SOCIAL, TECHNICAL, AND ORGANIZATIONAL DETERMINANTS OF EMPLOYEES' PARTICIPATION IN ENTERPRISE SOCIAL TAGGING TOOLS: A CONCEPTUAL MODEL AND AN EMPIRICAL INVESTIGATION

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To my mother, father, and Sydi Salaama Al-Radi

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ABSTRACT

Organizations are attempting to leverage their knowledge resources by integrating knowledge sharing systems, a key and new form of which are social computing tools. A large number of these initiatives fail, however, due to employees' reluctance to use, contribute content to, and share knowledge through such tools. Although research regarding one's motivation to share knowledge is extensive, there has been little research examining social computing systems, especially from the seeking and contributory perspectives—the two distinct, but closely interrelated facets of knowledge sharing. Motivated by such concerns, and by incorporating knowledge-seeking and knowledge-contribution perspectives in a single study, this research develops and empirically examines a theoretical model to explain what motivates employees to seek, contribute and share social tags using Enterprise Social Tagging Tools (ESTTs).

Two research phases were employed to address the research objective. The goal of the first phase of the study was to explore factors affecting users' tagging behavior in online social tagging tools. An extensive literature review was synthesized and a preliminary theoretical model emerged. A pilot study was conducted yielding 184 responses featuring eight different online social tagging tools. Mostly, the preliminary theoretical model showed positive influence on users' tag behavior with a special focus on the newly developed concepts of information retrievability, information refindability.

The goal of the study's second phase was combining the results from the first phase with motivational theories to build and validate a belief-based and socio-organizational model that can explain employees' tag seeking, contributing, and sharing behavior in ESTTs. The model was developed by employing theories such as Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), and social exchange theory. Through a large-scale survey (n=481) in two large Information Technology (IT) companies, the model was validated. The results speak to the importance of the three newly developed factors impacting employees' tag seeking, contributing and sharing behavior. These factors are uniquely context-specific reflecting actual features of social tagging tools and potentially social media in general. Particularly, the results reveal that employees' tag seeking behavior is affected by their perception of the ESTTs in terms of enjoyment, information retrievability, ease of use, and managerial influence. In the context of tag contribution and sharing, the results show that employees contribute and share tags because of their perception of information refindability, ease of use, altruism, and pro-sharing norms. Differences among the seeking, contributing and sharing model have implications for future research and practice.

LIST OF ABBREVIATIONS USED

Acronym	Name
ALT	Altruism
ATTC	Attitude to Create
ATTU	Attitude to Use(Seek)
AVE	Average Variance Extracted
CA	Cronbach Alpha
CBSEM	Covariance-Based SEM
CFA	Confirmatory Factor Analysis
CMB	Common Method Bias
CMV	Common Method Variance
CR	Composite Reliability
DF	Degree of Freedom
ESTTs	Enterprise Social Tagging Tools
F^2	Effect Size
INTC	Intention to Create
INTU	Intention to Use (Seek)
IR	Information Retrievability
IRF	Information Re-findability
IS	Information Systems
LV	Latent Variable
MG	Management Influence
MGMTI	Managerial Influence
MIS	Management Information Systems
MOD	Moderator
MS	Microsoft
PCA	Principal Component Analysis
PE	Perceived Enjoyment
PEOU	Perceived Ease of Use
PLS	Partial Least Squares
PSN	Pro-Sharing Norms
PU	Perceived Usefulness
REC	Reciprocity
RECOG	Recognition
REW	Organizational Reward
SEM	Structural Equation Modeling
SP	Social Presence
TAM	Technology Acceptance Model
TAM2	Technology Acceptance Model2

Acronym	**Name**
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action

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CHAPTER 1 INTRODUCTION

Social computing has spread rapidly among consumers during the past five years. Social computing has been defined as “applications and services that facilitate collective action and social interaction online with a rich exchange of multimedia information and evolution of aggregate knowledge” (Parameswaran and Whinston, 2007, p. 762); and as “applications and services that are distinguished by their decentralized and technological flexibility” (Ali-Hassan and Nevo, 2009, p. 14). Some of the best known examples of social computing applications include Facebook, Twitter, YouTube, Flickr, and Delicious. One major characteristic of these applications is the empowerment of end-users by co-opting individuals in endeavors that traditionally have been designated to top-down personnel, and the exploitation of user-based networks of relationships to help build these endeavors (Thom-Santelli and Millen, 2009). In most of the aforementioned social computing examples, users are motivated by their own personal interests and, at the same time, contribute information and knowledge that can be used and shared by others (Cuel et al., 2011).

As the popularity of social computing has grown, companies have noted the intense consumer engagement and creativity surrounding these technologies. Because these tools offer the potential to foster immediate collaboration and participation, and solicit customer feedback of the companies’ products, organizations are competing to adopt these tools (Lyons and Lessard, 2012; Lyons, Lessard and Marks, 2011; Bughin, 2007). Hence, the adoption rate of these technologies within organizations has been increasing rapdily (Chui et al., 2009). A report released by McKinsey Consulting in 2008 highlighted the results of a survey conducted across 2,000 companies and found an increase in the use of collaborative tools from 2007 to 2008. For example, usage of blogs in companies increased from 21% to 34%, usage of wikis surged from 24% to 32%, usage of podcasts jumped from 23% to 29%, usage of RSS feeds rose from 24% to 33% and usage of social networks increased from 27% to 28% (Bughin, 2007).

The increase in enterprise social computing tools drove companies to increase their spending on enterprise collaborative tools. It is predicted that enterprise investment in social computing technologies will rise dramatically over the next five years, reaching $4.6 billion by the year 2016, even with the current world recession (Perez, 2012). However, such an increase in companies' spending does not necessarily indicate more usage of collaborative tools, which diffuses the power of such technologies within organizational contexts.

Despite the potential benefits of organizational social computing tools and the increasing adoption rate, these tools are not achieving their intended collaborative purposes due to a lack of participation[1] in terms of contribution and utilization from members of organizations (Koh et al., 2007). Accordingly, sustained participation and content contribution from individual members of organizations are critical for the success of these online communities, especially with content-based services where contribution is voluntarily and relies primarily on community members (Adorno, 2009; Koh et al., 2007).

1.1 IMPORTANCE OF PARTICIPATION IN SOCIAL COMPUTING

Social computing tools differ from traditional static applications (such as Microsoft Office Suite and ERP system) in their high dependence on users' participation to be effective. Such applications are interactive in nature and call for vibrant user interaction to add value by generating and adding new content to others' posts; and editing or commenting on the work of other participants (Burke et al., 2009; Chui et al., 2009). A recent study on Facebook by Burke et al. (2009) stressed the importance of users' contributions to online media by tying the success of social media systems to the amount of contributions made by members and how much they produce: "An outcome that is dependent on the eventual participation of a large portion of the user base" (Burke et al.,

[1]It should be noted that technology adoption indicates users' overall acceptance of a technology, while technology participation denotes how much individuals use and contribute to adding content to technology tools.

2009, p .1). A prime example is Wikipedia, which is attractive to many people because it is built on an “architecture of participation” in which the contribution of “100 million hours of human thoughts” (Shirky, 2008, p. 1) makes it useful to the general public. In other words, it can be argued a system is most useful when people are motivated to glean knowledge from it.

Similar to online social media sites, enterprise social computing relies on users’ interaction and contributions to succeed and achieve its collaborative benefits in boosting companies’ information productivity. Furthermore, previous studies on organizational knowledge management showed the success of knowledge sharing tools depends heavily on users’ sustained contribution of content and knowledge to populate knowledge management tools (Koh et al., 2007; McDermott, 1999; Ruppel and Harrington, 2001). That is, the more people who use and contribute quality content to social computing tools, the more effective the tools will be for organizational members. For example, a company may build a blog to encourage employees’ collaboration on job tasks, but such a blog is useless until enough employees post material, links, and comments to establish enough collaboration (Daniel, 2007). Therefore, corporate managers must find ways to identify and cultivate a solid base of content contributors to help generate enthusiasm for collective intelligence systems that rely on users’ contributions (Bughin, 2007). Conventional and trite suggestions of ‘‘build it and they will come’’ and ‘‘technology can replace face-to-face interaction’’ are misleading myths for knowledge sharing solutions (Dixon, 2000). However, one of the major challenges facing knowledge sharing initiatives in the workplace in general is users’ willingness to contribute and share knowledge with other members (Hsu et al., 2007).

1.2 THE MANAGEMENT DILEMMA

Organizations’ spending on social computing applications is increasing, but they are having trouble reaping the benefits of these applications due to a lack of employee participation in adding content and using the tools (Chui et al., 2009). According to a study by Karrer (2008) on the use of social computing technologies in enterprises, one of the major obstacles organizations faced in adopting social computing tools was the considerably low participation and adoption rates of these tools among employees. The study cautioned corporate executives about the “1% Rule”, which indicates that in a collaborative environment “for every 100 people who sign up, 90 will only use (i.e. lurk), nine will participate in a limited fashion, and one will regularly post content” (Karrer, 2008).

A McKinsey Global Institute report titled “Six Ways to make Web 2.0 Work” showed social computing applications within companies do not achieve their sharing and collaborative purpose due to the lack of employee participation (Chui et al., 2009). Moreover, a significant number of knowledge management initiatives within organizations fail to achieve their purpose because employees are reluctant to contribute and share knowledge through these tools (Bock et al., 2005). In some cases, only a few users actively contribute content, while most others lurk around others’ contributions. For instance, research focusing on the patterns that characterize social annotation and tagging efforts in social computing communities found social tags are shaped by power law distributions, both in the relationship between number of tags and number of posts (Halpin et al., 2007; Koh et al., 2007) and number of tags and number of contributors (Furnas et al., 2006). This indicates that only few users contribute content while the larger proportion of users act as mere consumers of others' content.

The current research will focus on a subset of social computing tools, namely social tagging and its application within the organizational context. The research will investigate factors that impact employees’ participation around Enterprise Social Tagging Tools (ESTTs). Specifically, the study aims at understanding employees’ motivation to seek, contribute and share tags using ESTTs through developing and validating a theoretical model of the key drivers behind effective participation using ESTTs. Eliciting the degree of participation could increase the social and intellectual capital of organizations and enhance the organizational knowledge management process.

1.3 WHAT IS SOCIAL TAGGING?

Social tagging applications are a subset of social computing tools that offer strong potential for users in (metadata) knowledge sharing and collaboration. Social tagging is defined as labelling web resources with the users' own styles of descriptions of web content for easier retrieval and findability of previously found resources (Wu et al., 2009). Users add labels or tags to online items such as images, videos, bookmarks, and texts. These tags are sometimes refined and edited before being shared with others (Trant, 2009). It should be noted tagging tools first were developed in response to the need for individuals to organize their content and make it easier to re-find information resources. The core power of tagging is it leverages users' own language and personal logic to describe information resources to organize and retrieve content of interest. Further, social tagging is popular because the value of tags is seen to benefit groups as well as individuals. Users can find their own tags and also those of other users who have tagged additional potentially interesting and related content. Thus, tagging moved from simply a personal content management tool to a social tool to share tagged resources that could ignite serendipitous discovery of content, ideas, and peers (Lemieux, 2009). Further, with social tagging tools, people now have the desire to read what the important people are reading through clicking on their tagged resources. As one subset of social tagging, social bookmarking exemplifies the characteristics of social tagging in its features to empower users with the privilege of naming and labelling content. Additionally, social bookmarking allows users to tag and save websites and share them with others. Social bookmarking sites, such as Delicious, offer bookmarking features that enable users to post web addresses, comment on them, and add tags to uniquely describe them. Further, users' personal tags to online pages become a collection where everyone can browse, view, and share these bookmarks (Heymann et al., 2008). Hence, the collaborative power of social tagging tools inspired organizations to adopt it behind their firewalls under the term Enterprise Social Tagging Tools (ESTTs). A detailed definition of social tagging and related terminologies will be covered subsequently in section 2.1 of chapter 2.

1.4 ENTERPRISE SOCIAL TAGGING TOOLS

Although Internet-based social tagging sites such as Delicious offer collaborative benefits for publicly available web resources, they can be problematic when used by organizations through intranets. Mostly, corporate members are restricted by firewalls that do not allow access to tagging resources outside organizations. Even if firewalls permit access to these resources, public sharing of resources may be an issue of proprietary information (Millen et al., 2006). Organizational or enterprise social tagging refers to using social tagging technology both within workgroups and across the organizational environment. ESTTs offer many benefits for organizations on an individual and organizational level. For starters, ESTTs have the potential to improve the information retrieval process through knowledge management initiatives such as intranet and document management systems (Lemieux, 2009). Taking on the role of information categorizers, organizational members can use tags to enhance the findability and retrieval of previously found information resources. Moreover, employees can subscribe to “tagging streams” and monitor content of interest when tagged by others, which could come in the form of trend monitoring, blogs and current news. Additionally, they can improve the information retrieval process through knowledge management initiatives such as intranet and document management systems (Lemieux, 2009). Detailed benefits of online social tagging and ESTTs will be discussed in detail in Chapter Three.

1.5 RESEARCH GAPS

While research in the area of information sharing motivation is extensive (e.g. Wang et al., 2009; Hsu and Lin, 2008; Wasko and Faraj, 2005), users’ knowledge sharing behavior is still unknown, and organizations and their efforts to convince employees to use social computing tools have not been successful. The following section offers an overview of the research gaps in users' seeking and contributing behavior in knowledge sharing and social computing tools.

1.5.1 Employees' Motivations to Tag Information Resources

The question of why people contribute metadata tagging content to online information resources has been a subject of several studies in recent years. Some studies investigated several motivational factors to help understand users' tag contribution and sharing behavior. Some of these factors include self- and public motivation as well as social presence (Ames and Naaman, 2007; Lee, 2006), social psychological factors (Cheshire and Antin, 2008), trust belief and its antecedents (Kim and Han, 2009), voluntarism in adding and categorizing content (Schroer and Hertel, 2009), and altruism and enjoyment in helping others (Hickey, 2008). Although these studies helped explain some factors that drive users to contribute tagging content online, very few studies dealt with the motivation of using and contributing to social tagging tools within the organizational context.

1.5.2 Online Community Members' Participating Behavior

Previous studies in the area of online communities (e.g. Charalambos et al., 2004; Bruckman, 2002) explored the characteristics of online communities but suffered from clear lack of theoretical grounding in community members' participation. There are studies that are considered exceptions (e.g., Phang et al., 2009; Barab et al., 2001). These studies focused on how usability and sociability dimensions can play important roles in developing communities that support learning. However, these studies did not focus on increasing members' participation in the organizational environment. For example, Koh et al. (2007) studied the contribution of online community members, but their study did not target the organizational environment, and they did not examine modern social media tools such as social tagging, wikis, or blogs. Wattal et al. (2009) extracted their conceptual model from TAM and studied the effects of gender, age, managerial adoption, and spacial network on the adoption of blogs among employees. However, their study focused only on blog participation and its positive correlation with managerial adoption and spacial networks. Phang et al. (2009) tested a conceptual model for online knowledge seeking and contribution; however, their study was restricted to the Internet environment and they focused only on online discussion boards.

1.5.2.1 A Lack of a Socio-Technical and organizational

Previous studies lacked an integration of the social and technical perspectives on users' knowledge sharing behavior. Most of the previous studies emphasized the role of either the technical or social component of knowledge sharing tools and ignored a possible integration between them. Having a technically sophisticated information sharing system is an important element in the process of knowledge sharing; however, it does not guarantee the success of knowledge sharing initiatives (Bock et al., 2005; Cross and Baird, 2000; Kankanhalli et al., 2005; McDermott, 1999). This is because social issues play a substantial role in influencing users' knowledge sharing behavior (Adorno, 2009; Hsu et al., 2007; Ruppel and Harrington, 2001). Only a few recent studies have addressed the importance of combining the social and technical dimensions of the knowledge sharing process to better understand users' behavior of knowledge contribution and sharing, and to motivate a sustainable contribution to online knowledge sharing systems (e.g. Phang et al., 2009 and Adorno, 2009).

1.5.2.2 A Lack of Integrated Model for Seeking and Contributing

In general, the process of knowledge sharing through electronic media involves people contributing knowledge to populate electronic media and people seeking knowledge (Kankanhalli et al., 2005). For this process to succeed, knowledge contributors should be willing to add and share knowledge, and knowledge seekers should be willing to seek and reuse knowledge (Ba et al., 2001). This does not mean users are classified as either contributors or seekers; rather, a user can be mainly a contributor and seeker occasionally and vice versa (Kankanhalli et al., 2005). Thus, an organization's knowledge management initiatives must feature a balance of contribution and seeking behavior.

However, these two perspectives of knowledge behavior are usually examined independently by researchers.

To summarize some of the research gaps regarding knowledge sharing and seeking, it can be argued previous studies on knowledge management failed to fully explain users' contributing and sharing behavior; lacked an integration of the technical and social aspects of knowledge sharing systems; and lacked a balance between users' contributions and use of system content. Furthermore, there is also a paucity of studies on social tagging motivations within the corporate environment due to the novelty of these tools. Besides, little attention so far is given to social computing tools and the social aspect that makes this technology different from legacy knowledge sharing systems.

1.6 OBJECTIVES OF THE RESEARCH

Based on the previous literature gaps, this study aims to contribute to both theory and practice:

1.6.1 Theory

1. To gain insights into the factors that impact employees' motivation to participate in enterprise social tagging tools
2. To hypothesize a belief-based, social, and organizational model that explains employees' motivation to participate in tagging activies in an enterprise social tagging context. The hypothesized model will be theorized to propose employees' participation on ESTTs from both knowledge sharing and knowledge seeking perspectives—the two distinct, but closely interrelated, facets of knowledge sharing.
3. To expose this model to extensive empirical testing

1.6.2 Practice

Regarding practice, this research's purpose is producing guidelines and recommendations on employees' motivations to use, create, and share tagged resources using enterprise social tagging tools which would interest developers and managers who use these tools. In this thesis the author will use the words create, add, and contribute synonymously to indicate the act of adding, creating and contributing tags. To reach these objectives, the study follow a deductive research approach that polls real-life end users of this application, via a web-based survey, on the cognitive and contextual factors encompassing the adoption of enterprise social tagging tools.

1.7 RESEARCH QUESTIONS

This study aims at answering one general question:

What motivates employees to seek, add, and share tags to the ESTTs?

To answer the general question, this study seeks to answer the following subquestions pertaining to the study's hypotheses:

- ***RQ1*****:** *What is the effect of employees' perceptions of system-related characteristics of enterprise social tagging tools on their attitudes toward tag seeking?*
- ***RQ2*** *What is the effect of employees' attitudes on their intention to seek tagging content?*
- ***RQ3:*** *What is the effect of organizational context (managerial influence) on employees' intentions to seek tagging content on ESTTs?*
- ***RQ4****: How appropriate is the proposed theoretical model in explaining employees' tag seeking behavior in ESTTs?*

- ***RQ5:*** *What is the effect of employees' perceptions of system related characteristics of enterprise social tagging tools on their attitudes toward contributing tags?*

- ***RQ6*** *What is the effect of employees' attitudes on their intention to contribute and share tagging content?*

- ***RQ7:*** *What is the effect of organizational context(managerial influence, pro-sharing norms, and organizational reward) on employees' attitudes toward creating and sharing tags?*

- ***RQ8****: How appropriate is the proposed theoretical model in explaining employees' tag contribution and sharing behavior in ESTTs?*

Accordingly, the study examines the underlying motivating factors behind employees' participation in ESTTs from two perspectives: (1) tag contributors as the first step toward knowledge leverage through ESTTs; and (2) tag seekers as the second step toward knowledge leveraging through ESTTs. As noted earlier, knowledge contributors must be willing to provide tagging content to ESTTs. Otherwise, knowledge and tagging reuse through ESTTs cannot occur. Drawing on theories of TAM, Social Exchange, and Value Theory, this research adopts a belief-based approach to understand how tag seeking and contributing in ESTTs is associated with a variety of users' beliefs. Specifically, I propose the process of metadata knowledge seeking and sharing in ESTTs should pertain to a unified social, technical, and organizational model to better understand users' participating behavior in ESTTs. I also propose a participation model for employees' motives to participate in ESTTs should be unified and take into consideration two distinct, but complementary, types of behavior of seeking and contributing and examine their motivation through using different set of factors.

