowledge in the field to help each other (Farber, 2007). Our interview results tell that there is also an increase in number of clients due to company's Web 2.0 presence.

Web 2.0 helps in collaboration by providing quick information sharing, publishing, open communication by which employees learn more from each other and help in idea innovation and online brainstorming (McPherson & Nunes, 2004). We see from the company interviews that Web 2.0 softwares are for reporting bugs, timely updates, sharing process, complaint registering, ordering products, online learning tools, online seminars for employees sitting at remote locations, resource planning etc.

When employees work on Web 2.0 tools like wikis and become co-authors of the articles that are read by many people then individualistic work behavior transforms into collective pride and they become part of a virtual intellectual community (Woods & Thoeny, 2007). According to the feedback of the interviews, these internal softwares boosts employee confidence and morale, results in effective collaboration, timely and accurate collaboration.

An RSS “feed” is used for subscribing to the updates in that particular webpage when any new information is posted. Now the question is how can RSS be used in internal communication? People subscribe to “blogs” using RSS. Employees can subscribe using RSS feed to the internal news and important updates. In this way the important messages for example from managers can be quickly communicated to every employee. One interviewee told that there is an eJobs portal where they subscribe and get RSS updates

“eJobs is a tool that supports internal and external recruitment. It is used by company HR managers for recruitment activities, and by internal and external candidates for applying for new positions. We subscribe to this and get latest job updates from other departments. If we find a good and related job in other department, then we shift internally” (Interviewee B)

Web 2.0 tools provide effective collaboration and open communication from anywhere (Vapola et al, 2006). Web 2.0 enables facilitating work of the employees. Interviewees tell us that Web 2.0 tools help in innovation process.

“These tools facilitate interactive training, we can quickly get answers on our questions and it’s easy to find information.” (Interviewee C)

“Deploy relevant technology at right place. Chat messenger should be available all the time in manager level post. Offline message system is a nice idea in software development team. It can help to share one’s problem with other employees. ” (Interviewee A)

Seybold (2006) claims that Web 2.0 tools help to innovate and gain competitive advantage. Almost all the companies are using Web 2.0 tools. If they are not using then they have to use it in near future. One interviewee says that

“This is debatable that companies should use Web 2.0 software and this decision is more related to company’s objectives or business it’s looking for e.g. we can say that a company is not developing any web application – then there is a no question of it. However, any company having prime business from Web technologies will eventually need to embrace it, and if a company don’t have a profile in Web 2.0 then how it will market outdated technologies when the 2.0 is shining with all its brightness? So it’s utmost important for any company to explore 2.0 technologies to keep its business going” (Interviewee E)

Since employees can work from coffee shops, from cafes, from trains while commuting, thus saving time. As mentioned in the interview of interviewee E, using Web 2.0, time and resources are saved thus internal collaboration increases when employees work remotely from anywhere around the world. Time and resources are saved by using Web 2.0 software which increases internal collaboration. Web 2.0 makes important information available online using knowledge and in this way knowledge is rightly used and will not be just forgotten away (Pugh & Dixon, 2008). When employees have an open working environment, for collaboration using Web 2.0 then they will share knowledge and will have strong relations in company which adds up to the competitive advantage. From our interview conclusion we find that organizational process becomes transparent and stakeholders have a solid control over the information and output.

“Yes effective collaboration and communication saves resources for organization.....”
(Interviewee A)

“Effective collaboration saves communication time which is an important resource.”
(Interviewee C)

Using Web 2.0 tools companies may involve information capture, idea generation, storage of information and information distribution (Hindle, 2008). These tools will help in finding key skill set of employees and management and group them according to their skill set which can then be mobilized. Knowledge sharing using online collaboration helps managing intellectually prepared documents to advance their business model (Chesbrough, 2003). After we interpret from five interviews comparison of companies, we find that companies get more effective conclusions when there is an increase in employee collaboration by using Web 2.0.

“We have very open policy in the organization to communicate and just not limit any one by his/her position. Such policy improves confidence in employees. All employees within organization have messaging/chat tools, by which they can access relevant person in real time. Such situation can arise not only within office but also office at geographically disperse location.” (Interviewee C)

Web 2.0 can be used for quick motivation of employees by managers in collaboration with those who have motivational skills (Seybold, 2006). Employees can work remotely and can have their say listened to by higher management so may feel more motivated. As mentioned by interviewee E, Web 2.0 also enables real time and quick communication at geographically disperse location and can motivate each other thus employees can collaborate with each other remotely anytime.

