IS5113 Computer Mediated Communications

Research Project Proposal

Knowledge Contribution and Virtuality in Web 2.0 Environment

Prepared for

Dr. Klarissa Chang

By:

Damien Forest (A0066246A)

Karthikeyan Kanapathy (HT096176B)

Liu Lang Bruce (HT086350N)

Loh Hon Chun (HT086353Y)

Pimpuk Sansuth (HT086303A)

Rajen Suchede(HT086364E)

10 November 2010

Table of Contents

Introduction

Knowledge management (KM) systems have been implemented by organizations that view knowledge as their critical and strategic asset to sustain growth and gain competitive advantage. With the increasing decentralization and globalization of work processes, many organizations have responded by introducing virtual teams, in which members are geographically dispersed and coordinate their work predominantly with electronic information and communication technologies (e-mail, video-conferencing, etc.)(Hertel et al 2005).One of the key questions in traditional KM systems is what motivates employees to contribute their knowledge (Alavi and Leidner 2001). With the advent of new Internet technologies, it is critical for organizations to understand the determinants of knowledge contribution, examine the platforms that support virtual teams, and address what traditional KM systems have failed to do.

In this study, knowledge contribution occurs 1) when individuals spend time and effort to codify their knowledge as they feel that their expertise is adequate and recognize the opportunities of knowledge sharing, and 2) when individuals are motivated to respond to questions asked and spend time and effort to respond. Vast amount of KM research has focused on motivations for knowledge contribution and various organizational, individual, cultural and technological factors have been identified. As a result, KM system implementation in organizations is not only technology implementation but also comprises organizational and cultural changes to create an environment and platform that motivates individuals to contribute their knowledge. Yet organizations face problems with traditional KM systems related to their tediousness of use, large investment of time required or even because of tools that fail to accommodate virtual teams in which team members work remotely (Spanbauer 2007). Additionally, there is widespread perception that KM systems have not lived up to expectations (Whelan 2007).

In recent years, the concept of Web 2.0 technologies, defined as “community-driven web services such as social networking sites, blogs, wikis, etc. which facilitates a more socially connected web where everyone is able to communicate, participate, collaborate, add to and edit the information space (Anderson, 2007; Ankolekar et al., 2008; Pachler and Daly, 2009; Rollett et al., 2007)”, has gained much attention and success in voluntary knowledge contribution and sharing on public Web 2.0 websites such as Wikipedia, TripAdvisor and YouTube. This demonstrates that Web 2.0 technologies can be used as the alternative platforms for knowledge sharing that organizations can adopt (Allen 2010).

Combining the increasing implementation of virtual teams and emergence of Web 2.0 technologies as possible knowledge sharing platforms in organizations motivates us to examine the relationship between virtuality and the motivations for knowledge contribution using Web 2.0 technologies. Therefore the objective of this study is to examine the conditions under which individual motivations would enhance knowledge sharing. These conditions include features of Web 2.0 tools such as reprocessability (the extent to which the medium enables a message to be reexamined or processed again) and velocity (the speed at which a media can deliver a message to intended recipients)and degree of virtuality of the team. Practically this study will relate the importance of individual motivations, such as trust, collectivism, reciprocity to quote

but a few, to features of Web 2.0 tools and see how they vary with the degree of virtuality of the employees.

Theoretical Framework

Determinants of Knowledge Contribution

The knowledge management literature has identified a wide range of factors that influence knowledge sharing behaviors in traditional KM systems. In this section we provide an overview of common factors found in the litterature.

The norm of reciprocity in virtual communities and centrality has vital influences on individuals and encourages them to share knowledge in the communities (Sun et al 2009). The study suggests that Social Capital Theory, which highlights the value of social network by rewarding individuals' efforts and ensuring the ongoing knowledge sharing, can be applied to increase individuals' willingness to share their knowledge. The study also highlights that organizations are able to influence and change the habits of individuals. Changing habits influences individuals to develop and to continue sharing their knowledge and experiences in virtual communities.

Wasko and Faraj (2005) note that factors such as reputation, altruism, generalized reciprocity, and community interest influence knowledge sharing. Individuals contribute knowledge when they perceive that it enhances their professional reputations. By altruism, one seeks to increase welfare of others, at one's own expense, just simply because it is enjoyable to help others. The paper also found that individuals who contribute knowledge do not seem to expect help in return.

Barson and his colleagues highlight technological barriers to knowledge sharing and that effective knowledge management systems require a mix of technology (software tools) and practice methods (Barson et al. 2000).Currently available knowledge management products are not yet fully mature and often have to integrate with multiple systems in an attempt to support the requirements of people, but often end up raising questions on compatibility. Trying to make legacy systems to work across multiple departments and the question of interoperability are identified as significant barriers to knowledge management.

Cultural influences on knowledge sharing, a study by Ardichvili et al discusses about 'Saving the face', Modesty, Competitiveness, Authority, Preferred mode of communication and information sharing, and Individualism–Collectivism in a cross cultural differences context, and highlights the need of a cultural assessment before introducing country specific knowledge sharing systems(Ardichvili et al 2006). Due to the limitation that the study was conducted among the online community members of one company and focused only on cultural differences, some of the factors that were highlighted in the paper could not be directly used in our survey research, which covers Knowledge sharing in general. For our survey, we were interested in using individuals'

collectivism which is discussed in the study, and its influence on knowledge sharing in a community or an organization.

The research, Knowledge sharing in eCollaboration by Ireson and Burel considers how knowledge can be effectively shared among individuals. Individuals' motivation factors combined with codifying the knowledge to enable its interpretation and reuse are essential for an effective knowledge sharing (Ireson and Burel 2010). The motivation factors are classified broadly into intrinsic factors (self-oriented) and extrinsic factors (external oriented). Self-expression, personal development, utilitarian motives, economic motives and self-efficacy are classified as intrinsic motivation factors. Social affiliation, reputation within the company, social ranking, competition, reciprocity and rewards are classified as extrinsic motivational factors. Two critical factors were discussed: the need to motivate users to contribute their knowledge and the need to codify that knowledge to enable its interpretation and rehearsability. Since information can come from outside of organizations, Web 2.0 technologies are proposed. Web 2.0 technologies primarily improve knowledge contribution and sharing by lowering temporal and spatial barriers between the contributor and recipients.

Determinants of knowledge sharing using Web 2.0 technologies by Sotirios and Alya (ParoutisandAl Saleh2009) studied the factors determining the success of contribution and sharing knowledge using Web 2.0 technologies by exploring the reasons for and barriers to employees' active participation in these platforms. The results of the study highlighted "trust" to be a key determinant of participation in Web 2.0 knowledge sharing platforms. Given the open nature of Web 2.0, it is important that contributors ensure truth and accuracy in their contributions.

The number of variables in these models is too high to be fully integrated. So in our study, we will only retain self-oriented motives as a whole. We will use the extrinsic factors of recognition and rewards as organizational factors that will motivate individuals' knowledge sharing.

These factors could be summarized into the following three categories: technological factors, organizational or environmental factors, and individual or personal factors. Although our study examines knowledge contribution on Web 2.0 technologies, our focus will not be on technological factors because, as has been shown in past studies, though technology is one of four complementary components in knowledge management, technology has its limitations and effective knowledge management cannot take place without extensive behavioral, cultural and organizational change (McDermott 1999, Davenport and Prusak 2000). Accordingly, the research questions of our study are designed to focus on the human and organizational factors - the social aspects of knowledge contribution.

Knowledge Contribution and Web 2.0 in Enterprise

The principles of Web 2.0 and Knowledge Management (KM) are found to be matching in various areas as summarized in Table 1.

Web 2.0 Principle	Knowledge Management
Web as a Platform	Technology as a platform Both Web 2.0 and KM utilize technology to enable high value activities such as collaboration, social networking and knowledge sharing.
Active participation of users	Active Participation of users Success of KM and Web 2.0 is dependent on contribution and active participation from users. One difference is that, participation is normally encouraged by central team in traditional KM, while in Web 2.0 participation is voluntarily.
Harnessing collective intelligence	Collective organizational knowledge The power of Web 2.0 technologies comes from connectedness and participation of Internet users to create collective intelligence (such as Wikipedia, del.icio.us, Flickr and Amazon which provides collective intelligence via user reviews) (O'Reilly 2005) Similarly, traditional KM systems aim to achieve similar objective by providing tools to users for knowledge sharing to create organizational knowledge.
Content as the core	User-generated content is a key features of Web 2.0. That can also be said for KMS, as the quality of knowledge contributed to KMS as well as continuous contribution from employees is critical to the success and sustainability of KMS.

Source: Adapted from Levy, 2009.

Table 1

The advent of Web 2.0 and the rich suite of tools that encapsulate the core principles of Web 2.0 bring with it added motivations for people to contribute and codify their knowledge. Unlike in Web 1.0 where people had to rely solely on Web editors and web page administrators to update content on pages, Web 2.0 empowers users to publish content and share knowledge at will. Web 2.0 helps augment the concept of Communities of Practice which brings together a group of people who in interested in the same topics and share a common practice within the same period of time (Keyes2006). This motivates people to collaborate and work with a dynamic group of people. A study

conducted by Rizova found that success and innovation can be stimulated from structural properties in organizations (Rizova 2006). In the study, it was found that being networked with people in the organization aided successful innovation. Expert directories helped people network and connect with the experts to get advice on some of the more intricate issues they were faced with.

Research has shown that the Web 2.0 architecture and the concept of democracy on which the Web 2.0 tools are based further encourage users to add value and contribute their knowledge (Umeda 2006). Web 2.0 tools are well known to have good aesthetics, are simple, accessible and appealing to people. People often dislike using tools and systems, especially the legacy tools, to share knowledge since they consider these tools to be onerous and not worth their time. In contrast, Web 2.0 enabled tools gives people a notion of socializing in a work context and are thus much happier to share their thoughts and experiences (Tebbutt 2007). The tools help bring out the best people and the best in people. Contributions get recognized and help people gain the visibility they deserve in the organization (Levy 2009).

In the Enterprise 2.0 paper (McAfee 2006), McAfee introduced six components called SLATES to described Enterprise 2.0 technologies which describe how Web 2.0 can be a paradigm shift from traditional corporations' Intranet and traditional KMS. SLATES are briefly described below:

- Search

For any information to be useful, users must be able to easily search for it using keywords. This characteristic differs from traditional Intranet or KMS where a structured navigation system is normally used.

- Links

One of the factors for keyword search to return accurate and relevant results is links to provide guidance as to what is important as well as provide structure to online content. In Intranet or KMS environment, links are created only by Intranet/KM team. To enable keyword search and provide accurate and relevant result, users have to be given the ability to build links.

- Authoring

The success of Wikipedia and blogs is a strong sign that people have something to contribute and granting authorship to them is a way to elicit the contribution. Additionally, Wikipedia also demonstrates that group authorship can lead to high-quality content.

- Tags

In addition to have a better search mechanism based on links, Web 2.0 technology allows users to categorize information by using tags. This is the opposite of taxonomy in traditional KMS where the categorization is predefined.

- Extension

Based on user's preference or categorizations, Web 2.0 technology enhances the user experience further by suggesting similar articles or websites by using extensions. An early example of extensions is Amazon.com's recommendations. This provides a faster way for users to discover new things and new knowledge.

- Signals

Even with better search and user-defined categorization, the amount of information can still be overwhelming. The final component in SLATES is to provide signals/notifications to users when new content of interest has been added.

With SLATES characteristics, Web 2.0 can be adopted in a enterprise setting as another option for KMS or as a complimentary to existing KMS. It can provide a easy to use platform and does not impose on users, any preconceived notions about how knowledge should be documented or how it should be categorized or structured.

Based on the literature review above, we added another category of factors to knowledge contribution which arose from distinct characteristics of Web 2.0 technologies as part of our study, and the factors in this category are: empowerment, networking and ease of use, access and good aesthetics of the tools. The factors that we examined are summarized in Table 2:

Organizational or environmental factors	- Management/Peer Influence (Paroutis and Al Saleh 2009) - Economic rewards (Bock and Kim 2002, Kankanhalli et al. 2005) - Recognition (Kankanhalli et al. 2005, Paroutis and Al Saleh 2009)
Individual or Personal factors	- Self-interest - Trust (Ridings et al, 2002, Paroutis and Al Saleh 2009) - Reciprocity (Wasko and Faraj2005, Sun et al 2009) - Collectivism goals (Wasko and Faraj2005, Paroutis and Al Saleh 2009)
Web 2.0	- Empowerment (McAfee 2006, Allen 2010) - Networking (Rizova 2006) - Ease of access (McAfee 2006) - Good aesthetics of the tools (Tebbutt 2007)

Table 2

Web 2.0 as Media

Media Synchronicity Theory (MST) proposed by Dennis and his colleagues created a framework that can be used to characterize media in the communication process. The characteristics are summarized in Table 3.

Media Capability	Definition	Implications for Tool Usage

Media Capability	**Definition**	**Implications for Tool Usage**
Transmission Velocity	Speed at which a medium can deliver a message	For urgent tasks and messages, getting immediate feedbacks/responses and conveying complex issues
Parallelism	Number of simultaneous connections in/during communication	Suitable when users cannot/do not want to wait for their turn to speak and when users can focus on multiple threads of conversation at the same time
Symbol Sets	Number of ways in which a medium allows information to be encoded for communication (natural symbol sets: physical, visual, and verbal)	For communicating/clarifying complex issues, building relationships, for novel (as opposed to familiar) tasks and for transfer of tacit (as opposed to explicit) knowledge
Rehearsability	Ability to rehearse/fine tune a message before sending	Suitable when a sender needs to carefully craft a message before transmission to ensure the intended meaning is expressed precisely and when fast response is not required
Reprocessability	Ability to be re-examine or process the message again	Suitable when logs/records of all communication are necessary or preferred, when recipients need to review and deliberate on the message carefully and for conveying complex issues

Table 3

In Table 4, we describe characteristics of Web 2.0 according to MST.

