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KNOWLEDGE SHARING AND COLLABORATION THROUGH SOCIAL MEDIA - THE CASE OF IBM

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Intellectual capital is the single most important asset owned by any organization. Business continuity, innovation, and long-term sustainability of Small Medium Enterprises depend partly on accumulated organizational knowledge. Knowledge is hard to capture and manage due to its implicit nature. This paper seeks to investigate how Web 2.0 technologies are being used to overcome knowledge sharing and collaboration issues. The new web technologies, which are based on platforms, are referred to as emergent social software platforms (ESSP's). The use of ESSP's within a business enterprise to achieve business goals is known as enterprise 2.0 (E2.0). Central to this research is the proposed knowledge sharing cycle model, which has three main stages - internalization, externalization, and objectification. This model is adapted based on the findings of a case study of IBM Corporation. The findings indicate that ESSP's can be used to support knowledge sharing practices and to help convert knowledge into its different forms.

Keywords: Social Media, Knowledge Sharing, Mass Collaboration, Web 2.0, E 2.0, and ESSP

1 INTRODUCTION

Collaboration is so common in today's society. It is proven powerful for solving problems, building consensus, and helping decision-making processes (Straus and Layton, 2002). Historically, collaboration has been governed through *collaboration hierarchies*, where every member is controlled and supervised by other top members, employees are dominated by managers, and customers are controlled by organizations (Tapscott and Williams, 2006). However, through new technologies, new scientific initiatives and new forms of collaboration emerge in the global market, predominantly initiated by communities and self-organizing agents.

This form of collaboration, referred herein as *mass collaboration* (Tapscott and Williams, 2006), enabled by the introduction of Web 2.0 technologies (O'Reilly, 2005), has led organizations to rethink their methods of managing and distributing information, and creating business value. Furthermore, mass collaboration challenges many mature and established firms such as BMW, Boeing, and Procter & Gamble to rethink their collaboration activities (Tapscott and Williams, 2006). This was emphasized by the surprisingly high and increasing number of firms adopting Web 2.0 technologies and services (Libert and Spector, 2008), which help these organizations create new and unique collaborative environments (McAfee, 2006). Its adoption is expanding especially for corporate affairs (Grossman and McCarthy, 2007; Hideo and Shinichi, 2007) so that organizations can improve their products and services or solve an intractable problem (Tapscott, 2008).

Previous research works indicate that social media tools like wikis are increasingly becoming popular for managing knowledge and collaboration within enterprises. Some studies have contributed to this field by creating awareness among organizations about the benefits of using ESSP's for knowledge creation. The concept of Enterprise 2.0 is quite young. Researchers argue that intellectual capital is the biggest asset of any organization and serves as the greatest source of power (Druker, 1993; Toffler, 1990; Quin, 1992). These authors agree that the future belongs to those who are endowed with knowledge (Nonaka, 1996). We live in a knowledge-driven world, which therefore makes the "knowledge worker" the greatest single asset (Druker, 1993). One of the most popular management concepts developed over the past few decades is knowledge management (Huysman, 2002). Researchers and practitioners confirm that knowledge sharing improves organizational performance (Lesser & Storck, 2001). Often, organizations do not realize what they know. Locating and retrieving

knowledge within organizations can be problematic (Huber, 1991). IT is used as an enabler in most knowledge management initiatives (Alavi & Leidner, 2001). The research question this paper aims to answer therefore is- *How is social media being used within an organization to facilitate knowledge sharing and collaboration to achieve an objectified knowledge?* Though the problem focuses around knowledge sharing, more emphasis is placed on ESSP's. This paper covers only the ESSP's which are applied and used in the case study

The body of this paper is organized into seven sections. Section two discusses the literature on IT tools for knowledge sharing and collaboration among peers. Sections three and four state the theoretical basis and research methodology, respectively. Meanwhile, section five explains the social media strategy adopted by International Business Machines (IBM) in Sweden. Our analysis of the case is presented in section six while the last section draws out the conclusion and recommendations for future research.

