ADOPTION OF WEB 2.0 TECHNOLOGIES AMONG KNOWLEDGE WORKERS: A THEORETICAL INTEGRATION OF KNOWLEDGE SHARING AND SEEKING FACTORS

Research in Progress

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Abstract

Web 2.0 applications have attracted considerable attention among knowledge workers as a means via which they can connect to peers for knowledge sharing. Web 2.0 use has potential to facilitate knowledge transfer in a much more improved way compared to previous communication tools. Despite of its benefits, there is limited research on adoption behaviour of these technologies. We propose a model linking knowledge sharing and seeking factors to web 2.0 acceptance among knowledge workers. Proposed research model is based on the extended attitude-behaviour framework. The model shows that attitudes towards sharing and seeking, determined by their salient belief sets, could have an impact on web 2.0 use. This study will make important contribution to IS area as it attempts to investigate the influence of drivers from two motivational domain i.e. knowledge sharing and seeking on technology acceptance based on an integrated theoretical framework.

Keywords: Web 2.0, IT Adoption, Knowledge sharing, Knowledge seeking.

1 Introduction

The global economy is in transition to knowledge economy as there is an increasingly greater reliance on intellectual capabilities for production of goods and services (Powell and Snellman, 2004). In this economy, knowledge workers are responsible for driving innovation and growth. Typically, knowledge workers have high degree of expertise, education or experience, for example legal professionals, consultants and health care practitioners (Davenport, 2005). Their job involves creating, distributing or application of knowledge and they require access to information and knowledge from both public and private sources (Davenport, 2011).

Over the last several years, web 2.0 applications (such as blogs, wikis, and social-networking sites) have been widely adopted by knowledge workers due to its promising potential to boost knowledge sharing and collaboration (Tredinnick, 2006). These applications have led to the paradigm shift in creation and dissemination of knowledge (Huang and Güney, 2012) as it enables much faster and broader scope of knowledge transfer (Huang et. al., 2010).

Knowledge workers are greatly benefiting from the advice, insights, and experiences of others on internet by web 2.0 applications (Schneckenberg, 2009). Despite of ubiquity of these applications, there is a limited understanding of web 2.0 adoption among knowledge workers. It has been acknowledged that current technology acceptance models provide limited explanation to web 2.0 adoption and use (Parameswaran and Whinston, 2007). Usage of web 2.0 means that someone is willing to share knowledge by codifying it through blogs, wikis etc. and also seeking out the knowledge made available by others. This pattern of usage necessitates for a framework that could link knowledge seeking and sharing motivations to its acceptance.
Web 2.0 applications serves multiple needs both intrinsic and extrinsic and their use may be defined by motives related to ‘individual person’ as well as ‘organizational actor’ (Soliman and Beaudry, 2010). Prior studies have established that knowledge sharing is driven by both intrinsic and extrinsic motivational factors (Wasko and Faraj, 2000). That is why it has been suggested that web 2.0 are being adopted for reasons not limited to performance related motivations which is largely the basis of technology acceptance model (Kane and Fichman, 2009).

The objective of this study is to deepen our understanding of the factors that explains knowledge worker’s adoption behaviour of web 2.0 applications. It focuses on the research question: What drives knowledge workers to adopt web 2.0 applications? We conceptualize web 2.0 as a technological platform that facilitates knowledge seeking and sharing. In particular, with an integrated theoretical framework, we attempt to link the seeking and sharing motivations to adoption of these applications. Our theoretical model is based on ‘extended’ TRA framework and uses the concepts of technology acceptance research and knowledge management literature.

Organization of the paper is as follows: In the next section, characteristics of web 2.0 tools and its knowledge management potential is presented. Subsequent to this, a brief review of literature of technology adoption in particular and latest development in attitude-behaviour framework in general is discussed. The next section presents the research model and hypotheses. Following this, proposed methodology for the study is presented. In the last section expected contribution to theory and practice is discussed.