Tools	**Transmission Velocity**	**Parallelism**	**Symbol Sets**	**Rehearsability**	**Reprocessability**
Wikis	Low Communication through Wikis is asynchronous, so the intended recipients will receive the message slower in comparison to instant messaging or face-to-face interaction.	High Many users can contribute to a document/article in Wikis simultaneously.	Low-Medium Contribution to Wikis at present is largely text-based with some integration with images and videos.	High Editing and posting to wikis can be reviewed before submission.	High Content in Wikis are maintained along with modification history. Even deleted and modified content can be retrieved by accessing previous editions.
Blogs	Low Similar to Wikis, communication through blogs is asynchronous, so the intended recipients will receive the message slower in comparison to instant messaging or face-to-face	High Blog entries can be published by Blog's owner and, at the same time, multiple audiences are able to comment or feedback on the entries concurrently.	Low-Medium Contribution to blogs at present is largely text-based with some integration with images and videos.	High Editing and posting to blogs can be reviewed before submission.	High Blog entries and comments are maintained on the blog website allowing audience to revisit and examine blog entries.

	interaction.				
Video Sharing	Medium-High When webcams and other video conferencing technologies are used to communicate, the intended recipients receive the message instantly and are able to provide their feedback on the same video call	Low While on the video call, normally one person speaks while others listen and wait for their turn to speak.	High Communication via video sharing allows various cues (such as verbal, visual, tonal) in information exchange which is missing in other web 2.0 tools.	Low People do not have the chance of rehearsing before saying something on the video call since whatever they say gets transmitted directly to the recipients.	Medium – High If the recording facility is available, video recordings are a good medium to reprocess old information.
Microblogging	Medium Similar to blogs, users post their micro-blogs asynchronously and hence the readers / subscribers will receive the message slower as compared to face-to-face or video communication.	High Similar to blogs, users can post micro-blogs and the readers can post comments on older posts simultaneously.	Low Micro-blogs are usually text based and is meant to be used for short message posts	High The micro-blog post can be reviewed and edited before submission	High All old micro-blog posts and comments are maintained on the website for users and readers to reprocess when required

Instant Messaging (IM)	High Communication and contribution through IM is done synchronously enabling high velocity of message delivery.	High Most IM software have a group chat option that allows people to contribute ideas and knowledge simultaneously	Medium-High Many IM software allow sharing of photos, files and some even allow video sharing for information exchange	Medium-High Usually the messages and files can be reviewed before sending them across to the participants in the IM chat	High Most IM software have a logging function which stores the conversations that transpired between the participants which can be reprocessed later

Table 4

Web 2.0 tools that are available in the organization where the study was conducted are:

- Intranet Wikis – available on an Intranet website called WikiCentral and Lotus Connection with similar features to Wikipedia and Confluence wikis
- Intranet Blogs – available on an Intranet website called BlogCentral and Lotus Connection
- Instant Messaging – official Intranet instant message tool is Lotus Sametime Connect, which has similar features to Microsoft MSN Messenger.
- Social Network Sites –IBM has an intranet social network site called SocialBlue which is similar to Facebook, but with lesser features
- Microblogging – BlueTwit is IBM's Intranet microblogging site and it is similar to Twitter.

In this study we focused on transmission velocity and reprocessability feature of the tools. The Web 2.0 tools listed above are presented in Table 5 according to the two features.

		Reprocessability	
		Low	High
Velocity	Low		Wikis, Blogs
	Medium		Social Network Site (SNS), Microblogging (SocialBlue, BlueTwit)
	High	Instant Messaging (Lotus Sametime Connect)	

Table 5

Virtual Team and Knowledge Sharing

KM is an essential component of an organization with virtual teams. KM enables the industry to face the challenges of the modern business world with various innovative solutions e.g. the use of Web 2.0 collaborative tools to enable knowledge among distributed teams to be codified and shared. Knowledge Management Systems (KMS) have been characterized as consisting of four overlapping processes: creation, storage/retrieval, transfer and application (Alavi and Leidner 2001).

KM approaches can be used to capture lessons learnt and past work experiences across virtual teams onto common shared knowledge databases for existing and

incoming new employees to learn. Such codified knowledge can serve as reusable components without having to reinvent the wheel as information gets passed down to new employees taking over the reins of a project. Here, we shall elaborate further on KM techniques relating to contribution and sharing.

Knowledge Contribution

It is especially important for virtual teams to document both dimensions of knowledge – explicit and tacit, since team members have infrequent face-to-face communication. According to a study, 80% of knowledge lies in people's brain, which is tacit, which means if lost and not captured, only 20% of explicit knowledge will be left (Oakes 2002).

Knowledge contribution must be championed and supported by the top-level management. The level of top management support will have a positive effect on the level of employees' commitment to contribute and share (Lee et al 2006). The management must make it a point to make known, the existence of knowledge management systems to all. Knowledge contribution culture should be cultivated and become part of the work process at all levels. When contributing knowledge, virtual team members should be encouraged to contribute to a shared common knowledge repository so everyone across different geographical regions will have access to it. At the end of the day, the knowledge contributions from virtual team members should be recognized, rewarded accordingly and finally reviewed by subject matter experts or a knowledge facilitator to ensure the quality and relevance of the contributed knowledge.

Knowledge Sharing

After knowledge is contributed and stored in a knowledge repository, it will only be useful if it is effectively shared and applied by others to gain competitive advantage. The constraints on physical locations in virtual teams amplifies the importance of achieving communication effectiveness and information sharing (Sheng Wu 2006). There are several methods to share knowledge e.g. through Web 2.0 tools like Wikis and Blogs.

One challenge in knowledge sharing in virtual teams is the public goods problem. One way to assure the provision of public goods is management control (R. Albanese). A knowledge manager or a leader in a virtual team can review the process of knowledge sharing, give feedback to each member and distribute outcomes to individuals based on the evaluation of effort on sharing knowledge. A study by (Hambley 2007) indicates the importance of the role of a leader in virtual teams.

Degree of Virtuality

In this study, we defined 3 degrees of virtuality, which can be described as following:

a. Employees who work independently and remotely most of the time and participate in teams that are dynamic and short term. We refer to this group of employees as **purely virtual workers**.
b. Employees who work on customer-based or project-based and work remotely from their managers and most of their peers from the same unit, but are still part

of a longer term project and sometimes interact face-to-face with project team members. We refer to this group of employees as **hybrid workers**.

c. Employees who work in fixed location and interact with their team members face-to-face most of the time. We refer to this group as **traditional workers**.

Research Method

Context Settings

We conducted our study at IBM. IBM has implemented and put to use knowledge sharing tools such as wikis, blogs and instant messaging. Organizational units within IBM such as the consulting services team, technical service and sales teams, implement a virtual working program. Other units such as the software development team and the software support team work at company premises. As such, IBM provides us a suitable setting with employees that have various degrees of virtuality as we described in the earlier section, to conduct this study.

Questionnaire Design

We designed our questionnaire based on the list of determinants of knowledge sharing in Table 2. Past researchers have studied in more depth, some of the factors we listed. Due to length restrictions for our survey, in order to get enough responses, we only selected the factors that were identified as major trends in previous studies. Concretely we designed the survey to be answered in less than 20 minutes.

We briefly describe the questionnaire in this section and provide the full list of questions in Appendix A. The questionnaire is divided into 3 sections as following:

- Demographics information
- Work environment information
- Knowledge contribution behavior using Web 2.0 tools available in the organization Intranet

The Web 2.0 tools are divided into 3 groups, which are:

- Wikis and Blogs - represent low velocity and high reprocessability tools
- Instant Messaging - represent high velocity and low reprocessability tools
- Social Network Sites (SocialBlue) and Microblogging (BlueTwit and Twitter) - represent high velocity and high reprocessability tools

For each group of tools, the respondents are asked the following questions:

1. If they have a clear idea of the benefit or reward of contributing knowledge via such tool. Likert scale is used to provide choices for the respondents (i.e. Strongly Disagree, Disagree, Neutral, Agree and Strong Agree).
2. How often do they contribute their knowledge via such tools with team members and non-team members? Five choices are provided which are never, once a year, a few times a year, every month and all the time.

3. If the respondents identify that the frequency of their contribution is at least a few times a year, they are then asked to identify the motivations to their contribution. Each motivation in Table 2 is phrased into a sentence with which respondents can rate their agreement or disagreement. Again, Likert scale is used to provide choices for the respondents (i.e. Strongly Disagree, Disagree, Neutral, Agree and Strong Agree) and the following information is provided to further explain the choices:
   "Agree" or "Strongly agree" indicates that the reason is applicable to you. Neutral indicates that that reason has no relevance on your decision to contribute your knowledge. "Disagree" or "Strongly disagree" indicates that the reason is not applicable to you as a motivation.

Data Collection and Analysis

The data was gathered through a survey posted on the Internet from September 19, 2010 to September 28, 2010. A total of 44 responses were gathered. We asked survey respondents to identify their work environment provided with 3 choices, which represent the three levels of virtuality that we have described earlier. The breakdown by degrees of virtuality of respondents and the frequency of face-to-face and electronic communication is shown in Table 6. We also collected data on the particulars of respondents such as age , seniority in the companyand education in order to remove any bias that can be introduced by such characteritsitcs.

From now on, we refer to respondents who identified themselves as working in a fixed and in the same location as their team members, as traditional workers, those who work in a mobile environment on project-based assignments as hybrid workers and those who work in a mobile environment with short-lived and dynamic teams or work independently as virtual workers.

	How often do you interact with your team members face-to-face?				**How often do you interact with your team members via electronic communication?**				**Total**
	Every day	**Every week**	**Every 2 weeks**	**Every month or more**	**Every day**	**Every week**	**Every 2 weeks**	**Every month or more**	
I work in a fixed and in the same location as my team members	12	5	1	0	17	1	0	0	18
I work in a mobile environment on a project-based assignment	2	2	5	6	15	0	0	0	15
I work in a mobile environment with short-lived and dynamic team or I work independently	2	0	1	8	9	2	0	0	11

Table 6

The demographics of the respondents are shown in Table 7.

Age group	Count	Education level	Count
25 years and below	4	High school	4
26-35 years	11	Bachelor's Degree	20
36-45 years	20	Master's Degree	17
46-55 years	9	Doctoral Degree	3

Table 7

After we examined the respondents' work environment and the frequency of their face-to-face communication and electronic communication with their team members, as shown in Table 6, we found that 93% of the respondents use electronic means to communicate with their team members every day regardless of their work environment or degree of virtuality, while the frequency of face-to-face communication has given us more information about their level of virtuality, as shown in Figure 1.

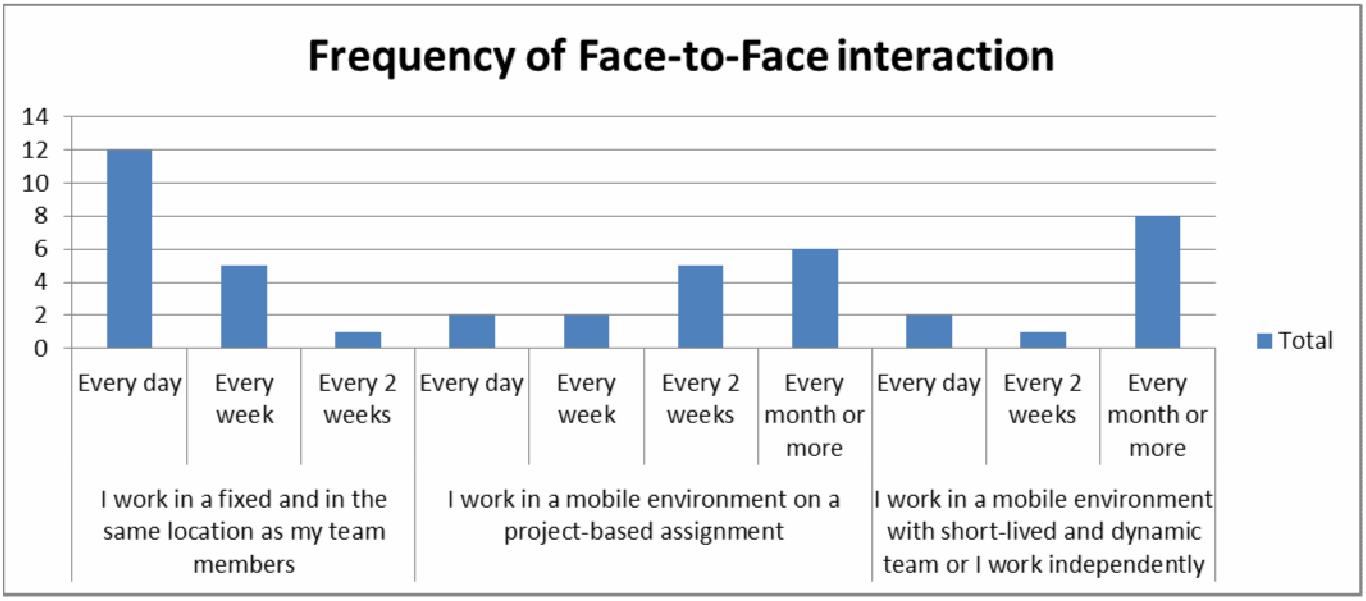

Figure 1

From Figure 1, we can see that 17 out of 18 traditional workers communicate with their team face-to-face at least every week. The frequency of face-to-face communication of hybrid workers is understandably varied, from every day to every month or more, while 9 out of 11 virtual workers have face-to-face communication with their team members every 2 weeks or less frequently (i.e. every 2 weeks and every month or more). Based on this finding, we examine the motivations of knowledge contribution in the following manner:

- Traditional workers – we considered only those who interact with their team members face to face at least every week.
- Hybrid workers – we considered all respondents in this group
- Virtual workers - we considered only those who interacted with their team members face to face at every 2 weeks or less

Number of contributors for each group of workers and the tools used are summarized in Table 8 and the detailed breakdown of knowledge contribution frequency is included in Appendix B, C and D.

Worker type	Wikis and Blogs		SNS and Microblogging		Instant Messaging	
	For team members	For non-team members	For team members	For non-team members	For team members	For non-team members
Traditional	16	15	4	5	14	14
Hybrid	13	13	7	6	14	11
Virtual	9	9	3	2	9	8

Table 8

The answers to the motivation questions are then assigned a numerical value (Strong Disagree = -2, Disagree = -1, Neutral = 0, Agree = 1 and Strongly Agree = 2) and the score for each motivation is then achieved by summation of the value from all considered respondents.

Statistical relationships, correlation and covariance, between age, virtuality and seniority for each motivation are also calculated.

Findings

Perceived benefit for knowledge contribution

Firstly we looked at whether the respondents have a good understanding of the benefits or rewards accorded to them when they contribute their knowledge through a given media. We found that the respondents generally agreed that they understand the benefit of knowledge contribution through Wikis and Blogs and Instant messaging (average score of 4.27 and 4.31 respectively on the scale of 5), but the understanding of the benefit of knowledge contribution through SocialBlue (Intranet Social Network Site) and BlueTwit (Intranet microblogging) was comparatively much lower (average score of 2.97 on the scale of 5). The detailed breakdown of the score is shown in Figure 2.This explains why the frequency of using SNS and Microblogging for knowledge contribution purpose by workers is much lower than for the two other groups.

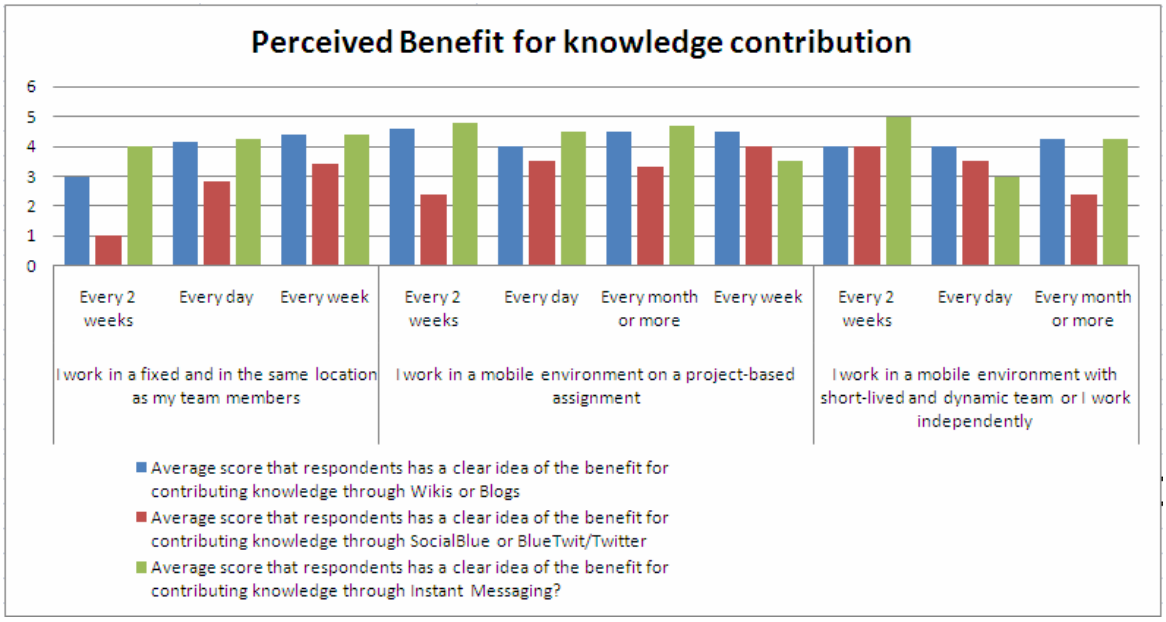
Perceived Benefit for knowledge contribution
6
5
4
3
2
1
0
Every 2 weeks
Every day
Every week
Every 2 weeks
Every day
Every month or more
Every week
Every 2 weeks
Every day
Every month or more
I work in a fixed and in the same location as my team members
I work in a mobile environment on a project-based assignment
I work in a mobile environment with short-lived and dynamic team or I work independently
Average score that respondents has a clear idea of the benefit for contributing knowledge through Wikis or Blogs
Average score that respondents has a clear idea of the benefit for contributing knowledge through SocialBlue or BlueTwit/Twitter
Average score that respondents has a clear idea of the benefit for contributing knowledge through Instant Messaging?