1.8 IMPORTANCE OF THE RESEARCH

Investigating factors impacting participation in social media and in knowledge sharing tools in general is important for organizational productivity. At the individual level, understanding what motivates employees to sustain an effective pattern of participation in such tools helps develop and maintain communities in which individuals have both the opportunity and the motivation to contribute information and knowledge to organizational social capital. For organizations, it is necessary to identify key factors associated with knowledge contribution and sharing as a means to use employees' organizational assets. The results will suggest organizational strategy interventions and technology design considerations that can promote knowledge contribution to ESTTs and social computing tools in general, thereby facilitating reuse of organizational knowledge and resources. Besides, understanding of knowledge sharing development provides a foundation for facilitating collaboration and learning among employees who are separated by physical distance and organizational boundaries. Achieving the right amount of participation would help organizations gain the potential benefits of crowd wisdom and would help cultivate a collaborative environment that may enhance the organization's performance and productivity.

1.9 OUTLINE OF DISSERTATION

The dissertation consists of six chapters. Chapter one (this chapter) introduces the problem under investigation, presents the research area and highlights the importance of the study for both theory and practice.

Chapter two offers a comprehensive literature review of online and enterprise social tagging tools and prepares the groundwork for the theoretical model that will be introduced in the subsequent chapter. Iit explores prior work on social tagging systems and its characteristics, advantages and disadvantages, and the use of social tagging inside organizations. The second part of chapter two covers Enterprise Social Tagging Tools (ESTTs) and applied examples of such tools in organizations.

Chapter three is the theory component of this study, featuring a thorough literature review of what motivates people to use social tagging tools and discussing commonly used theories to explain users' motives pertaining to IT adoption, information seeking and contributing behavior. The chapter also describes in detail each potential factor that will form the theoretical model in chapter five and its relevance and use in previous Information Systems (IS) literature. Chapter three concludes with the first proposed model and several initial hypotheses.

Chapter four illustrates the methodology used in this dissertation to test the hypotheses and to answer the research questions. First, it describes the process of selecting respondents, response rate, and recruitment procedures. Second, it presents data collection strategies for deductive analysis. Specifically, the chapter presents the actual survey instrument as used in organizational context, and outlines quantitative data analysis techniques that are used to validate the proposed model.

Chapter five describes the data analysis process. It starts with the results of the pilot study conducted to test the initial proposed model. Specifically, it describes an approach for filtering out the non-significant factors that did not correlate with online social tagging use. The first part of the chapter concludes with a final set of factors, along with the final proposed model of ESTTs to be tested in a subsequent chapter. The second part of chapter five discusses the full study in detail and summarizes the preliminary statistics used to fortify the data against possible method bias effect. Further, it describes users' background pertaining to gender, age, occupation, education, and location. Additionally, it gives an overview of the model testing procedures beginning by testing for common method bias assessment, examining the measurement model, the structural model, the effect size, and the model's predictive power. Finally, chapter five provides a proof of theoretical saturation and offers data validity checks.

Chapter six (the last chapter) offers a comprehensive discussion and conclusion. First, it covers methodological, theoretical, and practical contributions of this dissertation. Second, it presents several limitations of the study, suggests future areas of research, and offers concluding remarks.

CHAPTER 2 LITERATURE REVIEW

2.1 INTRODUCTION

This chapter examines the literature defining online and enterprise social tagging tools. First, it differentiates between similar terms relating to tagging such as folksonomy, social bookmarking, and enterprise social tagging tools. Second, it demonstrates the importance of the element of participation in social media and social tagging applications. Third, it describes the characteristics of social tagging tools with regards to tagging components, tagging trends, tagging interfaces and tag entries. Fourth, the chapter outlines topics related to the features of social tagging tools such as tag navigations and tag clouds. Fifth, the chapter summarizes the advantages and disadvantages of tagging as reflected in prior literature. Sixth, the chapter introduces real examples of online social tagging tools. Last, the chapter provides an overview of literature pertaining to social tagging use inside organizations.

2.2 WEB 2.0 AND ENTERPRISE 2.0

Web 2.0 is the popular term for advanced Internet technology and applications including blogs, wikis, RSS, and social networks. One of the most significant differences between Web 2.0 and traditional Web is greater collaboration among internet users and other users, content providers, and enterprises. Web 2.0 is not only changing what is on the Web but also how it works. Among the biggest advantages of Web 2.0 is better collaboration with customer, partners, and suppliers, as well as internal users (O' Reilly, 2005). Enterprise social computer or enterprise 2.0 refers to the concept of moving the Web 2.0 tools and technology into the enterprise to help organizational members, partners, supplier, and customer collaborate together to build networks of like-minded people and to share information (McAfee, 2006).

2.3 SOCIAL TAGGING

2.3.1 Definition

"Tags" are freely chosen keywords, category names, and are metadata. Tags are not created by professional archivists, so they do not follow formal guidelines. In other words, any user can assign any keyword or tag to describe an item based on his/her conception of this item regardless of whether the assigned keyword is meaningful to other users or not (Guy and Tonkin, 2006).

Social tagging is defined as labelling web resources (including people) with users' own styles of description of web content (Wu et al., 2009); as a promising social environment that utilizes a range of tools to create, aggregate, and share dynamic content in creative and interactive ways that are more than transactions previously conducted on the Internet (Connor, 2006); as a more personalized way to search web content and a means to mark, store, retrieve, and keep track of valuable web content (Rainie, 2007); as "the most recent incarnation of the World Wide Web, which allows users to create, change, and publish dynamic web content using digital tools" (Stephens, 2006, p.8); as "the tendency to let users create…net content"(Nielsen, 2000, p.15); as the classification of resources "by the use of informally assigned, user-defined keywords or tags" (Barsky and Purdon, 2006, p.66); and as a social classification by using free-text metadata for describing and discovering resources (Tonkin, 2006). Other terms have been used interchangeably to describe social tagging, including "ethnoclassification" (Furnaset al., 2006; Merholz, 2004; and Walker, 2005) "community cataloguing" , and "cataloguing by crowd" (Chun and Jenkins, 2005) "social classification" (Furner and Tennis, 2006; Lanbeck, 2007;Tant, 2006; Xu et al., 2008) "collaborative tagging" (Golder, S. and B. Huberman, 2005; Halpinet al., 2007; Lee, K. J., 2006); and "socially-generated semantic tags" (Chen and X. Liu, 2008). A tagged resource can range from a photo, map, video clip, or any other object on the Web (Velsen and Melenhorst, 2009). Tags can even describe genre (e.g. "garagerock"), mood (e.g. "chill"), artist characteristic (e.g. "baritone"), or any other form of user-defined classification as in the tag "seen live" (Bischoff et al., 2008). One of the main characteristics of tagging is there are no specific standards for tagging web content. For example, users might describe content according to its subject matter as in 'how to' , 'blogs', 'travel', or it could be in the form of self referential notes as in 'to do', 'to read', or 'to call' (Lee, 2006).

2.3.2 Social Bookmarking

Trant (2009) noted a tendency among young social tagging literature to mix social tagging with social bookmarking. She gave an example of a study done by Noruzi (2006) where social bookmarking and social tagging were used as synonyms. Social bookmarking allows users to tag, save, and share websites with other users. Social bookmarking sites, such as Delicious, offer bookmaking features that enable users to post websites, comment on them, and then add tags to describe them. Further, users' personal tags to web pages become a collection where everyone can view, browse, and share these bookmarks (Heymann et al., 2008). Social bookmarking systems typically use date, user names, and the titles of the websites to structure the collections of bookmarks submitted by users. Typically, users are allowed to tag a bookmark with multiple tags, and each user is offered a personal page on which his/her bookmarks are displayed (Noruzi, 2006).Other example of social bookmarking are CiteUlike and Connotea, which are sites dedicated to the presumed needs of academics in that they are used to tag or bookmark research papers (Smith, 2008).

Based on the bove definition , social bookmarking is considered a subset of social tagging relating to tagging webpages for future retrieval, while social tagging is naming and tagging of any infomraiton resources (including webpages, pictures, video clips..etc) for future findability and retrieval.

2.4 PARTICIPATION IN SOCIAL TAGGING AND SOCIAL MEDIA

Drawing on Preece and Shneiderman (2009), social participation can be categorized into four levels. The successive levels describe the degree of users' involvement in the social computing process: reading, contributing, collaborating, and leading. Each level involves sublevels shown in the following list:

1 Reader: reading, browsing, searching, returning
2 Contributor: rating, tagging, and reviewing
3 Collaborator: developing relationships, working together, setting goals
4 Leader: Promoting participation, mentoring novices, setting and upholding policies

Forte and Bruckman (2008) noted a typical behaviour of users in social web-applications involves starting using the web, joining a discussion group, reading a blog, or tagging a photo. Some get satisfied with one look or one experience, few decide to return to a social application for a second or third time, and others get more involved by contributing to the application. Preece and Shneiderman (2009) continued in the same line by noting new users start their social computing journey by doing simple things such as editing simple words, or agreeing with someone's comments. As users get more experience with the system they may "dip their toe in" and decide to come back for more active participation.

Since the categories of participation of Preece and Shneiderman (2009) fit social computing in general, this research will focus only on social computing activities that pertain to social tagging such as: readers (tag seekers) and contributors(tag adding or creating) . Hence, social tagging participation for this study will include (1) tag seeking: searching, reading, browsing, and returning to tags; and (2) tag contributing: posting and editing tags.

2.5 SOCIALITY IN TAGGING

Although tagging is similar to keyword–based systems that have existed in other web management systems for years, its new social dimensions have helped in adding a needed social flavour. The social dimension in tagging offers potential capacity to collect individual bookmarks and tags in rich networks of shared resources (Marlow et al., 2006). By involving a computer mediating interaction among large groups of users, collaborative tagging systems are considered a "laboratory of semiotic dynamics", a field that deals with how humans can build and share semiotic communication systems through collaborative interaction (Catutto, 2006).

Tagging behavior becomes social when it is performed and shared by a community of users, where users generate, view, and share tags among each other. In the context of an audience, tagging a resource is no longer primarily a self-serving activity for the organization of personal information, but a social act that impacts the entire community of visitors to a website. Therefore, the nature of the tags and the act of tagging itself, in essence, become a social or even collaborative activity (Zollers, 2007).

Tagging applications offers social capabilities that allow users to keep track of specific tags, recommend tags to others, and know more about users' contacts (Zollers, 2007). Many of these social tagging applications facilitate a 'user driven content' and provide a capacity to orchestrate between personal and community information across groups, organizations, and teams (Razavi and Iverson, 2009). By using keywords or tags to organize information within users' information space in a sharable way, social tagging applications facilitate the searching and browsing of information targets by other users giving users the chance to add their information resources to popular tags created by other users and that can be explored by any web user (Macgregor and McCulloch, 2006).

2.6 TAXONOMY

The term "taxonomy" is generated from the greek word "taxis" which means the arrangement or organization. Taxonomy is the science of classifications of information artificats based on pre-defined rules. The resulting catalog is used as a conceptual framework for information retrieval. A main element in designing a good taxonomy is to divide groups into subgroups that are mutually exclusive resulting in a simple, and easy to remember rule for information retrieval. Web taxonomies are usually created to describe categories and subcategories of topics found on the website. The categorization of words on a website is an example of web taxonomy (Rouse, 2005).

2.7 FOLKSONOMY

Folksonomy is defined as the total collection of users' tags on a given website (Melenhorstet al., 2008); as ''a folk taxonomy" of important and evolving concepts within the user group (Marlowet al., 2006); and as a web-based technology that allows users to generate free tags used to categorize web content (Chang et al., 2008). Folksonomy is the counterpart to taxonomy in that the authors of the tagging system are also the users who created the tags for the content (Noruzi, 2006). In folksonomy, casual terms are used as metadata describing various objects; the resulting tagging system is used for information resource management, resource discovery and content description (Tonkin, 2006). One value of folksonomy emerges from the interactions between three important elements: a user (could be a browser), information object, and the tags used to describe information resources (Velsen and Melenhorst, 2009). Another value of folksonomy arises from the users' addition of their own understanding of the content of information objects and from the free vocabularies that add explicit meaning to the information objects (Wal, 2005). In folksonomies, users may or may not actively contribute tags to the tagging system, but they can read and use tags assigned by others (Spiteri, 2007).

Glassey (2007) positioned folksonomy under the family of "distributed classifications" whose process is created by a group of non-expert users who follow no defined structure to validate common thesauri to use. He connoted that the main function of the folksonomy classification process is offering taggers efficient means to navigate web contents in a way that reflects their own way of classifying things.

With a low barrier of entry and the facilities to connect related users to each other, folksonomy sites, such as Delicious and Flickr, have been attracting large number of users. For example, in Delicious, users can tag, save, and organize their bookmarks along with any related resources with free style of tag descriptors. Additionally, users can collaborate with each other in socially annotating resources implicitly or explicitly and create meaningful categories of information artifacts (Xu et al., 2008).

Smith (2008, P.46) , in his book, *Tagging: People-Powered Metadata for the Social Web*, defines four characteristics of a folksonomy:

- First, tagging is done independently: users must be free to choose a keyword to tag a certain object. Even when the system offers suggestions, users still are free to choose which suggested items they will use as tags.
- Second, tags are aggregated: tags are gathered and accumulated through an automatic algorithm to be used by users. Tag sampling is different from tag aggregation in that it separates tag collections from a taxonomy-based system in building category from tags. Such is the case with Etsy, a social networking web application that connects makers and buyers to trade handmade items, vintage items, as well as craft supplies (Etsy, 2009).
- Third, relationship is aggregated: while other classification systems establish relationships between items using semantic relationship, the relationship between tags is inferred from their use, pattern of use, and real users' behavior.
- Fourth, any inference method is valid (including the no-method): taggers can choose any methods of inferences, as long as they choose the methods themselves.

2.8 TAGGING TRENDS

Because of the popularity and the social value of tagging, many web-based organizations facilitate the tagging process to users by making it available and convenient. For example, Google allows users to tag their e-mail content; Amazon users can tag books and other products offered by Amazon; and Yahoo! enhanced its service with web tools making it easier for users to label and store webpages. Many sites are allowing users to tag their pages in the site directly to favorite tagging sites with a simple click. Recent reports showed some users are making tagging sites as their home pages to create some sort of a competition between these sites and large media companies (Rainie, 2007).

A current tagging trend is the integration between desktop and web-application that gives users the convenience of working with their tags through their desktop. Google Desktop gives users the power of managing their web tags through a small simple add-on to the desktop, while Windows7 and Mac OS offer tools that help users use web-tags. Some file management applications such as Journal have tagging features that allow users to manage their web-based or personal computer tags (Panke and Gaiser, 2009).

2.9 TAGGING COMPONENTS

Catutto (2006) noted that users' activities with the tagging system are either navigation through existing tagged resources, or finding resourcing and tagging them. Accordingly, the basic unit of information (a post) in a tagging system consists of three elements: user, resource, and tags. A typical post features a time marker to facilitate its ordering, storing, and retrieval. Catutto (2006) depicted a scenario of a collaborative tagging process by inferring that users, while viewing and freely tagging a resource, can see previous tags named by themselves and by others. The collective tag activities create a dynamic connection between tags and resources that will eventually generate a shared categorization of tags.

Halpin et al. (2007) followed the same stream by indicating that tagging system components establish three spaces: (1) *user space*, having all users of the tagging system; (2) *tag space*, including a set of all tags that corresponds to terms such as "music" or "to read"; and (3) *resources space*, including a set of all the resources, where each resource is known as a specific object such as URLs in Delicious. They continued by denoting that each tag instance, normally associated with a date and time, has two edges linking a user to a tag and a tag to a resource. Stating that tagging is a simply a link between users and the target search concept (a resource), Halpin et al. (2007) suggested that a tagging system is just another methodology of information retrieval, much like traditional methodologies, with some structural differences.

2.10 HOW TAGGING WORKS?

Tagging mechanics are simple and almost similar on most tag-centered websites. After a user registers for an account on a social tagging site such as Flickr, he/she can upload his/her own collections of photos and give them names (tags). A user can search the site using normal keywords that represent a topic or an item in mind. When finding an interesting photo, a user might label it with a tag that describes the photo for future retrieval. A user may use a previous tag to apply it to the new photo or use a different name that will make sense to him/her. Furthermore, a user can access his/her tagging account from any computer that has an access to the Internet and hence view and use his/her tags as well as other's assigned tags to retrieve the marked photos (Rainie, 2007).

2.11 INDIVIDUAL'S TAG USE OVER TIME

Marlow et al. (2006) indicated individual users' tagging behavior over time is affected by the interaction between the user, tags, and the utility of tags. In their study of Flickr tagging, they identified three classes of tags use levels over time: (1) users who increase their tags as more resources are added to the system over time, indicating that the 'freshness of vocabularies' and resources added to the system might have given users steady motivations to add more tags to the system; (2) users who start with few tags and then suddenly increase their tags substantially, suggesting those users might have discovered related tags, or they might have found new incentives and uses for tags; (3) users whose tagging declines over time, suggesting they either lost interest in making tags, or made more agreement on tag vocabularies.

2.12 TAGS OVER TIME

Golder and Huberman (2005) studied how URLs evolved over time through Delicious. They classified URLs into two categories based on how popular their tags are: URLs quickly reached high peak, shortly after they were added to Delicious, suggesting these tagged URLs might have been displayed in a high traffic page that enticed users to tag them more often; and URLs reached high peak suddenly after being there for a long time, suggesting that these URLs might have been "rediscovered" and hence users started bookmarking them. In terms of tagging stability, Golder and Huberman (2005) found that tags frequencies tend to stabilize over time, especially after the first 100 bookmarks.

On their studies on tag use in CiteULike and Connotea Santos et al. (2009) noted users' reuse of tags are considerably higher than their re-tagging behavior. They attributed the low level of re-tagging behavior to the expanding interests of the existing users. From such finding, they indicated tagging systems may be used to eliminate the sparseness problem found in some tagging websites. They identified three types of taggers based on their organization of tags: (1) *singletons*, which refers to users who own unique tagging preferences with low tagging activity; (2) *small components*, including users with high similarity of interests but isolated from the tagging system; and finally (3) *giant components*, including users who do not share their tags, but create large number of tags.

2.13 TAGGING SYSTEM

2.13.1 Tagging Interfaces

According to Smith (2008), there are five modes of tagging interfaces:

2.13.1.1 Adding and Tagging

The first purpose of this mode is allowing users to add their own resources, whether they are photos, video clips, URLs, or any uploadable objects. The second purpose is having users title, describe, or add extra metadata that can mark the resources for future uses. Users can add the resources and the tags concurrently, as in YouTube and most of the social networking sites, add the resources and then add the tag later (as in Flickr), or add categories and tags and then add resources, as in CiteULike and LibraryThing. This mode is characterized by its simplicity for users and its potential for improving the quality of tag vocabularies.

2.13.1.2 Adding and Bulk Tagging

This mode takes place when users add one resource and associate many tags to it, as is the case with Delicious and LibraryThing.

2.13.1.3 Bulk Adding and Bulk Tagging (Taggers' resources)

This mode of tagging interface allows users to assign tags to multiple, or batches of, resources at once. Bulk tagging typically takes place when users transfer a batch of bookmarks from their browser to a social bookmarking site like Delicious, or when they want to upload a set of photos from a PC to a photo management and sharing site like Flickr. Bulk tagging is considered an advantage when users have a large number of object collections. However, Bulk Adding and Bulk Tagging might increase the use of generic tags versus specific tags and influence the quality of tags in the system.

2.13.1.4 Just Tagging

Just tagging mode allows users only to add tags or descriptions to a resource already in the system. The resource might be posted by other users, as in Delicious, provided by the system, as in Amazon, or posted by the taggers themselves, as in Flickr and most of the social tagging sites.

2.13.1.5 Bulk Tagging for System Resources

This mode allows users to add tags to multiple resources already in the system. An example of this mode applies when users add tags or new categories for a group of resources to place them in a tag bundle as in Flickr and CiteULike.

The previous modes are not mutually exclusive, and some social sites feature more than one. For example, Flickr offers the five modes in its interface: Adding and Tagging, uploading photos one by one and adding tags to each one; Adding and Bulk Tagging, where uses can add one photo and associate it with multiple tags; Bulk Tagging for Taggers resources, where users can save multiple photos and add tags to them as a batch from the user's desktop; Just Tagging, where users can tag existing photos from the photo page interface; and Bulk Tagging for system resources, that lets users tag batches of photos they have already uploaded to the system.