2 Web 2.0: Characteristics and Knowledge Management Perspective

Web 2.0 is a network platform through which end users interact with each other to generate and share information over the web. These platforms are digital environment in which contributions and interactions by the end users are widely visible, persistent and searchable (McAfee, 2009). Web 2.0 is difficult to define because it is not enabled by new or revolutionary technology but represents a progression (Wilson et al., 2011). It is a broad topic encompassing various related concepts and its understanding is varied. Since the web 2.0 term has been coined, academicians and practitioners both have attempted to formally define web 2.0. Initially, question was raised that how web 2.0 technologies are different from traditional ITs such as email, instant messaging, groupware, knowledge management (KM) system etc. Kim et al., (2009) specified that web 2.0 applications’ technological characteristics are different than those of traditional IT as later are generally standalone software packages with compartmentalized application having low or limited interactivity. Whereas, web 2.0 technologies have web itself as software platform (offer applications via a web browser) with high interactivity. Web 2.0 applications provide opportunities for massively connected social interactions and collaboration in much larger scope than traditional communication and collaboration technologies (2009). McAfee (2009, p47) further states that specific trends in technological characteristics have led to web 2.0. First is the availability of free and easy platforms for communication and interaction. The main goal of these platforms is to make content widely and permanently available to its members. They are free and easy in the sense that they require little or no cost to acquire them over internet and these are easy to use as it requires minimum technical knowledge to use. Second is that these applications are free of imposed structure such as workflow, interdependency and decision right allocations which are associated with traditional ITs such as ERP. Web 2.0 applications are inherently egalitarian in nature i.e. indifferent to credentials, titles and ranks (2009). It is recognized that web 2.0 is as much about the technology as the way people use them.

The type of technologies that come under web 2.0 umbrella are wikis, blogs, social networking sites information sharing sites, syndication and mashups. Based on the above definitions, key features that
differentiate it from traditional IT, are grounded in the principles of participation, networking, egalitarian notion and collective intelligence. Web 2.0 engaged by these principles, imparts control over applications to users, enabling users to extract data, information and knowledge and reuse those in a flexible way (Tredinnick, 2006). So, web 2.0 is not just a technology type or a collection of tools, but rather a set of characteristics discussed before. These characteristic facilitates the creation of virtual communities where information and knowledge are generated and shared (Huang et al., 2010).

From the above discussion, it is evident that web 2.0 applications promote knowledge sharing and seeking. This is true particularly among knowledge workers, as web 2.0 applications have contributed most in knowledge intensive businesses (Andreoli, 2010). Evidence suggests, web 2.0 applications are contributing to business performance due to speedy access to knowledge and other factors (Bughin et al., 2009). Despite of wide-spread use of web 2.0 technology, there is limited understanding of factors affecting its adoption and use. A 2009 McKinsey report stated that executives find managing web 2.0 adoption challenging, as traditional financial or performance incentives are not wholly effective. Such incentives may cause low quality contribution, it further states that any management intervention must also appeal to users’ ‘egos and needs’ (Chui et al, 2009). In this study, we argue that motivational factors that influence adoption of web 2.0 among knowledge workers may coexist with performance/productivity related motivational factors (for knowledge seeking) and other intrinsic/extrinsic motivational factors (for knowledge sharing). Significant body of research, within the knowledge management stream, have investigated the motivation to share and seek knowledge. Although knowledge sharing and seeking might have unique motivational features, both are a pair of closely interrelated and inseparable behaviours for the effective use of knowledge repositories (He and Wei, 2009a). However, most of the studies consider two perspectives independently with unstated understanding that both seeking and sharing behaviours are performed through technological systems.

3 Theoretical Framing

Studies related to knowledge management (Bock and Kim, 2002; Bock et al., 2005), theory of reasoned action, TRA (Fishbein and Ajzen, 1975) has been used as a theoretical model for explaining the knowledge sharing behaviour in organizations. While studies related to seeking behaviour (Bock et al., 2006; He and Wei, 2009b and Kankanhalli et al., 2005b) TRA, theory of planned behaviour, TPB (Ajzen, 1985), extant literature on Technology Acceptance Model, TAM (Davis, 1989) have been the theoretical basis to explain the seeking behaviour. Reviews of IT adoption research have also reported that TRA, TPB and TAM are the popular theories to study the IT acceptance behaviour in general (Dwivedi et al., 2008, Williams et al., 2009).