Figure 2

Motivations to knowledge contribution

In this part, we present how the different motivations rank in relation with the media used within a given context and provide trails for a qualitative explanation.

Based on our questionnaire, which caters for groups of employees with different degrees of virtuality and groups of Web 2.0 tools (categorized according to their velocity and reprocessability as communication medium), we looked into the motivations for employees to contribute their knowledge to their team members and non-team members, and identified commonalities or differences .

In summary, the degrees of virtuality are traditional, hybrid and virtual as described earlier. The tools are categorized according to velocity and reprocessability of the communication medium, as below:

- Wikis and Blogs represents low velocity and high reprocessability tools
- Instant Messaging represents high velocity and low reprocessability tools
- Social Network Sites (SocialBlue) and Microblogging (BlueTwit and Twitter) represents high velocity and high reprocessability tools

There are 12 motivations provided in the questionnaire, based on Table 2 and they are:

Organizational or environmental factors	Individual or Personal factors	Web 2.0-related motivations
- Management and Peer Influence - Economic reward - Recognition – Professional Performance - Recognition – Work relationship	- Self-interest - Trust - Reciprocity - Collectivism goals	- Empowerment - Ease of access - Networking - Aesthetics

We present the top 5 motivations for knowledge contribution in Table 9. The detailed breakdown is included in Appendix E, F and G.

Traditional Workers											
Wikis and Blogs –Team	**Score**	**Wikis and Blogs-Non-Team member**	**Score**	**IM-Team**	**Score**	**IM-Non-Team member**	**Score**	**SNS/Twitter-Team**	**Score**	**SNS/Twitter-Non-Team member**	**Score**
Collectivism goals	24	Collectivism goals	18	Empowerment	19	Ease of access	18	Ease of access	7	Ease of access	7
Reciprocity	23	Reciprocity	18	Reciprocity	19	Reciprocity	17	Networking	5	Networking	6

Trust	19	Recognition-Professional performance	15	Management and Peer	17	Empowerment	13	Reciprocity	5	Reciprocity	5
Empowerment	19	Ease of access	14	Ease of access	15	Networking	12	Collectivism goals	3	Trust	4
Ease of access	17	Self-interest	14	Trust	15	Collectivism goals	12	Empowerment	2	Collectivism goals	4
Hybrid Workers											
Wikis and Blogs –Team	**Score**	**Wikis and Blogs-Non-Team member**	**Score**	**IM-Team**	**Score**	**IM-Non-Team member**	**Score**	**SNS/Twitter-Team**	**Score**	**SNS/Twitter-Non-Team member**	**Score**
Ease of access	18	Empowerment	19	Self-Interest	23	Ease of access	18	Self-interest	6	Networking	7
Self-interest	18	Ease of access	18	Ease of access	22	Self-interest	18	Empowerment	6	Empowerment	7
Empowerment	18	Collectivism goals	17	Networking	21	Networking	18	Recognition-Work relationship	5	Self-interest	6
Collectivism goals	17	Recognition-Professional Performance	16	Reciprocity	18	Reciprocity	15	Aesthetics	5	Ease of access	6
-Recognition-Professional Performance - Recognition-Work relationship	15	Recognition-Work Relationship	15	Empowerment	17	Empowerment	14	Networking	4	- Collectivism goals - Aesthetics - Reciprocity	5
Virtual Workers											
Wikis and Blogs –Team	**Score**	**Wikis and Blogs-Non-Team member**	**Score**	**IM-Team**	**Score**	**IM-Non-Team member**	**Score**	**SNS/Twitter-Team**	**Score**	**SNS/Twitter-Non-Team member**	**Score**
Collectivism goals	15	Collectivism goals	15	Collectivism goals	11	Ease of access	10	N/A		N/A	
Empowerment	12	Empowerment	11	Ease of access	9	Trust	10				
Self-interest	11	Reciprocity	11	Reciprocity	9	Empowerment	10				
Ease of access	10	Self-interest	11	Trust	8	Collectivism goals	10				
Reciprocity	10	Ease of access	9	Empowerment	8	Reciprocity	9				

Table 9

Note: For motivations of virtual workers to contribute their knowledge through SNS and Twitter, as the respondents in this category is relatively low (3 for team members and 2 for non-team members), the score is quite evenly spread out for all motivations. We were not able to distinguish the Top 5 motivations and did not include them in our analysis.

Next, we present the bottom 4 motivations for knowledge contribution inTable 10.

Traditional Workers											
Wikis and Blogs –Team	**Score**	**Wikis and Blogs-Non-Team member**	**Score**	**IM-Team**	**Score**	**IM-Non-Team member**	**Score**	**SNS/Twitter-Team**	**Score**	**SNS/Twitter-Non-Team member**	**Score**
Networking	9	Networking	6	- Recognition – Professional performance - Recognition – Work relationship - Self-interest	11	Self-interest	8	- Recognition – Work relationship - Aesthetics	0	- Recognition – Professional performance - Recognition – Work relationship	-1
- Aesthetics - Management and peer	8	Aesthetics	5	Economic incentives	3	- Recognition – Professional performance - Recognition – Work relationship	6	Economic incentives	-2	- Management and peer - Economic incentives	-5
Economic incentives	-1	Economic incentives	3			Economic incentives	3	- Recognition – Professional performance	-3		
		Management and peer	2					Management and peer	-4		
Hybrid Workers											
Wikis and Blogs –Team	**Score**	**Wikis and Blogs-Non-Team member**	**Score**	**IM-Team**	**Score**	**IM-Non-Team member**	**Score**	**SNS/Twitter-Team**	**Score**	**SNS/Twitter-Non-Team member**	**Score**
Networking	10	- Networking - Trust	10	Aesthetics	9	- Collectivism goals - Management and peer	7	Recognition – Work relationship	2	Recognition – Work relationship	1
Aesthetics	5	Economic incentives	5	- Recognition – Professional	7	Recognition – Professional	6	Recognition – Professional	1	Recognition – Professional	0

				performance - Collectivism goals		performance		performance		performance	
Management and peer	3	Aesthetics	3	Economic incentives	2	Economic incentives	0	Economic incentives	-3	Economic incentives	-1
Economics incentives	-2	Management and peer	2					Management and peer	-4	Management and peer	-5
Virtual Workers											
Wikis and Blogs –Team	**Score**	**Wikis and Blogs-Non-Team member**	**Score**	**IM-Team**	**Score**	**IM-Non-Team member**	**Score**	**SNS/Twitter-Team**	**Score**	**SNS/Twitter-Non-Team member**	**Score**
Recognition – Professional performance	3	Recognition – Professional performance	5	- Networking - Management and peer	4	- Networking - Management and peer	4	N/A		N/A	
Aesthetics	0	Aesthetics	2	Economic incentives	2	Economic incentives	2				
Management and peer	-3	Management and peer	-5								
Economic incentives	-6	Economic incentives	-6								

Table 10

From the above summary, we present some of the main study findings in this section.

Main motivations

From the results of the survey, the main motivations for knowledge contribution through Web 2.0 technologies in the organization across the degrees of virtuality and tools are: Collectivism goals, Reciprocity, Ease of access and Empowerment. Combining these and the deterrent of economic rewards and management and peer influence indicates that knowledge contribution is a norm in the organization.

Different tools, Different purposes in Different environments

When we examined other motivations apart from the main motivations highlighted above, we found out that differences with the velocity, reprocessability and degree of virtuality and they are shown in

Traditional team **Hybrid team**

Figure 3

according degree of virtuality and our 2 focused features of Web 2.0 tools.

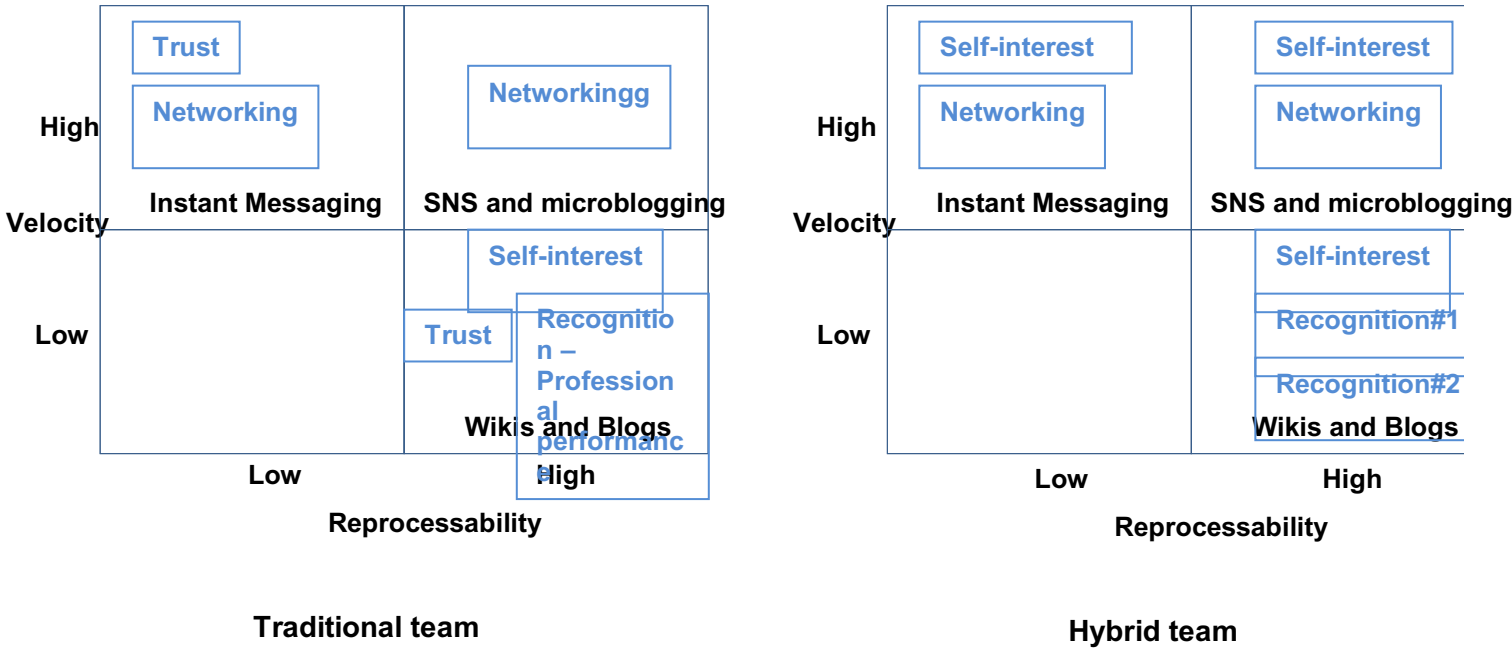

Figure 3

With traditional and hybrid workers, we see an obvious shift of motivations between the groups of tools. Recognition, both in terms of work relationship and professional performance, is viewed as an important factor for knowledge contribution through Wikis and Blogs, while networking has become more important in instant messaging, SNS and microblogging. This can be explained by the highreprocessability of Wikis and Blogs, so the contents of the contributions are perceived to bring in more recognition. Even though, reprocessability of SNS and microblogging is high too, the lack of clear understanding of the benefits in using SNS and microblogging as knowledge contribution tools may explain the shift in motivation towards networking that we observe in this group of tools.

Additionally, self-interest purposes (such as self-knowledge management, to better employees' effectiveness) becomes more important with hybrid workers (appears in 5 out of 6 categories in Table 9) and virtual workers (appears 2 out of 4 categories) while it appears only once for traditional workers.

In contrast, we noted that, there are no differences in the motivations of both groups of tools that we examined in virtual workers, and more importantly, the lack of organizational factors in their motivations to knowledge contribution. Additionally, virtual workers also have the strongest negative reaction among the 3 groups, towards management, peer influence and economic incentives as motivations.

Statistical Findings

We summarize our statistical findings in this section and provide the full results in Appendix H.

Global trends for each set of tools

Earlier we highlighted what factors appeared to be important in the context of our survey. Now we would like to mine global trends for each set of tools with more confidence in order to provide a framework for Knowledge sharing practitioners (due to the limited the size of our survey results these findings do not take into account the degree of virtuality).

With the results of our survey, our methodology is to highlight the factors that motivate the most employees to contribute and share their knowledge. In this respect we kept only the motivations for which the level of confidence is at least 95%[1] that contributors at least agree to be a reason for contributing in Knowledge sharing. The level of agreement was rated as follows:

Strongly Disagree	-2	Neutral	0	Strongly Agree	2
Disagree	-1	Agree	1		

Since our sample was too small for SNS/Twitter, we were not able to highlight any global trend for this group of tools.

Motivations for contributing to wikis and blogs

Collectivism Wikis and Blogs –Team		***Empowerment*** Wikis and Blogs –Team		***Collectivism*** Wikis and Blogs-Non-Team member	
Mean	**1.487804878**	Mean	**1.268292683**	Mean	**1.3**
Median	2	Median	1	Median	1
Standard Deviation	0.675349	Standard Deviation	0.922615	Standard Deviation	0.72324
Count	41	Count	41	Count	40
Confidence Level(95.0%)	0.213166748	Confidence Level(95.0%)	0.291213411	Confidence Level(95.0%)	0.23130

Table 11: Wikis and Blogs main motivations

For wikis and blogs, the main motivation appears to be collectivism (helping the company). Empowerment (feeling empowered by the use of Knowledge sharing media) is the second main motivation. This suggests that a strong company culture can foster contribution through Wikis and Blogs and that the features of tools that enhance empowerment are important in further enabling knowledge sharing.

Hence, we would like to emphasize that motivations were more easily recognized for knowledge sharing with team members than for knowledge sharing with people that are

[1] The level of confidence is estimated assuming that the answers follow a normal law defined by their mean and Std.

external to the team. This might suggest that motivations for contribution to Knowledge sharing beyond the team circle should rather be studied on a case by case basis.