2.14 TAG NAVIGATION

2.14.1 Tag Cloud

The most common navigation feature of tagging system is the tag cloud. A tag cloud is simply a list of all the tags that belong to a certain user group where popular tags are highlighted typographically (Panke and Gaiser, 2009). Tag cloud is similar to the query mechanism in traditional search. After a user clicks on a tag within the cloud, the tagging system takes the tag and adds it to the system algorithm as a regular query. The system matches the tags with related tags in its collections and displays a list of the results in a new page with another tag cloud with tags related to the previous search (Mesnage and Carman, 2009). Typically, users are given a choice to filter out the tag cloud to include or delete selected tags. Some systems enable users to control the properties of tag clouds through a slide bar on the side of the page to manage the size, the coarseness, and the visibility of tags within the tag cloud. Figure 2-1 is an example of a tag cloud.

Figure 2-1 An Example of a Tag Cloud
From Dursteler (2012)

2.15 TYPES OF TAG CLOUD

2.15.1 Nodes clouds

Shaw (2005) proposed a graphical tag cloud, where tags are shown as visually distributed nodes and relationships as edges between nodes. A node cloud features a graphical layout that exposes some of the interesting features by visualizing the relationship between tags. Using the node cloud, users can spot interesting features coming from intersecting the axies of the map and the attributes of the tags. A node cloud is helpful in giving interesting features such as proximity of synonyms and the existence of distinct regions. Figure 2-2 shows and example of a node cloud.

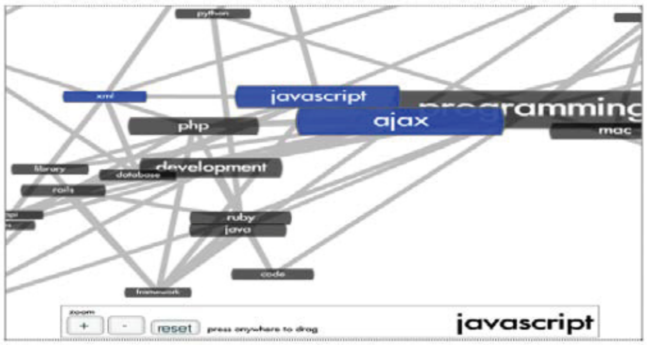

Figure 2-2 Node Cloud
From Shaw (2005)

2.15.2 Circular Tag Cloud

Bienlenberg and Zacher (2006) presented a circular tag cloud in which most frequent and related tags are grouped in the center with bigger font size, and less frequent and unrelated tags are scattered around the edges with smaller font size. Figure 2-3 shows an example of Circle Cloud.

Figure 2-3 Circle Cloud
Bielenberg and Zacher (2006)

2.15.3 Elastic Map

Another interesting tag cloud version is (Stefaner, 2007) elastic map. The elastic tag map is a flash-based interactive tag cloud that visualizes the complex relationships emerging between tags in a two-dimension plan: first, tags that tend to frequently co-occur are visualized closer to each other; and second, tags that tend to co-occur with the selective tags are brought to the front. Elastic tag maps enable users to click on a tag to explore more semantic context. An example of elastic tag cloud is shown in Figure 2-4.

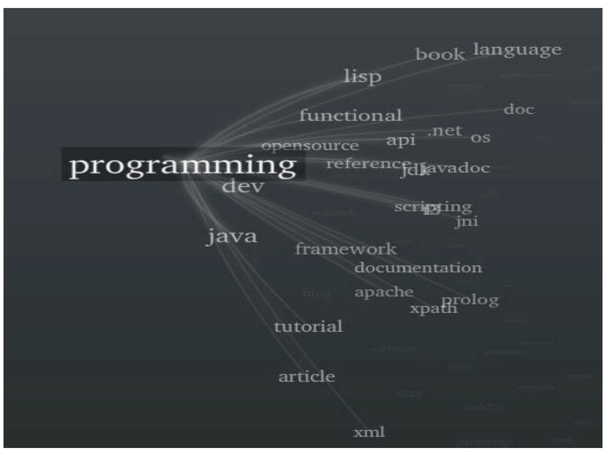

Figure 2-4 Elastic Tag Cloud,
Stefaner (2007)

2.15.4 Time Span Cloud

Dubinko et al. (2006) proposed a tag visualization technique for Flickr based on the evolution of tags over time. Designed as an add-on to the Web browser, their visualization approach is Flash-based and enables users to observe and interact with sequences of tags. The visual tool has two main features: first, it has a timeline showing the current time of the tag, which can be shifted by the user to show random access to the sequence of tags; second, the sequence of tags is displayed using 'river metaphor', where tags flow from the right to the left, and 'waterfall metaphor', where tags slots stay fixed while tags sequences flow through the slot over time.

2.15.5 Tag Browsing

Another feature of tagging navigation is Tag Browsing, where a tag functions as a hyperlink to additional resources tagged by others users. Since tagging is considered as a triplet of users object, and keyword, the aggregation of the three can produce the following visualization modes: all objects tagged by the user, all tags for the object, all users using the tag, all users referencing the object, and all objects that are marked by this tag (Panke and Gaiser, 2009).

2.15.6 Tag Bundle

Tag Bundle is simply 'tagging of tags'. It allows users to collect (bundle) a number of tags under one general tag. For example, users can create a tag bundle with the name photography that would include tags like 'technique', 'Nikon", and 'club'. Tag Bundles are important in creating tag neatness and help in the tag retrieval process (Tonkin, 2006).

2.15.7 Pivot Browsing

Pivot Browsing means moving from one information space to another by choosing a new pivot point for exploring the system. The main advantage of Pivot Browsing is it allows users to look at tags from different perspectives: who tagged what, what is related to this particular tag, and how it is categorized. Users have the option to click on any pivot-tagged point to view its content (Smith, 2008).

2.15.8 Facet Browsing

Facet Browsing is another navigational tool that helps users in locating tags. A typical example of Facet Browsing is wine.com. In Facet Browsing, users can choose a facet or point, and after exploring it, they can go back to the collections of facets to change the directions of browsing to more interesting facets. Since users are in control in each step, Facet Browsing could be "the holy grail of tagging systems" (Rashmi, 2006a, p.1). In other words, users who use facet browsing could have more control of their browsing session, when to start and when to change topics.

2.15.9 Clustering and Recommendation

Although Clustering and Recommendation are different techniques to use with tag find-ability, Rashmi (2006) combines them under one category for tag navigation because they are based on a system algorithm and users do not have control over them. In this navigational mode, the system decides what items should be offered to the user in the form of personalized tag clusters. Flickr is an ideal example of social tagging applications that deploys tag clustering. For example, under the cluster "Katrina", there are many photos that belong to the "Katrina" tag with recommendations on the left side of related tags such as "hurricanes" and "neworleans" (Flickr, 2009).

2.15.10 Tag Mash

TagMash is LibraryThing' s own tool for making tags findable and adding more quality of search. TagMash allows users to look for a book with a combination of tags - art, Paris,fiction. Using a single minus sign as in "-fiction" , users can de-emphasize fiction, and a double minus sign as in "--fiction" allows users to exclude fiction from the search. A TagMash with "19th century," "romance" and "- - fiction" will find every non-fiction entry with "19th century" and "romance" in the title (Smith, 2008).

2.15.11 Geotagging

Having reached popularity among tagging systems, Geotagging is the process of adding geographical identification data to information resources such as websites, RSS feeds, or images (Rader and Wash, 2008). Metadata of latitude, longitude, place names, and resources are added to tags by the camera and then attached to the image to give a unique name by which it can be retrieved easily. Geotagging is different from regular tagging in that it requires more structure metadata for the information media to place resources on the maps. Geotagging is used by Flickr users to tag photos with geographical descriptions and then place them on Google Maps. Geotagging requires adding three components to a Flickr photo: A marker tag that identifies photos with a location tag; a latitude tag in the form of "geo:lat=53.541"; and a longitude tag in the form of "geo:lon=113.497" (Smith, 2008).

2.15.12 Tags and Maps

One of the most interesting trends in tag visualization is TagMaps. TagMaps is an innovative approach to visualizing tags on geographic maps. TagMaps is a Flash- based application that can be used to reflect key characteristics of location-based data in an easy-to-understand way. A project deployed by Yahoo! and Flicker, TagMaps combines tag cloud, photos, and geotags in one place, available for the user to use. World Explorer is one application that uses TagMaps. Users can explore a place on the map by clicking on a highlighted tag from the tag cloud drawn on the location to view photos taken by users for that place. For example (shown below) a user may click on Alamo Square to get a list of the places in Alamo Square. By clicking on a particular place, a user would see photos taken for this place (Yahoo, 2009).

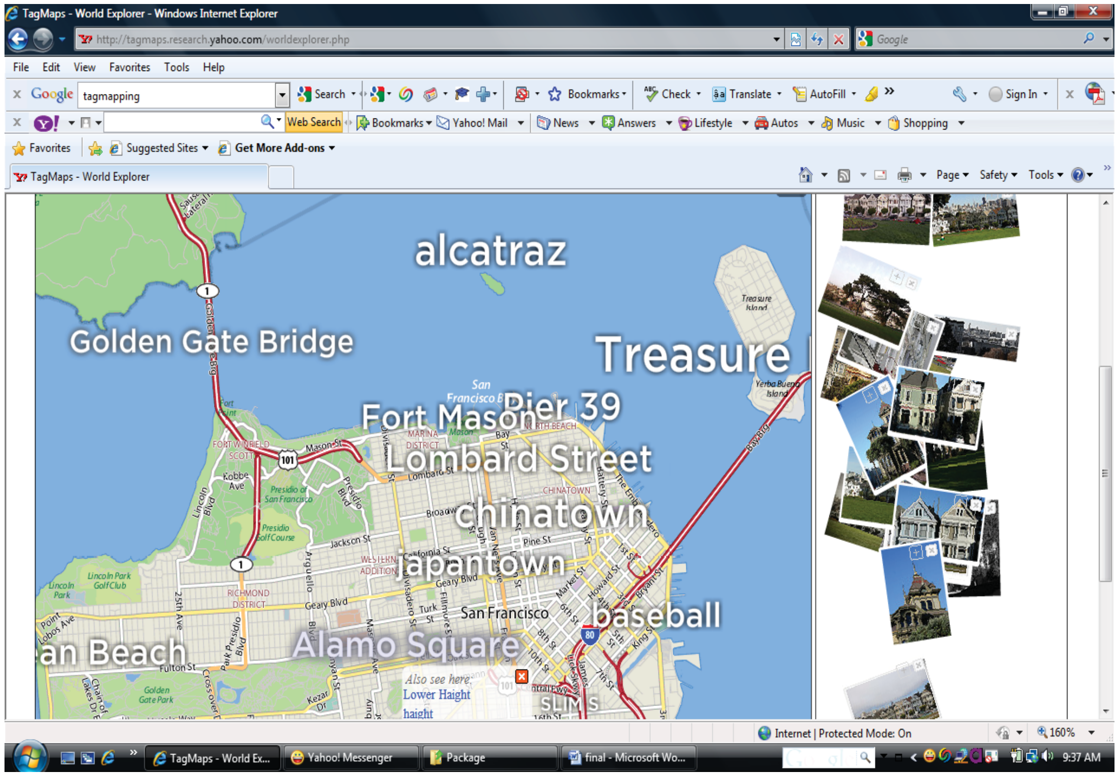

Figure 2-5 World Explorer Project done by Yahoo! and Flickr
Yahoo! (2010)

2.15.13 Tag Format

Tags are typically single terms that describe the content of a web page. Multiple tags can be assigned to a single source by removing punctuation and by using symbols to combine terms (Macgregor and McCulloch, 2006). ‘Triple’ tag or ‘machine’ tag is another tagging naming convention, used by Flickr, to add extra syntax to a tag for a better naming and precise tag retrieval. ‘Machine tags’ is comprised of three components: a namespace to define a class for a tag (‘Flickr’, ‘Geo’); a predicate to describe the property of the name space (‘latitude’, ‘user’, etc.); and a value to specify a definition for the tag (‘startup’, ‘coniferous’, etc). For example, a user could tag a photo with the following machine tags: flickr:user=straup, or flora:tree=coniferous (Cope, 2007).

Hash tags are another type of tag naming convention, used by Twitter, where users can tag short messages or events by assigning one or more word or phrase preceded by a hash symbol “#” as in the following example: #realale is my favourite kind of #beer. Hashtags are used to add more context to the tags and to create tag grouping or clustering as in Flickr. Twitter, the social micro-blogging service, uses hashtags to make it easier for users to follow a topic of interest (Bredehoft, 2009). Since hashtags are community-driven, the quality of tags will depend on users' choice of tags. Some tags can be very attractive and indicative to its content. For example, ‘#Sandiegofire’ is a quality tag that got the attention of real-world resources for help during the San Diego fire (Leaman, 2009).

2.15.14 Tagging Rights

Marlow et al. (2006) identified two kinds of systems based on the system rights: ‘self tagging’ where users are restricted to tag only the resources they created (e. g. Technorati); and ‘free-for all-tagging’ where users can tag any resources (e.g. YahooPodcast). Marlow et al. identified a mixed system where the tagging systems give levels of permission to system users. For example, a system may restrict the resources that users tag as in ESP[2] game; or may restrict who can remove tags: no one as in YahooPodcast; the tag creator as in Last.fm; and the resource owner as in Flickr. Although there are differences in tagging rights, all the tags for a resource are visible to everyone. Thus users are aware (or may perceive) an audience for their tags (Zollers, 2007).

2.15.15 Scope

VanderWal (2005) identified two types of folksonomies: broad and narrow. Broad folksonomy is created by individual users with the help of other users. Delicious is an example of broad folksonomy, where users can tag URLs and post their tags to be

[2] The ESP Game is an idea in computer science for solving the issue of creating difficult metadata. The rationale of this game is using humans to do difficult tasks that a computer cannot do, such as choosing the right word that matches a certain context. The game was originated to help name images that computers cannot recognize.

aggregated by Delicious system. All users can view the posted tags and hence learn and get ideas of how to properly label their own URLs. Narrow folksonomy is generated by individual users for personal purposes and with no intended help from other users. An example of narrow folksonomy is Flickr, the famous photo sharing website. Although users' photo stays public, users tag photos for their own future retrieval (Walker, 2005).

2.15.16 Tag Aggregation

Marlow et al. (2006) identified two models for aggregating tags around resources: 'bag-model', where the system allows users to add multiple tags (allowing tag repetition) to certain resources (e.g. Delicious); and 'set-model' where the system requires users to add tags collectively to eliminate tag duplications (e.g., Flickr). The authors (2006) pointed out that many systems that use 'bag' tagging (e.g. Delicious) offer statistics on given resources to show taggers' opinions on a resource. Further, such statistics help in finding hidden relationships between tags, users, and resources.

2.15.17 Type of Object

Marlow et al. (2006) indicated any object that can be virtually presented can be tagged or used in a tagging system. They listed some of the objects that users tag as follows:

- Web pages: Delicious, Yahoo!
- Bibliographic material: CiteUlike
- Blog posts: Technorati, and LiveJournal
- Video: YouTube
- Images: Flickr, and ESP Game
- Users: LiveJournal
- Songs: Last.fm
- Podcast: Yahoo! Podcasts, and Odeo
- Physical location or event: Upcoming

Panke and Gaiser (2009) added to the previous list by indicating that users can tag digital address books, e-mails of clients, and others' profiles. For example, Facebook allows users to tag profiles to describe the nature of a user's relationship with others users, whether they are friends, colleagues, or just a potential contact.

2.15.18 Tag Functions

Tagging systems are used for many purposes. Golder and Huberman (2005) highlighted the following tagging functions performed by different taggers:

- Identifying what (or who) it is about, broadly, with most tags describing the topic of the bookmarked items.
- Identifying what it is, tags may describe the type of object (e.g. blog, book...etc).
- Identifying who owns it, tags are used to identify the owner of an object.
- Refining categories, tags can be used to establish and refine categories.
- Identifying qualities or characteristics, tags are used as adjectives such as scary, funny, etc.; self reference: "my," like "mystuff and mycomments".
- Task Organizing, tags are used to describe and organize the task being performed by the tagger, as in "toread" and "jobsearch".

Smith (2008) describes seven kinds of tags:

1. Descriptive, such as "webdesign", "ajax", "drama".
2. Resources, such "blog", "photo", "video".
3. Ownership/Source (e.g. "newriders", "nytimes", "genesmith").
4. Opinion , such as "cool", "funny", "lame".
5. Self-reference (e.g. "mystuff", "mine", "me").
6. Task organizing such as "toread", "todo", "work".
7. Play and performance, such as "seenlive", "aka Vogon poetry".

2.16 ADVANTAGES OF SOCIAL TAGGING

2.16.1 Simple Indexing and User-Powered

Social tagging offers a flexible, cumulative, and intuitive approach for information indexing that is a good fit to the majority of non-technical users of the Web environment. Unlike traditional indexing where experts are needed to catalog and create metadata to describe search terms for efficient retrieval, social tagging can be performed by anyone by 'freely attaching' keywords or tags to describe the content of a webpage. With such features, social tagging has the capacity to assign metadata to the ever-expanding web content (Golder and Huberman, 2006). Further, social tagging is "simple enough for people actually to use and robust enough to be of value to a community of users, not just the one doing the tagging" (Matt, 2005, P.1).

Mathes (2004) indicated that in traditional retrieval systems, vocabularies are generated by the system user, system designer, material author, or the classification scheme creator-translating among these creators could be challenging and time consuming. For Mathes folksonomy presents a solution for such problem by directly depicting users' choices in delivery, terminology, and precision. Kroski (2005) studied tagging in Flickr, Delicious, 43things, and Technorati and noted that folksonomy strategies in describing information resources harvest the concept of "wisdom of crowd" and Kroski summarized the benefits as:

1. *Inclusive:* focusing mainly on the users as it includes everyone's vocabulary and reflects everyone's needs without cultural, social, or political bias.
2. *Current:* users can tag quickly and immediately, which absorbs swift changes in terminology and world events.
3. *Non-binary:* folksonomy items can be tagged in multiple categories which eliminates the re-categorizing and re-indexing process found in traditional indexing.

4. *Enhancing discovery:* in that folksonomy encourages users to explore new topics, users, and resources.
5. *Democratic and self-moderating:* everyone can tag to the total poll of tags.
6. *Reflective:* tags in folksonomy reflect the users' original information needs.
7. *Offering insight into user behavior:* users' tags and the untraditional categories they build using folksonomy can help create an understanding of users' behavior and their desire in information spaces.
8. *Engendering community:* users' tags inject the spirit of the social sharing among tagging communities.
9. *Offering a low cost alternative:* compared to traditional cataloging, social tagging is inexpensive to build and maintain.
10. *Offering usability:* folksonomies are apparently intuitive to most users.

Razavi and Iverson (2009) noted the recent growth and adaptation of social systems for personal and social information management has created new opportunities for users to be producers as well as consumers of information. Social tagging applications, such as Delicious and Facebook, not only enable their users to create personal information spaces easily accessible from anywhere on the Web, but also give them the tools to share their personal information artifacts with others and take advantage of others' shared information artifacts.

In their study of video content tagging, Melenhorst et al. (2008) suggested tagging offers users more maneuverability to organize content of interest. They pointed out tagging makes it easier for users to annotate content, given it requires no system knowledge and no metadata or classification rules, which in turn leads to an easy content retrieval relevant to users' needs.

Glassey (2007) claimed folksonomy offers users a practical means of content navigation similar to their natural way of navigating, classifying, and organizing things. Social tagging, as stated by a member of the Delicious team, is "a little bit like keywords, but they're chosen by you, and they do not form a hierarchy. You can assign as many tags to a bookmark as you like and rename or delete the tags later. So, " tagging can be a lot easier and more flexible than fitting your information into preconceived categories or folders" (Delicious, 2009, P. 1).

Mathes (2004) indicated folksonomy has an advantage over taxonomy in that it adapts quickly to changes in users' vocabularies and users' needs. Mathes also indicated the overall costs for users of the folksonomy system is quite low, considering time and effort, compared to the complex hierarchal classification and categorization schemes in taxonomies. Mathes also pointed out that besides its organization context, folksonomy offers social context for communication and sharing. Additionally, participating in folksonomy is far easier in terms of time, effort, and cognitive costs in choosing the right label for an information resource. Similarly, Furnas et al. (2006) noted folksonomy uses a shared pool of tagged resources which enhances the metadata for all users, potentially distributing the workload for metadata creation amongst many contributors.