To understand the theoretical background for integrating motivational domain of knowledge contribution and knowledge seeking, we first discuss briefly theory of reasoned action (TRA), theory of planned behaviour (TPB) and technology acceptance model (TAM). Subsequently, we propose our research model for acceptance of web 2.0.

3.1 TRA, TPB and TAM

TRA posits that a person’s conscious behaviour is determined by strength of his/her intention (BI) to perform that particular behaviour (Fishbein and Ajzen, 1975). According to TRA, BI is a function of Attitude (A) and subjective norm (SN) concerning the behaviour. Attitude is further determined by a person’s salient beliefs towards performing the behaviour. More formally TRA is represented as:

$$BI = w_1A + w_2SN;$$

($w_1$ and $w_2$ are relative weights estimated by regression or other techniques)
Ajzen (1985) put forth the Theory of Planned Behaviour (TPB), positing that translation of behavioural intention into actual behaviour was dependent not only on attitude and subjective norms but also perceived behavioural control (PBC). According to TPB,

\[ BI = w_1 A + w_2 SN + w_3 PBC. \]

PBC is the perceived ease or difficulty of performing behaviour and a personal sense of control over performing it (Ajzen, 1985). Both TRA and TPB are context specific. That is, beliefs, attitude, subjective norms and behavioural control, differ drastically from one behavioural to other. TAM is grounded in TRA and TPB framework with two parsimonious belief set i.e. perceived usefulness and ease of use (Davis, 1989).

The generalizability, measurability and simplicity of TAM resulted in large number of technology adoption studies being based on it (Lucas et al., 2007). Reviews and Meta analysis of studies using TAM have confirmed its empirical support (Chang et al., 2010; King and He., 2006; Legris et al., 2003 and Lee et al., 2003). TAM itself has evolved over the years, as researchers using the theory, added variables that enhanced the applicability of the model. Addition of salient beliefs, other than the perceived usefulness and ease of use in the TAM model, are driven by change in both context of the IT and nature of IT itself. For example, beliefs such as social presence in case of collaborative communication technologies (Yoo and Alavi, 2001) and trust in online shopping context (Gefen et al., 2003) have significant influence on acceptance behaviour. Hu et al. (1999) stated the changing nature of IT, user group and context drives the acceptance research. Thus, researchers have been including additional construct in TAM model to explain the changing nature of IT and its context of use.

### 3.2 Role of attitude in IT adoption

In initial studies related to TAM models, attitude construct reported to have partial mediating role between perceived usefulness and ease of use. However in later studies (Venkatesh and Davis, 2000) this construct has been dropped. According to Davis et al. (1989), adoption of technology does not depend upon a person’s attitude and he/she will adopt the technology in spite of a negative attitude if the person feels that adoption will enhance his performance in the organization. Some researchers have demonstrated the mediating role of attitude between usefulness, ease of use and intention (see for example, Taylor and Todd, 1995; Pavlou and Fygenson 2006). Today, the access to technology has catapulted an individual to diverse connections, including that to the peer group, while the individual is engaged in his organizational role. Motivation to adopt a particular technology may not be exclusively performance/productivity related and it may coexist with other intrinsic factors. In such situations individual’s belief structure will shape the attitude about the specific behaviour that will have significant role in attitude-behaviour link as originally stated by TRA.