Motivations for sharing knowledge through Instant Messaging

Reciprocity IM-Team		***Trust*** IM-Team		***Networking*** IM-Team	
Mean	**1.243902439**	Mean	**1.268292683**	Mean	**1.277777778**
Median	2	Median	1	Median	1
Standard Deviation	0.969032709	Standard Deviation	0.742441588	Standard Deviation	0.659485129
Count	41	Count	41	Count	41
Confidence Level(95.0%)	0.305864464	Confidence Level(95.0%)	0.234343481	Confidence Level(95.0%)	0.223137665

Table 12: Main motivations for instant messaging

As mentioned earlier, motivations differ strongly with the kind of media used. In the case of instant messaging, a media with stronger velocity and less reprocessability, the motivations shift towards networking, trust and reciprocity. Indeed, within the team, improving the relationship with team members, trusting team members, and expanding one's network are strong factors affecting the ability to excel at work.

However from a KM practitioner's point of view, these motivations are quite natural and it is difficult for managers to have an impact on them. Again motivations beyond the team circle are harder to highlight and would require more investigation.

Study of the dependency between virtuality and motivations for contribution to knowledge sharing

Earlier we discussed motivations independently of the degree of virtuality. One important point for KM practitioners is adapting the knowledge sharing policies according to degree of virtuality of their employees. In this respect, knowing the dependency between degree of virtuality and motivations can be considered as an important asset.

Methodology

In what follows, we transformed our survey data with the following scale:

Degree of virtuality			
I work in a fixed and in the same location as my team members	-1	I work in a mobile environment with short-lived and dynamic team or I work independently	1
I work in a mobile environment on a project-based assignment	0		

One of our objectives was to find how virtuality influences our contribution to knowledge sharing. For that, we first tested the dependency between virtuality and the different motivations that respondents rated. To estimate this dependency, one common test is to calculate the correlations (2 variables being independent implies having a null correlation coefficient).

We first calculated the Spearman correlations[2] with the degree of virtuality (the correlation of spearman applies to all models) and then for the highest correlations (>0.25), we verified that the degree of virtuality is the main factor for these motivations. Indeed high correlations can be due to dependency with other variables, so we need to see the relative impact of the different factors we have. For that, we did regressions on the parameters (including age, education, seniority) that present correlations superior to 0.1 with the tested motivator[3]. Finally the regressions are confirmed by a test on the size of the unexplained errors (P>|t|) that has to be lower than 10%.

Virtuality and contribution to wikis and blogs for non-team members

Following the above mentioned methodology, in the case of wikis and blogs for non-team members, we observed high correlations with Collectivism, Empowerment and Networking.

Correlations Wikis and Blogs-Non-Team member	**Collectivism**	**Empowerment**	**Networking**
Virtuality	0.35324059	0.26456347	0.29998068

Next, we tested whether these high correlations are not incurred by other variables.

1. Correlation between virtuality and Collectivism:

Collectivism	Coeff.	P>|t|	[95% Conf. Interval] for Coeff.
Age	-.0321488	0.807	[-.2972258 .2329283]
Education	-.2754536	0.065	[-.5689955 .0180883]
Virtuality	.2915408	0.054	[-.0046747 .5877563]

2. Correlation between virtuality and empowerment:

Empowerment	Coeff.	P>|t|	[95% Conf. Interval] for

[2] $\rho_{X,Y} = \frac{cov(X,Y)}{\sigma_X * \sigma_Y} = \sum_i \frac{(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_i (x_i - \bar{x})^2 (y_i - \bar{y})^2}}$

[3] Our analysis was done with the software Stata.

			Coeff.
Virtuality	.3055286	0.099	[-.0602078 .671265]

3. Correlation between virtuality and networking:

Networking	Coeff.	P>|t|	[95% Conf. Interval] for Coeff.
Age	.0485779	0.804	[-.3460325 .4431884]
Virtuality	.3551113	0.109	[-.0830278 .7932505]

Though there is a strong negative correlation with education, virtuality seems to positively influence collectivism as a motivation for knowledge sharing.

So an increased virtuality has a positive impact on collectivism, empowerment and networking as motivations for contributing to wikis and blogs.

Virtuality and motivations for sharing knowledge though instant messaging

Correlations instant Messaging	**Empowerment** Team Members	**Empowerment** Non Team Members	**Collectivism** Non Team Members
Virtuality	0.35801651	0.31576715	0.31413128

We applied the same methodology for instant messaging tools.

1. Correlation between virtuality and empowerment within the team:

Empowerment	Coeff.	P>|t|	[95% Conf. Interval] for Coeff.
Age	.0262712	0.870	[-.2982737 .3508161]
Virtuality	.360678	0.051	[-.0012192 .7225751]

2. Correlation between virtuality and empowerment beyond the team:

Empowerment	Coeff.	P>|t|	[95% Conf. Interval] for Coeff.
Age	-.13497	0.341	[-.4193782 .1494383]
Virtuality	.3264365	0.051	[-.0014534 .6543264]

3. Correlation between virtuality and Collectivism beyond the team:

Collectivism	Coeff.	P>|t|	[95% Conf. Interval] for Coeff.

Age	.0438379	0.821	[-.3480518 .4357276]
Education	-.1558838	0.526	[-.6514886 .339721]
Virtuality	.3606939	0.103	[-.076489 .7978767]

Again the tests were successful and virtuality has a positive impact on collectivism, empowerment as motivations for contributing our knowledge through instant messaging.

Virtuality and motivations for sharing knowledge though social networks

Finally we studied the dependency with virtuality for SNS/Twitter with team members.

Correlations SNS/Twitter - Team members	**Self Interest**	**Trust**
Virtuality	0.41564427	0.30794088

1. Correlation between virtuality and self-interest within the team:

Self-interest	Coeff.	P>|t|	[95% Conf. Interval] for Coeff.
Seniority	-.1569521	0.654	[-.907704 .5937997]
Education	.0153045	0.973	[-.967408 .9980169]
Virtuality	.5639857	0.236	[-.4257714 1.553743]

2. Correlation between virtuality and trust within the team:

Trust	Coeff.	P>|t|	[95% Conf. Interval] for Coeff.
Seniority	-.0867796	0.790	[-.78698 .6134209]
Education	.0364702	0.932	[-.8800719 .9530123]
Virtuality	.386519	0.377	[-.5365933 1.309631]

Our test is less reliable given that P>|t|=23.6% but we can assume for further studies that the role of trust and self interest in Knowledge Sharing through social media may be increased by virtuality.

Implications of this model

It is interesting to note that virtuality stresses the influence of certain motivations. Indeed we did not observe strong negative correlations between virtuality and the motivations

for contributing to knowledge sharing. This suggests that companies having a higher rate of virtual workers maybe advantaged for the use of knowledge sharing technologies.

Studying the impact of virtuality on the motivations is of interest for companies to adapt their strategies with their level of virtual workers and we hope that the insights we provided will be useful for KM practitioners.

To a larger extent, we advise that companies take into account how their workers are dispatched before designing, purchasing tools for Knowledge sharing and designing their policies for contribution on these tools.

Discussion and Implications

Even though our study highlighted some of the impacts degree of virtuality and features of tools have on motivations to knowledge contributions, given that there are not many empirical studies in this area, there is a definite need to further examine these relationships.

Some of the areas that could be further investigated in future studies are, a more detailed analysis of the motivations for knowledge contribution among teams with different degrees of virtuality. Even though we asked the respondents to identify their motivations separately between contribution towards their team members and non-team members, we found that there was not enough information for us to further explore this area. Additionally, we noticed that trust and self-interest were key motivations in some cases; however we did not have enough information from our survey results to further explain these cases.

As our study focused only on two features of Media Synchronicity Theory (velocity and reprocessability) in Web 2.0 tools for knowledge contribution purposes, further studies can also explore the effect of other features such as symbol sets and parallelism in knowledge contribution motivations.

The main limitation of this study is that it was conducted among employees of one company. Our results could be strongly affected by the organizational culture and level of IT proficiency of employees in the company. Additionally, employees who were asked to participate in our questionnaire are mostly from the United States, Canada and European countries. Therefore, to determine whether the study findings can be applied in other organizations, there is a need for conducting similar studies at additional multinational firms in other industries.

Implications for knowledge management practitioners

The results of this study suggest that employees' degrees of virtuality and the features of the knowledge sharing tools (velocity and reprocessability, in this case) affected their motivation towards knowledge contribution. As enterprises increasingly implement virtual teams and with the variety of Web 2.0 tools that are available for knowledge sharing tools among employees, management and knowledge management practitioners need to

1) Ensure that employees have a clear understanding of the benefits for using such tools.

2) Have a better understanding on what factors motivate employees with different degrees of virtuality and nature of each tool in order to emphasize the right factors. For example, a professional recognition scheme should be implemented in the traditional and hybrid settings, where employees perceive that their contributions on such platforms have an impact on their professional performance and work relationships. If employees contribute their knowledge as a give-back for betterment of the company, a show of appreciation and feedback given to employees on how their contributions have helped the company would be suitable.

3) Not only emphasizing on the right factors, but management and knowledge management practitioners must also be aware of employees' negative perception of some of the factors. For example, in our studies, organizational factors such as economic incentives and management influence do not motivate virtual workers.

Conclusion

With ease of use and Web 2.0 technologies' omnipresence on Internet, employees can soon expect similar tools in their corporate environment. Enterprises can take advantage of this by using Web 2.0 technologies as alternative platforms, which can be used as extensions or complimentary to their existing KMS, as principles of Web 2.0 and KM are similar in many ways. Additionally, we also see that Web 2.0 helps to address issues faced in traditional KMS such as difficulties of use or not being able to accommodate the virtual team settings. In this study, we found that employees with various degrees of virtuality use Web 2.0 technologies, especially Wikis, Blogs and instant messaging for knowledge contribution. However, the motivations for each group of employees can be different according to their work settings and features of the tools. Management and KM practitioners have to continue being observant of and open to employees' attitude towards the use of Web 2.0 to be able to successfully gain benefits from using Web 2.0 technologies in the KM context.

References

1. Alavi, M. and Leidner, D. (2001),"Knowledge management and knowledge management systems: Conceptual foundations and research issues", *MIS Quarterly*, Vol. 25 No. 1, pp. 107–135.
2. Albanese, R. and Fleet, D. D. V. (1985),"Rational Behavior in Groups: The Free-Riding Tendency", *Academy of Management Review,*Vol. 10, pp. 244-255.
3. Allen, J. (2010), "Knowledge-Sharing Successes in Web 2.0 Communities", *IEEE Technology and Society Magazine*, Vol. 29 No. 1, pp. 58-64.
4. Anderson, P. (2007),"What is Web 2.0? Ideas, technologies and implications for education", *JISCTechnology & Standards Watch*, available at: www.jisc.ac.uk/media/documents/techwatch/tsw0701b.pdf
5. Andrews,D. (2001), "Knowledge Management: Are we addressing the right issues?",*Managing Partner*, Vol. 4 No. 1, pp. 23-25.
6. Ankolekar, A., Krotzsch, M., Tran, T. and Vrandecic, D. (2008),"The two cultures: mashing up Web 2.0and the semantic web", *Web Semantics: Science, Services and Agents on the World Wide Web*, Vol. 6 No.1, pp. 70-5.
7. Ardichvili, A., Maurer, M., Li, W., Wentling, T. and Stuedemann, R. (2006),"Cultural influences in knowledge sharing through online communities of practice", *Journal of Knowledge Management*, Vol. 10 No. 1, pp. 94-107.
8. Barson, R., Foster, G., Struck, T., Ratchev, S., Pawar, K., Weber, F. and Wunram, M. (2000), ''Inter- and intra-organizational barriers to sharing knowledge in the extended supply chain'', e2000 ConferenceProceedings, University of Nottingham, Nottingham.
9. Cabrera, A., Collins, W.C. and Salgado, J.F. (2006),"Determinant of individual engagement in knowledge sharing", *The International Journal of Human Resource Management*, Vol. 17 No. 2, pp. 245-64.
10. Garcia-Perez, A and Ayres, R.(2010), "Wikifailure: the Limitations of Technology for Knowledge Sharing", *Electronic Journal of Knowledge Management*, Vol. 8 No.1, pp. 43-52.
11. Hambley, L. A., O'Neill, T. A., Kline, T. J. B. (2007), "Virtual team leadership: The effects of leadership style and communication medium on team interaction styles and outcomes", *Organizational Behavior and Human Decision Processes*, Vol. 103, pp. 1-20.
12. Hertel, G., Geister, S., Konradt, U. (2005), "Managing virtual teams: A review of current empirical research", *Human Resource Management Review*, Vol. 15 No.1, pp. 69-95.
13. Ireson, N. and Burel, G. (2010), "Knowledge Sharing in E-Collaboration", In Wimmer,, Maria, Chappelet,, Jean-Loup, Janssen,, Marijn, and Scholl,, Hans (Eds.), *Electronic Government*, Volume 6228 of *Lecture Notes in Computer Science*, pp. 351-362. Springer Berlin / Heidelberg.
14. Kankanhalli, A., Tan, C.Y.B., Wei, K.K. (2005),"Contributing knowledge to electronic knowledge repositories: an empirical investigation", *MIS Quarterly*,Vol. 29 No. 1, pp. 113–143.

15. Keyes, J. (2006), *Knowledge Management, Business Intelligence, and ContentManagement: the IT practitioner's Guide*, Taylor & Francis Group, USA.
16. Lee J., Y. Km, and M. Kim. (2006),"Effects of Managerial Drivers and Climate Maturity on Knowledge-Management Performance: Empirical Validation", *Information Resources Management Journal,*Vol. 19 No. 3, pp. 48-60.
17. Levy, M. (2009), "Web 2.0 - Implications on knowledge management", *Journal of Knowledge Management*, Vol. 13 No. 1, pp. 120-134.
18. McAfee, A. (2006), ''Enterprise 2.0: The dawn of emergent collaboration'', *MIT Sloan Management Review*, Vol. 47 No. 3, pp. 21-8.
19. McDermott, R. (1999),"Why information technology inspired but cannot deliver knowledge management", *California Management Review*, Vol. 41 No. 4, pp. 103-117.
20. Oakes K. and Rengarajan R. (2002), "E-learning: The hitchhiker's guide to knowledge management", *T&D*, Vol. 56 No. 6, pp. 75(3).
21. Pachler, N. and Daly, C. (2009), "Narrative and learning with Web 2.0 technologies: towards a research agenda", *Journal of Computer Assisted Learning*, Vol. 25 No. 1,pp. 6-18.
22. Paroutis, S. and Saleh, A. A. (2009),"Determinants of knowledge sharing using web 2.0 technologies",*Journal of Knowledge Management*, Vol. 13 No. 4, pp. 52-63.
23. Ridings, C.M., Gefen, D., Arinze, B. (2002), "Some antecedents and effects of trust in virtual communities", *Strategic Information Systems*, Vol. 11 No. 3-4, pp. 271–295.
24. Rizova, P. (2006), "Are you networked for Successful Innovation?"*MIT Sloan Management Review*, Vol. 47 No. 3, pp. 49-55.
25. Rollett, H., Lux, M., Strohmaier, M., Gisela Dosinger, G. and Tochtermann, K. (2007), "The Web 2.0 way of learning with technologies", *International Journal of Learning Technology*, Vol. 3 No. 1, pp. 87-107.
26. Scarff, A. (2006),"Advancing knowledge sharing with Intranet 2.0",*Knowledge Management Review*, Vol. 9 No.4, pp. 24-27.
27. Spanbauer, S. (2006),"Knowledge Management 2.0", *CIO*, Vol. 20 No. 5, p. 29-34
28. Sun, S. Y., Ju, T. L., Chumg, H. F., Wu, C. Y., and Ju, C. P. (2009),"Influence on willingness of virtual community's knowledge sharing: Based on social capital theory and habitual domain",*World Academy of Science, Engineering and Technology*, Vol. 53, pp. 142-149.
29. Tebbutt, D. (2007), "Breathing new life into KM",*Information World Review*, www.iwr.co.uk/information-world-review/features/2172573/breathing-life-km
30. Umeda, M. (2006), *Web Shinkaron*,ChikumaShobo Publishing Co. Ltd.,Japan.
31. Wasko, M., and Faraj, S. (2005), "Why should I share? Examining social capital and knowledge contribution in electronic networks of practice", *MIS Quarterly*, Vol. 29 No. 1, pp. 35-57.
32. Whelan, E. (2007),"Exploring knowledge exchange in electronic networks of practice", *Journal of Information Technology*, Vol. 22 No. 1, pp. 5-12.
33. Wu, Sheng, Lin, C. S., and Lin, Tung-Ching (2006), "Exploring Knowledge Sharing in Virtual Teams: A Social Exchange Theory Perspective", In *HICSS '06: Proceedings of*

the Proceedings of the 39th Annual Hawaii International Conference on System Sciences (HICSS'06) Track 1, Washington, DC, USA, pp. 26b. IEEE Computer Society.