4.4 Disadvantages in internal collaboration

There are a number of key disadvantages identified by our interviewees when they use these softwares in daily activities in the company. They gave these answers according to their experience and feelings which has developed by the use of these softwares over number of years in the company. We also find relevant material on disadvantages from our literature survey and looked for the similarity of the results from our interviews. The results are reported as discussions which contain some of the important quotations from the interviews related to this theme.

Table 4.4: Disadvantages in internal collaboration

Interviewees	Disadvantages in internal collaboration
System developer interview (A)	Employee's personal, family and friends information can be misused and they can threaten.
System developer interview (B)	Web 2.0 chatting softwares can cause trouble in work if chatting is used while working.
Software designer interview(C)	Sharing of customer specific information with the employees can cause loss of the trust by the customer.
R&D project manager interview(D)	Making decision online using web softwares can lead to wrong decision when many employees are consulted
Team Leader (E)	Un-authorized employees can access to confidential information of the company. This can damage to the company outputs. Administer should make the access levels for the employees by policing.

Interviewee B mentioned as a drawback that if employees solely concentrate on the collaboration software like updating their status on facebook, Twitter, chatting on orkut online etc will destroy the company time. So this will decrease efficiency. The companies need to have strict measures on the parameters on what software may be used inside the company. Lahiri et. al,(2008) claims that softwares which are used within the organization for open communication requires control from managers on information transfer, wireless communication tools and how to avoid and adapt to the change from external factors. Literature tells that new innovative Web 2.0 tools when used require lot of effort from managers and employees for using web tools within the organization for knowledge sharing (Seybold, 2006).

Open communication using Web 2.0 can be misused and company's confidential data which is the base of competitive advantage can be sold to competitors (Laudon & Laudon 2004). Since using Web 2.0 tools employees can manipulate data if important security access is not defined, this will cause trouble for top management when they share info with trusted employees. We say that staff can post incorrect data or unclear or misleading instructions Dawson (2009).

“Employees can have confidential information of the company and may be share with competitors. Before implementation collaborative tools in the company's administrator must establish clearly their use and operation policies. These policies have to mark the usage limits, the accepted contents and he has to classify the information and define the access levels.” (Interviewee E)

Just as employees gain quick recognition if they perform well using Web 2.0, their mistakes can cause great damage to their integrity and can cause damage to the name of the company (Bonabeau, 2009). Our interview results tell that wrong level of access can cause breach of company specific information which can cause mistrust and employee personnel information can be misused. They can cause trouble while work if used quite frequently and can lead to wrong report writings and delay in deliverables.

Privacy issues, brand leakage and security issues may occur when these Web 2.0 tools are used. As mentioned by one of the interviewees that employees hesitate to put information on web 2.0 softwares as they think that their personal, family and friends information can be misused and they can threaten. These employees may even hesitate in giving their opinion in front of their internal and external management when they are communicating using Web 2.0 tools.

One of the companies is not using msn, video, voice chat and Skype. They think it's not secure to use these internally.

“We normally communicate using phone. These softwares are considered not secure for big organizations like us. Our management has put restrictions on these softwares to be used internally. We have internal softwares which are alternatives to these softwares”
(Interviewee B)

4.5 Findings from Empirical Findings

Google talk, Skype, wikis, blogs, podcasts, messengers, file transfer websites, photo gallery websites, face book, orkut etc are some of the softwares among the employees. There are many different internal softwares which are used in the companies itself but MS Exchange Server, Outlook Express, IBM Sametime, Gordon, financial systems are the most common used internal Web 2.0 softwares.

New employees get quick help using out -of -the- box tools and become familiarized easily in the working environment. It may help employees keep them self updated with other employees and this is a key factor for sharing knowledge with other employees effectively. It helps to work virtually without meeting personally which saves time. It is much easier to locate other employees because they update their status using Web 2.0 tools.