Rainie (2007) pointed out that while folksonomy enables users to add their own tags to a shared tool of tags, it can categorize users' tags in a better way for future retrieval and better access for other community users. Rainie noted that folksonomy helps build meaningful categories using a bottom-up approach versus the traditional top-down approach used by taxonomy, which in essence helps users sort out the vastness of the Web using the categories that matter to them. Rainie connoted that social tagging enables users to organize the Internet their own way. For example, some users would want to tag a Stephen King story as "horror", but others may want to tag it as 'ghost story'. In his blog titled "Can Social Tagging Overcome Barriers to Content Classification?" Bryant (2004) saw folksonomy as a means encouraging people to participate in the process of creating people-powered metadata, and as a means to create a simple ontology that satisfies users' needs:

> The main benefit of folksonomy in the real world will be to extract and link metadata from users who do not have the confidence or the inclination to apply anything more than a keyword…… social tagging is a revelation for anybody who has sat through days of agonizing taxonomy design with client organizations who are unsure of their users' real

needs. It is an excellent illustration of the advantages offered by simple, emergent and iterative systems over old-sckool (school) top-down communications software (Bryant, 2004, p. 1)

2.16.2 Information Sharing and Discovery

Suchanek et al. (2008) argued tagging's primary goal is serving users' needs by organizing their personal bookmark collections for better retrieval. They indicated tags help users browse, categorize, and find items. Further, tags are used as a form of information discovery, sharing, and social ranking. According to Suchanek et al. (2008), tags could be useful for tasks such as search, navigation, or even information extraction. Lee (2006) added to that by indicating a collaborative tagging system offers its users two features: extracting information at the most cumulative level; and, with its implanted social networks, a more guided sharing and discovery of information. In line with the discovery of new topics, another study by Velsen and Melenhorst (2009) noted tags help users conduct serendipitous browsing when they are displayed in the form of a tag cloud; and when presented along with the content items, they help users decide quickly on items' relevance.

Quintarelli (2005) claimed social tagging adds a sense of serendipity in users' search tasks. As users start with their own tags, they end up clicking on similar tags that might lead them to unexpected but related information about a certain topic. Quintarelli concluded by referring to some advanced social tagging features such as 'tag cloud' that enhance the browsing and searching process by displaying popular tags based on the frequency of users' visits to these tags. Rainie (2007) noted social tagging can help users stumble upon interesting resources already found by others when dealing with online catalogs like Amazon.com. For example at Amazon.com, on the "most popular tags" page, a search for things tagged "horror" would result in about three thousand books and movies that presumably belong to the horror genre.

2.16.3 Information Scent

Guo et al. (2009) claimed that just as animals rely on scents to forage, users rely on information scent provided by various cues in judging information sources and navigating through information spaces. They indicate tags serve as “proximal cues” that provide an information scent to web objects. The authors claimed tags can be considered as external representation of users’ mental concepts activated by web items.

2.16.4 Understanding Genres

Panke and Gaiser (2009) indicated that because of the increasing complexity of the information environment, users may have difficulty distinguishing between some genres and technology. For example, a user might get confused in classifying an e-mail as a personal note or a memo based on what it contains. The authors claimed social tagging vocabularies offer rich material to investigate and analyze the characteristics and the traits of information resources to help define its genres. Further, the authors noted a social tagging network analysis can explain how certain genres evolved, how they are connected to each other, and how they induce certain activities, which eventually can lead to a more productive information environment.

2.16.5 Finding Expertise

Tags return items and concepts to their social community of practice: “The issue is not whether an individual tagger has correctly identified (‘tagged’) a reference. What tagging essentially does is link a concept to its social practice. . . . [Tags] connect the objects involved and the correlated concepts to activity clusters in a community” (Schill et al., 2007, p. 107). Further, tagging allows social groups to form around similarities of interests and points of view: “If you're using the same tags as I do, we probably share some deep commonalities” (Rainie, 2007, p. 7). Heymann et al. (2008) indicated that tags can guide communities to valuable content that would not be available in regular search engines. For example, the tag "Katrina" proved useful in updating people with a real picture of Hurricane Katrina before it reached regular news channels. They noted that sometimes non-obvious tags are useful for some expert users. For example, the tag "analgesic" on a page about painkillers might be useful for some users who are seeking expert opinion on certain medications which would not be available without such rare tags.

2.16.6 Search Efficiency

Tagging can be very efficient in searching by allowing users to conduct either an intersection of tags, by filtering only items that match the tag name or union of tags, or by bringing up all items tagged with any of the given tags (Golder and Huberman, 2005). LibraryThing supports such use of tags for offering users features that help them conduct more effective book searches. Sen et al. (2007) suggested good tags can enhance a search system's performance by tying entities to one another, enhancing browsing and searching, or may serve as a source of a thorough description of information that produces better search output.

Suchanek et al.(2008) showed the meaningfulness of a tag improves with the increasing number of taggers for a resource. They indicated popular tags contain useful terms that could not be thought out by traditional queries, which could be leveraged for advanced search applications. They also indicated tag suggestion can control the tagging process as it can be powerful enough to amplify trends or to distort popularity of other tags. Morrison (2008) indicated through their study on Web search comparison that folksonomies have the potential to be an effective tool for Information Retrieval (IR) on the Web and should be given the same importance as traditional search engines. His study showed a folksonomy can be more efficient in news searches than traditional search engines. Although the overall results showed a preference for traditional search engines, the author indicated folksonomies have the potential to improve IR performance because they can handle some query types (e.g. operator queries) more efficiently than traditional search engines. Further, even though tagging's original goal was improving personal content management, recent studies (Sigurbjörnsson and Zwol, 2008) recognized its potential to build a collaborative information asset that can be leveraged for use in search engines and for building effective recommendation strategies that will guide users toward more relevant results (Santos et al., 2009).

Merholz (2004) pointed out some classification systems do not reflect users' needs since they are not built by regular users. He noted folksonomy is an efficient way to understand the thinking process of users through their tags, which will allow us to build a better classification system based on the concept of ethnoclassification-- how people organize and categorize the world around them (Merholz, 2004). He noted: "A smart landscape designer will let wanderers create paths through use, and then pave the emerging walkways, ensuring optimal utility. Ethnoclassification systems can similarly 'emerge.' Once you have a preliminary system in place, you can use the most common tags to develop a controlled vocabulary that truly speaks the users' language." (Merholz, 2004, p.1). Hammond et al. (2005) argued that social tagging is more beneficial than traditional search engines in that search engines tend to index and search the global space for the user's need; while folksonomy helps users locate their information needs within their local space and within the domain of other related users who most likely would have relevant information resources that satisfy users' needs.

2.16.7 Reduce Cognitive Load

In Sinha's (2005) blog entry titled "A cognitive analysis of tagging", she indicated social tagging has an advantage over traditional indexing tools by adding less cognitive load on users while choosing keywords to tag objects than taking the responsibility of thinking about the right keyword. Social tagging uses existing cognitive processes submitted by others when they tagged the information objects to help new taggers choose the right tag to describe an item. According to Sinha, some people experience a "state of fear" about losing a webpage forever if they make the wrong decision to bookmark it with the right keyword. By doing so, users may fall into what she called 'post activation analysis paralysis', where users experience a state of thinking freeze during the decision making process. Sinha noted social tagging helps prevent such a problem by offering users immediate tagging feedback of their chosen tags compared to others' tags, or by offering tag suggestions from people's collections of submitted tags.

Golder and Huberman (2005) found tags' frequencies tend to stabilize over time. They indicated such stabilization might occur as a result of imitation and shared knowledge among users, suggesting users tend to trust others' tags and then use them to properly tag their own resources. Golder and Huberman grounded their finding with Cialdini's views (2001) of imitation as a means for "social proof", suggesting people will choose what others have already considered safe and secure.

Quintarelli (2005) notices that although the concepts of bookmarks and keywords are not new to the Web, social tagging applications, like the one adopted by Delicious, offer relevant new features that make bookmarks more appealing to users. For instance, the feedback is immediate as users assign a tag to an item and see clusters of items with the same tags. Further, users are given incentives to change the tag or add another, so they do not have to worry about making the right choice when assigning tags. Folksonomy's strongest power comes when users control the scope of the terms to include more items from other matching users; users have the choice to adapt to the group norm, keep tags in a bid to influence the group norm, or both (Udell, 2004).

2.16.8 From Solitary to Social

In her blog titled "A Social Analysis of Tagging", Sinha (2005), a cognitive psychologist and the CEO of SlideShare Inc., explored the cognitive aspect of social tagging. According to Sinha, social tagging takes users in a transition from being solitary to being social. She noted social tagging allows a user to be with a crowd of people with whom he/she has something in common. A user can enjoy the presence of others, but s/he does not have to converse with them, nor does s/he have to 'follow threads' and participate with them: "It is the same reason that I like working in a cafe – enjoying the presence of others without the burden of active interaction. Similarly, tags provide a companionable social hum that I enjoy"(Rashmi, 2006, p.1) .

2.17 SUMMARY OF SOCIALTAGGING BENEFITS

Table 2-1 summarizes the previous discussion on the benefits of social tagging. The Table classifies the benefits into three main categories:

- Ease of Use, Simple Indexing and User-Powered
- Information Discovery, Sharing, and Collaboration
- Enhance Search Efficiency and Better Findability

Table 2-1 Summary of Tagging Benefits

	Benefits of Tagging System Use	**Studies**
Ease of Use, Simple Indexing and User-Powered	Tagging allows users to use meaningful words that make sense to them to describe information resources for easy retrieval.	(Delicious, 2009)
	Social tagging offers a flexible, cumulative, and intuitive approach for information indexing to harness the ever-expanding information landscape.	(Golder and. Huberman, 2005)
Information Discovery, Sharing, and Collaboration	Social tagging offers a more guided sharing and discovery of information.	(Lee, 2006)
	Tagging systems, with their advanced and user friendly features like tag clouds and tag maps, encourage users to explore new topics, people, and resources.	(Kroski, 2005)
	In tagging systems, feedback is immediate as users assign a tag to an item and see clusters of items with the same tags, which allows them to learn more about their topics from the similar clustered tags.	(Quintarelli, 2005)

	Benefits of Tagging System Use	Studies
	Social tagging can help users find interesting resources already found by others. Social tagging has the potential to help users generate new ideas by allowing millions of users to publicly express their opinions about online information resources.	(Rainie, 2007)
	Social tagging systems takes users in a transition from being solitary to being social.	(Sinha, 2005)
Enhance search efficiency and better findability	When tagging is presented along with the content items, it helps users decide quickly on an item's relevance.	(Melenhorstet al., 2008)
	Social tagging offers the potential to locate and find experts in specific area.	(Schillet al., 2007)
	Tagging systems allow users to filter information at the most aggregate level.	(Lee, 2006)
	Tagging systems have an advantage over traditional taxonomy in that they adapt quickly to changes in users' vocabulary and indexing needs.	(Mathes, 2004)
	Social tagging systems offer potential to improve the effectiveness of search engines by combining users' tags with regular key word searches to render more relevant search results.	(Santos, et al., 2009; Suchanek et al., 2008; Golder and Huberman, 2005; Sen et al. 2007).
	Tags serve as "proximal cues" that provide an information scent to web objects and provide users a sense of what is relevant to them.	(Zhan et *al.* , 2009)

2.18 ADVANTAGES OF SOCIAL TAGGING IN ORGANIZATIONS

Amitay et al. (2009) questioned whether social data generated from social tagging applications can enhance the search results within an enterprise environment. They conducted a large user study with more than 600 IBM employees to evaluate the contribution of tagged data for searches. Their study used a multi-faceted approach that first made all objects that are socially tagged discoverable, searchable, and retrievable.

Second, the study focused on discovering hidden relations between all the social entities. Then the authors used the heterogeneousness of all the entities to run "all-encompassing" social search solutions. Using their own search engine with a multi-faceted approach in a large enterprise, the authors found social tagging data is highly beneficial in augmenting search results in two ways: first, the results showed a high precision of top retrieved items, suggesting users' feedback added quality content and hence filtered in only good data; second, users' tags and comments were important in highlighting object popularity while enhancing the description of objects. Amitay et al. also found personal relation derived by social tagging networks can be manipulated for search personalization. They noted personal relationships can help in object ranking by using the searcher's close community as additional criteria for search refinement. Additionally, social relationship can be used to offer document recommendation based on the strength of the relation between users with others who share common interests; similarly, tags can be recommended to taggers based on the relation between the tag and other similar tags and documents.

Van-Damme et al. (2008) proposed a methodology to generate small-scale ontology from organizations' collections of tags that can replace other commercial ontologies and help in getting an introductory view of all corporate terminologies. The authors applied their methodology on a corporate folksonomy of a European company with more than 60 million tags. The authors combined the results with employees' detailed feedback and reached the conclusion that the generated ontology (folksonomy) helped in giving an idea of the overall corporate terminologies. Using the proposed folksonomy-based ontology, the authors generated visual output that was used by the corporate managers in their decision-making process through detecting irregularities between certain tags. The authors' concluded their folksonomy visualization approach could be valuable to organizations as a decision management tool, follow-up tool for new terminology, and as a tool for the creation of new teams through tag correspondence.

Pan and Millen (2008) investigated how social bookmarking can support knowledge sharing in large enterprises. The authors conducted a 12-month field study examining the information sharing and users' interaction in three groups within a large enterprise (corporate headquarters, research, and software development). The log files analysis showed users created 12,239 bookmarks, of which 92% were public and 8% were private. The analysis showed social bookmarking could be used to leverage the self-interested action of bookmarking and make it valuable to a group. The results also showed that based upon the number of shared URLs, tagging vocabulary could play a major role measuring shared interests among individuals and organizations.

Chua (2007) used a metadata search tool to build an experts' profile through data generated from corporate blogs, social tagging and bookmarking tools. The tool used users' profiles to search for and locate experts throughout the company. She ran a usability study on the search tool using a sample from a multinational information technology company. The results were shown to users visually based on "recency", "organization", and "geographic location". The study showed users are highly satisfied with the tool in locating expertise, suggesting that intranet social computing tools can successfully detect skills and job expertise efficiently and help enterprises find the right people to solve business problems.

Damianos et al. (2007) used MITRE Corporation, a not-for-profit system engineering and IT solution company, to test their hypothesis of whether social bookmarking can add value to the corporate intranet. A pilot study was conducted on Onomi, a social bookmarking prototype run on the company's intranet. The study showed MITRE's employees used the social bookmarking tool : (1) as a personal bookmarking tool, as some employees used the application to store their personal links; (2) as a mechanism for sharing and disseminating information, as teams used social bookmarking to share and distribute resources; (3) for information discovery, as users found interesting information just by clicking on others' bookmarks; (4) to help form social networks, as virtual communities of users started to emerge as tags emerged; and (5) for finding experts, as users fed the application with expertise data for future finding and retrieval.

Farrell et al. (2007) conducted a study in an IBM environment using Fringe Contact, a system that enables users to tag other users with key words that are displayed on their profiles. They surveyed 63 employees to find out how people perceive the feature of people tagging in Fringe. They also conducted in-depth interviews with 19 users to get a specific view of how employees use tags. They found employees used tags for personal benefits. In particular, users found tagging tools effective in organizing their contacts into distinguished groups with meaningful tags that related people to their expert field. They also found users find it very useful to use tags to associate people with different projects and different groups.

In a different study, Farrell and Lau (2006) ran a survey on the use of Dogear, a social bookmaking application run on IBM's intranet. The survey was sent out to 233 bookmarking users and 100 participants responded. Forty-four percent of the respondents indicated they used the applications at least once a day; while 42% reported they used the application once a week. A total of 65% of the respondents indicated they were expert users of other social bookmarking services. Another 43% described their job function as IT specialist/IT architect, 27 % said RandD, and the remainder was spread over a variety of other IT-related jobs. The results showed social bookmarking helped in the following tasks:

- Improved awareness of corporate resources or services (49%).
- Improving ability to find information on the corporate intranet (45%).
- Increased awareness of the interests and expertise of other corporate employees (34%).
- Improved organization of personal bookmarks (39%).
- Increased ability to search and find web information (42%).
- Improved ability to find information on a specific topic (37%).
- Decreased the time needed to find a web resource (40%).
- Increased sharing of information with group or project team (25%).
- Increased ability to search and locate someone with a specific interest or expertise (26%).
- Decreased the time to find someone with a similar interest or skill (23%).

Millen et al. (2005) questioned if social bookmarking could add value to the corporate environment. They used a bookmarking prototype within an international company. They assessed the use patterns of the early adopters of the prototype based on log files. Although the application ran on a small scale, it showed good potential in helping the organization's users create bookmarks based on the quality and personal interest of content and showed a sense of potential for future use. The data collected helped the authors identify patterns of use and clusters of information seekers and information providers.

2.19 SUMMARY OF BENEFITS OF SOCIAL TAGGING IN ORGANIZATIONS

The following table summarizes the previous discussion pertaining to the advantages of social tagging within the organizational context.

Table 2-2 Value of Social Tagging and Bookmarking in Organizations

Value	Studies
Augmenting search results Highlighting topics of popularity Adding a better description to information resources Helping detect social relations that can be used as a search personalizing technique	(Amitayet al., 2009)
Building a folksonomy-based ontology to enhance the decision making process	(Van-Damme et al., 2008)
Enhancing knowledge sharing	(Pan and Millen, 2008)
Locating experts	(Chua, 2007; and Damianoset al., 2007)
Organizing bookmarks Sharing and disseminating information, Discovering information Helping form social networks	(Damianoset al., 2007)
Organizing contacts in meaningful groups	(Farrell et al., 2007)
A marking technique to keep track of previous online social interactions	(Gibson and Teasley, 2006)

Value	Studies
Using functional tags can reflect the contents of information resources without the need to click on them Building common norms for the learning practices	
Enhancing social navigation	(Millen and Feinberg, 2006)
Detecting patterns of information seeking versus information contributing	(Millen et al., 2005)

2.20 PITFALLS OF SOCIAL TAGGING

In addition to the many benefits described in the previous section, the concept of folksonomy and social tagging in general suffers from some flaws. The following sections list studies that covered the pitfalls of folksonomy and tagging.

2.20.1 Spam

Hammond et al. (2005) noted social tagging applications may expose users to serious issues like spam attack. However, they noted, these attacks do not seem to deter people from using these services mainly because the risk of spyware and spamming, like in any other computer applications, can be managed by vigilant legitimate use.

Any system permitting users on the Web at large to add or remove information freely will open itself to the issue of spam (Henzinger et al., 2002). Having folksonomy applications open for everyone makes it vulnerable to “spagging” or spam tags. Some taggers, for personal benefits, may tag sites just to pull visitors to them.

2.20.2 Uncontrolled Vocabularies

Mathes (2004) pointed out some problems with the use of uncontrolled vocabulary in folksonomies. He argued that because of the lack of systematic guidelines and the lack of explicit rules in tagging, terms in social tagging can be ambiguous as different users assign different terms to describe the same content. Taking into account that different users may have different interpretations of the same content, users can label bookmarks with tags that could be misleading to other users. For example, the “filtering” tag in Delicious includes Web pages whose theme is “filtering”, but referring to totally different domains: it refers to personal audio network in Last.Fm, or to collaborative knowledge gardening as in Info World. Consistent with that, Arch (2007) suggested the various level of taggers understanding of resources may impose tags variation for the same content, which would lead to tag confusion.

Kroski (2005), in her study of tags in Delicious, Flickr, 43things, and Technorati, listed the following drawbacks of folksonomy-based systems:

1. *No synonym control*: users may use many different terms to describe the same thing.
2. *Lack of precision:* folksonomy is considered a discovery system, which normally produces a low rate of precision.
3. *Lack of hierarchy*: folksonomy is a flat system offering no deeper, nor robust classification of entities which would lead to less finer search results.
4. *The basic level problem*: users have different levels of knowledge of how to tag objects.
5. *Lack of recall :* a search for “cat” will not yield cats, feline, or kitten.
6. *Susceptible to gaming*: gaming is like spamming, where users show unethical conduct to propagate certain tags and links.

Golder and Huberman (2005) noted collective tagging can increase “fuzziness of linguistic and cognitive boundaries”, given that the collective system gets larger by accepting tags from various users with different personal categories. They also indicated a tagging system may be vulnerable to some problems related to the natural way of generating semantic relation between vocabularies such as polysemy, synonymy, and basic level of variation. Polysemy is a logical ambiguity of one word that can give multiple meanings. For example, "bank" can refer to a financial institution, or a river's edge (Pustejovsky, 1991). Golder and Huberman (2005) indicated that when querying tags, polysemy dilutes query results by returning related but possibly inapt items. They argued the lack of synonym control in tagging can impose uncertainty problems when users' interact with tagging tools. Because of the inconsistency among users when choosing tag terms, users may find it difficult to choose the right keyword to query a tag. For example, items about television may be tagged either with "television" or "TV". They noted a basic level of variations of tag use takes place when some users use certain terms for a specific purpose, while others use them for a general purpose to describe a tag. For example, for most people "cat" would refer to a pet, while others may use it to refer to a feline animal such as tiger or a lion (Golder and Huberman, 2005).