2 RELATED LITERATURE

2.1 Wikinomics and the Mass Collaboration

Mass collaboration happens when many participants work independently yet collaboratively in a single project. These projects are often modular in nature. They execute tasks, generate solutions (e.g. InnoCentive), or create new knowledge (e.g. Wikipedia). Mass collaboration is said to owe its success to its decentralized model of collaboration which outperforms more centrally controlled collaboration models (Brafman and Beckstrom, 2006).

Mass collaboration is characterized by four main principles introduced by Tapscott and Williams (2006) - peering, sharing, openness and acting globally. *Peering*, or peer production, is allowing users to participate in the creation and development of products and services, and coactively share, classify, and rate contents that enhance the production (Tapscott and Williams, 2006; McKercher and Mosco, 2007; Wilkinson, 2008). Meanwhile, *sharing*, considered as one of the distinctive features of mass collaboration, simply refers to sharing knowledge. It creates new opportunities for development. Tim Bray, the director of Web technologies at Sun Microsystems, said "we genuinely believe that radical sharing is a win-win for everyone; expanding markets create new opportunities" (ibid, 2006, p.27). *Openness*, according to Tapscott and Williams (2006), refers to having boundaries that are porous to external solutions, ideas, and knowledge. Being *open* to outside human capital outperforms companies that rely on their internal resources and capabilities. This type of openness is associated with "candour, transparency, freedom, flexibility, expansiveness, engagement, and access" (p.21). Lastly, *acting globally* or making mass collaboration projects available on the Internet through Web 2.0 technologies enables firms to access new ideas and solutions by engaging more innovative and open-minded users around the world.

While traditional collaboration is mainly dedicated to people sharing common interests, goals, abilities, and areas of expertise, mass collaboration in contrast finds its way to a large number of individuals from various knowledge areas, with diverse interests expertise, and specializations (Tapscott and Williams, 2006; Panchal and Fathianathan, 2008; Libert and Spector, 2008). An example of a successful mass collaboration project is *Wikipedia*, an online collaborative encyclopedia that attracts millions of internet users from all over the world. Wikipedia enables users to view, create, edit, or remove articles in different subjects. This project currently has about 10 million volunteers contributing 9.5 million articles in 256 languages (Panchal and Fathianathan, 2008, p.1). Another example is *InnoCentive*, a mass collaboration project that is specifically created for the global community. Its main goal is to allow researchers, scientists, engineers, inventors, R&D groups, and companies to collaborate to achieve solutions for research and development problems in a broad range of disciplines like chemistry, biology, engineering, math, computer science, entrepreneurship, and others (Tapscott and Williams, 2006; Harrison and Sullivan, 2006; Lakhani et al., 2007; Dodgson et al., 2008; Libert and Spector, 2008). This project attracts more than 80,000 independent problem solvers from more than 150 countries (Lakhani et al., 2007). They help more than 34 mature firms including Proctor & Gamble, Dow Agro Sciences, and Eli Lilly (Brown and Boulderstone, 2008). These firms pay problem solvers \$10,000 to \$100,000 per solution in addition to the subscription fees they pay (Ahonen and Lietsala, 2007).

2.2 Social Media vs. Web 2.0 and E2.0

Social media is setting revolutionary trends for online business and communication. But there seems to be confusion about what constitutes social media (Kaplan and Haenlein, 2010). According to Forrester Research, 75% of Internet users used social media in second quarter of 2008. Kaplan further states that, users have joined social networks, read blogs, and acted as community members. Yet, companies seem uncomfortable to adopt social media, where users get the opportunity to speak freely among workers. Given its technical advances, social media is more powerful than conventional media.

The concept Web 2.0, the technology used in social media, was first presented in the Web 2.0 Conference in 2004. Tim O'Reilly introduced this term as the next generation web services and business models. Enterprise 2.0 does not differ from web 2.0. It is the use of web 2.0 technologies within organizations for business purposes. McAfee (2009) describes platforms as a collection of digital content where contributions are globally visible and persistent. Some examples of Web 2.0 technologies are blogs (blogspot.com), wikis (Wikipedia), social networking software (Facebook, in 2004), social media platforms (YouTube), and forums.