Since the Web 2.0 tools provide increase in reliability and effective collaboration which provides quick updates and feedback, its gives timely and accurate collaboration as every employee has a virtual appearance over the internet so they can talk, chat and monitor the activities of each other effectively at anytime. Using computer technology and tools for Web 2.0 saves time and resources and provides interactive training from the management perspective. These softwares in many ways empower the employee and thus sales increases when employees take their tasks as personnel assignments. Web 2.0 tools give effective stakeholder feedback to the clients and customers. Managers and shareholders who are remotely located can have employee meetings using Web 2.0. All of this boosts employee confidence and morale thus increases productivity. Profits are increased, time is saved and real time and quick collaboration at geographically disperse location can be done. Business operations will be improved by offering mobility and RIA.

Wrong level of access can cause breach of company specific information which can cause mistrust and employee personnel information can be misused. Web 2.0 tools can cause trouble while work if used quite frequently and can lead to wrong report writings and delay in deliverables.

5. Conclusion

Our research question were

1. How can Web 2.0 tools assist in internal collaboration?
2. What are the positive and negative effects of using such tools for the organization?

To get the answer, we conducted five interviews in telecom companies and software houses in Sweden and in Pakistan. Almost all the interviewees (employees) have been using the web technologies tools since 10 years.

5.1 Web 2.0 helps in internal collaboration

Well-known Web 2.0 softwares are for reporting bugs, timely updates, sharing process, complaint registering, ordering products, online learning tools, online seminars for employees sitting at remote locations and resource planning etc. These internal software's boosts employee confidence and morale, results in effective collaboration, timely and accurate collaboration. Similar groups of different employee's work together using Web 2.0 tools thus helping out the work of each other. Employees can work remotely from anywhere and share knowledge among each other. They do not need to sit in one place and work hard as it was before Web 2.0. The information gets available to everybody sitting anywhere in the work within company regional offices. Many medium sized companies are preferring to introduce IT collaboration software like Microsoft Share Point and social technology platform to help socialize the documents, manage people, tasks and time and ultimately increase internal collaboration .Conference tools , blogs, wikis and VOIP technology helps in communicating thus giving ease of knowledge sharing.

5.2 Advantages in internal Collaboration

We see that when employees are empowered by technology, employees become more productive for companies using Web 2.0 collaboration tools. After conducting the interviews, we came to this result those organizations which are using Web 2.0 technologies have deeply benefited by the internal collaboration. Using these tools employees in the organization can collaborate on time and easily with other employees which saves the time and collaboration resources of the company. When the internal collaboration is done using by Web 2.0 tools, the projects are delivered to the customers on time. Executive Support Systems and DSS help top management to see the result in a graphical form which tells about the company performance.

5.3 Disadvantages in internal Collaboration

Some possible drawbacks were mentioned which said that as Web 2.0 softwares are addicting like face book, twitter and YouTube, if these are misused by employees then this can effect employee motivation and reputation. When many employees are involved in decision making, they can have different opinions thus this can lead to wrong decisions. Employees when feel unsecure from their management that they will misuse there private family information, then they will also not participate openly in the discussion meeting held online using Web 2.0

Employees can waste their time and companies time in surfing Web 2.0 technologies like chatting, video conferencing and gaming while at work. This can lead to delayed deliverables and a bad feedback from customers. If wrong access level is given to an employee then he can misuse that access and put company information at stake.

Appendix

Appendix A: Interview Guide

This interview is about the information collection for the use of Web 2.0 softwares by the companies. In this guide we will talk about Web 2.0 and internal Collaboration. Web 2.0 is defines as "a system of web-based technologies that provide rapid and agile collaboration, information sharing, emergence and integration capabilities in the extended organization". It includes social and networked modifications to company intranets and other classic software platforms used by large companies to organize their communication.

Interviewee Information:

When interview is conducted:

Interviewee:

Place of interviewee:

Starting the interview

The purpose of this interview is to learn about what kind of Web 2.0 technologies have you used and what you think of existing technology usage for betterment of company."

"The reason for recording the interview is to capture all answers you gave us as accurate as possible. The original recording is kept confidential and we will send you written transcript if you desire."

Interview Questions

Q1 Please tell us; what is your professional background in terms of education and current job experience.

Q2 Have you previously dealt or dealing with Web 2.0 technologies? Please mention the names?

Q3 What do you understand by internal collaboration?

Q4 Can you please name the collaboration softwares which your team is using? Why do you think that each one of these enhance the effectiveness when used regularly.