Rainie (2007) noted web searchers cannot depend on tagging to search for topics due to the over simplicity of some of the tagging vocabularies that may lead to topic misunderstanding. For example, the tag "Roman" may refer to the director Roman Polanski, Italian fountain, or the French word for the literary genre known in English as 'novel'. For such tagging problems, Rainie (2007) suggested using a tag thesaurus that would suggest themes and categories for similar tags. Rainie also posited the collection of tags can lead to a "tyranny of the majority" as the dominant group of taggers may push their way of thinking on the local users.

Spiteri (2007) examined the structure of tags with three folksonomy applications: Delicious, Furl, and Technorati. She noted folksonomy is vulnerable to "ambiguity, polysemy, synonymy, basic level variation, and the lack of consistent guidelines for the choice and the form of tags" (p. 1). After comparing the tags from the three folksonomy applications against the tag criteria of the National Information Standards Organization (NISO), even though the percentage of ambiguous and polysemous tags was less than one quarter of the total tags, Spiteri gave more weight to the problems of ambiguity and polysemy as major weaknesses of the tested tags (Spiteri, 2007).

Halpin et al. (2007) argued the main problem of the tagging system lies in its lack of "controlled centralized vocabulary", which could impede the generation of "coherent categorization scheme" and eventually lead to destabilized tag patterns. They justified the lack of tag stability by the fact that tags and their frequencies are exposed to frequent change due to the increased number of non-expert taggers, as is the case with Delicious. However, they argued tagging eventually follows more stable distributions when new taggers mostly reinforce present tags.

Suchanek et al. (2008) indicated the nature of tags in most tagging systems is not clear. For example, Wikipedia uses tags for description, classification, and search for information, while other applications use tags for mere personal organization. Moreover, users tag according to their own "gusto". For example, some users may use the tag to identify an item, or identify the owner of an item like "sleazy", or sometimes they give a subjective assessment of a document like "crazy". Interestingly, tags are sometimes well organized under well defined keywords like "to read"; or sometimes very ill-organized under vague labeling like "#####". The authors indicated such organization of tags would be useless for semantic applications unless it carries some meaning. In other words, user generated tags reflect substantial semantic noise compared to the page content and search queries.

Guy and Tonkin (2006) indicated the use of imprecise tagging terms in folksonomy systems. They noted that since system users are the ones who create the tagging vocabularies, generated tags are often vague, overly personalized, and inadequate and they criticized the single-word metadata standard imposed by some tagging systems because it encourages taggers to combine terms to make a tag more distinguished and personal.

2.20.3 Tags Can Be Manipulated

VanDamme (2008) stated the tagging process can lead to "tag pollution". She pointed out "tag pollution" emerges from the taggers' excessive freedom to choose any keyword to describe content without predefined tagging rules. It can influence the way the tags are displayed and hence affect the overall analysis of the tag collections and distribution. For example, users can assign certain tags that would visually reduce or increase the frequency of certain terms in a tag cloud and hence affect people's choice in tags selection.

Suchanek et al.(2008) noted that since tagging suggestion is controlled by the system designer or by the system algorithm, these factors might influence users' choice of tags, their directions, and their meaningfulness. Users may use suggested tags without paying attention to the implications of these suggestions in diverting them from their original goals, or in directing them to different context for the same topic.

Sen et al. (2007) indicated there is a clear lack of control over the quality of tags which can negatively affect tag makers given the self-reinforcing nature of tags. Further, the authors found tag selection methods such as the number of searches per tag are skewed by a small group of "power" users, which does not reflect a tag's actual popularity. Marlow et al. (2006) noted tags can be misused by users, especially when tags are represented as a tag cloud. According to the authors, some taggers, namely in Odeo.com, know tag clouds highlight certain tags based on their frequency. So they are enticed to add and remove certain tags to control the tag cloud.

Sen et al. (2006) noted system designers might influence how the community tags evolved by choosing which tags to display. In some cases, system designers might never show others' tags, hence completely eliminating the community influence. The authors also noted that even if tagging systems attempt to make all tags visible to the user, some tagging systems still suffer from a poor tagging interface design that would display too many tags in one page to be noticed by users.

2.20.4 Lack of Structure and Low Quality of Tags

The lack of structure of tagging is considered by Glassey (2007) as one of the main pitfalls of folksonomy, because it fails to give users a clear guidance for user navigation within the tagging system. Glassey indicated query results based on folksonomy classification are imprecise, given that there is a lack of controlling tools that manage semantic ambiguity, especially in open system folksonomy. He continued by referring to the long lasting evolution of tags (i.e., tags are in constant edition and re-edition) that affects the quality and meaning of used tags. He stated that due to the lack of lexical standards on tags systems, tags may be vulnerable to intentional manipulation by users with conflicting views.

Sen et al. (2007) asked how a user of Flickr should go about finding a high quality photo among 65 million photos already on the Flickr application. The same question applies to the huge collection of articles, pictures, and bookmarks that exist on the web. The authors indicated that since photos on Flickr are tagged by experts and novices, tag vocabularies sometimes range between high quality, with carefully chosen labels, and low quality labels that could yield unexpected, misleading, and offensive results. The authors argued displaying only quality tags on a system is a challenging process, given that most tags are typically labelled with only one keyword, which is not enough to give a rich description of the tag's content. Further, the authors noted many tagging systems have limited screen space that allows only a certain number of tags to be shown to users, minimizing the possibility of getting a high quality tag from thousands of tags.

Guy and Tonkin (2006) noted tagging systems lack a control over the quality of tags being used. For example, some tags are in single vs. plural, conjugated words, and combined words. They described the system results as an "uncontrolled and chaotic" set of tags that do not support searching as effectively as controlled vocabularies.

2.20.5 Other Pitfalls

Folksonomies are in a sense subversive to website owners, especially those of online stores. Website owners took the time and effort to design and organize their websites to win the credibility of their customers. By allowing any customer to tinker with their "organized aisles and clean signage", there is a chance of getting negative tags that may affect the site's reputation and revenue. A good case in point is Amazon.com, where the most popular tag is "defectivebydesign", which directs users to a page of products that Amazon taggers have tagged defective (Becker, 2007). Hammond et al. (2005) pointed out that social tagging tools may cause users to give up some of their privacy by publishing their bookmarks and interests; however, for them, these tools offer more utilities for the price of giving personal bookmarking data.

2.21 WAYS TO IMPROVE TAGS

2.21.1 Hybrid Approach

Some tools have emerged to solve the conflict between taxonomy and folksonomy using what is called "taxonomy-directed tagging", which combines the advantages of both tagging and taxonomy (Lemieux, 2009). A similar name was also proposed by Zigtag, the social bookmarking website, under the name of "defined tags". A defined tag is a relevant keyword, chosen by the bookmark owner, from a dropdown list of defined tags offered by the tagging system, providing a distinct meaning of a tag and helping users in their cognitive process of choosing an appropriate tag for an information object. The logic behind "defined tags" is simply to minimize the lack of semantic distinction of many tags by offering users meaningful suggestions that would classify a tag under defined categories which would consequently lead to proper connection between items. One of the main advantages of defined tags is reducing the users' need for using multiple tags to properly classify and find web content, thus creating a much easier and faster connected web. Even if users decided to add multiple defined tags to their bookmarks, it would only strengthen the relationship between tags and web objects, which eventually would lead to relevant content on the topic they were searching (Zigtag, 2009).

Marlow et al. (2006) noted the overlap between tags and social connection, shown in their analysis of Flickr's tags, reflects a possible sociotechnical concept of tagging systems that has the potential to overcome some pitfalls of social tagging such as the problem of uncontrolled vocabulary, by combining tags with traditional indexing without necessitating rigidity of controlled vocabularies, or without using a purely automatic vocabularies disambiguation.

Lemieux (2009) indicated companies should not see the pitfalls of social tagging as an invitation to forget about applying it to their environment; rather, they should adopt it with the intention to harvest its benefits and be keenly careful about its drawbacks. An approach to minimize this issue is using a combination between taxonomy and folksonomy. Organizations should keep their traditional taxonomy for tagging the high value content with a focus on consistency in categorization and terminology. She added that social tagging should be introduced gradually to employees through the organization intranets with official categories through using less critical content. Furthermore, organizations should focus on social tagging as an effective tool to enhance the organization taxonomy through users' fresh and natural terminology input (Lemieux, 2009).

Sen et al. (2007) noted one reason people do not take part in tagging is their lack of tagging experience. Accordingly, they indicated tagging systems could suggest tags to users to get them to submit more tags. They also indicated that since users' tags are mainly influenced by a tagging community, as shown by their study, a tagging system can work on "steering" a user community toward more meaningful and more beneficial tags that would improve the quality of tags. Based on the notion that users' tags are affected by pre-existing tags, they recommended injecting the system with a large set of quality ontology tags that would help draw the line for better folksonomy. Additionally, they recommended analyzing the information value for some common tags to be used by the system algorithm to display the most useful tags that would optimize the value to users.

Santos et al. (2009) suggested the following solutions to improve tagging systems:

- *Recommendation systems*: recommending tags to users would help decrease the sparseness of users' tag and attain better precision and recall results;
- *Malicious user detection*: system designers could use the interest sharing characteristics of users to spot malicious users when deviating from one interest sharing group to another;
- *Support for collaborative behavior*: designers can use the characteristics of interests sharing groups to profile a group and use the profile to predict collaborative behavior, or to filter out the unlikely one (Santos et al., 2009).

Some studies suggested using tagging systems as a supplement to traditional search engines like Google and Yahoo! to increase search relevance and to benefit from the social aspect of tagging systems. Morrison (2008) noted if traditional search engines direct their searches to tagging systems in addition to the regular webpage content, the quality of the search results will be more likely to increase.

Rainie (2007) suggested another way to improve tagging through the concept of tag clustering, where tags are gathered under specific themes. For example, Flickr is one of the adopters of tag clustering in photographs by subject with high precision. For example, photos of Gerald Ford are separated from photos of Ford Motor cars. Some studies suggest using tag intersection with social networks to help users get trusted tags in their search for quality tags. So tags coming from the trusted people we know would have more weight than regular tags (Rainie, 2007).

To improve the quality of tags, Damianos et al. (2007) proposed the idea of semantic tagging by organizing tags based on their semantic meaning to improve the tags' quality. For example, is it java programming language or a coffee? Damianos et al.(2007) suggested using sub-tagging to create more distinctive tags through adding suffixes to tags as in the tag "person: john", "location: office".

In a study of the ethnography of social practices, Mejias (2004) indicated that although certain tags carry hidden and personalized meaning that can be interpreted only by the tagger, other tags are repeated by users which carry hidden social meaning and can be used to increase the tagging system's efficiency. Mejias (2004) indicated taggers may need a marginally controlled tagging system that allows the use of a dropdown menu or some tagging formality to help taggers properly tag, as indicated by one of his study participants: "the free tagging feature is too free".

2.22 FUTURE OF TAGGING

Some future trends in the development of tagging systems have been suggested to include more structure and more formality added to the tagging system, encouraging and leveraging community contribution, and a combination of user and automatic methods to assign and filter tags (Smith, 2008).

Deep Tagging allows people to create a direct link to a small part of a complete piece of media, such as a video or an image. Although Deep Tagging is already adopted by some social tagging sites (e.g. MotionBox), it is considered by media experts as the next generation of tagging. Deep Tagging enables users to retrieve specific content from media files such as video and audio files just as easily as text based material. Further, Deep Tagging has the potential to offer users the ability to conduct quick searches and learning by allowing users to look for specific pieces in large media files. With the increasing stream of media clips online, Deep Tagging is creating a way for users to easily reference a particular segment of a clip that could facilitate the creation of a resource collection based on carefully chosen themes. Furthermore, tagging within video and audio clips could help in the re-organization and the re-description of rich media and enable users to co-create content by annotating the media (Horizon, 2009).

Leading media pioneers are facilitating Deep Tagging, such as MotionBox, JumpCut (acquired by Yahoo! in 2006), Viddler, and Click.TV. Google is using Deep Tagging in the form of video captioning in its video service and enables its users to permanently link to a time spot in a clip (Arrington, 2006). MotionBox allows its users to tag segments of a video and jump directly to these segments, which improves efficiency looking for relevant clips (Nielson, 2006). YouTube is using Deep Tagging under the utility of Tag Annotation, where users, while playing a video clip, can click on the progress bar of the clip to stop and add their annotations to describe a particular video segment.

2.23 SOCIAL TAGGING IN ORGANIZATIONS

The growing popularity of social tagging tempted organizations to see how this web 2.0 feature can benefit the enterprise environment. By making tagging visible to other users, social tagging systems encourage collaboration among co-workers and show signs of collaborative intelligence that can boost the quality of the the business world's information process. Hence, organizations look to adopt social tagging in their intranet, blogs, and news monitors to harvest knowledge management.

2.23.1 Difference between the Web and the Organization

Compared to traditional applications, enterprises are relatively slow in adopting social tagging applications behind their firewall because of some contextual differences between the web and the enterprise environment. The first and most influential difference is that the Web and the enterprise are opposite with regard to the nature of content. The Web content is almost infinite with billions of resources that are hard to organize. So having users organize this vast amount of information via social tagging is appropriate for such an environment. However, at the organization level, content is more defined with rules and specific structures that must be followed to match the organization's norms.

Additionally, organizational members must have more precise and reliable sources of information to achieve their job goals (Lemieux, 2009).

The second difference between the Web and enterprise environments is the number and the nature of the people participating in them. A recent study by Lemieux (2009) showed that people who used social tagging on the web are about 16-18% of the web population, which can be interpreted in millions compared to the relatively small size of users in enterprise. The number of people participating in the tagging process affects the success and failure of adopting social tagging in the business environment. Social tagging proved its success in the web environment because many people got to test it and witnessed its success. Under the organization dome, it would be hard to get enough motivated employees to use and test a social tagging application, especially with the daily activities and responsibilities that employees have. Further, given that tagging is social and visible to all organization members, some employees would be concerned with security and privacy issues which may delay their adoption of tagging practices (Lemieux, 2009).

Another difference between web and enterprise environments is the quality of tags. Because tagging is done by individual users, there is a high probability that users' tags would represent personal find-ability which translates into "dubious" quality and inconsistency of tags and eventually affects recall and precision in tagged-based searches. For the web environment, recall (completeness) and precision (exactness) seem to have less value since users are dealing with millions of items (Lemieux, 2009).

2.24 EXAMPLES OF SOCIAL TAGGING APPLICATIONS IN ORGANIZATIONS

The collaborative platform market is not new; however, it has seen more evolution over the past few years. Vendors of collaborative applications have recently adopted new communication and content generation patterns like microblogging, activity streams, and business social networks because they recognized the potential benefits of social networking in building usable collective intelligence (Koplowitz, 2009). The following are examples of social and collaborative platform made for enterprise.

2.24.1 IBM adoption of Social Tagging Applications

Dogear: Developed by IBM, Dogear is the first social bookmarking application designed particularly to support the corporate environment. Dogear started in July 2005 and had aggregated more than 21,072 tags entered by 1,710 users and a total of bookmarked URLs and documents of 72,677 as of the closing date of the study (Millen and Feinberg, 2006) . Dogear offers potential in enhancing search activities by integrating corporate resources with social bookmarking capabilities. Dogear is distinguished from other user-centered bookmarking systems by its ability to work behind a corporate firewall, which allows for sharing and bookmarking intranet resources among coworkers (Millen and Feinberg, 2009). Figure 2-7 shows a screenshot of Dogear tagging tools.

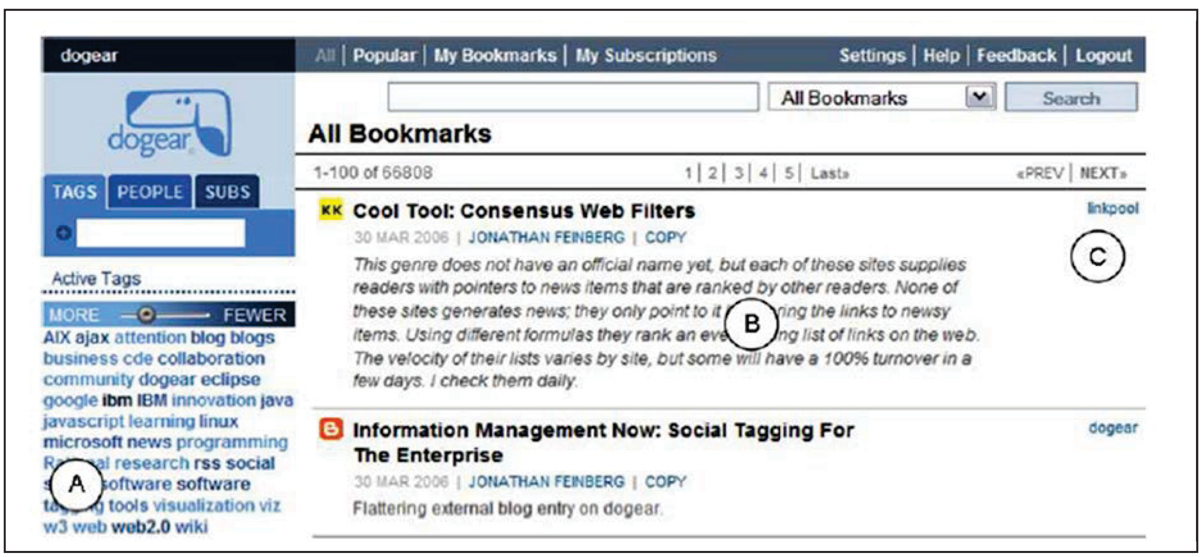

Figure 2-6 Screen Shot of DogearService[3]
(Millen and Feinberg, 2006)

[3] A - Tag cloud with browsable tags; B - list view of bookmarks; and C - clickable tags for each bookmark

The Dogear social bookmarking service is an application run by a browser which makes it accessible to everyone in the corporate environment. It was designed to serve both Internet and intranet navigation. To use Dogear, users have to install its toolbar in their browsers to allow easy bookmarking of webpages. Dogear has a navigational bar showing a list of active users, while the Dogear homepage shows the most recent bookmarks, including bookmarker name and the date it was created. To ensure formality and appropriate use of the corporate resources, Dogear authenticates users across the corporate directory. To ensure a personalized browsing experience, Dogear offers “my bookmarks”, a view that displays individual personal bookmark collections. Tags are given special attention in Dogear because of its interactive nature in enabling users to click and browse information resources. Dogear offers tag clouds to show the tag history and the frequency of tags; font darkness shows the most frequently used tags, and lighter font shows the less frequently used tags. A user can use the Dogear slider to control the tag index (Millen and Feinberg, 2006).

Cogenz: An IBM enterprise social networking and bookmarking platform that helps organizations to use employees' knowledge through cultivating a collective intelligence environment, adding quality to search results, and using expertise location and entities to build self-organizing communities. Cogenz is very similar to Delicious in that it helps employees store and organize pages for fast retrieval. However, Cogenz allows employees to perform the bookmarking process in a more secure and safe environment that matches organizations’ norms. Employees can use Cogenz to store and organize Internet and intranet resources used in their daily job tasks, share resources with others of common interests, navigate and search collective intelligence from inside and outside the organization, and locate experts and communities of interest for exchanging opinions and insights (Boothby, 2007). One of the most important features of Cogenz is that while asking users to tag an item, it requires a short summary and description of that item. This helps others viewing the same item to get a concise look at the item without having to read the associated page (Boothby, 2007).

IBM Lotus Connections is social software for enterprise that enables enterprise professionals to develop, nurture, and remain in contact with a network of their colleagues, respond quickly to business opportunities by calling upon the expertise in their network, and discuss and refine new creative ideas with communities of coworkers, partners, and customers. Lotus Connections has the following integrated components: *(1)Communities,* allowing users to create, find, join and work with communities of interest; (*2) Files*, enabling users to upload, tag and recommend files to peers and partners; *(3) wiki management*, where users can create, subscribe to, and comment on wikis; *(4) Profiles*, allowing users to find expert profiles of interest; *(5) Blog*, where users can create their own blog spaces, and provide comments and feedback on their blogs; (6) *Bookmarks*, to save, organize, and share bookmarks using social bookmarking; *(7) Activities*, where business professionals can gather e-mails, IM chats, documents, messages, and other information they need to accomplish a business objective; and *(8) Home page*, which keeps users informed of social data updates across the Lotus Connections services (IBM, 2009).

Table 2-3 outlines the key capabilities of IBM Connections as posted on IBM (2013) software website.