2.3 Emergent Social Software Platforms (ESSP's)

ESSP's are equipped with the characteristics of web 2.0 and are used for different purposes today. These tools are called social software because they are social in nature. They help people collaborate through computer-mediated communication (McAfee, 2009). These tools are freeform; hence, they are optional; free from imposed structure like workflows, interdependencies, and decision right allocations. They are egalitarian; free from ranks; and thus accept a wide variety of data types (McAfee, 2009). The examples of ESSPs are blogs, wikis, social networking software, social media platforms, and forums. It is the "new strategy to knowledge management as a "Community of Practice (COP)", according to Keyes (2006). Communities are based on interest and expertise. They bring together people with common interest or skill, and give them a place to exchange knowledge and ideas.

2.4 Theoretical Frame of Reference

The conceptual diagram below illustrates the main theories to be used in the analysis. Wikinomics advocates for mass collaboration and constitutes four main pillars. These include being open, acting globally, sharing, and peering. There is a fifth concept added to these pillars that is communities of practice. These five concepts are all user activities. These are performed with the aid of web 2.0 platforms (ESSP's) such as blogs, wikis, social networking sites, and forums, . When these platforms are used within organizations, for organizational goals, the web 2.0 concepts become Enterprise 2.0. This then generates and uses a lot of information and knowledge to supports the knowledge sharing cycle. After a detailed analysis of empirical findings, the authors developed the knowledge sharing cycle to illustrate how collaborative intelligence supports to achieve objectified knowledge.

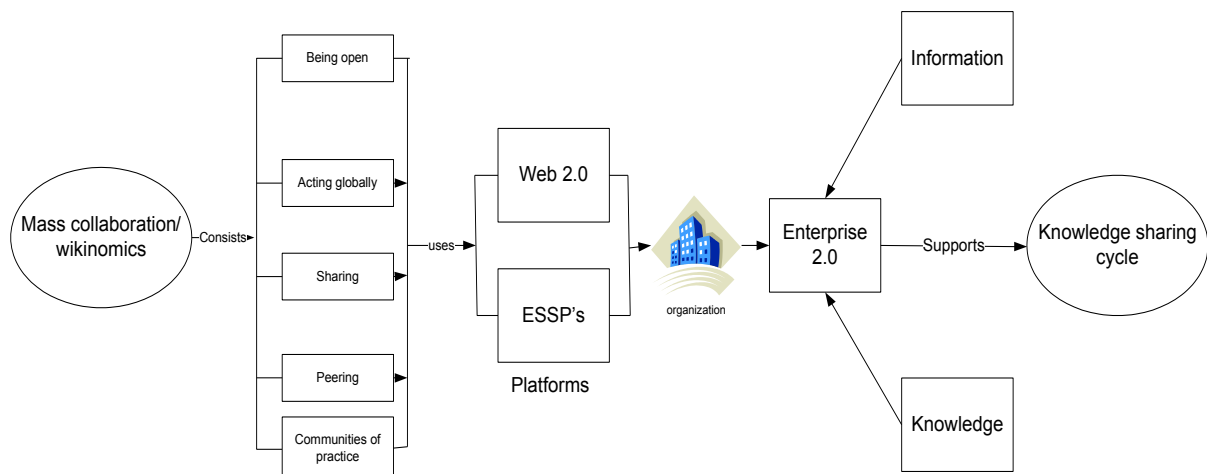


Figure 1: Theoretical Frame of Reference

3 THEORETICAL BASIS

3.1 Knowledge Sharing Cycle

Knowledge can be implicit or explicit. The explicit form of knowledge is much harder to capture than the implicit form because it transfers from one state to another (Huysman 2002). Nonaka (1995) elaborates a knowledge conversion model which constitutes four stages - i.e. Socialization, Externalization, Combination and Internalization. As knowledge passes through these stages, its state changes between implicit and explicit forms. A similar model was developed by Huysman (2002). This specifically illustrates the knowledge sharing cycle, as depicted below. The three processes - internalization, externalization, and objectification work to formulate the organization learning process (Huysman, 2002).