Q5 Do you have any federated network used for connecting people to have shared interests within company's different offices?

Q6 Role-playing games and simulations are used by many companies as learning tools, this new approach permits employees to immerse themselves in a digital realm where learning, collaborating and play are all part of the work environment ? Explain please?

Q7 What is the benefit of using the Web 2.0 tools? Do you think that the companies which do not embrace Web 2.0 and its facilities will get left behind by the competitors? Explain?

Q8 Do you think Web 2.0 technology used is the best for future? What are the ways of receiving feedback for better future by the use of deployed technology?

Q9 Web 2.0 can help new employees to learn quickly. Do you think this is true?

Q10 How can the use of Web 2.0 tools improve internal collaboration?

Q 11 Do you have timely, accurate, open two-way communication with your employees? When and how?

Q12: What can be the disadvantages to your company from Web 2.0? Please tell us in detail.

Interview completed

Any other information which you would like to give us?

Thanks for the time and contribution towards our research

Appendix B Interview Transcript Summary

Interviewee A (System developer) in Company X

Q1- Please tell us; what is your professional background in terms of education and current job experience.

A.1-

The System developer which we interviewed is working with the core NSS software API's and its extension. He has an expertise level knowledge of computer communication, programming languages, databases, and artificial intelligence and web technologies.

Q2- Have you previously dealt or dealing with Web 2.0 technologies? Please mention the names?

A.2- He is a regular user of the famous web technologies. As he recalls his memories, he tells that he first used chat from yahoo at chat.yahoo.com in 1998 when it was quite unpopular. At that time hotmail was quite famous. He regularly uses Web 2.0 technologies like Skype, Yahoo Chat, Facebook, Blog, Wiki, Twitter, Microsoft outlook. He thinks that facebook, orkut and other social networking websites are good if they are used for some money making/benefit of company.

Q3- What do you understand by internal collaboration?

A.3- He defines "Internal collaboration as to have a friendly environment within the company. When there is more collaboration using Web 2.0 softwares, then, effectiveness (satisfaction/happiness) and company output will increase."

Q4- Can you please name the collaboration softwares which your team is using? Why do you think that each one of these enhance the effectiveness when used regularly.

A.4-MSN Live Messenger, Skype and Microsoft outlook are most commonly used chatting software. He always prefers to use these softwares because of its simplicity and voice quality.

Q5- Do you have any federated network used for connecting people to have shared interests within company's different offices?

A.5- "Outlook express is the main medium of communication, and the conference call is another way if we require voice chat with different offices in different countries."

Q6- Role-playing games and simulations are used by many companies as learning tools, this new approach permits employees to immerse themselves in a digital realm where learning, collaborating and play are all part of the work environment ? Explain please?

A.6- "Right now we are not using any technique like this".

Q7- What is the benefit of using the Web 2.0 tools? Do you think that the companies which do not embrace Web 2.0 and its facilities will get left behind by the competitors? Explain?

A7- yes, The companies will get left behind from others. *He says*

"Executive Support Systems and DSS help top management to see the result in a graphical form which is easier to understand. This helps to take the measures according to the company performance thus effecting the growth and productivity of the company."

Q8- Do you think Web 2.0 technology used is the best for future? What are the ways of receiving feedback for better future by the use of deployed technology?

A-8 *"Putting a message board on the web site can help the users leave their feedbacks there to be read by supervisors and managers."*

About Web 2.0 he says that Web 2.0 is a right idea to be deployed at this right time and as this technology will work for at least 5 years and it will work until scientists do not develop a technology better than this one.

Q9- Web 2.0 can help new employees to learn quickly. Do you think this is true?

A9- Yes it was when he was new in his company. Web 2.0 really helped him to understand the current the environment and technologies used by the company.

Q10 How can the use of Web 2.0 tools improve internal collaboration?

A10- He said about improvement of internal collaboration *“Deploy relevant technology at right place. Chat messenger should be available all the time in manager level post. Offline message system is a nice idea in software development team. It can help to share one’s problem with other employees.”*

Q 11 Do you have timely, accurate, open two-way communication with your employees? When and how?

Internal weekly online journal helps to know all activities in last 5 days. Outlook express is another way of communication which helps to know about upcoming meetings and seminars

He says

“Yes effective collaboration and communication saves resources for Organization.....”