2-3 IBM Connections Features, Descriptions, and Benefits

Feature	Description	Benefit
Activity Stream	A list of recent, relevant social and integrated business process activities occurring in your personal network or community.	View and take action quickly on content and events in context, without navigating to another process or application.
Embedded Experience	Work in a single, familiar environment, reducing time and making users more effective.	Provides access to business critical actions from a wide variety of applications, including 3rd party applications.
Integrated email and calendar	Access both IBM Lotus Domino and Microsoft ® Exchange messaging services.	Brings mail and calendar into your social context by integrating key messaging and calendar views and functions into your social environment.
Social Analytics	Access a comprehensive set of analytics for Connections components in the form of reports and recommendations.	Eliminates guesswork by discovering trends in content, social activity and expertise for

Feature	Description	Benefit
		better decision-making.
Mobility	Access all of your Connections data from mobile browsers and free native apps.	Unlock creativity everywhere with anytime access to your professional network and communities.

Figure 2-7 IBM Connections Home Page
(IBM, 2012)

A big part of the Lotus Connections platform is tagging. That is, users can easily assign tags or keywords to many parts of the Lotus Connections environment. The tags can be used to search for similarly tagged items in Lotus Connections. Also, existing tags assigned to items can be selected to kick off a tag search of similar items. Tags provide a useful way to categorize elements and search for elements of personal interest.

Figure 7 provides a good demonstration of tags because it includes an extensive list of tags for the blog shown. You can select any word in the tag cloud to locate blogs with the same tag. In addition, you can use the text box above the tag cloud to filter the tag list.

Also, the slider control (more to less) allows you to expand or trim the contents of the tag cloud (Patton, 2007).

Figure 2-8 Tagging Features in Lotus Connections
(IBM, 2012)

Figure 2-8 provides a good demonstration of tags because it includes an extensive list of tags for the blog shown. You can select any word in the tag cloud to locate blogs with the same tag.

SharePoint is a Microsoft application for collaborative computing made for the business environment. The platform offers sharing capabilities of information resources across teams, communities, and task driven processes. While keeping IT control over corporate assets, the software enables teams to create workspaces and share artifacts across departments and organizations. To ensure good utilization of corporate collective intelligence, SharePoint offers social computing tools that enable users to interact with each other based on similarity of interests or expertise (Millen and Feinberg, 2009). SharePoint enables people to work with other people, with content and information, by allowing them to use the rich, out-of-the-box set of integrated features that includes the SharePoint suites. Using SharePoint, people can customize the platform capabilities to address specific business needs and integrate them with other products and solutions. Companies can deploy SharePoint both inside the enterprise through the intranet, or outside the enterprise through the extranet or Internet so employees, customers, and business partners can work with the platform (Microsoft, 2010a). Table 2-4 summarizes main features, descriptions, and the benefits of SharePoint. The following table is based on a presentation (Microsoft, 2010 b) on SharePoint's benefits.

Table2-4 Microsoft SharePoint Features, Descriptions, and Benefits

Features	**Descriptions**	**Benefits**
Collaboration	Sharing calendars, document collaboration, email integration, task coordination, social networking, real time presence and communication.	Platform for sharing information and working together in teams, communities and people-driven processes.
Portals	Audience targeting, content syndication, profile synchronization, directory import, document roll-up, colleagues and membership web parts.	Connect employees to business critical information , expertise, and applications.
Search	Configurable scope, search within a site collection, advanced search, business data search, indexing control, people search, cross site-collection search.	Find people, and locate expertise in the enterprise.
Enterprise Content Management	Navigation control, content authoring and publishing, slide libraries, email content as records, site variation, standard publishing site templates.	Extends content management to every information worker through integration with familiar tools like the Microsoft Office system.
Business Process Forms	Compatibility checker, form import wizard, forms library, browser-based forms, centralized forms management and control.	Built-in workflow templates to automate approval, review, and archiving process.
Business Intelligence	Business data actions, business data Web parts, data connection library, filter Web parts, integrated business intelligence dashboards, key performance indicators, spreadsheet publishing.	Get up-to-date information at work, collaborate, and make decisions, whether it is on the desktop or over the Web.

2.24.2 Social Tagging Features in SharePoint

SharePoint allows employees to use tags by assigning descriptive words or categories to content. SharePoint Communities features two types of tagging: social tagging and expertise tagging. Social tagging adds metadata to content to describe what it is, what it contains, or what it does. Expertise tagging adds metadata to describe the person on the My Site profile, such as what they do, which projects they work on, or what skills they have. By using social tagging to tag content, people can help build the structure of the company's information and improve search relevance for that content. By using expertise tagging to tag other people in SharePoint 2010, people help build relationships and connections in the company. In total, about 40,000 employees are using the tagging features in SharePoint.

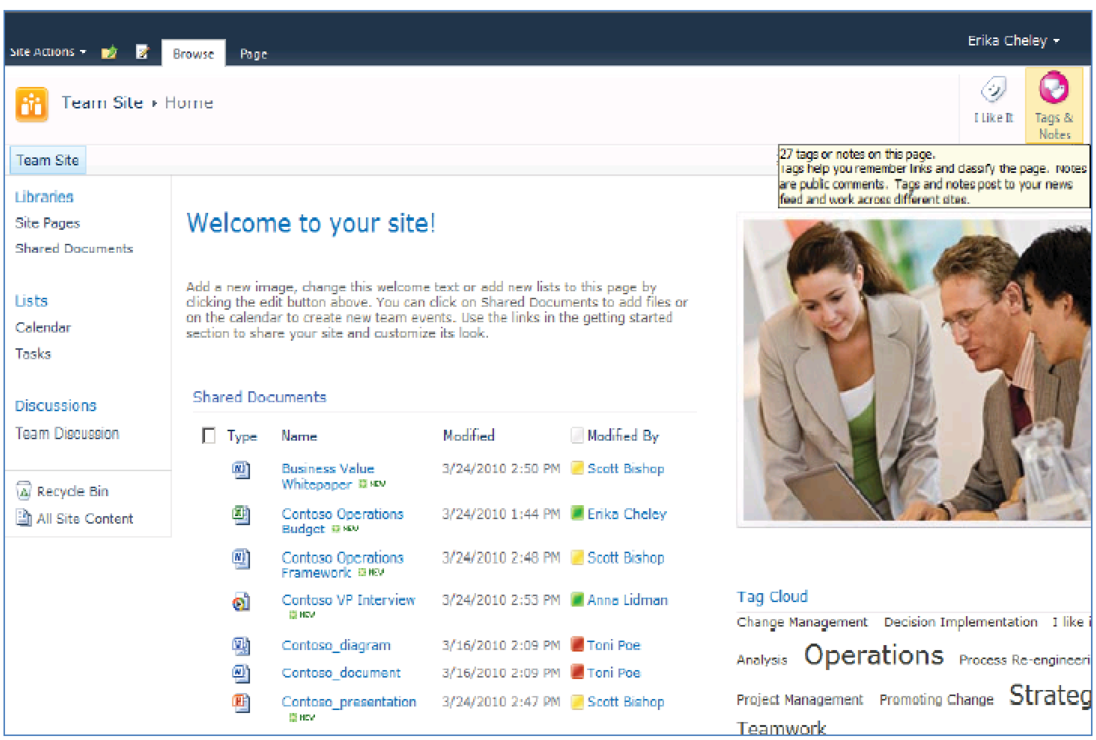

Figure2-9 Tags and Notes in SharePoint (Microsoft, 2013)

2.24.3 Bookmarks in SharePoint

SharePoint has a bookmarking feature which allows people to share bookmarks with a community of users to help build the knowledge and perspective of the community as a whole. In SharePoint 2010, people bookmark content by clicking the "I Like It" tag. By using bookmarks in SharePoint 2010, employees can include any piece of Internet content in their communities' sets of social bookmarks (Microsoft, 2010).

2.24.4 IBM Lotus Connections vs Microsoft SharePoint

The following table is based on a blog post by Mark Polly (2011) comparing features of IBM Lotus Connections vs Microsoft SharePoint.

2-5 Lotus Connections Vs. SharePoint

	IBM Lotus Connections	Microsoft SharePoint
Popularity	Less popular with smaller market share.	Popular with a bigger market share.
Social Capabilities	Has a richer social features that allow for more file sharing.	Lack of social capabilities that allow for less file sharing.
File Duplication	Maintain one copy of the file and simply share tags/metadata to connect to the file.	Makes physical copies of the file, which makes users lose the "shared file" concept and all the social tags connected to it.
File Sharing	Tracks how and when a file is shared between users.	Does not track sharing of documents in the file properties view.
Personal vs. Shared documents	Maintains one library and controls sharing through a concrete "sharing" approach.	Maintains two libraries on "My Site": a personal and a shared library. Sharing files entails emailing links, changing permissions of the file, or simply moving the document from the personal to the shared library.
Global View of Shared Documents	SharePoint does have an aggregated view of all the shared files. Users must navigate to each site to see his/her own files.	Has an aggregated view where users can see all the files they own and share in one place.
Tagging	Includes the capability to tag resources where other users can find them via a tag or tag cloud search.	Include the capabilities to tag resources, but tags are not visible publicly to other users.

2.24.5 Summary of Tagging Concept Used in the Thesis

Table2-6 Summary of Tagging Terminologies

Terms	Definition	Resource
Tags	"Tags" are freely chosen keywords or category names, and are metadata for information resources.	Guy and Tonkin, 2006
	Labeling web resources with users' own styles of description of web content. Social classification by using free-text metadata for describing and discovering resources.	Wu et al., 2009 Tonkin, 2006
Bookmarking	Social bookmarking allows users to tag, save, and share websites with other users. Users' personal tags to webpages become a collection where everyone can view, browse, and share these bookmarks.	Trant (2009) Heymann et al., 2008.
Folksonomy	The total collection of users' tags on a given website. A web-based technology that allows users to generate free tags used to categorize web content.	Melenhorstet al. (2008) Chang et al. (2008)
Taxonomy	Taxonomy is the science of classifications of information artificats based on pre-defined rules. The resulting catalog is used as a conceptual framework for information retrieval.	Rouse(2005)
Tag Cloud	Simply a list of all the tags that belong to a certain user group where popular tags are highlighted typographically.	Panke and Gaiser(2009).
Geotagging	The process of adding geographical identification data to information resources such as websites, RSS feeds, or images.	Rader and Wash (2008).
Enterprise Social Tagging	Using social tagging technology both within workgroups and across the organizational environment. ESTTs offer many benefits for organizations on an individual and organizational level.	Lemieux (2009)
SharePoint	Microsoft application for collaborative computing made for the business environment. The platform offers sharing capabilities of information resources across teams,	Millen and Feinberg (2009)

Terms	Definition	Resource
	communities, and task-driven processes.	
Lotus Connections	IBM social software platform for enterprise that enables enterprise professionals to develop, nurture, and remain in contact with a network of their colleagues, respond quickly to business opportunities by calling upon the expertise in their network, and discuss and refine new creative ideas with communities of coworkers, partners, and customers.	IBM (2009

2.25 SOCIAL TAGGING IN ORGANIZATIONS

2.25.1 Social Tagging in Government

Warner and Chun (2009) investigated social tagging used to help government employees find and share information. They indicated sharing information between related organizations is important in promoting efficiency, productivity, and enriching customer satisfaction. They noted some challenges for sharing such information coming from the abundance of information available, its heterogeneity, and its distant geographical locations across organizations. They proposed the concept of “collaborative semantics and pragmatic annotation” as a method of leveraging local information resources to serve a wider government community. They also proposed using the social networking capabilities of annotation in enabling members of government offices to locate, discover, and tag important and relevant information for use by other members within and outside organization. Their investigation claimed this approach will not only assign semantics to resources, but also will identify important concerns like who, where, when, and why resources are tagged. They also claimed a semantic and pragmatic tagging approach would enable users to discover, filter, and search for new resources in addition to the hidden ones; navigate between resources through the semantic association of tags; and offer efficient recommendations of the most relevant government information being distributed across related government agencies.

2.25.2 Social Tagging in Corporations

Pan and Millen (2008) investigated the possibility of using social bookmarking in large corporations to enhance knowledge sharing among its members. They conducted a field study that lasted for a year in a multinational company to run a comprehensive analysis on tags and bookmarks to monitor the pattern of sharing and bookmarking interaction. The study results showed social bookmarking leveraged the "self-interested actions" for individuals and made it available to the group, suggesting potential sharing capabilities. When they compared the browsing activities for their Internet group and intranet group, the results showed the number of shared bookmarks for intranet pages was more than the number in Internet webpages, indicating bookmarks were used to find and explore job-related information.

Brzozowski (2009) described an analysis of internal use of Web 2.0 in an HP environment using WaterCooler, an application that aggregates internal social media and cross-references it to an HP directory. The analysis found that social networking and social tagging tools helped in changing the overall perception of sharing, allowing employees to feel more connected to each other and more linked to the company's initiatives. In particular, the WaterCooler application was a proper channel to get an audience for those who like to share their views and insights with others. Additionally, WaterCooler worked as an "organization explorer", guiding employees to current updates of the company's progress. The result showed the shared capacity of the bookmarking application had a positive impact on redistributing employees' attention to interesting topics of outside groups, helping them share knowledge and insights (Brzozowski , 2009).

In a subsequent study, Brzozowski, et al. (2009) conducted a quantitative study relating organizational and social motivators to users' behaviour in social media application on companies' sites. They found employees participate more when they receive feedback in the form of posted comments for their previous posts, suggesting that people would act more when they perceive their work is significant to others. They also found the visibility of managers, co-workers, and same group' activities on the network motivated employees to actively participate. The results implied that direct exposure to social media to employees' peers is important to encourage employees to participate in the media. The study also showed a significant correlation between users' histories of posts and their amount of participation. In particular, employees who have previous posts are likely to participate more on the company site.

Rowlands and Hawking (2008) investigated the use of social tagging for small enterprises. They noted that in public institutions privacy issues can hinder recording personal information resulting from tagging application, suggesting the use of a simpler anonymous tagging system. They indicated anonymous tagging systems have the potential to augment the quality of retrieval systems in small scale enterprise websites. According to the authors, intranet can help staff find targeted pages quickly, even with few tags of influential pages. The study also showed that although synonymous tagging cannot perform alone as a retrieval system, it can help answer most of the queries (in their study 54%) not answered by metadata designed by the content authors, suggesting that combining synonymous and regular search engines would increase retrieval quality.

Amitay et al. (2009) studied the use of social tagging in the enterprise environment. They questioned whether data generated from social tagging applications can enhance the search results within the enterprise environment. Their study used a multi-faceted approach that first made all objects in the social data discoverable, searchable, and retrievable. Second, the study focused on discovering hidden relations between all the social entities. Then the authors used the heterogeneousness of all the entities to run "all-encompassing" social search solutions. Using their own search engine with a multi-faceted approach in a large enterprise, the authors found social tagging data is highly beneficial in augmenting search results in two ways: first, the results showed a high precision of top retrieved items, suggesting that users' feedback added quality content and hence extracted only good data; and second, users' tags and comments were important in highlighting object popularity while enhancing the description of objects.

Their user study also showed the multifaceted system approach of searching social tagging data is successful in two ways: (1) users associated to queries were indeed interested in the query topics and have posts on the topic searched; and (2) tags retrieved by the system were highly related to the queries using Google semantic distance measures.

2.25.3 Social Tagging in Education

Gibson and Teasley (2006) conducted a study in a university environment with undergraduate classes to find out the benefits and the motives of using social tagging in higher education. They indicated that social tagging can be used in the learning environment first to form group knowledge (e.g. for members of groups or researchers and analyzers of the tags); and second, to facilitate the learning process. The results showed that using social tagging in the classroom environment can help students interact with each other about the tagged topics and can help them build common norms for the learning practices. In their study, they showed that "functional tags" like "opinonSlug" helped students define the purpose of blog posts and decide if they wanted to participate in the blog or not. Furthermore, the students used tags as markers to keep track of their previous interactions with other students.

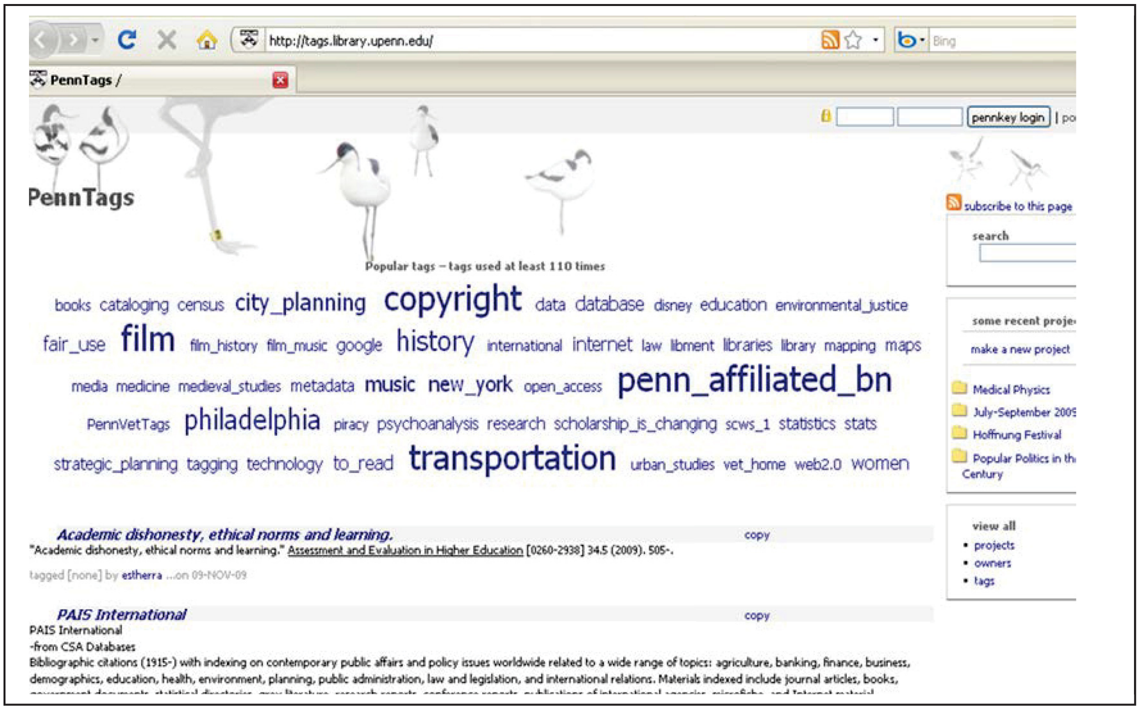

Figure 2-10 University of Pennsylvania's PennTags social tagging system (UP, 2005)

One of the suggested motives of using tags in the higher education environment is helping students locate related information resources (Arch, 2007). University of Pennsylvania (UP) adopted social tagging in its library PennTags platform (shown in Figure 2-10) (www.tags.library.upenn.edu/). This application enables UP members to bookmark quality websites and important resources into the university catalog to share them with the UP community. PennTags offers another important tagging feature by allowing its authenticated members to create shared projects or group links on special pages for its members to exchange ideas and get updated on the progress of selected projects (Arch, 2007).

Ohio State University (OSU) is using LibraryThing, an online social tagging application for books, as a tool to recommend books to its students and faculty. OSU used the tag "leisurereading" to list all the books that its members can read during their leisure. OSU members can click either on the tag to view the whole list of books included in this tag, or on a book to see the details of the book. When clicking on the book, a member can see a review of the book, and recommendations for other books related to the original book. OSU members can also benefit from the tag cloud made by LibraryThing to see which tags and books are popular. The tag cloud displays the tag typographically based on the number of members who assign the tags (Steele, 2009). Figure 2-11 shows an example of tag use within Ohio State University.