Internalization

Internalization is the process of acquiring knowledge by an individual member from the organization, (Huysman, 2002). Tenkasi and Boland (1995) stated that organizations often try to practice the information technology to equip the peers with strong knowledge, speed up processes, and reduce cost of knowledge sharing or form the classes of networks (Yoo, et al., 2008). In knowledge creation and sharing through open innovation, organizations act in open systems (Thompson, 1967) while keeping the external environment in view (Lawraence and Lorsch, 1967). The notion is the same but not in a broad sense, where supplier also acts as a peer producer (Wikhamn et al., 2011) or “old wine in new bottles” (Trott and Hartmann, 2009). The active participation of peers is required to generate and transfer knowledge. The identities of works do not matter while interacting (Demil and Lecocq, 2006) but the reputation and status of persons may matter while participating (Bergquist and Ljungberg, 2001).

Web 2.0 tools facilitate network workers and play the vital role as a fundamental layer of digital information infrastructure. According to Huysman (2002), internalization is the only process that makes one an “insider”. According to MaCafee(2006), the different ways to support the knowledge creation and transfer among peers might be knowledge systems, training sessions, manuals and others(Tapscott & Williams, 2006). There is huge amount of unrecorded knowledge (Huysman, 2002). Sharing stories and exchanging anecdotes could be some ways of internalizing knowledge.

Externalization

Externalization happens when workers share achieved knowledge with each other (Huysman, 2002). According to MaCafee (2009), this might take place in various formal or informal ways. The formal channels include meeting, project groups, and others. The informal channels, meanwhile, include conversation in the corridors and lunch-break chats (Huysman, 2002). Still according to Huysman (2002), explicit knowledge can be formulated and facilitated using formal and systematic language. Nonaka and Takeuchi (1995) illustrate that implicit knowledge can obstruct the externalization process, thereby leading to substandard learning processes. The two reasons for externalizing knowledge based on Huysman and de Wit (2002) are knowledge exchange for the sake of reuse and benefit of developing knowledge. Knowledge development is an outcome of knowledge transfer (Huysman, 2002).

Objectification

Von Krogh et. al. (2000) defines objectification as the process of globalizing local knowledge. Exchanging knowledge does not always necessarily mean though that the knowledge would be collectively accepted. The shared knowledge becomes organizational only when it is accepted by the members of the organization (Huysman and de Wit 2002; Von Krogh et al., 2000). The process of objectification is not always a conscious one, and often takes a long time to take place (Von Krogh et al., 2000). Huysman and de Wit (2002) illustrate objectification with the example of a group of technicians who have learned a new way of fixing a machine. Their operational knowledge remains local until it is accepted by the organization. For example, publishing manuals containing the operational knowledge in the training of new comers is a proof of acceptance. Of the three processes

discussed, objectification takes the longest time to take place. The table below shows the classification of various processes involved in knowledge sharing and organizational learning.

Learning process	Learning from	Resulting in	Type of knowledge-sharing support
Internalization	Organizational Knowledge	Individual Knowledge	Knowledge Acquisition
Externalization	Individual Knowledge	Shared Knowledge	Knowledge exchange (for purpose of reuse or development)
Objectifying	Shared knowledge	Organizational Knowledge	All types of knowledge-sharing

Table 1: Classification of Various Processes Huysman (2002)

Intermediation

The important concept in the knowledge sharing cycle that is not part of the aforementioned model is Intermediation. The process of connecting knowledge seekers with knowledge providers is important according to Nonaka and Takeuchi (1995) who provided a model called the SECI model. This model describes the various modes of knowledge as follows: 1) Socialization converts Tacit-to-Tacit knowledge; 2) Externalization or articulation converts Tacit to Explicit knowledge; 3) Combination converts Explicit-to-Explicit knowledge; and 4) Internalization converts Explicit to Tacit knowledge.