In social psychology research, attitude toward a particular behaviour is an important determinant for predicting adoption of that behaviour (Fishbein and Ajzen, 2005). Fishbein and Ajzen assert that attitude towards performing a specific behaviour is a better predictor of the adoption of the specific behaviour. Studies have found empirical support for the predictive power of ‘attitude towards specific target behaviour’ in diverse contexts. For example in IS research, attitudes toward microcomputer usage (Igbaria, 1998), attitude towards using office productivity technology (Taylor and Todd, 1995), and consumer attitude toward use of the internet (Porter and Donthu, 2006) explained their acceptance behaviour respectively. These studies confirm the contention of Fishbein and Ajzen (2005) that attitude toward performing the behaviour is good predictor of the behaviour (i.e. use behaviour) in question. Jennings et al., (2012) extended attitude-behaviour framework and identified ‘closely related and opposing attitudes’ as equally important predictor of behaviour. In their study, Jennings et al. explained that son’s marriage behaviour was influenced by specific attitude about childbearing and old-age care of parents in non-western social context. Their theoretical extension of TRA and TPB is very important to our research model because it maintains the focus of specific attitude but broadens
the range of attitudes that may be relevant for predicting behaviour. With this extension, a specific behavior is determined by his or her behavioral intention (BI) to perform the behavior, and BI is determined by the person's relevant specific attitudes (A1, A2,…,An), stated mathematically below:

\[ B = BI = w_1A_1 + w_2A_2 + \ldots + w_nA_n + SN \]

Where A1, A2,... are the relevant attitudes with respect to a behavior and SN is subjective norm.

The above attitude-behaviour framework provides an opportunity to explain acceptance behaviour by integrating knowledge sharing and seeking factors within a single research model which is still a theoretical gap in existing literature. Based on IT adoption research and the knowledge management literature, one can theorize the influence of attitudes about knowledge sharing and seeking (with their corresponding beliefs set), on acceptance of web 2.0 applications.

4 Research Model and Hypotheses

Our research model is presented in figure 1 based on the extended TRA. Other deviation of the model from TRA is that construct subjective norm is not included. As this study is targeted among knowledge workers and given autonomous characteristics of knowledge workers (Davenport, 2005) subjective norm will not have significant influence on adoption behaviour.

Web 2.0 technology has significantly influenced the knowledge management process for knowledge workers (Bughin et al., 2009). One must also recognize that ‘individuals share knowledge directly with others or indirectly through technology agents’ (Bock et al., 2005). Similarly, this is true for knowledge seeking also. Information technology lowers temporal and special barriers between knowledge workers and improves access to information (Hendricks, 1999). Therefore, favourable attitude towards knowledge sharing and seeking will have positive impact on intention to adopt web 2.0 applications. Considering this discussion, we develop following hypothesis.

**H1:** Favourable attitude towards knowledge sharing will have a positive influence on intention to adopt web 2.0 applications by knowledge workers.

**H2:** Favourable attitude towards knowledge seeking will have a positive influence on intention to adopt web 2.0 applications by knowledge workers.

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**Figure 1. Research Model**
4.1 Factors influencing knowledge sharing

It is stated that two broad classes of motivation i.e. intrinsic and extrinsic affect the knowledge sharing behaviour of individuals (Lin, 2007). Extrinsic motivational factors, such as expected rewards and anticipated reciprocal benefits (Wasko and Faraj, 2000) grounded in economic exchange and social exchange theories (Kelley and Thibaut, 1978; Blau, 1964) respectively, are posited to influence knowledge sharing. Within intrinsic motivational domain, enjoyment in helping others (Kankanahalli et al., 2005a; Lin, 2007) derived from social psychological theory (altruism) (Krebs 1975; Smith 1981) and knowledge self-efficacy (Kankanahalli et al., 2005a; Lin, 2007) from social cognitive theory (Bandura, 1985) are believed to affect the sharing behaviour also. Motivational domain of knowledge workers might be different as fundamental quality they possess is humanness (Von et al., 2000), the implication is that knowledge workers are less likely to be influenced by monetary rewards. Therefore, we have not included the expected rewards factor in our research model. Based on the above discussion, we will develop the posited relationship in the following section.