Appendix A – Questionnaire

Personal Data

What is your age group? *

- ☐ 25 years and below
- ☐ 26-35 years
- ☐ 36-45 years
- ☐ 46-55 years
- ☐ 56 years and above

What is your highest education level? *

- ☐ High school
- ☐ Bachelor's Degree
- ☐ Master's Degree
- ☐ Doctoral Degree
- ☐ Other: _____

How long have you been working in the company? *

- ☐ Less than 1 year
- ☐ 1 to 3 years
- ☐ 3 to 5 years
- ☐ More than 5 years

How many people are you directly working with (that you see or communicate with at least once every 2 weeks)? *

- ☐ 1-5 people
- ☐ 6-10 people
- ☐ More than 10

What is your job function? *

- ☐ Administrative
- ☐ Technical
- ☐ Service-oriented
- ☐ Managerial
- ☐ Sales/Marketing
- ☐ Other: _____

YourWorkEnvironment

Which one of the following statements describes your work environment the best? *

- ☐ I work in a fixed and in the same location as my team members
- ☐ I work in a mobile environment on a project-based assignment
- ☐ I work in a mobile environment with short-lived and dynamic team or I work independently

How often do you interact with your team members face-to-face? *

- ☒ Every day
- ☐ Every week
- ☐ Every 2 weeks
- ☐ Every month or more

How often do you interact with your team members via electronic communications? *

- ☐ Every day
- ☐ Every week
- ☐ Every 2 weeks
- ☐ Every month or more

Knowledge Contribution to Wikis or Blogs

You have a clear idea of what benefit or reward you will receive by contributing your knowledge through Wikis or Blogs? *

	1	2	3	4	5	
Strong Disagree	☐	☐	☐	☐	☐	Strongly Agree

How often do you contribute to knowledge sharing through Wikis or Blogs for your team members? *

- ☐ Never
- ☐ Once a year
- ☐ A few times a year
- ☐ Every month
- ☐ All the time

Knowledge Contribution to Wikis or Blogs for team members

I contribute my knowledge to Wikis or Blogs for my team members because:

** Kindly note that this is related to your motivation to the act of knowledge contribution. Agree or Strongly Agree indicate that the reason is applicable to you. Neutral indicate that that reason has no relevance on your decision to contribute your knowledge. Disagree or Strongly disagree indicate that the reason is not applicable to you as a motivation.*

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My management or peers use/advise me to use it	☐	☐	☐	☐	☐
There are incentives based on my contribution of	☐	☐	☐	☐	☐

knowledge through this media					
My peers and/or management will recognize the quality of my contribution and it may affect my professional performance					
My peers and/or management will recognize the quality of my contribution and it may affect my work relationship with them					
I can easily access this media from my work and home					
For my self-interest, such as self-knowledge management or make me work more effectively					
I trust the people who have access to my contribution will not misuse the knowledge					
I expect that someone will reciprocate with their knowledge, especially when I am in need of it					
I think that my contribution will be useful to the company and I contribute my knowledge as a give-back					
I feel empowered by having access to the tools and being able to contribute at will					
I mainly use the tools to network and connect with the experts in the company to get assistance with some of the issues I face					
The look and feel and the general aesthetics of these tools makes me want to use them					

If none of the above reasons is applicable to you, please describe your motivation for knowledge contribution through Wikis or Blogs for team members:

If possible, could you give an estimation of the number of people who read/access your contribution through Wikis or Blogs for team members?*

- ○ 1-10
- ○ 11-30
- ○ 31-50
- ○ more than 50
- ◉ Unknown

Knowledge Contribution to Wikis or Blogs for non-team members

How often do you contribute to knowledge sharing through Wikis or Blogs for your non-team members? *

- ○ Never
- ○ Once a year
- ○ A few times a year
- ○ Every month
- ○ All the time

I contribute my knowledge to Wikis or Blogs for my non-team members because:

** Kindly note that this is related to your motivation to the act of knowledge contribution. Agree or Strongly Agree indicate that the reason is applicable to you. Neutral indicate that that reason has no relevance on your decision to contribute your knowledge. Disagree or Strongly disagree indicate that the reason is not applicable to you as a motivation.*

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My management or peers use/advise me to use it	○	○	○	○	○
There are incentives based on my contribution of knowledge through this media	○	○	○	○	○
My peers and/or management will recognize the quality of my contribution and it may affect my professional	○	○	○	○	○

performance					
My peers and/or management will recognize the quality of my contribution and it may affect my work relationship with them	☐	☐	☐	☐	☐
I can easily access this media from my work and home	☐	☐	☐	☐	☐
For my self-interest, such as self-knowledge management or make me work more effectively	☐	☐	☐	☐	☐
I trust the people who have access to my contribution will not misuse the knowledge	☐	☐	☐	☐	☐
I expect that someone will reciprocate with their knowledge, especially when I am in need of it	☐	☐	☐	☐	☐
I think that my contribution will be useful to the company and I contribute my knowledge as a give-back	☐	☐	☐	☐	☐
I feel empowered by having access to the tools and being able to contribute at will	☐	☐	☐	☐	☐
I mainly use the tools to network and connect with the experts in the company to get assistance with some of the issues I face	☐	☐	☐	☐	☐
The look and feel and the general aesthetics of these tools makes me want to use them	☐	☐	☐	☐	☐

If none of the above reasons is applicable to you, please describe your motivation for knowledge contribution through Wikis or Blogs for non-team members:

If possible, could you give an estimation of the number of people who read/access your contribution through Wikis or Blogs for non-team members? *

- ☐ 1-10 readers
- ☐ 11-30 readers
- ☐ 31-50 readers
- ☐ more than 50 readers
- ☐ Unknown

Knowledge Contribution to SocialBlue or BlueTwit/Twitter

You have a clear idea of what benefit or reward you will receive by contributing your knowledge through SocialBlue or BlueTwit/Twitter? *

	1	2	3	4	5	
Strong Disagree	☐	☐	☐	☐	☐	Strongly Agree

How often do you contribute to knowledge sharing through SocialBlue or BlueTwit/Twitter for your team members? *

- ☐ Never
- ☐ Once a year
- ☐ A few times a year
- ☐ Every month
- ☐ All the time

Knowledge Contribution to SocialBlue or BlueTwit/Twitter for team members

I contribute my knowledge to SocialBlue or BlueTwit/Twitter for my team members because:

** Kindly note that this is related to your motivation to the act of knowledge contribution. Agree or Strongly Agree indicate that the reason is applicable to you. Neutral indicate that that reason has no relevance on your decision to contribute your knowledge. Disagree or Strongly disagree indicate that the reason is not applicable to you as a motivation.*

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My management or peers use/advise me to use it	☐	☐	☐	☐	☐
There are incentives based on my contribution of knowledge through this media	☐	☐	☐	☐	☐
My peers and/or management will recognize the quality of my contribution and it may affect my professional performance	☐	☐	☐	☐	☐

My peers and/or management will recognize the quality of my contribution and it may affect my work relationship with them	☐	☐	☐	☐	☐
I can easily access this media from my work and home	☐	☐	☐	☐	☐
For my self-interest, such as self-knowledge management or make me work more effectively	☐	☐	☐	☐	☐
I trust the people who have access to my contribution will not misuse the knowledge	☐	☐	☐	☐	☐
I expect that someone will reciprocate with their knowledge, especially when I am in need of it	☐	☐	☐	☐	☐
I think that my contribution will be useful to the company and I contribute my knowledge as a give-back	☐	☐	☐	☐	☐
I feel empowered by having access to the tools and being able to contribute at will	☐	☐	☐	☐	☐
I mainly use the tools to network and connect with the experts in the company to get assistance with some of the issues I face	☐	☐	☐	☐	☐
The look and feel and the general aesthetics of these tools makes me want to use them	☐	☐	☐	☐	☐

If none of the above reasons is applicable to you, please describe your motivation for knowledge contribution through SocialBlue or BlueTwit/Twitter for your team members:

If possible, could you give an estimation of the number of people who read/access your contribution through SocialBlue or BlueTwit/Twitter for team members?*

- ☐ 1-10 readers
- ☐ 11-30 readers
- ☐ 31-50 readers
- ☐ more than 50 readers
- ☐ Unknown

Knowledge Contribution to SocialBlue or BlueTwit/Twitter for non-team members

How often do you contribute to knowledge sharing through SocialBlue or BlueTwit/Twitter for non-team members? *

- ☐ Never
- ☐ Once a year
- ☐ A few times a year
- ☐ Every month
- ☐ All the time

Knowledge Contribution to SocialBlue or BlueTwit/Twitter for non-team members

I contribute my knowledge to SocialBlue or BlueTwit/Twitter for my non-team members because: **Kindly note that this is related to your motivation to the act of knowledge contribution. Agree or Strongly Agree indicate that the reason is applicable to you. Neutral indicate that that reason has no relevance on your decision to contribute your knowledge. Disagree or Strongly disagree indicate that the reason is not applicable to you as a motivation.*

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My management or peers use/advise me to use it	☐	☐	☐	☐	☐
There are incentives based on my contribution of knowledge through this media	☐	☐	☐	☐	☐
My peers and/or management will recognize the quality of my contribution and it may affect my professional performance	☐	☐	☐	☐	☐
My peers and/or management will recognize the quality of my contribution and it may affect my work relationship with them	☐	☐	☐	☐	☐

I can easily access this media from my work and home	☐	☐	☐	☐	☐
For my self-interest, such as self-knowledge management or make me work more effectively	☐	☐	☐	☐	☐
I trust the people who have access to my contribution will not misuse the knowledge	☐	☐	☐	☐	☐
I expect that someone will reciprocate with their knowledge, especially when I am in need of it	☐	☐	☐	☐	☐
I think that my contribution will be useful to the company and I contribute my knowledge as a give-back	☐	☐	☐	☐	☐
I feel empowered by having access to the tools and being able to contribute at willl	☐	☐	☐	☐	☐
I mainly use the tools to network and connect with the experts in the company to get assistance with some of the issues I face	☐	☐	☐	☐	☐
The look and feel and the general aesthetics of these tools makes me want to use them	☐	☐	☐	☐	☐

If none of the above reasons is applicable to you, please describe your motivation for knowledge contribution through SocialBlue or BlueTwit/Twitter for non-team members:

If possible, could you give an estimation of the number of people who read/access your contribution through SocialBlue or BlueTwit/Twitter for non-team members?*

- ☐ 1-10 readers
- ☐ 11-30 readers

- ☐ 31-50 readers
- ☐ more than 50 readers
- ☐ Unknown

Knowledge Contribution through Instant Messaging

You have a clear idea of what benefit or reward you will receive by contributing your knowledge through Instant Messaging? *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

How often you contribute to knowledge sharing through Instant Messaging for team members? *

- ☐ Never
- ☐ Once a year
- ☐ A few times a year
- ☐ Every month
- ☐ All the time

Knowledge Contribution through Instant Messaging for team members

I contribute my knowledge through Instant Messaging for my team members because:

** Kindly note that this is related to your motivation to the act of knowledge contribution. Agree or Strongly Agree indicate that the reason is applicable to you. Neutral indicate that that reason has no relevance on your decision to contribute your knowledge. Disagree or Strongly disagree indicate that the reason is not applicable to you as a motivation.*

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My management or peers use/advise me to use it	☐	☐	☐	☐	☐
There are incentives based on my contribution of knowledge through this media	☐	☐	☐	☐	☐
My peers and/or management will recognize the quality of my contribution and it may affect my professional performance	☐	☐	☐	☐	☐
My peers and/or management will recognize the quality of my contribution and it may affect my work relationship with them	☐	☐	☐	☐	☐
I can easily access this	☐	☐	☐	☐	☐

media from my work and home					
For my self-interest, such as self-knowledge management or make me work more effectively	☐	☐	☐	☐	☐
I trust the people who have access to my contribution will not misuse the knowledge	☐	☐	☐	☐	☐
I expect that someone will reciprocate with their knowledge, especially when I am in need of it	☐	☐	☐	☐	☐
I think that my contribution will be useful to the company and I contribute my knowledge as a give-back	☐	☐	☐	☐	☐
I feel empowered by having access to the tools and being able to contribute at willl	☐	☐	☐	☐	☐
I mainly use the tools to network and connect with the experts in the company to get assistance with some of the issues I face	☐	☐	☐	☐	☐
The look and feel and the general aesthetics of these tools makes me want to use them	☐	☐	☐	☐	☐

If none of the above reasons is applicable to you, please describe your motivation for knowledge contribution through Instant Messaging for team members:

If possible, could you give an estimation of the number of people who read/access your contribution through Instant Messaging for team members?*

- ☐ 1-10 readers
- ☐ 11-30 readers
- ☐ 31-50 readers

- ☐ more than 50 readers
- ☐ Unknown

Knowledge Contribution through Instant Messaging for non-team members

How often you contribute to knowledge sharing through Instant Messaging for non-team members? *

- ☐ Never
- ☐ Once a year
- ☐ A few times a year
- ☐ Every month
- ☐ All the time

Knowledge Contribution through Instant Messaging for non-team members

I contribute my knowledge through Instant Messaging for my non-team members because:

** Kindly note that this is related to your motivation to the act of knowledge contribution. Agree or Strongly Agree indicate that the reason is applicable to you. Neutral indicate that that reason has no relevance on your decision to contribute your knowledge. Disagree or Strongly disagree indicate that the reason is not applicable to you as a motivation.*

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My management or peers use/advise me to use it	☐	☐	☐	☐	☐
There are incentives based on my contribution of knowledge through this media	☐	☐	☐	☐	☐
My peers and/or management will recognize the quality of my contribution and it may affect my professional performance	☐	☐	☐	☐	☐
My peers and/or management will recognize the quality of my contribution and it may affect my work relationship with them	☐	☐	☐	☐	☐
I can easily access this media from my work and home	☐	☐	☐	☐	☐
For my self-interest, such as self-knowledge management or make me work more effectively	☐	☐	☐	☐	☐
I trust the people who	☐	☐	☐	☐	☐

have access to my contribution will not misuse the knowledge					
I expect that someone will reciprocate with their knowledge, especially when I am in need of it					
I think that my contribution will be useful to the company and I contribute my knowledge as a give-back					
I feel empowered by having access to the tools and being able to contribute at willl					
I mainly use the tools to network and connect with the experts in the company to get assistance with some of the issues I face					
The look and feel and the general aesthetics of these tools makes me want to use them					