Q12: What can be the disadvantages to your company from Web 2.0? Please tell us in detail.

He told us that it’s highly insecure to give the personnel information on Web 2.0 websites. By personnel information he means the information about ones friends, family, information about eating/ drinking/ sleeping habits. All this information becomes public which can later be used against the company employees if required.

Appendix C Interview Transcript Summary

Interviewee B (System developer) in Company Y

Q1 Please tell us; what is your professional background in terms of education and current job experience.

A1- She has studied software engineering in his Bachelor, and has an MSc in Internetworking. She is working as a system developer in multimedia department now.

Q2 Have you previously dealt or dealing with Web 2.0 technologies? Please mention the names?

A2- Over the years, she has been a regular user of web technologies since there boom. She has extensively used orkut, facebook, msn, file2ws, IBM Sametime, Podcast, collaborating with different teams, Reading discussion boards, Complains and bugs update, Product life cycle control, Ordering products, Agency Handler, CDM,CFT and COO. In terms of Web 2.0 software she has used much company internal software like IBM Sametime which is just like msn, as she describes it.

Q3- What do you understand by internal collaboration?

A3- It's "Employee talking and working together"

Q4 Can you please name the collaboration softwares which your team is using? Why do you think that each one of these enhance the effectiveness when used regularly.

A4- "IBM Sametime. The obvious strength of using this is that colleagues can communicate without moving from one place to another to meet."

She says Web 2.0 also increases the efficiency at the employee level. She used "GORDON" internal software to order products. Using this software she has ordered the internal softwares she needed and also her ID card from the HR department which is in another city. So this made her quite familiar with the internal softwares architecture.

Q5 Do you have any federated network used for connecting people to have shared interests within company's different offices?

A5- "*Yes. For example, using outlook*"

Q6 Role-playing games and simulations are used by many companies as learning tools, this new approach permits employees to immerse themselves in a digital realm where learning, collaborating and play are all part of the work environment ? Explain please?

A6- They are not using this kind of technology.

Q7 What is the benefit of using the Web 2.0 tools? Do you think that the companies which do not embrace Web 2.0 and its facilities will get left behind by the competitors? Explain?

A7- "*Yes, I think so. Using Web 2.0 technology can increase the interaction between the users and the company which may bring more profits.*"

Q8 Do you think Web 2.0 technology used is the best for future? What are the ways of receiving feedback for better future by the use of deployed technology?

A8- "*Yes, I think Web 2.0 technology used is the best for future as it will provide better collaboration and results.*"

Q9 Web 2.0 can help new employees to learn quickly. Do you think this is true?

A9- She says Web 2.0 tools can help new employees settle in the new environment very quickly and efficiently. They make it easy to find any employee, collaborate, complain, report immediately and timely manner

Q10 How can the use of Web 2.0 tools improve internal collaboration?

A10- She says that employees collaborate regularly. They finish their task in SPRINTS and maintain it in internal software and they have agile development approach. They keep themselves updates with the news, discussion using internal softwares

Q 11- Do you have timely, accurate, open two-way communication with your employees? When and how?

A11-She thinks that by using Web 2.0 technologies, companies can increase the interaction between the users and their human resource department which may bring more profits. Web 2.0 technologies being used right now are the best according to her. The feedbacks to other coworkers using Web 2.0 softwares efficiently and effectively increase the efficiency of work.

“eJobs is a tool that supports internal and external recruitment. It is used by company HR managers for recruitment activities, and by internal and external candidates for applying for new positions. We subscribe to this and get latest job updates from other departments. If we find a good and related job in other department, then we shift internally”

Q12: What can be the disadvantages to your company from Web 2.0? Please tell us in detail.

A12-While telling us the disadvantages, she told that Web 2.0 tools can decrease the efficiency for example while working /computer programming, if employee uses facebook or msn chatting then it can distract the thinking process thus delaying the work. If work is delayed a lot at the individual employee level then at the end it will affect company productivity.

“We normally communicate using phone. These softwares are considered not secure for big organizations like us. Our management has put restrictions on these software’s to be used internally. We have internal software’s which are alternatives to these software’s”.

Appendix D Interview Transcript Summary

Interviewee C (Software designer) in Company Y

Q1- Please tell us; what is your professional background in terms of education and current job experience.