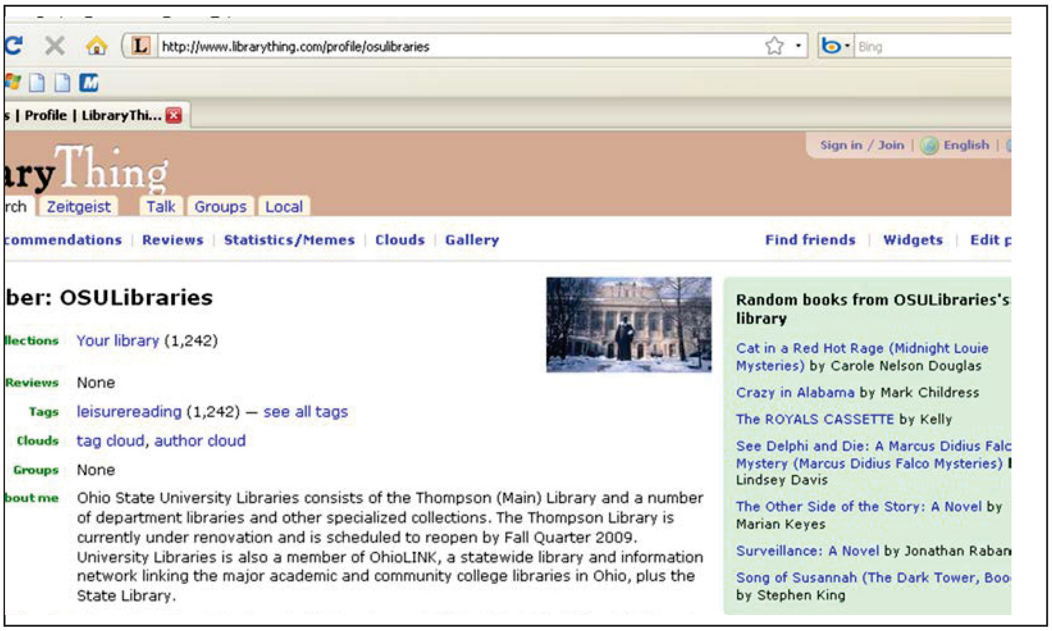

Figure 2-11 The use of social tagging in Ohio State University
From (OSULibraries, 2009)

Stanford University is another example of educational institutions that have adopted social tagging using a platform called “Drupal”. Drupal is a community-built content management system for Web publishing and collaboration. With Drupal, Stanford members can create, format, publish, and revise their Web collaborative resources (Stanford University, 2009). The main motive for Stanford’s use of Drupal is empowering its community members to bookmark interesting webpages and educate its members with its library resources. Drupal offers collaborative tools like blogs, wikis, and a Delicious-integrated module to enhance the searching for tagging by subject (Arch, 2007).

2.26 PREVIOUS STUDIES ON SOCIAL TAGGING MOTIVATION

This section starts with a literature review of social tagging motivation in both online and enterprise environments in an attempt to identify major factors behind employees' participation in enterprise social tagging tools. The dissertation combines prior findings pertaining to information systems, computer science, human-computer interaction, and sociology research to understand users' knowledge seeking and contributing behavior pertaining to such tools. The premise of why people contribute metadata tagging content to information resources has been a subject of researchers in recent years. Many studies investigated several motivational factors to help understand users' behavior of tag contribution and sharing. Some of these factors include self and public motivation along with social presence (Ames and Naaman, 2007; Lee, K. J., 2006); social psychological factors (Cheshire and Antin, 2008); trust belief and its antecedents (Kim and Han, 2009); voluntarism in adding and categorizing content (Schroer and Hertel, 2009); and altruism and enjoyment in helping others (Nov et al., 2008). The following section covers prior research on users' motivation to tag online resources.

Using a large data set from four different tagging sites, Strohmaier et al. (2010) questioned users' motivation for tagging and whether or not users' motivation can be quantitatively measured. Their results showed users' motivation to tag is divided into two sets: to describe and to categorize information resources. The result also showed that motivation to tag differs not only within different tagging systems, but also within a single system. Further, users who are motivated by tag categorization showed a lower tag agreement when naming tag categories, while those who were motivated by tag description showed higher agreement when describing their resources using tags. Similarly, Körner (2010) investigated tagging motivation from two distinct categories: users who categorize and users who describe tags. They identified a number of measures to discriminate between describers (i.e. users who use tags for describing resources) as opposed to categorizers. Based on qualitative and quantitative measures of tagging behavior, they indicated that tag-based measures are the most accurate in predicting users' behaviour followed by content independent measures.

A recent study by Nov et al. (2009) investigated factors associated with users' photo sharing in an online community. Nov et al. proposed and validated a conceptual model based on intrinsic and extrinsic motivation. Their model included the following factors as main drivers for tagging behavior: enjoyment in helping others, commitment to the community, self-development through learning from others, and gaining reputation among like-minded users. Basing their analysis on users' survey responses and tagging system data, they concluded the level of tag sharing declines with the user's tenure in the tagging community. In line with their hypothesis, users' who showed more commitment to the community and significant involvement tend to have more sharing activities.

Hammond et al. (2005) described the reasons users perform tagging in Flickr and Delicious as ranging from "selfish", where users tag their own contents for their own easy retrieval as is the case with Flickr; to "altruistic", where users tag other users' content for easy retrieval by anyone using that system, as is the case with Technorati. The authors noted most social tagging sites follow the "selfish" path, where users tag content mainly for their own benefit.

Nov et al. (2008) studied the motivations associated with the tagging behavior on Flickr and how they affect users' tagging activity level. Basing their work on a qualitative study by Ames and Naaman (2007), they confirmed social presence works as a main motivator for users to add tag content. With regard to the tagging level, they found a strong positive relationship between the number of tags and self and public motivation, social presence, and the number of photos in users' collections of tags. According to their results, people tend to increase the number of tags if they perceive the social presence of others. Those people are self or publicly motivated, and they are characterized by having a bigger collection of photos in their profile. The results showed no significant correlation between family and friend as motivational candidates and the tagging activity level. This suggests users are not mainly tagging content for friends and family but they tag for their own personal use. The study recommended managers of tagging systems direct their systems to feature public exposition of tags to help attract more people to use their systems. Lee (2006) stated that although tags are largely directed towards personal organizational reasons, social presence plays an important role in getting users to tag resources. Her analysis of Delicious users' behavior showed that users, when perceiving the social presence of others, tend to describe their bookmarks with tags that are more meaningful to facilitate other users' access to the bookmarks. Lee also noted that the social presence of others pushes people to tag more frequently to reveal more information about their tags to other groups.

Some tagging motivations come from a group contribution perspective. When users get the feeling their contribution is important to groups, they are more likely to contribute more to the system. Conversely, if they feel their contribution is less effective, they are less likely to contribute (Karau and Williams, 1993). Beenen et al. (2004) conducted a study on the "under contribution" of some users on the movie recommender system MovieLens. They found that users, when reminded their tag contribution will help others to choose the right movie, perceived a sense of uniqueness to their tags and hence added more movie tags to help the group.

Becker (2007b) indicated that tagging gives some users the power of naming by which they can be recognized as the initiators or the founders of new tags from the very beginning of the game: "If I sell size 8.5″ blue-striped widgets, and I'm the first to use the tag 'widget', I claim a powerful findability label for my very specific merchandise", (Becker, 2007, p. 1).

Ames and Naaman (2007) studied users' incentives to tag in Flickr and ZoneTag, a camera phone capture tool that helps users post images on Flickr. They studied users' motivations from two dimensions: "social", whether users are tagging items for individual use or for public use; and "function" by measuring the intended use of tags. The result of their study showed participants were motivated by the following factors: (1) *organize for general public*, either to participate in public pools and help others search, or to self-promote their photo collections; (2) *self-organization*, to organize their photos for future retrieval; or (3) *social communication*, using tagging as a tool to add more contexts for their friends, family, and the public.

From a collection of tags on books and music, Zollers (2007) studied users' tagging motivations in Amazon and Last.fm. Using a snowball and random sampling techniques, the study deduced three motivations for users to tag a resource: (1) *opinion expressing*; (2) *performance*, using tags as a show-off technique to others; and (3) *activism*, to broadcast a group view on a certain topic to a certain audience. With regard to activism as a motivational factor, the study found 480 users tagged 1,054 Amazon products with the *defectivedesign* tag.

Aiming at collecting the most important motivations for users to tag video material, Velsen and Melenhorst (2009) classified users' motivations for tagging into three categories: indexing, socializing, and communicating:

- Motivations related to indexing: users tag an item to re-find this item in the future, make it easier for others to find that item, add more information for the item to be discovered by others, or to help users find information related to that item.
- Motivations related to socializing: users tag an item to recommend it to others, to find friends or peers, and to connect their personal profile with other's matching profiles for topic recommendations.
- Motivations related to communication: users may tag to express personal opinion, or to contact similar taggers to share opinions about an object.

Based on their findings, Velsen and Melenhorst (2009) noted that motivations related to indexing outweighed motivations related to socializing or communication.

In their study of users' media tagging, Cunningham and Nichols (2008) indicated that individuals use tags in media items for the following reasons: *mental* satisfaction, to pass the time or to enjoy something; *visual*, to have a look at a media item from a friends' referral; *audio,* to listen to a media item; *learning*, to learn a new technique for a certain task; *social*, to follow a friend's preference or to share something interesting with friends; *MSM*, to get updated on Mainstream Media; *temporal*, to follow up on a future event; and *others*, to mark the item for later review.

Marlow et al. (2006) noted users begin tagging for personal purposes and later appreciate its social aspect, and then participate in the social tagging process. They also indicated tagging motivations vary with the variance of users' interaction with the tagging system. They connoted that motivation for tagging can be categorized in two directions: organizational and social. Tagging meant for the purpose of organization is used as a tool for structured filing, wherein users utilize their personal structure standards or other's tagging standards to organize their links; while some users consider tagging as a communicative tool to express their opinions and issues and their views to others in the tagging community.

The following are motivations for tagging resources identified by Marlow et al. (2006):

1 *Contribution and sharing*, to add more tags to a cluster of tags for the purpose of sharing and contributing resources (e.g., tagging vacation photos for a partner or a friend).

2 *Attracting attention*, to have others look at their tags to make their tag popular either for personal reasons or for spamming reasons.

3 *Play and competition*, to tag others' resources for competition as in ESP Game, or to change how the tags in the system look via playing with tag clouds.

4 *Self-presentation*, to leave personal marks on selected resources.

5 *Opinion expressing*, to express views and opinions to others.

6 *Future retrieval*, to mark items for personal retrieval (e.g. tagging a group of pages on Delicious in preparation to write a book).

Marlow et al. (2006) noted tagging resources could be used to incite an activity or work as reminders of oneself or others and they are sometimes extremely helpful in providing metadata about information resources without tags.

Panke and Gaiser (2009) conducted two quantitative and qualitative surveys to study the impact of social tagging on personal information management. They found the use of tagging as a personal management tool was much more important to participants than using it as an information sharing tool. They identified four types of taggers: (1) *ego taggers*, including those users who consider themselves as the information elite and who seek the publicity of being taggers; (2) *archivers*, users who use tagging mainly to organize their daily web activities; (3) *broadcasters*, which includes users who tag items to share them with the public; and (4) *team players*, those users who use tags to exchange information with personal networks. The authors found also that taggers were highly sensitive to privacy issues and used their tags to reserve some privacy of their own. In their interview with tagging experts, the authors noticed that even though tagging systems had many tagging features for taggers to use, many features were rarely used. Examples of these features were building a contact network, using bundles to organize tags, or renaming keywords. They concluded participants in their study used tags as a "mnemonic device" under the rubric of "out of sight, out of mind".

Zhan *et al.* (2009) indicated different information "foragers" have different knowledge backgrounds and hence different mental activation processes for the same web content. They considered social tagging as a "socio-cognitive artifact", where tags and web-content intersect to influence the activation of the user's mental state and the action of tagging. The concept of "socio-cognitive artifact" also entails users tagging items intentionally as a supplement to make sense of information when they revisit it and reduce the cost of operation. Zhang et al. (2009) indicated the generation of users' tags is determined by user's interests, salient activation, and the expected reuse of tags.

Table 2-7 shows a summary of users' motivation to tag resources as extracted from prior literature. The table is orgnaized chronologically starting with most recent to older studies.

Table 2-7 Social Tagging Motivation in Prior Research

Studies	**Objective**	**Tagging Motivation**	**Systems Investigate**	**Methods**	**Number of Users**	**Finding**
Strohmaier et al. (2010)	Explore a quantitative way for measuring and detecting the tacit nature of tagging motivation in social tagging systems.	To categorize and describe resources.	ESP Game, Flickr, Delicious, Bibliosonomy,CiteUlike,Diigo, and Movielense	Quantitative analysis of a large data set.	4,076 users	Users' motivation for tagging varies not only across, but also within tagging systems; and tag agreement among users who are motivated by *categorizing resources* is significantly lower than among users who are motivated by *describing resources.*
Korner et al. (2010)	Define and evaluate a number of measures designed to discriminate between tag describers and categorizers.	To categorize and describe resources.	Delicious	Qualitative and quantitative.	6 users, 896 users and 184,746 tags	Tag content measures are the most accurate in predicting user's tagging behavior, followed by a content independent measure.
Nov et al. (2009)	Investigate factors associated with users' photo sharing in an online community.	Enjoyment, commitment, self-development, and reputation.	Flickr	Survey, Quantitative	278 expert users	Photo sharing declines in respect to the users' tenure in the community; users with higher commitment to the community tend to share more tagging content.
Velsen and Melenhorst (2009)	Construct an overview of users' motives to tag video content.	Indexing, socializing, communicating	YouTube, Hyves, Skoeps	Focus group	11 regular Internet users who have tagging experience.	Motives to tag content are system based.

Studies	Objective	Tagging Motivation	Systems Investigate	Methods	Number of Users	Finding
Nov et al. (2008)	Explore the effects of various motivations and social presence on actual tagging behavior.	Public motivation Social Presence	Flickr	Survey, Quantitative	Pilot study of 196 users; actual study of 237 respondents; some tagging experience.	Public motivations, together with social presence indicators are positively correlated with tagging level, while family and friends motivations are not significantly correlated with tagging.
Cunningham and Nichols (2008)	Investigate tagging motivation to locate tagged media items.	Mental: passing the time or enjoying something; visual: having a look at media items; audio: listening to media items; and getting updated media items; following up on future events.	YouTube	Qualitative and quantitative analysis	27 ethnographies and large system data	Locating and viewing videos that are deeply embedded in participants' lives; many of the participants' video queries were driven by their mood or emotional state.

Studies	Objective	Tagging Motivation	Systems Investigate	Methods	Number of Users	Finding
Zollers (2007)	Describe emergent social motivations for tagging.	Opinion expression, performance , and activism	Amazon.com, and Last.fm	Quantitative	Tags of 4,800 books from Amazon, and tags from 50 users (25 artists and 25 tracks) from Last.fm	Users' tags shape themselves according to the design, content and community of the tagging site.
Ames and Naaman (2007)	Investigate the incentives for annotation and tagging in mobile and online media.	Sociality (tag for others to use); and function (either to facilitate future retrieval or communicate some additional context to viewers)	Flickr, ZoneTag	Qualitative	13 users	Social incentives for tagging are important in motivating users to tag their photographs.
Lee (2006)	Analyze motivation in bookmarking sites.	Social presence	Delicious	Quantitative	8,058 users (1.75 million bookmarks)	Users who perceive the presence of others on Del.icious increase their annotation activities with more quality tags.
Beenen et al. (2004)	Use social psychology to tackle the problem of under contribution on social media sites.	Reminding users of the uniqueness and importance of tagging contribution.	Movielense	Quantitative	833 of users who have tagging experience	Specific goals led to higher contribution rates than non-specific ones.

2.27 SUMMARY

In this chapter the phenomenon of social tagging was introduced. Specifically, the definition of social tagging and folksonomy were introduced with more focus on the role of users' participation in making social media applications successful. Next, an overview of social tagging systems was explored in terms of tagging trends, tagging components, how tagging works, tagging systems over time , tag navigation, types of tag clouds, and examples of tagging systems. Further, the chapter covered both the advantages and disadvantages of social tagging as presented in previous literature. The second part of the chapter was dedicated to presenting an overview of using social tagging within organizations with examples of enterprise social tagging tools. In the next chapter, I will go through motivational theories to identify other factors (including those indentified in chapter 2) responsible for motivating people to use social tagging tools.

CHAPTER 3 THEORETICAL MODEL

This chapter attempts to reconcile popular theoretical perspectives which aim at explaining users' adoption of technology and users' social interaction with Information and Communication Technology (ICT). Specifically, it will discuss the following theories: Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975), Theory of Planned Behaviour (TPB) (Ajzen, 1985), Technology Acceptance Model (TAM) (Davis,1989), Social Exchange Theory (SET) (Blau, 1964); Social Capital Theory (SCT) (Nahapiet, and Ghoshal, 1998b); and Social Presence Theory (Short et al., (1976). Additionally, this chapter combines recent viewpoints on social media applications and users' interaction of online information systems to extract fitting factors that may contribute to explaining employees' seeking, contributing, and sharing behaviour in Enterprise Social Tagging Tools (ESTTs). The chapter then introduces a theoretical model of potential factors influencing employees' participation in ESTTs. Taking the perspective of an employee, the model highlights employees' perceptions of three dimensions of ESTTS: Technical, social, and organizational. Finally, the suggested model is used to frame the research questions and the study's hypotheses.

3.1 THEORETICAL PERSPECTIVES

Three main directions are normally thought of when analyzing employees' motivation to use knowledge sharing technologies:

- Individual aspects such as willingness and personal gain (Venkatesh et al., 2003; Wasko, 2000)
- Knowledge sharing aspects such as reciprocal behavior and relationships with others (Kalman, 1999)
- Organizational influence such as pro-sharing norms, organizational reward, and social influence (Bock et al., 2005; Kankanhalli et al., 2005; Venkateshet al., 2003)

Consistent with most IT tools, to participate in ESTTS, an employee needs to be willing to use such tools given that they are provided by his/her organization. Further, users' willingness to use a technology relies on their acceptance of such technology (Davis, 1989; Davis et al., 1989, Venkatesh et al., 2003). Consistent with this notion, an employee's willingness to use a collective or collaborative technology is contingent upon his/her acceptance and adoption of such technology. Further, users' use of knowledge sharing tools relies on their knowledge sharing beliefs (Kalman, 1999). Knowledge sharing refers to the willingness of people in an organization to share with others the knowledge they have acquired and learned (Gibbert, 2002). Further, since the objective of this study is investigating employees' motivations to participate in ESTTs, organizational context factors (such as pro-sharing norms and managerial influence) are thought to have a significant influence on users' IT behavior within the organizational context (Wasko and Faraj, 2005; Kankanhalli et al., 2005). Provided that ESTTS are IT tools that get adopted by individuals, used by employees for contributing and sharing tags, and are operated within an organizational context, this research will focus on three aspects of ESTTs: technology acceptance, knowledge sharing, and organizational influence.

With respect to users' technology adoption, three traditional theories often are applied to explain users' acceptance and adoption of technology: Theory of Reasoned Action (TRA) (Fishbein et al., 1975); Theory of Planned Behaviour (TPB) (Ajzen, 1985), and Technology Accptance Model (TAM) (Davis, 1989).

When studying the topic of knowledge sharing, previous IS research (e. g. Bock and Kim, 2002; Chang et al. , 2008; Kankanhalli, et al., 2005) used social exchange theory to account for individual cost and benefit factors associated with knowledge sharing tools. Further, the impact of cost and benefit factors on users of knowledge sharing tools (enterprise social tagging tools in this thesis) is likely to be influenced by contextual factors (Constant et al., 1996; Jarvenpaa and Staples, 2000). Previous IS studies have used social capital theory to account for contextual factors impacting employees' knowledge sharing behavior (Kankanhalli et al., 2005; Bock et al., 2005;Venkatesh et al., 2003).

Accordingly, this research (in addition to TAM and TRA, TPB), uses social exchange theory and social capital theory as a theoretical foundation for the proposed model of the study.

3.1.1 Theory of Reasoned Action

Over the past decades, TRA (Fishbein and Ajzen, 1975) has become a widely adopted theory to explain users' behavior toward technology. According to Fishbein and Ajzen, an individual's behavior is predicted by his/her intention to act in such behavior, which is determined by the individual's attitude and subjective norm concerning his or her behavior. Attitude is defined as the individual's positive or negative feelings about performing a specific behavior. A person's attitude is determined through his/her evaluation of the consequences resulting from that behavior and his/her own evaluation of the desirability of those consequences. Subjective norm is defined as a person's perception of whether people who are important to the person think he/she should perform a specific behavior (Eagly, 1993).