If none of the above reasons is applicable to you, please describe your motivation for knowledge contribution through Instant Messaging for non-team members:

If possible, could you give an estimation of the number of people who read/access your contribution through Instant Messaging for non-team members?*

- 1-10 readers
- 11-30 readers
- 31-50 readers
- more than 50 readers
- Unknown

Appendix B – Frequency of knowledge contributions of traditional worker

How often do you interact with your team members face-to-face?	How often do you contribute to knowledge sharing through Wikis or Blogs for your team members?					
	Never	Once a year	A few times a year	Every month	All the time	Grand Total
Every day	1	0	1	2	8	12
Every week	0	0	0	1	4	5
Every 2 weeks	0	0	1	0	0	1
Every month or more	0	0	0	0	0	0
Grand Total	**1**	**0**	**2**	**3**	**12**	**18**

Table 13 Frequency of knowledge contribution through Wikis and Blogs for team member by traditional workers

How often do you interact with your team members face-to-face?	How often do you contribute to knowledge sharing through Wikis or Blogs for your non-team members?					
	Never	Once a year	A few times a year	Every month	All the time	Grand Total
Every day	2	0	5	2	3	12
Every week	0	0	0	2	3	5
Every 2 weeks	0	0	1	0	0	1
Every month or more	0	0	0	0	0	0
Grand Total	**2**	**0**	**6**	**4**	**6**	**18**

Table 14 Frequency of knowledge contribution through Wikis and Blogs for non-team member by traditional workers

How often do you interact with your team members face-to-face?	How often do you contribute to knowledge sharing through SocialBlue or BlueTwit/Twitter for your team members?					
	Never	Once a year	A few times a year	Every month	All the time	Grand Total
Every day	10	0	0	0	2	12
Every week	3	0	0	1	1	5
Every 2 weeks	1	0	0	0	0	1

Grand Total	**14**	**0**	**0**	**1**	**3**	**18**

Table 15 Frequency of knowledge contribution through SocialBlue and BlueTwit/Twitter for team member by traditional workers

How often do you interact with your team members face-to-face?	How often do you contribute to knowledge sharing through SocialBlue or BlueTwit/Twitter for non-team members?				
	Never	**A few times a year**	**Every month**	**All the time**	**Grand Total**
Every day	9	1	0	2	12
Every week	3	0	1	1	5
Every 2 weeks	1	0	0	0	1
Grand Total	**13**	**1**	**1**	**3**	**18**

Table 16 Frequency of knowledge contribution through SocialBlue and BlueTwit/Twitter for non-team member by traditional workers

How often do you interact with your team members face-to-face?	How often you contribute to knowledge sharing through Instant Messaging for team members?			
	Never	**Once a year**	**All the time**	**Grand Total**
Every day	2	0	10	12
Every week	0	1	4	5
Every 2 weeks	0	0	1	1
Grand Total	**2**	**1**	**15**	**18**

Table 17 Frequency of knowledge contribution through Instant Messaging for team member by traditional workers

How often do you interact with your team members face-to-face?	How often you contribute to knowledge sharing through Instant Messaging for non-team members?				
	Never	**A few times a year**	**Every month**	**All the time**	**Grand Total**
Every day	3	2	2	5	12
Every week	0	0	2	3	5
Every 2 weeks	0	0	0	1	1
Grand Total	**3**	**2**	**4**	**9**	**18**

Table 18 Frequency of knowledge contribution through Instant Messaging for non-team member by traditional workers

Appendix C – Frequency of knowledge contributions of hybrid workers

How often do you interact with your team members face-to-face?	How often do you contribute to knowledge sharing through Wikis or Blogs for your team members?					
	Never	Once a year	A few times a year	Every month	All the time	Grand Total
Every day	0	0	1	0	1	2
Every week	0	0	1	0	1	2
Every 2 weeks	0	1	0	1	3	5
Every month or more	1	0	1	1	3	6
Grand Total	**1**	**1**	**3**	**2**	**8**	**15**

Table 19 Frequency of knowledge contribution through Wikis and Blogs for team member by hybrid workers

How often do you interact with your team members face-to-face?	How often do you contribute to knowledge sharing through Wikis or Blogs for your non-team members?					
	Never	Once a year	A few times a year	Every month	All the time	Grand Total
Every day	0	0	0	1	1	2
Every week	0	1	0	0	1	2
Every 2 weeks	1	0	0	1	3	5
Every month or more	0	0	1	2	3	6
Grand Total	**1**	**1**	**1**	**4**	**8**	**15**

Table 20Frequency of knowledge contribution through Wikis and Blogs for non-team member by hybrid workers

How often do you interact with your team members face-to-face?	How often do you contribute to knowledge sharing through SocialBlue or BlueTwit/Twitter for your team members?					
	Never	Once a year	A few times a year	Every month	All the time	Grand Total
Every day	0	0	1	0	1	2
Every week	1	0	1	0	0	2
Every 2 weeks	3	0	1	0	1	5
Every month or	2	2	1	0	1	6

more						
Grand Total	**6**	**2**	**4**	**0**	**3**	**15**

Table 21Frequency of knowledge contribution through SocialBlue or BlueTwit/Twitter for team member by hybrid workers

How often do you interact with your team members face-to-face?	**How often do you contribute to knowledge sharing through SocialBlue or BlueTwit/Twitter for non-team members?**				
	Never	**Once a year**	**A few times a year**	**All the time**	**Grand Total**
Every day	0	0	1	1	2
Every week	2	0	0	0	2
Every 2 weeks	3	1	0	1	5
Every month or more	2	1	1	2	6
Grand Total	**7**	**2**	**2**	**4**	**15**

Table 22Frequency of knowledge contribution through SocialBlue or BlueTwit/Twitter for non-team member by hybrid workers

How often do you interact with your team members face-to-face?	**How often you contribute to knowledge sharing through Instant Messaging for team members?**			
	Never	**A few times a year**	**All the time**	**Grand Total**
Every day	0	0	2	2
Every month or more	0	1	5	6
Every week	1	0	1	2
Every 2 weeks	0	0	5	5
Grand Total	**1**	**1**	**13**	**15**

Table 23Frequency of knowledge contribution through Instant Messaging for team member by hybrid workers

How often do you interact with your team members face-to-face?	**How often you contribute to knowledge sharing through Instant Messaging for non-team members?**				
	Never	**A few times a year**	**Every month**	**All the time**	**Grand Total**

Every day	0	0	1	1	2
Every week	1	0	0	1	2
Every 2 weeks	1	0	0	4	5
Every month or more	2	1	1	2	6
Grand Total	**4**	**1**	**2**	**8**	**15**

Table 24Frequency of knowledge contribution through Instant Messaging for non-team member by hybrid workers

Appendix D – Frequency of knowledge contributions of virtual workers

How often do you interact with your team members face-to-face?	How often do you contribute to knowledge sharing through Wikis or Blogs for your team members?					
	Never	**Once a year**	**A few times a year**	**Every month**	**All the time**	**Grand Total**
Every day	0	0	0	0	2	2
Every week	0	0	0	0	0	0
Every 2 weeks	0	0	0	0	1	1
Every month or more	0	0	1	1	6	8
Grand Total	**0**	**0**	**1**	**1**	**9**	**11**

Table 25Frequency of knowledge contribution through Wikis or Blogs for team member by virtual workers

How often do you interact with your team members face-to-face?	How often do you contribute to knowledge sharing through Wikis or Blogs for your non-team members?					
	Never	**Once a year**	**A few times a year**	**Every month**	**All the time**	**Grand Total**
Every day	1	0	0	0	1	2
Every week	0	0	0	0	0	0
Every 2 weeks	0	0	0	0	1	1
Every month or more	0	0	1	2	5	8
Grand Total	**1**	**0**	**1**	**2**	**7**	**11**

Table 26Frequency of knowledge contribution through Wikis or Blogs for non-team member by virtual workers

How often do you interact with your team members face-to-face?	How often do you contribute to knowledge sharing through SocialBlue or BlueTwit/Twitter for your team members?					
	Never	**Once a year**	**A few times a year**	**Every month**	**All the time**	**Grand Total**
Every day	2	0	0	0	0	2
Every 2 weeks	0	0	1	0	0	1
Every month or	4	2	1	0	1	8

more						
Grand Total	**6**	**2**	**2**	**0**	**1**	**11**

Table 27Frequency of knowledge contribution through SocialBlue or BlueTwit/Twitter for team member by virtual workers

How often do you interact with your team members face-to-face?	**How often do you contribute to knowledge sharing through SocialBlue or BlueTwit/Twitter for non-team members?**				
	Never	**Once a year**	**A few times a year**	**All the time**	**Grand Total**
Every day	2	0	0	0	2
Every 2 weeks	0	0	1	0	1
Every month or more	5	2	0	1	8
Grand Total	**7**	**2**	**1**	**1**	**11**

Table 28Frequency of knowledge contribution through SocialBlue or BlueTwit/Twitter for non-team member by virtual workers

How often do you interact with your team members face-to-face?	**How often you contribute to knowledge sharing through Instant Messaging for team members?**	
	All the time	**Grand Total**
Every day	2	2
Every month or more	8	8
Every 2 weeks	1	1
Grand Total	**11**	**11**

Table 29Frequency of knowledge contribution through Instant Messaging for team member by virtual workers

How often do you interact with your team members face-to-face?	**How often you contribute to knowledge sharing through Instant Messaging for non-team members?**				
	Never	**A few times a year**	**Every month**	**All the time**	**Grand Total**
Every day	0	1	0	1	2
Every 2 weeks	0	0	0	1	1

Every month or more	1	1	0	6	8
Grand Total	**1**	**2**	**0**	**8**	**11**

Table 30Frequency of knowledge contribution through Instant Messaging for non-team member by virtual workers

Appendix E – Survey result for traditionalworkers

Wikis and Blogs – Team members

	Q1 - Management and Peer					Q2 - Economic Incentives					Q3 - Recognition - Professional Performance				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**2**	**1**	**3**	**7**	**3**	**3**	**2**	**5**	**5**	**1**	**0**	**1**	**3**	**8**	**4**
Score	-4	-1	0	7	6	-6	-2	0	5	2	0	-1	0	8	8
Sum of score	**8**					**-1**					**15**				

	Q4 - Recognition - Work Relationship					Q5 - Ease					Q6 - Self Interest				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**4**	**10**	**2**	**1**	**0**	**1**	**9**	**5**	**1**	**0**	**2**	**8**	**5**
Score	0	0	0	10	4	-2	0	0	9	10	-2	0	0	8	10
Sum of score	**14**					**17**					**16**				

	Q7 - Trust					Q8 - Reciprocity					Q9 - Collectivism / Give-back				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**1**	**1**	**8**	**6**	**0**	**0**	**0**	**9**	**7**	**0**	**0**	**0**	**8**	**8**
Score	0	-1	0	8	12	0	0	0	9	14	0	0	0	8	16
Sum of score	**19**					**23**					**24**				

	Q10 - Empowerment					Q11 - Networking					Q12 - Aesthetics				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**1**	**2**	**6**	**7**	**0**	**2**	**5**	**7**	**2**	**1**	**1**	**6**	**5**	**3**
Score	0	-1	0	6	14	0	-2	0	7	4	-2	-1	0	5	6
Sum of score	**19**					**9**					**8**				

Wikis and Blogs – Non-Team members

	Q1 - Management and Peer					Q2 - Economic Incentives					Q3 - Recognition - Professional Performance				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**2**	**2**	**4**	**6**	**1**	**2**	**1**	**5**	**6**	**1**	**0**	**0**	**3**	**9**	**3**
Score	-4	-2	0	6	2	-4	-1	0	6	2	0	0	0	9	6
Sum of score	**2**					**3**					**15**				

	Q4 - Recognition - Work Relationship					Q5 - Ease					Q6 - Self Interest				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**3**	**11**	**1**	**0**	**0**	**4**	**8**	**3**	**1**	**0**	**2**	**8**	**4**
Score	0	0	0	11	2	0	0	0	8	6	-2	0	0	8	8
Sum of score	**13**					**14**					**14**				

	Q7 - Trust					Q8 - Reciprocity					Q9 - Collectivism / Give-back				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Answer	**0**	**2**	**3**	**6**	**4**	**0**	**0**	**2**	**8**	**5**	**0**	**0**	**2**	**8**	**5**
Score	0	-2	0	6	8	0	0	0	8	10	0	0	0	8	10
Sum of score	**12**					**18**					**18**				

	Q10 - Empowerment					**Q11 - Networking**					**Q12 - Aesthetics**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**1**	**3**	**8**	**3**	**1**	**1**	**4**	**9**	**0**	**1**	**1**	**6**	**6**	**1**
Score	0	-1	0	8	6	-2	-1	0	9	0	-2	-1	0	6	2
Sum of score	**13**					**6**					**5**				

Instant Messaging –Team members

	Q1 - Management and Peer					**Q2 - Economic Incentives**					**Q3 - Recognition - Professional Performance**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**2**	**7**	**5**	**2**	**1**	**5**	**4**	**2**	**0**	**1**	**4**	**6**	**3**
Score	0	0	0	7	10	-4	-1	0	4	4	0	-1	0	6	6
Sum of score	**17**					**3**					**11**				

	Q4 - Recognition - Work Relationship					**Q5 - Ease**					**Q6 - Self Interest**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**1**	**4**	**6**	**3**	**0**	**1**	**2**	**6**	**5**	**1**	**0**	**3**	**7**	**3**
Score	0	-1	0	6	6	0	-1	0	6	10	-2	0	0	7	6
Sum of score	**11**					**15**					**11**				

	Q7 - Trust					Q8 - Reciprocity					Q9 - Collectivism / Give-back				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**1**	**1**	**8**	**4**	**0**	**0**	**0**	**9**	**5**	**1**	**0**	**1**	**8**	**4**
Score	0	-1	0	8	8	0	0	0	9	10	-2	0	0	8	8
Sum of score	**15**					**19**					**14**				

	Q10 - Empowerment					Q11 - Networking					Q12 - Aesthetics				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**0**	**9**	**5**	**0**	**1**	**2**	**8**	**3**	**0**	**1**	**4**	**7**	**3**
Score	0	0	0	9	10	0	-1	0	8	6	0	-1	0	7	6
Sum of score	**19**					**13**					**12**				

Instant Messaging –Non-Team members

	Q1 - Management and Peer					Q2 - Economic Incentives					Q3 - Recognition - Professional Performance				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**1**	**2**	**7**	**3**	**2**	**1**	**4**	**6**	**1**	**1**	**1**	**5**	**5**	**2**
Score	-2	-1	0	7	6	-4	-1	0	6	2	-2	-1	0	5	4
Sum of score	**10**					**3**					**6**				

	Q4 - Recognition - Work Relationship	Q5 - Ease	Q6 - Self Interest

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**2**	**1**	**3**	**5**	**3**	**0**	**0**	**1**	**8**	**5**	**1**	**1**	**2**	**9**	**1**
Score	-4	-1	0	5	6	0	0	0	8	10	-2	-1	0	9	2
Sum of score	**6**					**18**					**8**				

	Q7 - Trust					**Q8 - Reciprocity**					**Q9 - Collectivism / Give-back**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**2**	**2**	**7**	**3**	**0**	**0**	**0**	**11**	**3**	**1**	**0**	**1**	**10**	**2**
Score	0	-2	0	7	6	0	0	0	11	6	-2	0	0	10	4
Sum of score	**11**					**17**					**12**				