A1- He has done masters in computer engineering degree and working as a software designer

Q2 Have you previously dealt or dealing with Web 2.0 technologies? Please mention the names?

A2- Yes. He told that he is using company internal organization softwares and some of them are following softwares

- Orkut
- Facebook
- IBM Sametime
- GORDON
- CPI Store
- CSR Online
- DEC register
- Dialog Survey
- Discussion Forum
- e-Flow invoice handling
- Social Networks

Q3 What do you understand by internal collaboration?

A3- According to him the internal collaboration means effective, efficient and immediate communication between employees of the company.

Q4 Can you please name the collaboration softwares which your team is using? Why do you think that each one of these enhance the effectiveness when used regularly.

A4- Our team is not using any collaboration software but we are allowed to use IBM sametime connect and some other internal softwares. Its benefits are same as MSN or yahoo messenger but communication is secure.

He says *“Discussion Forum is an online tool for collaborative discussions. Our team uses Discussion Forum to create an open or restricted discussion on the web for any project or temporary tasks.”*

Q5 Do you have any federated network used for connecting people to have shared interests within company’s different offices?

A5- “Yes but we rely mostly on phone communication. Moreover we have an internal website which has all the latest news about company from all the departments around the world. We have information about all the offices all over the world”.

He says *“We have very open policy in the organization to communicate and just not limit any one by his/her position. Such policy improves confidence in employees. All employees within organization have messaging/chat tools, by which they can access relevant person in real time. Such situation can arise not only within office but also office at geographically disperse location.”*

Q6 Role-playing games and simulations are used by many companies as learning tools, this new approach permits employees to immerse themselves in a digital realm where learning, collaborating and play are all part of the work environment ? Explain please?

A 6- “These could be quite good techniques to train the employee to fit him in a new role quickly in a few sessions but we don’t use these techniques”.

Q7 What is the benefit of using the Web 2.0 tools? Do you think that the companies which do not embrace Web 2.0 and its facilities will get left behind by the competitors? Explain?

A7- Yes he thinks those companies which do not embrace the web tools will definitely left behind. These web tools have very effective collaboration and communication which saves resources for organization.

Q8 Do you think Web 2.0 technology used is the best for future? What are the ways of receiving feedback for better future by the use of deployed technology?

A8- In the future Web 2.0 technologies will remain effective to get feedback about technology and feedback from employees can also be taken.

Q9 Web 2.0 can help new employees to learn quickly. Do you think this is true?

A9- New employees gather all the new employee related information quickly and their questions can be answered quickly thus making them used to the organization efficiently and quickly

Q10 How can the use of Web 2.0 tools improve internal collaboration?

A10- These tools can improve the internal collaboration of greater deal when employees are working on the same projects from different offices.

“These tools facilitate interactive training, we can quickly get answers on our questions and it’s easy to find information.”

He says

“Effective collaboration saves communication time which is an important resource.”

Q 11 Do you have timely, accurate, open two-way communication with your employees? When and how?

A11-Yes “We have timely, accurate open two way communication with peers using IBM sametime connect software”.

Q12: What can be the disadvantages to your company from Web 2.0? Please tell us in detail.

A12- He told us that the main disadvantage is that when they are having the meeting, sharing of customer specific information with the employees can cause loss of the trust by the customer. But this is an unusual practice as without telling the company information, the managers cannot get better feedback from the employees of how to conduct the research and development to keep the pace in delivery.

Appendix E Interview Transcript Summary

Interview D (R&D Manager) in Company Y

Q1 Please tell us; what is your professional background in terms of education and current job experience.

A1-He has Master of Science in Telecommunications from Lunds Tekniska Högskola in 1975.He worked as SW Developer (Intel, Motorola assembler), SW project manager, Total project manager for printer development, Test department manager, Consultant (I&V project manager), I&V Line manager & Project manager for Mobile system PDC, Sales manager and Technical Support manager (Japan), Sales manager Messaging products, I&V Manager (miscellaneous Service Network products and systems), I&V project manager multiple IMS solutions, I&V manager Converged TV prototype, I&V Manager Networked Media.

Q2 Have you previously dealt or dealing with Web 2.0 technologies? Please mention the names?