4 RESEARCH METHOD

4.1 Research Strategy – Case Study

The research strategy is dictated by the nature of the research questions. According to Yin (1994), if the research answers a how or why question, the strategy could be a case study. This strategy gives a rich and in-depth look at a particular phenomenon within the subject being studied. Yin (1994) also states that a single case study is suitable if the purpose is to examine the established theories. Hence, a case study was conducted at IBM. Using IBM's case, several social media theories are tested where the goal is to create a framework. This framework would illustrate how social media supports the knowledge sharing cycle to have an objectified knowledge. To answer the "how" question without ambiguities, all possible data should be explored. After a careful study, International Business Machines (IBM) in Sweden was chosen as the most suitable choice for the case study. IBM has pioneered and set industrial standards using older systems such as Lotus Notes which the organization has grown and developed as new systems for collaboration and knowledge sharing. It does not only use social media and ESSP's tools for its own purposes, it also sells IT solutions for collaboration and knowledge sharing to external clients.

4.2 Data Collection and Analysis

Both primary and secondary data were used in this paper. The primary data collection included detailed interviews and meetings. This process took over 7 months to complete, from December 2010 to July 2011. Details of the primary data collection are shown in the table below. Secondary data from existing research works on the role of wikis for knowledge sharing were also analyzed. All data collected have been carefully and critically analyzed using a mixture of deductive and inductive methods.

S. No.	Managers' Name	Designation	Date, Time & Duration of Interview
1	James EK	Country Executive Manager Lotus Software and Collaboration	2011-03-23 One hour seven minutes, 13:00 to 14:07
2	Karl	Manager for Sales Tax Collaboration	2011-03-23 One hour, 14:10 to 15:10
3	Christer Wikmark	Social Media Manager	2011-03-23 One hour twenty minutes, 15:10 to 16:30

Table 2: Details of Interviews and Meetings

According to Ghauri and Gronhaug (2005), interviews can be categorized into structured, unstructured, and semi-structured. This research adopted a semi-structured interview because it best suits our purpose. The respondents were given liberty to discuss the questions but some level of guidance and control were provided to help us get the answers needed. Saunders et. al. (2007) proposes two methods of data collection - qualitative and quantitative. In this work, qualitative method using a case study has been chosen. One advantage of the qualitative approach is that it helps us collect data from people in real life settings, thereby helping us get a deeper understanding about their experiences and local context (Creswell, 2003). Relevant and detailed articles from journals and books on the same topic were gathered. Most importantly, only updated and authentic materials were used in the literature review. Presentations, videos, scientific reports, blogs, and commercial articles were also explored. Most of the literature was retrieved from online journals and University library databases of Göteborg, Chalmers, and Jönköping universities.

5 CASE STUDY RESULTS

5.1 IBM Connections

At IBM, a set of ESSP's has been integrated into one Social Networking Site (SNS) called IBM Connections. IBM connections integrate different platforms across the organization. The system is designed to allow easy integration with existing systems in the organization. In a typical intranet system, there are structures imposed to control the flow of information and knowledge. The managers and system administrators decide what information is accessible, who can access them, and when to access. In contrast, IBM connections let users decide for themselves what type of information to share, how it is shared, and whom to share it with.

James Ek, the country executive of collaborative solutions, reiterates that: *"Employees decide what information is relevant for them through the help of social tools".*

There are key services in this SNS, as IBM calls it, which are designed for collaboration and knowledge sharing within the organization. Karl, the Technical sales manager, explains that:

"All of these services are based on rest API"s. This is a standard, which makes it possible to utilize these services somewhere else. All services can be integrated in other web-based systems such as SharePoint. All or some of the services can be used on existing platforms or systems."

These services are divided into seven categories - profiles, communities, blogs, bookmarks, activities, files, and wikis. These services have specific functions which are described below.