4.1.1 Perceived enjoyment in helping others

Enjoyment in helping others is derived from concept of altruism. Altruism is an important aspect of human attribute which motivates individuals seeking enjoyment in helping others without expecting anything in return (Krebs 1975; Smith 1981). Knowledge workers may be motivated by such desire to help others (Davenport, 2005). Prior research shows that people who contribute their knowledge possess this helping belief (Kankanahalli et al., 2005a; Lin, 2007). Therefore, knowledge workers who derive intrinsic enjoyment in helping others will more likely to have a favourable attitude towards knowledge sharing. Based on this reasoning, we present the following hypothesis.

**H3:** Perceived enjoyment in helping others will have a positive influence on knowledge sharing attitude of knowledge workers.

4.1.2 Knowledge self-efficacy

Self-efficacy refers to the perception about what one can do with the skills or knowledge that they have (Bandura, 1985). It is grounded in the belief of individual that their knowledge can solve issues faced by others, for example solving job related problems (Constant et al., 1994). Sharing their knowledge or expertise with people who are in need, enhances the confidence and thus gaining self-efficacy which leads to knowledge contribution (Kankanahalli et al., 2005a; Lin, 2007). It is suggested that self-efficacy can be an intrinsic motivational factor for knowledge workers to share knowledge (Bock and Kim, 2002) and hence they would develop positive attitude towards knowledge sharing. This leads to the following hypothesis.

**H4:** Knowledge self-efficacy will have positive influence on the knowledge sharing attitude of knowledge workers.

4.1.3 Expected reciprocal benefits

Expected reciprocal benefits or reciprocity is defined as a sense of mutual obligation of returning the favour that individual has received from others (Blau, 1964). Reciprocity is based on the principle of expectation and exchange, where one perceives that if a person contributes to the knowledge repository, in future, if a need for others expertise arises, the request for the same will be favourably met with. Prior research has shown that people who share knowledge believe in reciprocity (Lin, 2007; Wasko and Faraj, 2000; Wasko and Faraj 2005) and expected reciprocal benefits can be effective motivation to knowledge sharing (Bock et al., 2005; Lin, 2007). Therefore, if knowledge workers believe that by sharing knowledge they can expect similar behaviour from others, when it required,
they would develop favourable attitude towards knowledge sharing. Hence, following hypothesis is proposed.

**H5:** Reciprocity will have a positive influence on the knowledge sharing attitude of knowledge workers.

### 4.2 Factors influencing knowledge seeking

Value of any knowledge system cannot be realized without understanding one of the important key processes i.e. knowledge seeking. In the last few years, a body of research have investigated the factors affecting knowledge seeking behaviour (Bock et al., 2006; He and Wei, 2009b; Kankanhalli et al., 2005b). These studies conclude that motivational factors related performance/productivity influence seeking behaviour. Two salient beliefs related to technology acceptance model: perceived usefulness and perceived seeking effort are found to be significantly influencing knowledge seeking behaviour.

Significant number of studies in acceptance research have stated that attitude mediates between perceived usefulness/ease of use and behaviour intention, therefore we are not elaborating further the linkages between perceived usefulness and knowledge sharing attitude and perceived seeking effort to seeking attitude. We state the hypothesis related to it as follows.

**H6:** Perceived usefulness of web 2.0 applications will have a positive influence on the knowledge seeking attitude of knowledge workers.

**H7:** Perceived seeking effort through web 2.0 applications will have a negative influence on the knowledge seeking attitude of knowledge workers.

### 4.3 Factor influencing both knowledge sharing and seeking

The main aim of technological solutions for knowledge work is to retrieve knowledge contributed by other users in the system. When people are mutually dependent on each other trust becomes an important factor. Contrary to the understanding that individuals have tendency to hoard knowledge, Ardichvili et al. (2003) found that barriers to knowledge sharing are risk of being criticised or being misunderstood by others. Similarly, a user takes a risk when appropriates knowledge provided by others as it comes with no guarantee in many cases (Desouza et al., 2006).