A2-*"I have used Wiki sites for information sharing and collaboration in projects, Mail groups, Chat forums, Outlook, SMS/MMS, Trouble Report handling systems (like MHS.....), Anatomy Drawings (Find-Out), Document archives (CDM,...), Financial systems (SAP, ONE...), Sametime Connect conferencing and Clear Case "*

Q3- What do you understand by internal collaboration?

A3-He told us that internal collaboration to him can be defined as

"All employees can share information published by anyone on the authorized blog. Joint development of documents or products becomes easier to use networking tools. This also makes it possible to have immediate feedback to the employees".

Q4- Can you please name the collaboration softwares which your team is using? Why do you think that each one of these enhance the effectiveness when used regularly.

A4- His team uses "IBM Sametime Connect" internally. This makes it easier e.g. to develop material jointly with participants remotely connected. He thinks that an increase of goal oriented collaboration increases the efficiency. The communication between the employees in his groups happens as ad hoc face to face meetings, by telephone and by Mail (all the time). From time to time they have team meetings, Information meetings (weekly, bi weekly) and meeting at coffee time (FIKA at around 3.00 clocks).

"We use Eri-COLL for collaboration within internal networks and Clear Case for saving the data on the multiserver distributed computing machines in RIMS lab."

Q5- Do you have any federated network used for connecting people to have shared interests within company's different offices?

A5- They are using much internal networked software for the collaboration within different department s and offices. Web 2.0 is the most used when it comes to collaboration in outsourced projects

"The web without any doubt is a key factor (a base technology) on employee collaboration across the organization regardless how the content delivery works and on which device; Atom like processor are now working in devices, Android 3 or iPhone 5.0. Organizations will tend to make such solutions which are easily searchable without requiring too much power from relational systems, solutions which are self-contained"

Q6 Role-playing games and simulations are used by many companies as learning tools, this new approach permits employees to immerse themselves in a digital realm where learning, collaborating and play are all part of the work environment ? Explain please?

A6- They are not using this kind of technology.

Q7- What is the benefit of using the Web 2.0 tools? Do you think that the companies which do not embrace Web 2.0 and its facilities will get left behind by the competitors? Explain?

A7- “Yes. The collaboration between individuals takes all parts of the product development cycle to a higher level. The discussion between people with different background normally creates better ideas. Reviews of the outcome give higher quality. Securing that everyone uses the latest information avoids wasted work.”

He says that Web 2.0 technology is the future of the world there company is leading in it. Actually a competitor from China had started aggressively as there competitor in Web 2.0 and it could become there competitor but due to some client side issues they could take the top place. All the benefits are for their companies due to its market placement and its products excellence.

Q8- Do you think Web 2.0 technology used is the best for future? What are the ways of receiving feedback for better future by the use of deployed technology?

A8- He thinks it is probably a very good path. He says

“If it is the best is hard for me to tell!”

Q9- Web 2.0 can help new employees to learn quickly. Do you think this is true?

A9- He thinks that using Web 2.0 a new employee can easily get himself familiarized with the internal working environment. Like for example by having Interactive trainings, immediate answers to questions posted on internal forums are received and it’s easier to find information by quick search.

There are tools which they are developing to have ease of access for the employees and better cooperation between the clients and customers. This all process increases the company’s productivity and thus affects the business profits.

Q10 How can the use of Web 2.0 tools improve internal collaboration?

A10- He says that better customer feedbacks, updates, client complaint on time handling and sending the technical support to the customer sites from their manufacturing department can increase the productivity and business operations.

Q 11- Do you have timely, accurate, open two-way communication with your employees? When and how?

A11-They have Ad hoc face to face meetings, Telephone, Mail (all the time). There are team meetings, Information meetings which are weekly or bi weekly.

Q12: What can be the disadvantages to your company from Web 2.0? Please tell us in detail.

A12-He told us that the disadvantage of having many employees online using Web 2.0 softwares in the decision making process creates chaos and troubles for the management to have a final quick and accurate decision.

Appendix F Interview Transcript Summary

Interviewee E (Team Leader) in Company Z

Q1- Please tell us; what is your professional background in terms of education and current job experience.

A1-He has done BS-CS. He has professional experience in web and desktop development technologies with more than 3 years experience.

Q2 Have you previously dealt or dealing with Web 2.0 and Web 2.0 technologies? Please mention the names?

A2-Yes. *“The Company has built some projects around 2.0 or under development wikis, RSS Syndication and Blogging. They are quite beneficial and are easily accessible”*

Q3- What do you understand by internal collaboration?