	Q10 - Empowerment					**Q11 - Networking**					**Q12 - Aesthetics**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**1**	**1**	**10**	**2**	**0**	**1**	**1**	**11**	**1**	**0**	**1**	**4**	**8**	**1**
Score	0	-1	0	10	4	0	-1	0	11	2	0	-1	0	8	2
Sum of score	**13**					**12**					**9**				

Social Network Site or Twitter –Team members

	Q1 - Management and Peer					**Q2 - Economic Incentives**					**Q3 - Recognition - Professional Performance**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**2**	**1**	**0**	**1**	**0**	**2**	**0**	**0**	**2**	**0**	**2**	**0**	**1**	**1**	**0**

Score	-4	-1	0	1	0	-4	0	0	2	0	-4	0	0	1	0
Sum of score	**-4**					**-2**					**-3**				

	Q4 - Recognition - Work Relationship					**Q5 - Ease**					**Q6 - Self Interest**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**0**	**1**	**2**	**0**	**0**	**0**	**0**	**1**	**3**	**1**	**0**	**1**	**1**	**1**
Score	-2	0	0	2	0	0	0	0	1	6	-2	0	0	1	2
Sum of score	**0**					**7**					**1**				

	Q7 - Trust					**Q8 - Reciprocity**					**Q9 - Collectivism / Give-back**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**2**	**0**	**1**	**1**	**0**	**0**	**0**	**3**	**1**	**0**	**0**	**1**	**3**	**0**
Score	0	-2	0	1	2	0	0	0	3	2	0	0	0	3	0
Sum of score	**1**					**5**					**3**				

	Q10 - Empowerment					**Q11 - Networking**					**Q12 - Aesthetics**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**3**	**1**	**1**	**0**	**1**	**2**	**0**
Score	-2	0	0	2	2	0	0	0	3	2	-2	0	0	2	0
Sum of score	**2**					**5**					**0**				

Social Network Site or Twitter – Non-Team members

	Q1 - Management and Peer					Q2 - Economic Incentives					Q3 - Recognition - Professional Performance				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**2**	**2**	**0**	**1**	**0**	**2**	**2**	**0**	**1**	**0**	**1**	**1**	**1**	**2**	**0**
Score	-4	-2	0	1	0	-4	-2	0	1	0	-2	-1	0	2	0
Sum of score	**-5**					**-5**					**-1**				

	Q4 - Recognition - Work Relationship					Q5 - Ease					Q6 - Self Interest				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**1**	**1**	**2**	**0**	**0**	**0**	**0**	**3**	**2**	**1**	**0**	**0**	**3**	**1**
Score	-2	-1	0	2	0	0	0	0	3	4	-2	0	0	3	2
Sum of score	**-1**					**7**					**3**				

	Q7 - Trust					Q8 - Reciprocity					Q9 - Collectivism / Give-back				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**1**	**0**	**3**	**1**	**0**	**0**	**1**	**3**	**1**	**0**	**0**	**1**	**4**	**0**
Score	0	-1	0	3	2	0	0	0	3	2	0	0	0	4	0
Sum of score	**4**					**5**					**4**				

	Q10 - Empowerment	Q11 - Networking	Q12 - Aesthetics

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**0**	**1**	**2**	**1**	**0**	**0**	**0**	**4**	**1**	**1**	**0**	**0**	**3**	**1**
Score	-2	0	0	2	2	0	0	0	4	2	-2	0	0	3	2
Sum of score	**2**					**6**					**3**				

AppendixF – Survey result for hybridworkers

Wiki and Blogs – Team members

	Q1 - Management and Peer					Q2 - Economic Incentives					Q3 - Recognition - Professional Performance				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**2**	**3**	**1**	**4**	**3**	**2**	**2**	**5**	**4**	**0**	**0**	**0**	**3**	**5**	**5**
Score	-4	-3	0	4	6	-4	-2	0	4	0	0	0	0	5	10
Sum of score	**3**					**-2**					**15**				

	Q4 - Recognition - Work Relationship					Q5 - Ease					Q6 - Self Interest				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**2**	**7**	**4**	**0**	**0**	**0**	**8**	**5**	**0**	**0**	**1**	**6**	**6**
Score	0	0	0	7	8	0	0	0	8	10	0	0	0	6	12
Sum of score	**15**					**18**					**18**				

	Q7 - Trust					Q8 - Reciprocity					Q9 - Collectivism / Give-back				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**1**	**2**	**8**	**2**	**0**	**0**	**2**	**9**	**2**	**0**	**1**	**0**	**6**	**6**
Score	0	-1	0	8	4	0	0	0	9	4	0	-1	0	6	12
Sum of score	**11**					**13**					**17**				

	Q10 - Empowerment					Q11 - Networking					Q12 - Aesthetics				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**1**	**6**	**6**	**0**	**0**	**4**	**8**	**1**	**0**	**2**	**4**	**7**	**0**
Score	0	0	0	6	12	0	0	0	8	2	0	-2	0	7	0

Sum of score	**18**					**10**					**5**				

Wiki and Blogs – Non-Team members

	Q1 - Management and Peer					**Q2 - Economic Incentives**					**Q3 - Recognition - Professional Performance**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**3**	**1**	**2**	**5**	**2**	**1**	**1**	**5**	**4**	**2**	**0**	**0**	**2**	**6**	**5**
Score	-6	-1	0	5	4	-2	-1	0	4	4	0	0	0	6	10
Sum of score	**2**					**5**					**16**				

	Q4 - Recognition - Work Relationship					**Q5 - Ease**					**Q6 - Self Interest**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**1**	**0**	**8**	**4**	**0**	**0**	**0**	**8**	**5**	**0**	**1**	**1**	**8**	**3**
Score	0	-1	0	8	8	0	0	0	8	10	0	-1	0	8	6
Sum of score	**15**					**18**					**13**				

	Q7 - Trust					**Q8 - Reciprocity**					**Q9 - Collectivism / Give-back**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**1**	**3**	**7**	**2**	**0**	**0**	**2**	**9**	**2**	**0**	**0**	**2**	**5**	**6**
Score	0	-1	0	7	4	0	0	0	9	4	0	0	0	5	12
Sum of score	**10**					**13**					**17**				

	Q10 - Empowerment					**Q11 - Networking**					**Q12 - Aesthetics**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**1**	**5**	**7**	**1**	**0**	**2**	**8**	**2**	**1**	**2**	**4**	**5**	**1**

Score	0	0	0	5	14	-2	0	0	8	4	-2	-2	0	5	2
Sum of score	**19**					**10**					**3**				

Instant Messaging – Team members

	Q1 - Management and Peer					**Q2 - Economic Incentives**					**Q3 - Recognition - Professional Performance**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**0**	**4**	**4**	**5**	**2**	**2**	**4**	**4**	**2**	**0**	**2**	**6**	**3**	**3**
Score	-2	0	0	4	10	-4	-2	0	4	4	0	-2	0	3	6
Sum of score	**12**					**2**					**7**				

	Q4 - Recognition - Work Relationship					**Q5 - Ease**					**Q6 - Self Interest**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**1**	**3**	**6**	**4**	**0**	**0**	**1**	**4**	**9**	**0**	**0**	**1**	**3**	**10**
Score	0	-1	0	6	8	0	0	0	4	18	0	0	0	3	20
Sum of score	**13**					**22**					**23**				

	Q7 - Trust					**Q8 - Reciprocity**					**Q9 - Collectivism / Give-back**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**1**	**2**	**8**	**3**	**0**	**0**	**2**	**6**	**6**	**0**	**3**	**3**	**6**	**2**
Score	0	-1	0	8	6	0	0	0	6	12	0	-3	0	6	4
Sum of score	**13**					**18**					**7**				

	Q10 - Empowerment					**Q11 - Networking**					**Q12 - Aesthetics**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Answer	**0**	**0**	**3**	**5**	**6**	**0**	**0**	**1**	**5**	**8**	**0**	**0**	**8**	**1**	**4**
Score	0	0	0	5	12	0	0	0	5	16	0	0	0	1	8
Sum of score	**17**					**21**					**9**				

Instant Messaging – Non-Team members

	Q1 - Management and Peer					**Q2 - Economic Incentives**					**Q3 - Recognition - Professional Performance**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**2**	**1**	**3**	**4**	**3**	**2**	**1**	**2**	**3**	**0**	**2**	**3**	**4**	**2**
Score	-2	-2	0	3	8	-6	-2	0	2	6	0	-2	0	4	4
Sum of score	**7**					**0**					**6**				

	Q4 - Recognition - Work Relationship					**Q5 - Ease**					**Q6 - Self Interest**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**2**	**5**	**4**	**0**	**0**	**1**	**2**	**8**	**0**	**0**	**1**	**2**	**8**
Score	0	0	0	5	8	0	0	0	2	16	0	0	0	2	16
Sum of score	**13**					**18**					**18**				

	Q7 - Trust					**Q8 - Reciprocity**					**Q9 - Collectivism / Give-back**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	S A
Answer	**0**	**0**	**2**	**6**	**3**	**0**	**0**	**1**	**5**	**5**	**0**	**1**	**4**	**4**	
Score	0	0	0	6	6	0	0	0	5	10	0	-1	0	4	
Sum of score	**12**					**15**					**7**				

	Q10 - Empowerment					**Q11 - Networking**					**Q12 - Aesthetics**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**2**	**4**	**5**	**0**	**0**	**0**	**4**	**7**	**0**	**0**	**6**	**1**	**4**

Score	0	0	0	4	10	0	0	0	4	14	0	0	0	1	8
Sum of score	**14**					**18**					**9**				

Social Network Sites and Twitter –Team members

	Q1 - Management and Peer					**Q2 - Economic Incentives**					**Q3 - Recognition - Professional Performance**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**2**	**4**	**0**	**0**	**2**	**1**	**3**	**0**	**1**	**1**	**0**	**4**	**1**	**1**
Score	-2	-2	0	0	0	-4	-1	0	0	2	-2	0	0	1	2
Sum of score	**-4**					**-3**					**1**				

	Q4 - Recognition - Work Relationship					**Q5 - Ease**					**Q6 - Self Interest**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**1**	**4**	**1**	**1**	**0**	**1**	**2**	**2**	**2**	**0**	**0**	**2**	**4**	**1**
Score	0	-1	0	1	2	0	-1	0	2	4	0	0	0	4	2
Sum of score	**2**					**5**					**6**				

	Q7 - Trust					**Q8 - Reciprocity**					**Q9 - Collectivism / Give-back**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**5**	**1**	**1**	**0**	**1**	**3**	**2**	**1**	**0**	**1**	**4**	**0**	**2**
Score	0	0	0	1	2	0	-1	0	2	2	0	-1	0	0	4
Sum of score	**3**					**3**					**3**				

	Q10 - Empowerment					**Q11 - Networking**					**Q12 - Aesthetics**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Answer	**0**	**0**	**3**	**2**	**2**	**0**	**1**	**2**	**3**	**1**	**0**	**0**	**4**	**1**	**2**
Score	0	0	0	2	4	0	-1	0	3	2	0	0	0	1	4
Sum of score	**6**					**4**					**5**				

Social Network Sites and Twitter – Non-Team members

	Q1 - Management and Peer					**Q2 - Economic Incentives**					**Q3 - Recognition - Professional Performance**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**2**	**1**	**3**	**0**	**0**	**2**	**0**	**2**	**1**	**1**	**1**	**1**	**2**	**1**	**1**
Score	-4	-1	0	0	0	-4	0	0	1	2	-2	-1	0	1	2
Sum of score	**-5**					**-1**					**0**				

	Q4 - Recognition - Work Relationship					**Q5 - Ease**					**Q6 - Self Interest**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**2**	**2**	**1**	**1**	**0**	**0**	**3**	**0**	**3**	**0**	**0**	**2**	**2**	**2**
Score	0	-2	0	1	2	0	0	0	0	6	0	0	0	2	4
Sum of score	**1**					**6**					**6**				

	Q7 - Trust					**Q8 - Reciprocity**					**Q9 - Collectivism / Give-back**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**1**	**3**	**1**	**1**	**0**	**0**	**2**	**3**	**1**	**0**	**0**	**2**	**3**	**1**
Score	0	-1	0	1	2	0	0	0	3	2	0	0	0	3	2
Sum of score	**2**					**5**					**5**				

	Q10 - Empowerment	**Q11 - Networking**	**Q12 - Aesthetics**

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**2**	**1**	**3**	**0**	**0**	**2**	**1**	**3**	**0**	**0**	**3**	**1**	**2**
Score	0	0	0	1	6	0	0	0	1	6	0	0	0	1	4
Sum of score	**7**					**7**					**5**				

AppendixG – Survey result for virtualworkers

Wiki and Blogs – Team members

	Q1 - Management and Peer					Q2 - Economic Incentives					Q3 - Recognition - Professional Performance				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**2**	**1**	**4**	**2**	**0**	**4**	**1**	**2**	**1**	**1**	**1**	**0**	**4**	**3**	**1**
Score	-4	-1	0	2	0	-8	-1	0	1	2	-2	0	0	3	2
Sum of score	**-3**					**-6**					**3**				

	Q4 - Recognition - Work Relationship					Q5 - Ease					Q6 - Self Interest				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**0**	**3**	**3**	**2**	**1**	**0**	**0**	**4**	**4**	**1**	**0**	**0**	**3**	**5**
Score	-2	0	0	3	4	-2	0	0	4	8	-2	0	0	3	10
Sum of score	**5**					**10**					**11**				

	Q7 - Trust					Q8 - Reciprocity					Q9 - Collectivism / Give-back				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**0**	**1**	**4**	**3**	**1**	**0**	**0**	**4**	**4**	**0**	**0**	**1**	**1**	**7**
Score	-2	0	0	4	6	-2	0	0	4	8	0	0	0	1	14
Sum of score	**8**					**10**					**15**				

	Q10 - Empowerment					Q11 - Networking					Q12 - Aesthetics				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**0**	**0**	**2**	**6**	**1**	**1**	**2**	**1**	**4**	**1**	**3**	**2**	**1**	**2**
Score	-2	0	0	2	12	-2	-1	0	1	8	-2	-3	0	1	4

Sum of score	**12**					**6**					**0**				

Wiki and Blogs – Non-Team members

	Q1 - Management and Peer					**Q2 - Economic Incentives**					**Q3 - Recognition - Professional Performance**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**3**	**1**	**3**	**2**	**0**	**4**	**0**	**3**	**2**	**0**	**1**	**0**	**2**	**5**	**1**
Score	-6	-1	0	2	0	-8	0	0	2	0	-2	0	0	5	2
Sum of score	**-5**					**-6**					**5**				

	Q4 - Recognition - Work Relationship					**Q5 - Ease**					**Q6 - Self Interest**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**0**	**2**	**4**	**2**	**1**	**0**	**0**	**5**	**3**	**1**	**0**	**0**	**3**	**5**
Score	-2	0	0	4	4	-2	0	0	5	6	-2	0	0	3	10
Sum of score	**6**					**9**					**11**				

	Q7 - Trust					**Q8 - Reciprocity**					**Q9 - Collectivism / Give-back**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**0**	**1**	**5**	**2**	**1**	**0**	**0**	**3**	**5**	**0**	**0**	**0**	**3**	**6**
Score	-2	0	0	5	4	-2	0	0	3	10	0	0	0	3	12
Sum of score	**7**					**11**					**15**				