5.2 IBM Social Media Strategy and Vision

IBM is one of the few multi-national corporations that pioneered the adoption of social media. It has a rich experience in the use of social media which dates as far back as 2002. IBM has embraced it,

promoting its use throughout the organization. It has this system since Lotus was first integrated in the organization.

The strategy adopted at IBM is a “social business” as stated by James Ek. He sees social media as the new way to communicate and the strategy to achieve this is to make all applications in the organization ‘social’. According to him, the vision for enterprise 2.0 within IBM is summarised in the following sentence:

Quickly spreading information to a lot of people in an effective way is the way forward. Social awareness in combination with a great need, for enabling companies to better communicates internally and externally.

The company realizes that people are more socially aware today. But instead of regarding social media as a leisure tool to be used at home, IBM actively utilises it at the work place to increase productivity and efficiency. Collaboration is a key goal that is achieved by using social media within the organization. Hence, the common slogan among IBMers is - “*When team IBM comes together, we are unbeatable.*”

Social media form extensive networks throughout the organization, fostering even greater collaboration. Through this, IBM promotes an open information culture. Karl, the technical sales manager, states that “*Open standards, open platforms is the general strategic direction we want to go. The connection platform is a social and open platform developed for internal use IBM.*”

Access to information and resources throughout the organization has been facilitated, thanks to a flat organizational structure, made possible by social media. James EK states that - “*Social media flattens the organization and facilitates access to the right information and resources.*”

The company empowers employees to participate. Luis Suarez, a Knowledge Management Specialist at IBM Global Business Services states that “*Command and Control corporations will cease as people need to be freed to share what they know.*”

Through social media, IBM strives for a globally integrated company, one which increases the outreach of its employees. This vision prompted the CEO of the company Sam Palmisano to make the following statement:

“A globally integrated company looks very different. This is an enterprise that shapes its strategy, management, and operations in a truly global way. It locates operations and functions anywhere in the world based on the right cost, the right skills, and the right business environment. And it integrates those operations horizontally and globally.”

Palmisano’s vision is to provide the tools necessary to support collaboration. This tool is Lotus Connections. The system’s main vision is to build a professional network for former and current IBMers to collaborate and leverage social computing both within and outside the corporation.

Another social media strategy at IBM is using open programming models (platform approach). Lotus connections are designed using service-oriented architecture (SOA), which makes it easier to reuse services in the software.

Being both a user and vendor of social media, IBM does not only do the talking but also walks the walk. The company leads by example, actively using its own products as examples of what can be achieved. This is one strategy used by the company. James EK, Country manager for portal and Lotus Collaboration solutions states that - “*We lead when we say collaboration solutions to our existing and new users. Internally we strive to do what we say, and social media is the natural way to communicate with peers for quick and effective spread of information.*”

6 RESULTS

6.1 The knowledge Sharing Cycle

The knowledge sharing cycle has three dimensions -internalization, externalization, and objectification. A fourth one – intermediation, is introduced to this cycle. Intermediation is connecting knowledge seekers with the knowledge source. Sharing creates an environment for acting globally.

But not all knowledge is objective knowledge. The process of externalization transitions into objectification. But there has to be universal acceptance of the new knowledge by the whole organization. Wikis however, often consists of objective knowledge. At IBM, the wikis created contain conventional and generally accepted knowledge. Wikis are, therefore, the most suitable platform for the process of objectification. Unlike blogs and communities, other users within the organization with the right permissions can edit wiki material if they deem necessary. Wikis keep track of changes including those who made them and when the changes are made, thereby resolving issues of objectivity. Through wikis, knowledge can turn into organizational knowledge, and the cycle starts all over again with internalization.