Although trust is often conceptualized at an interpersonal level, in case of knowledge systems, the concept of trust may not be dyadic (He and Wei, 2009b). He and Wei further state that users in such contexts are usually member of a community, where they may or may not know the other users in the system and more often than not, there is no face to face interaction between the users. This is particularly true for larger cyber space in case of web 2.0 application, many of the members never meet physically or do not personally know each other at all. Thus, in such context, trust is at the generalized collective level. We adopt He and Wei’s definition which states trust is a form of social belief *that the extent to which other users, in general, are perceived to want to do good to the knowledge seeker or contributor based on an altruistic motive.* This means the good faith, knowledge seeker will have on the users who have made available the knowledge, similarly knowledge contributors’ good faith on users who is going to utilize the shared knowledge. Trust will reduce the risk of knowledge sharing and knowledge workers will more likely develop favorable attitude towards knowledge sharing. Knowledge exchange becomes less costly with trust (Zaheer et al., 1998) and increases the likelihood that it will be useful for recipient (Levin and Cross, 2004). Therefore, with trust in other user’s knowledge, seeker will be favorably disposed to knowledge seeking. With this theoretical reasoning we propose the following hypothesis.

**H8:** Knowledge workers perceived trust in collective users of web 2.0 applications will have a positive influence on the knowledge sharing attitude.
H9: Knowledge workers perceived trust in collective users of web 2.0 applications will have a positive influence on the knowledge seeking attitude.

5 Proposed Methodology

To assess our research model, we have chosen quantitative research method. Like most of studies in technology acceptance, a cross-sectional survey will be conducted. As noted earlier, web 2.0 applications are a collection of tools but we have conceptualized it as means for knowledge sharing and seeking. Prior acceptance research have dealt with such collection of tools, for example, collaboration technologies where underlie features of the technology are hypothesized in the research model (Brown et al., 2010). A brief description of web 2.0 applications will be provided in the questionnaire. We have identified various hospitals as our research site and respondents will be healthcare professionals working for these hospitals. As stated earlier, the study attempts to integrate both the aspects of knowledge management, namely, the knowledge seeking and knowledge contributing. Medical practitioners, typically, rely on the available literature and also the peer group in accessing the knowledge, which in turn, is put into practice. In other words, medical practitioners actively indulge in knowledge exchange. Thus the choice of healthcare domain, medical practitioners in particular, would provide useful insights on behaviour related to knowledge access and contribution via web 2.0 applications. As the peer group of the medical practitioners using web 2.0 for knowledge seeking and contribution consists of professionals from both private and public sectors, the sample for our study will include healthcare professionals from both the sectors. We propose to use convenience sampling for our study. As the purpose of our study is to test hypotheses based on the theoretical model developed through synthesis of literature, we posit that convenience sampling is more suited for our study as it would provide homogenous group of respondents with less noise (Lynch, 1982). Further convenience sampling is more cost effective as it provides a captive audience and enables researchers to achieve a significantly higher response rate than field sampling, which is important for conducting study in a niche group of respondents such as medical practitioners (Kardes, 1996). We are actively collaborating with a health care professional who is associated with a hospital mentioned previously. From our initial discussion, we found that these professional refer medical wikis, blogs and they frequently refer few online sites which have strictly peer-reviewed contents but user generated contents also exists due to comments, responses from the registered users. For developing survey instrument, we will use existing measures. Required control measures will be included in our model. Pre-test and pilot study will be conducted to modify and verify the items of the existing measures. For data analysis, we intend to use appropriate structural equation modelling technique.

6 Expected Contribution

By integrating the extant literature on knowledge sharing and knowledge seeking and linking it to adoption of web 2.0 applications, this study will make important contribution to both theory and practice. Our research is a novel attempt to investigate the influence of drivers from two motivational domain i.e. knowledge sharing and seeking on the technology acceptance in a single research model. Previous studies have investigated knowledge sharing and seeking behaviour either independently or in a single study with two research models with a focus on comparative analysis (He and Wei, 2009a). Output of this research will extend technology acceptance theory as it proposes that relevant and closely related attitudes will also explain technology adoption. For practitioners, this study will provide a comprehensive framework to assess the acceptance with respect to knowledge sharing and seeking and will help them to understand how to strive for balance between two behaviours.
References