	Q10 - Empowerment					**Q11 - Networking**					**Q12 - Aesthetics**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**0**	**0**	**3**	**5**	**1**	**0**	**0**	**5**	**3**	**1**	**2**	**2**	**2**	**2**

Score	-2	0	0	3	10	-2	0	0	5	6	-2	-2	0	2	4
Sum of score	**11**					**9**					**2**				

Instant Messaging – Team members

	Q1 - Management and Peer					**Q2 - Economic Incentives**					**Q3 - Recognition - Professional Performance**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**0**	**3**	**4**	**1**	**2**	**0**	**2**	**4**	**1**	**1**	**0**	**2**	**4**	**2**
Score	-2	0	0	4	2	-4	0	0	4	2	-2	0	0	4	4
Sum of score	**4**					**2**					**6**				

	Q4 - Recognition - Work Relationship					**Q5 - Ease**					**Q6 - Self Interest**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**0**	**2**	**4**	**2**	**1**	**0**	**2**	**1**	**5**	**1**	**1**	**1**	**2**	**4**
Score	-2	0	0	4	4	-2	0	0	1	10	-2	-1	0	2	8
Sum of score	**6**					**9**					**7**				

	Q7 - Trust					**Q8 - Reciprocity**					**Q9 - Collectivism / Give-back**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**0**	**1**	**4**	**3**	**0**	**1**	**1**	**4**	**3**	**0**	**0**	**1**	**5**	**3**
Score	-2	0	0	4	6	0	-1	0	4	6	0	0	0	5	6
Sum of score	**8**					**9**					**11**				

	Q10 - Empowerment					**Q11 - Networking**					**Q12 - Aesthetics**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Answer	**0**	**1**	**2**	**3**	**3**	**0**	**1**	**1**	**6**	**1**	**1**	**1**	**3**	**3**	**1**
Score	0	-1	0	3	6	0	-1	0	6	2	-2	-1	0	3	2
Sum of score	**8**					**7**					**2**				

Instant Messaging – Non-Team members

	Q1 - Management and Peer					**Q2 - Economic Incentives**					**Q3 - Recognition - Professional Performance**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**1**	**0**	**2**	**4**	**1**	**1**	**0**	**3**	**4**	**0**	**0**	**0**	**3**	**4**	**1**
Score	-2	0	0	4	2	-2	0	0	4	0	0	0	0	4	2
Sum of score	**4**					**2**					**6**				

	Q4 - Recognition - Work Relationship					**Q5 - Ease**					**Q6 - Self Interest**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**3**	**4**	**1**	**0**	**0**	**2**	**2**	**4**	**0**	**1**	**1**	**3**	**3**
Score	0	0	0	4	2	0	0	0	2	8	0	-1	0	3	6
Sum of score	**6**					**10**					**8**				

	Q7 - Trust					**Q8 - Reciprocity**					**Q9 - Collectivism / Give-back**				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**1**	**4**	**3**	**0**	**0**	**2**	**3**	**3**	**0**	**0**	**2**	**2**	**4**
Score	0	0	0	4	6	0	0	0	3	6	0	0	0	2	8
Sum of score	**10**					**9**					**10**				

	Q10 - Empowerment	**Q11 - Networking**	**Q12 - Aesthetics**

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**2**	**2**	**4**	**0**	**1**	**3**	**3**	**1**	**0**	**0**	**4**	**2**	**2**
Score	0	0	0	2	8	0	-1	0	3	2	0	0	0	2	4
Sum of score	**10**					**4**					**6**				

Social Network Site and Twitter – Team members

	Q1 - Management and Peer					Q2 - Economic Incentives					Q3 - Recognition - Professional Performance				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**1**	**2**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**1**	**2**	**0**	**0**
Score	0	-1	0	0	0	0	-1	0	0	0	0	-1	0	0	0
Sum of score	**-1**					**-1**					**-1**				

	Q4 - Recognition - Work Relationship					Q5 - Ease					Q6 - Self Interest				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**2**	**1**
Score	0	-1	0	1	0	0	0	0	2	2	0	0	0	2	2
Sum of score	**0**					**4**					**4**				

	Q7 - Trust					Q8 - Reciprocity					Q9 - Collectivism / Give-back				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**1**	**2**	**0**
Score	0	0	0	3	0	0	0	0	2	0	0	0	0	2	0
Sum of score	**3**					**2**					**2**				

	Q10 - Empowerment					Q11 - Networking					Q12 - Aesthetics				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**1**	**2**	**0**
Score	0	0	0	2	0	0	0	0	2	0	0	0	0	2	0
Sum of score	**2**					**2**					**2**				

Social Network Site and Twitter – Non-Team members

	Q1 - Management and Peer					Q2 - Economic Incentives					Q3 - Recognition - Professional Performance				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**0**
Score	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Sum of score	**1**					**0**					**0**				

	Q4 - Recognition - Work Relationship					Q5 - Ease					Q6 - Self Interest				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**1**
Score	0	0	0	2	0	0	0	0	1	2	0	0	0	1	2
Sum of score	**2**					**3**					**3**				

	Q7 - Trust					Q8 - Reciprocity					Q9 - Collectivism / Give-back				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**0**
Score	0	0	0	2	0	0	0	0	2	0	0	0	0	2	0
Sum of score	**2**					**2**					**2**				

	Q10 - Empowerment					Q11 - Networking					Q12 - Aesthetics				
Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Answer	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**1**	**1**
Score	0	0	0	2	0	0	0	0	2	0	0	0	0	1	2
Sum of score	**2**					**2**					**3**				

Appendix H – StatisticalFindings

Correlation

Correlations WikiBlogs Team	Mgt/Peer WBTM	Eco WBTM	Recog1 WBTM	Recog2 WBTM	Ease WBTM	Self Interest WBTM	Trust WBTM	Reciprocity WBTM	Collectivism WBTM	Empowerm WBTM
Virtualness	-0.17606223	-0.05604346	-0.09070313	-0.05339474	-0.00384335	0.1760094	-0.09542125	-0.07194162	0.04166587	0.1187
Age	-0.03464164	-0.12411037	**-0.30043155**	-0.08733668	-0.03412309	-0.23470011	-0.05981679	**-0.28028068**	0.12697794	-0.1076
Seniority	-0.09923062	-0.34127971	-0.16965507	0.06007915	-0.07488681	-0.22604758	-0.18141181	-0.06432223	0.08318903	-0.0913

Correlations WikiBlogsNonTeam	Mgt/Peer WBNTM	Eco WBNTM	Recog1 WBNTM	Recog2 WBNTM	Ease WBNTM	Self Interest WBNTM	Trust WBNTM	Reciprocity WBNTM	Collectivism WBNTM	Empowerm WBNTM
Virtualness	-0.15009149	-0.19893934	-0.05034222	0.04874044	0.17224813	0.1868624	0.04132344	0.10123015	**0.35324059**	**0.2645**
Age	0	-0.2271147	-0.17968379	0.04389813	-0.22198941	-0.05609927	0.12654121	-0.01013034	0.12175977	-0.0642
Seniority	-0.16840053	-0.40087701	-0.04393142	0.06940927	-0.09289291	-0.05241424	-0.08345577	-0.00630993	0.01467892	-0.0706

Correlations IM Team	Mgt/Peer IMTM	Eco IMTM	Recog1 IMTM	Recog2 IMTM	Ease IMTM	Self Interest IMTM	Trust IMTM	Reciprocity IMTM	Collectivism IMTM	Empowerm IMTM
Virtualness	0.10047301	0.09749633	0.07247062	0.10225862	0.13174766	0.06181623	-0.06875607	0.14322404	-0.043928	**0.3580**
Age	-0.22655686	-0.09966295	-0.09137138	0.02725075	-0.05218516	-0.15423368	0.15503826	0.32121057	-0.09104479	0.1426
Seniority	**-0.35451682**	-0.12817543	-0.10787577	-0.01856137	-0.07175619	-0.13535854	0.03589074	0.26656073	-0.12109234	0.0345

Correlations IM NonTeam	Mgt/Peer IMNTM	Eco IMNTM	Recog1 IMNTM	Recog2 IMNTM	Ease IMNTM	Self Interest IMNTM	Trust IMNTM	Reciprocity IMNTM	Collectivism IMNTM	Empowerm IMNTM
Virtualness	0.11085714	0.06620127	0.12288793	0.00956183	0.0748202	0.23275069	0.19929025	0.138648	**0.31413128**	**0.3157**
Age	-0.10658961	-0.13569938	0.34337361	-0.06859943	-0.18155883	0.10607485	0.25037415	0.04691993	0.13495043	-0.0791
Seniority	0.11399977	-0.05742229	0.40953654	-0.1658766	-0.23287023	0.02316719	0.10116824	-0.08395637	-0.05057904	-0.1248

Correlations SNS/Twitter Team	Mgt/PeerSocialTM	Eco SocialTM	Recog1SocialTM	Recog2 SocialTM	Ease SocialTM	Self Interest SocialTM	Trust SocialTM	Reciprocity SocialTM	Collectivism SocialTM	Empowerm SocialT
Virtualness	0.19004662	0.01547461	0.13413055	0.02587601	-0.08665896	**0.41564427**	**0.30794088**	-0.19617651	0.00768413	0.12244
Age	0.07528877	0.01379343	-0.02988961	-0.14992129	0.10101169	-0.0442374	0.0873364	**-0.38470005**	0.10958904	**-0.30013**
Seniority	0.11293315	-0.01379343	-0.11955845	-0.08072685	0.04753491	-0.17694958	-0.11852797	0.03497273	0.23287671	**-0.30013**

Correlations SNS/Twitter NonTeam	Mgt/PeerSocialNTM	Eco SocialNTM	Recog1SocialNTM	Recog2 SocialNTM	Ease SocialNTM	Self Interest SocialNTM	Trust SocialNTM	Reciprocity SocialNTM	Collectivism SocialNTM	Empowerm SocialNT
Virtualness	0.33567254	0.2710576	0.06629644	0.34405118	0.070014	0.33028913	0.03227486	0.06846532	0.20908335	0.29675
Age	0.4212657	-0.15776213	0.39936659	0.36845295	0	-0.09211324	0.32403703	-0.15275252	-0.26239752	-0.31599
Seniority	-0.3243404	-0.51782037	-0.13485959	-0.19036345	0.25635928	-0.12317635	0.02626129	-0.07427814	-0.2020248	-0.18109

Pearson Covariance

Correlations WikiBlogs Team	Mgt/Peer WBTM	Eco WBTM	Recog1 WBTM	Recog2 WBTM	Ease WBTM	Self Interest WBTM	Trust WBTM	Reciprocity WBTM	Collectivism WBTM	Empowerment WBTM	N
Virtuality	-0.18381916	-0.05651398	-0.07019631	-0.03509816	-0.00297442	0.14336704	-0.06960143	-0.0481856	0.02260559	0.08804283	0
Age	-0.03747769	-0.12968471	**-0.24092802**	-0.0594884	-0.02736466	-0.19809637	-0.04521118	**-0.19452707**	0.07138608	-0.08268888	-0
Seniority	-0.12016657	-0.39916716	-0.1522903	0.04580607	-0.06722189	-0.21356336	-0.15348007	-0.04997026	0.05234979	-0.07852469	-0
Correlations WikiBlogsNonTeam	**Mgt/Peer WBNTM**	**Eco WBNTM**	**Recog1 WBNTM**	**Recog2 WBNTM**	**Ease WBNTM**	**Self Interest WBNTM**	**Trust WBNTM**	**Reciprocity WBNTM**	**Collectivism WBNTM**	**Empowerment WBNTM**	**N**
Virtuality	-0.15	-0.186875	-0.03375	0.0325	0.113125	0.15	0.03125	0.0675	**0.2025**	**0.196875**	
Age	0	-0.236875	-0.13375	0.0325	-0.161875	-0.05	0.10625	-0.0075	0.0775	-0.053125	
Seniority	-0.2	-0.4475	-0.035	0.055	-0.0725	-0.05	-0.075	-0.005	0.01	-0.0625	
Correlations IM Team	**Mgt/Peer IMTM**	**Eco IMTM**	**Recog1 IMTM**	**Recog2 IMTM**	**Ease IMTM**	**Self Interest IMTM**	**Trust IMTM**	**Reciprocity IMTM**	**Collectivism IMTM**	**Empowerment IMTM**	**N**
Virtuality	0.09994051	0.08030934	0.05532421	0.07852469	0.11243308	0.04580607	-0.04045211	0.11005354	-0.02795955	**0.25**	0
Age	-0.24985128	-0.09101725	-0.07733492	0.02320048	-0.04937537	-0.12671029	0.10113028	0.27364664	-0.06424747	0.11111111	0
Seniority	**-0.39738251**	-0.1189768	-0.0928019	-0.01606187	-0.06900654	-0.11302796	0.02379536	0.23081499	-0.08685306	0.02777778	0
Correlations IM NonTeam	**Mgt/Peer IMNTM**	**Eco IMNTM**	**Recog1 IMNTM**	**Recog2 IMNTM**	**Ease IMNTM**	**Self Interest IMNTM**	**Trust IMNTM**	**Reciprocity IMNTM**	**Collectivism IMNTM**	**Empowerment IMNTM**	**N**
Virtuality	0.07484568	0.04861111	0.07330247	0.00925926	0.0787037	0.1882716	0.16743827	0.08179012	**0.25771605**	**0.20987654**	0

Age	-0.08024691	-0.11111111	0.22839506	-0.07407407	-0.21296296	0.09567901	0.2345679	0.0308642	0.12345679	-0.05864198	-(
Seniority	0.08873457	-0.04861111	0.2816358	-0.18518519	-0.28240741	0.02160494	0.09799383	-0.05709877	-0.04783951	-0.09567901	(
Correlations SNS/Twitter Team	**Mgt/Peer SocialTM**	**Eco SocialTM**	**Recog1SocialTM**	**Recog2 SocialTM**	**Ease SocialTM**	**Self Interest SocialTM**	**Trust SocialTM**	**Reciprocity SocialTM**	**Collectivism SocialTM**	**Empowerment SocialTM**	**N**
Virtuality	0.12	0.01333333	0.10666667	0.01777778	-0.05777778	**0.29777778**	**0.19555556**	-0.11111111	0.00444444	0.08888889	-(
Age	0.05333333	0.01333333	-0.02666667	-0.11555556	0.07555556	-0.03555556	0.06222222	**-0.24444444**	0.07111111	**-0.24444444**	(
Seniority	0.08	-0.01333333	-0.10666667	-0.06222222	0.03555556	-0.14222222	-0.08444444	0.02222222	0.15111111	**-0.24444444**	**(**
Correlations SNS/Twitter NonTeam	**Mgt/Peer SocialNTM**	**Eco SocialNTM**	**Recog1SocialNTM**	**Recog2 SocialNTM**	**Ease SocialNTM**	**Self Interest SocialNTM**	**Trust SocialNTM**	**Reciprocity SocialNTM**	**Collectivism SocialNTM**	**Empowerment SocialNTM**	**N S**
Virtuality	0.24489796	0.23469388	0.05102041	0.25510204	0.04081633	0.24489796	0.02040816	0.03061224	0.08163265	0.2244898	(
Age	0.32142857	-0.14285714	0.32142857	0.28571429	0	-0.07142857	0.21428571	-0.07142857	-0.10714286	-0.25	-(
Seniority	-0.29081633	-0.55102041	-0.12755102	-0.17346939	0.18367347	-0.1122449	0.02040816	-0.04081633	-0.09693878	-0.16836735	(