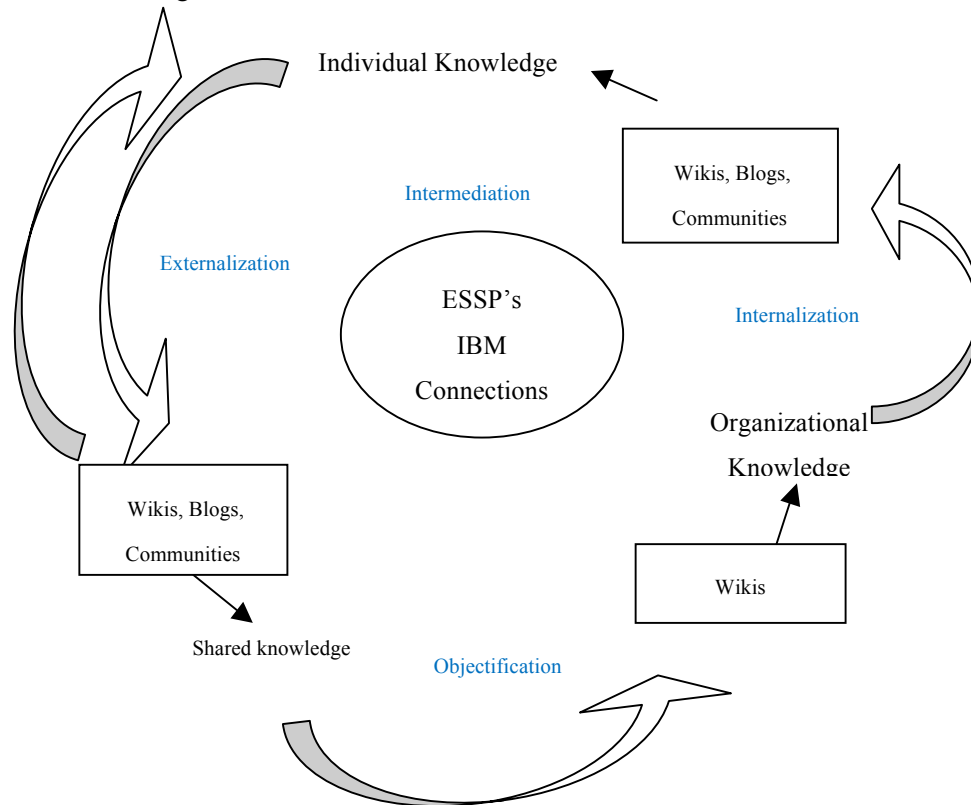


Figure 3: Proposed Objectified Knowledge Sharing Cycle

6.2 Collaboration

Tapscott and William (2006) argue that wikinomics is changing the manner in which we conduct modern business. This new theory has four characteristics – being open, peering, sharing, and acting globally. These are clearly discernible within IBM Corporation and are facilitated by the use of ESSP's. Unlike traditional intranets, platforms and the web 2.0 provide an open environment for collaboration. Being open refers to being transparent and having organizational boundaries that are porous to external ideas. IBM achieves openness through its social media usage and policies which also extensively promote peering. Through communities, employees with similar interests form peer groups, and help each other with problems. Sharing is made easy through ESSP's. All applications and services operating on IBM connections are heavily linked. Such links are very crucial for accessing and quickly sharing the right resources. IBM connections act globally because the platform is deployed and used throughout the IBM Corporations. It is fully integrated in the web and can be accessed virtually from anywhere around the world through the Internet.

7 CONCLUSION

The purpose of this study was to examine the way ESSP's can be used in knowledge sharing and collaboration within organizations while discussing the impacts of different forms of social media that can be used in different phases in the knowledge sharing cycle. Enterprise 2.0 platforms assist the

process of knowledge sharing, converting knowledge from its various modes. The phases in the knowledge sharing cycle are internalization, externalization and objectification. Knowledge can be explicit or implicit.

Through IBM Connections the origination achieves the four main characteristics of Wikinomics. Employees engage in peering through communities, wikis and blogs, among which wiki is considered the most useful open source technology. It facilitates incremental knowledge creation, value networks and multi-user participation. The files service of IBM Connections has been designed in such a way that emails are eliminated and are replaced with links to files that are shared. Other social media features such as tagging and book marking are also available. IBM maintains an extremely open, transparent and easily accessible information culture through ESSP's.

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