A3-He stated that internal collaboration is

“To share knowledge, cooperate and to encourage each other at every level”

Q4- Can you please name the collaboration softwares which your team is using? Why do you think that each one of these enhance the effectiveness when used regularly.

A4-He told that his company uses Gtalk, Skype, MS Exchange Server and Fogbugs and Outlook Express as collaboration software for different concerns

Q5- Do you have any federated network used for connecting people to have shared interests within company’s different offices?

A5-*“Due to nature of development model; teams’ personals are often from different offices. By using these tools we are sort of in a real time contact with other members and often such situation arises where we need to talk in person or a group chat, these tools comes into play and proved to be very handy. “*

Q6- Role-playing games and simulations are used by many companies as learning tools, this new approach permits employees to immerse themselves in a digital realm where learning, collaborating and play are all part of the work environment ? Explain please?

A6-*“Roles-playing games are very effective not only to immerse but can also be used to increase productivity of projects. Often times, it is easier to understand by putting yourself in the position required. It makes you think why, when and how about the situations.”*

Q7- What is the benefit of using the Web 2.0 tools? Do you think that the companies which do not embrace Web 2.0 and its facilities will get left behind by the competitors? Explain?

A7- He told that it is important for the company to adopt the Web 2.0 technologies to compete with competitors who are developing web technologies and adopted Web 2.0. So it’s utmost important for any company to explore 2.0 technologies to keep its business going. He thinks that Web 2.0 technologies are penetrating slowly and slowly in both consumer and organization market of web. Most of such innovations are based on the ideas what people want from the technology in future. A company’s productivity is the measure how successful it’s in delivering what it’s asked for not only in terms of key parameter of cost effectiveness but also timeliness. This directly relates to the capabilities of any software development company’s in project life cycle. Collaboration is a key factor to improve the company productivity.

“This is debatable that companies should use Web 2.0 software and this decision is more related to company’s objectives or business it’s looking for e.g. we can say that a company is not developing any web application – then there is a no question of it. However, any company having prime business from Web technologies will eventually need to embrace it, and if a company don’t have a profile in Web 2.0 then how it will market outdated

technologies when the 2.0 is shining with all its brightness? So it's utmost important for any company to explore 2.0 technologies to keep its business going"

Q8- Do you think Web 2.0 technology used is the best for future? What are the ways of receiving feedback for better future by the use of deployed technology?

A8- According to him it is necessary to have feedback from all stakeholders about such innovations to involve them where people want to see them. Such tool/interfaces are needed that can provide valuable feedback from the users and there should be portal, feedback forms, tool free calls to mature the products around Web 2.0.

He told that increase in collaboration is necessary using Web 2.0 tools

"It certainly does increase production e.g. a project to be successful; collaboration at all level is key factor not only within teams, but also with external stakeholders. If the organization processes are transparent and gives each stakeholder a real time update on ongoing activities through collaboration tools, it will enable an early feedback from relevant stakeholders which can be beneficial rather than knowing down line the road. It will help to chop with the changes as early as possible."

Q9- Web 2.0 can help new employees to learn quickly. Do you think this is true?

A9-He says "To ease the development and increase the productivity out-the-box tools are indeed required to meet the timelines of projects. These out-of-box tools are available to deliver the requirements to the new employees. Otherwise, they will need to understand first".

Q10 How can the use of Web 2.0 tools improve internal collaboration?

A10- He says "Web 2.0 certainly can improve business operations by offering mobility and RIA. They provide Real time and quick collaboration at geographically disperse location"

Q 11 Do you have timely, accurate, open two-way communication with your employees? When and how?

A11- According to him all employees within organization have messaging/chat tools, by which they can access relevant person in real time. Such situation can arise not only within office but also office at geographically disperse location.

"Due to distributed development environment there is always use of Skype, Google talk. In a context this is more helpful since it's interactive – share pictures instantly if needed and if you e-mail then it may be you are getting response late"

Q12: What can be the disadvantages to your company from Web 2.0? Please tell us in detail.

A12- Employees can have confidential information of the company and may be share with competitors. Before implementation collaborative tools in the company's administrator must establish clearly their use and operation policies. These policies have to mark the usage limits, the accepted contents and he has to classify the information and define the access levels.

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