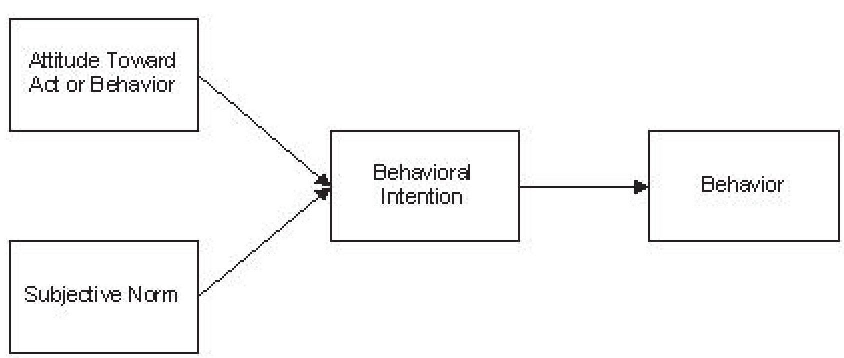

Figure 3-1 Theory of Reasoned Action (Fishbein and Ajzen, 1975)

TRA has been used in several studies to explain individuals' use of IT as in enterprise resource planning (Bagchi, 2003), expert systems (Liker, 1997), and website use behavior (Bobbitt, 2001). Although TRA is widely used, it suffers from some limitations. For example, TRA does not take into consideration individuals' beliefs about a particular behavior. Therefore, some researchers considered salient beliefs for a specific extent as a moderator for users' IS behavior. For example, Lu and Lin (2003) proposed customers' beliefs about a particular website's content and infrastructure could have an impact on their attitude toward repeated transactions. Additionally, based on the TRA, Bock et al. (2005) found that even though attitudes and subjective norms affect individuals' intentions to share knowledge in the context of knowledge sharing and organizational climate, reciprocal relationships have a major influence on individual's attitudes toward knowledge sharing. They also found both sense of self-worth and organizational climate affect subjective norms, while anticipated organizational rewards play a negative role on attitudes toward knowledge sharing. In a previous study, Bock and Kim (2002) suggested users' beliefs about expected rewards, association, and contribution have an impact on their attitude toward knowledge sharing in the organization.

TRA encountered other limitations, including a potential risk of mixing between attitudes and norms given that attitudes often can be reframed as norms and vice versa. James and Hensel (1991) found TRA ignored individuals' level of involvement, feeling and emotions and the influence of the environment to perform a given behavior. In practice, individuals may be limited to act in a certain way due to limited ability, time, environmental or organizational limits. The theory of planned behaviour (TPB) attempts to resolve this limitation.

3.1.2 Theory of Planned Behavior

To enhance the predictability of the TRA, Ajzen (1985 and 1989) revised its framework and developed the theory of planned behavior (TPB). Ajzen (1985 and1989) found many constraints in real life would hinder the formation of intention and behavior, so he added *perceived behavioral control* to enhance TRA's predictability and as an additional determinant of intention and behavior. Perceived behavioral control refers to the necessary skills, resources, and opportunities to engage in a specific behavior (Ajzen, 1991). In the context of IS research, it refers to the perceptions of internal and external limitations on individuals' behavior (Taylor, 1995b). According to TPB, the more favourable the attitude and the subjective norm and the greater the perceived control, the stronger the persons' intention to perform a given behavior. TPB has been successfully applied to the understanding of individual acceptance and usage of many different technologies (Brown, 2005; George, 2004; Taylor, 1995b).

Because knowledge sharing in social tagging is considered an intentional behavior, this thesis uses the TPB in which intentions "are assumed to capture the motivational factors that influence behavior" (Ajzen , 1991, p. 181). Researchers have used the TRA from which the TBP originated to study users 'acceptance and adoption of technology.' For example, Brown and Venkatesh (2005) used TPB to predict the adoption of technology in households. The result of their study showed their integrated model, incorporating TPB, explained 74 percent of the variance in intention to adopt a PC for home use. Bosnjak et al. (2005) utilized TPB to predict participation in a web-based panel study. Their results showed the predictive power of TPB theory in that perceived behavior control and attitude towards participation predicted the intention to participate, followed by internalized social pressure and moral obligation.

TBP has also been used to study knowledge-sharing behavior (e.g., Allam et al., 2012; Bock and Kim, 2002; and Bock, et al., 2005). Recent empirical findings give credence to the usefulness of the TPB for explaining knowledge-sharing behavior in organizations. For example, Chiu et al. (2006) found reciprocity norms have a positive influence on users' intention to share knowledge in a virtual community of practice. Similarly, based on the TPB, Ryu et al. (2003) claimed TPB is better than TRA at explaining physicians' intention to share knowledge. Their research results also show perceived behavioralcontrol has an influence on physicians' intention to share knowledge.

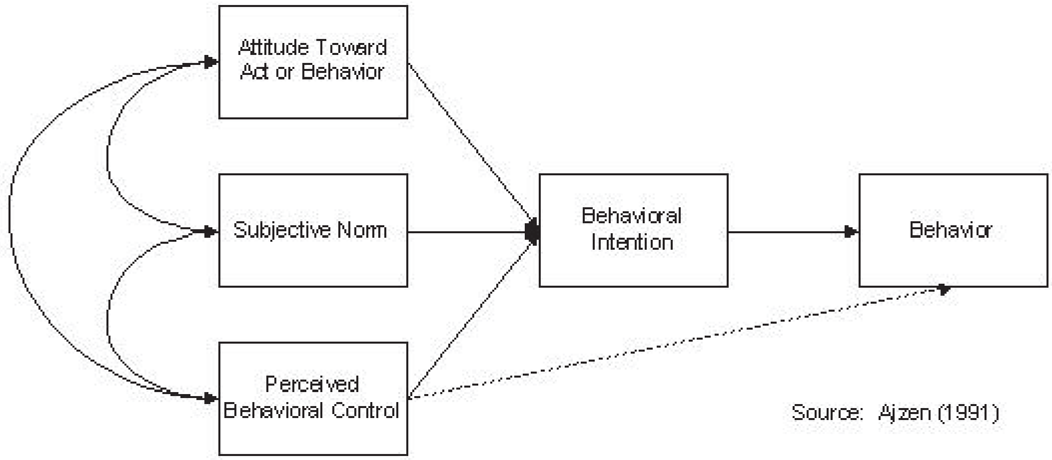

Figure 3-2 Theory of Planned Behavior
(Ajzen, 1991)

Figure 3-2 shows TPB as modified by Ajzen (1991). As shown in Figure 3-2, TPB was developed based on TRA in that it uses both attitude and subjective norm as predictors for users' behavioral intention. However, TPB is distinguished from TRA in that it added a new dimension, namely perceived behavior control as another predictor for both users' behavioral intention and actual behavior.

3.1.3 Technology Acceptance Model (TAM)

TAM represents an important theoretical contribution toward understanding IS use and information technology acceptance behaviors. Prior research used TAM to successfully predict users' acceptance of several information technologies, such as blog participation (Hsu and Lin, 2008), multimedia applications (Liao et al., 2008), Web surfing (Moon and Kim, 2001), microcomputer technology (Igbaria et al., 1994) and e-mail (Davis, 1989; Davis et al., 1992).

TAM was proposed by Davis (1989) as an adaptation of TRA to the field of IS (Adams et al., 1992). TAM posits that users' behavioral intention (BI) to use a technology is determined by users' attitude (A) towards a technology, which in turn is determined by perceived usefulness (PU) and perceived ease of use (PEOU). Perceived usefulness also is seen as being directly impacted by perceived ease of use. PU is defined as the user's “subjective probability that using a specific application system will increase his or her job performance within an organizational context” (Davis , 1989, p.985). PEOU refers to “the degree to which the user expects the target system to be free of effort" (Davis, 1989, p.985). According to TAM, both PU and PEOU predict attitude toward using a system and attitude is defined as the user’s desirability of his or her using the system. PU influences the individual’s BI to use the system (Davis, 1989).

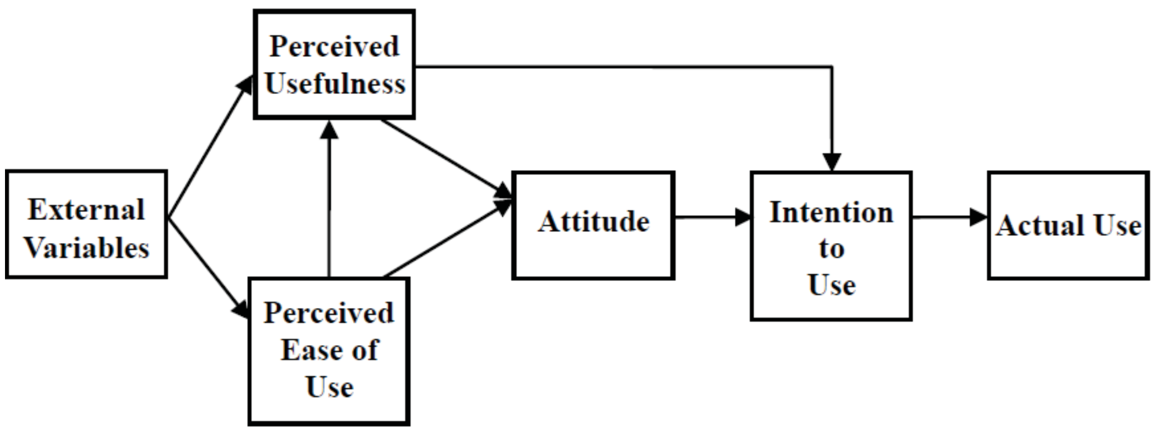

Figure 3-3 Original TAM
(Davis, 1989)

Figure 3-3 shows the original TAM. In the above figure, external variables are important for evaluating the consequences of using information technology. Examples of external factors include individual’s abilities, the type of information technology, the task, and situational constraints.

For the last two decades, IS scholars extended TAM to enhance its predictability of attitude (ATT), behavioral intention (BI) and actual use. For example, some researchers have simplified TAM by removing the attitude construct found in TRA from the current specification (Venkateshet al., 2003). Some of these extensions introduced factors from related models, by introducing additional or alternative belief factors, and by examining moderators and levels of perceived usefulness and perceived ease of use (Wixom, 2005). Attempts to extend TAM also incorporated additional variables such as computer playfulness (Moon, and. Kim, 2001), and product involvement and perceived enjoyment (Koufaris, 2002).

Although TAM represents seminal theoretical contribution towards understanding people's acceptance of using technologies (Davis, 1989; Robey, 1996), TAM may not be the appropriate approach to fully explain people's social media behavior. Several IS researchers (Davis, 1986; Davis, 1989; Hossain and Silva, 2009; Hufnagel, 1994) noted that TAM is incomplete and it does not account for social influence in the adoption and use of new information technology tools which are included within Web 2.0 social media tools.

User acceptance refers to users' willingness to use information technology for the purpose it is designed to support (Dillon, 1997). Social media tools including social tagging, social bookmarking, wikis, and blogs have attributes that distinguish them from traditional corporate technologies. Social media tools are considered bottom up technologies that are known to users before being adopted in organizations (Wattal et al., 2009). For example, popular social tagging and bookmarking sites like Wikipedia, Flickr, and Delicious are well known applications for many users. Even non-technical employees can use these applications with ease because they are similar to common tools those employees use often. Such substantial differences between social media tools and traditional technology tools in their dependence on users' social interaction raises concerns of whether the previously studied socio-demographic characteristics applied on previous technologies can hold strong on the adoption of the social media tools (Wattal et al., 2009). Considering that researchers are not seeking only acceptance, but effective sharing, contribution, and collaboration to harvest the potential benefits of these tools, it is important to take a different approach from TAM to explore hidden dimensions that can fit the nature of social media tools and in general. Accordingly, this study uses TAM and enhances it with other social theories to account for social and organizational factors that fit the context of organizational social tagging tools. Examples of social theories include social exchange and social capital theories.

3.1.4 Social Exchange Theory

Social exchange theory explains knowledge-sharing behavior from a cost-benefit dimension. Like economic exchange theory, social exchange theory assumes exchange of benefits takes place when the benefit that individuals gain outweighs the cost of acquiring that benefit. Further, social exchange focuses more on both intangible and tangible costs and benefits (Blau, 1964).

Several studies used social exchange theory to understand and predict users` knowledge sharing behavior. In their exploratory study of attitudes of knowledge sharing, Bock and Kim (2002) combined social exchange theory with social cognitive theory to test their exploratory factors on users' knowledge sharing behavior. The exploratory factors they used included expected contribution, expected rewards, and expected social association. They found significant effects of users' attitude on their knowledge sharing behavior. Bock and Kim’s concepts of recognition and reputation were based on social exchange theory. Chang et al. (2008) adopted a cost-benefit framework to predict users’ contributing behavior on social media tools such as blogs and online forums. Their research results showed that users’ intention toward knowledge sharing was affected by three dimensions: (1) extrinsic benefits including reputation and reciprocity; (2) intrinsic benefits including enjoyment in helping and self-efficacy; (3) and costs including convenience and interaction.

Kankanhalli et al. (2005) employ social exchange theory to identify cost and benefit factors influencing the use of electronic knowledge repository (EKR). Based on a large-scale survey of public sector organizations, they found users of EKR were motivated to contribute and share knowledge based on three dimensions: (1) contextual factors including loss of knowledge power, codification effort of trust, pro-sharing norms, and identification; (2) extrinsic motives including organizational reward, image, and reciprocity; and (3) intrinsic motives including knowledge of self-efficacy and enjoyment in helping others. The results of their study revealed intrinsic motives have a positive impact on users` knowledge sharing behavior. The results also reveal cost or contextual factors moderate the impact of extrinsic benefits such as codification effort reciprocity and organizational reward.

3.1.5 Social Capital Theory

Social capital theory often is used in understanding users' knowledge sharing behavior within the organizational context (Nahapiet and Ghoshal, 1998). Bourdieu (1985) is considered the first scholar who provided a detailed overview of the concept of *social capital* (Portes, 1998). Bourdieu defined *social capital* as the resources and value people can acquire from within human networks and relationships while Portes defines as:

> The aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition—or in other words, to memberships in a group—which provides each of its members with backing of the collectivity-owned capital, a "credential" which entitles them to credit, in the various senses of the word. Portes (1998, pp. 248–249)

Bourdieu argued people use multiple forms of capital to achieve their ends: (1) *Economic capital,* which refers to monetary resources allocated to individuals when performing a specific task; (2) *Embodied cultural capital,* which is acquired by individuals through their social interaction and the group norm; (3) *Objectified cultural capital,* which is obtained from "cultural goods" such as writings, paintings and media and; (4) *Institutionalized cultural capital,* which can be obtained from an academic degree.

The concept of social capital has been expanded by researchers to include these aspects. For example, Naapeit and Ghoshal (1998a) saw social capital from three dimensions: norm, trust, and identification. They claimed social capital theory is manifested through the concept of peers' contributions, peers' positive feedback, and manager's participation. Based on Bourdieu's systematic analysis of social capital, Putnam (1995) introduced a subsequent interpretation of the *social capital* concept that encompassed: (1) social organization features such as networks that differ in size and density and that get developed between individuals and groups; and (2) unwritten shared values known as subjective norms and social trust that play an important role in facilitating the coordination of mutual benefits. Other possible representations of social capital theory can be seen in terms of the following categories: (1) non-monetary concept such as long or short term reciprocal expectation for a given service; (2) trust-willingness to take initiatives (or risk) in a social context based on assumption that others will respond as expected; and (3) personal and collective efficacy--the active and willing engagement of citizens within a participative community (Israr, 2012)

Chow and Chan (2008) combined social capital theory with TRA to examine knowledge sharing behavior in organizations. Surveying 190 managers from Hong Kong firms, they found social networks and shared goals play an important role in facilitating an individuals' decision to share knowledge significantly and directly foster the perceived social pressure of the organization. Kankanhalli et al.(2005) used social capital theory to account for the moderating effect of contextual factors such as pro sharing norms and generalized trust on the cost and benefit factors affecting the use of electronic knowledge repository.

3.1.6 Social Presence Theory

According to Short et al. (1976), social presence is a subjective quality of the communication medium and relates to the social psychology concepts of intimacy which is determined by physical distance, eye contact, smiling, and personal topics of conversation. Social presence also relates to immediacy which is decided by the medium's capacity in transmitting information. Accordingly, social presence could be a function of verbal gestures and cues and nonverbal cues (Biocca and Harms, 2002). New channels of communications especially those based on networked interface such as social networks are designed to mediate and increase social communication (L, Daugherty and Biocca, 2001). Example of modern technologies that accentuate the elements of social presence and interaction among users is collaborative applications which is characterized by high level of mediated work interaction (Coovert and Thompson, 2001). Enterprise social tagging tools fall under the umbrella of collaborative suites that are built on users' social interaction and presence. Based on the theory of social presence and based on the social aspect embedded in enterprise social tagging applications, this thesis will use construct of social presence as a potential factor impacting employees' motivation to participate in seeking, adding and sharing tags.

3.2 MOTIVATING FACTORS OF SOCIAL TAGGING

An extensive review of information systems, human-computer interaction, and social media literature reveals several factors that may pertain to users' motivation to participate in enterprise social tagging applications. The factors that were extracted from previous literature are as follows: perceived enjoyment, perceived usefulness, and subjective norms. Additionally, I added the *Content Generation* construct as a potential factor impacting social media participation based on modern studies in social computing that considered user-generated content as a key feature of socially-oriented tools (e.g. Lyons and Lessard, 2012; Kim et al., 2010). These factors were selected based on the reasons explained in the following section.

3.2.1 Perceived Enjoyment

Motivation theory often is used to understand users' acceptance behavior in information technology (Davis et al., 1992; Igbaria et al. , 1994). Users' acceptance of technology is based on two types of motivations: extrinsic and intrinsic motivation (Deci et al., 2001; Deci and Ryan, 1985; and Scott, 1988). According to Deci, extrinsic motivation refers to the activities users take when interacting with IT tools to achieve a valued outcome such as improving a job performance or achieving efficiency at work related tasks. Intrinsic motivation is associated with all the activities users perform for non- extrinsic motives. In other words, intrinsic motivation pertains to all the activities that induce users' internal satisfaction and pleasure, such as enjoying helping others or enjoying interacting with an application.

Since social tagging is another social media channel for users to have social interaction, it is expected intrinsic motivation would have as much of an impact as extrinsic motivation. Hence, perceived enjoyment is proposed as a factor impacting employees' seeking for metadata tagging knowledge.

Although research in TAM often focuses more on the utilitarian aspect versus the hedonic aspect (Legris, 2003; Van der Heijden, 2004), several studies focused on the role of intrinsic motivation in guiding users' IT behavior. Davis et al. (1992) investigated the influence of both extrinsic and intrinsic motivation on intention to use a computer in the work environment. They defined perceived enjoyment as "the extent to which the activity of using the computer is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated" (p. 1113). In their classic study, they defined perceived usefulness as an extrinsic source of motivation and perceived enjoyments an intrinsic source of motivation. The result of their study showed perceived enjoyment and perceived usefulness mediated the influence of perceived ease of use on intention. They also identified a positive relationship between users' perception of computer usefulness and their perceived enjoyment. The study claimed that system with higher level of usefulness, perceived enjoyment has a higher positive influence on users' acceptance decision of IT, while the opposite is true.

Teo et al. (1999) used motivation theory to measure the influence of perceived ease of use (PEOU), perceived usefulness (PU), and perceived enjoyment (PE) on users' intention to use the Internet. They found PEOU has a stronger impact on Internet use compared to the indirect impact over perceived usefulness and perceived enjoyment. They also found the direct impact of PEOU on Internet use is larger than that of PE. Igbaria et al., (1996) studied the acceptance behavior of managers and professionals using mixed systems. Based on the theory of TRA and TAM and on Deci's motivational theory, they found PEOU has a significant influence on PE and PU at almost the same magnitudes. Their study reported a significant impact of PEOU on PU and PE on system use. Similarly, using a Dutch movie website, Van der Heijden (2004) found PEOU has a strong impact on PU, PE, and a direct impact on BI over PU and PE.

Li et al. (2009) drew on motivation theory and proposed a tri-dimensional intrinsic motivation model (3D-IM) and hypothesized about the differential roles of Intrinsic Motivation (IM) and Extrinsic Motivation (EM) in explaining routine and innovative use of IT applications. Their 3D model of intrinsic motivation included perceived motivation to accomplishments, to know, and experience simulation. Their findings illustrated the predictive power of the model on users' innovative use of IT.

Hsieh et al. (2008) studied digital inequality in knowledge economy on a city government project. They investigated the residents' post-implementation and continued use through the theory of planned behavior. Their results supported prior findings by Van der Heijden (2004) and Atkinson and Kydd (1997) and counted perceived enjoyment as a focal factor in the intention of using hedonic systems. Specifically, enjoyment and confidence in using information and communication technologies, availability, and perceived behavioral control are more powerful in shaping the intention of continued ICT use.

3.2.1.1 Perceived Enjoyment in Social Media Applications

Subsequent research in the area of extrinsic and intrinsic motivation on different technologies supported the previous findings. Recent studies on intrinsic motivation with a focus on perceived enjoyment showed users of IT are influenced by the enjoyment and pleasure they experience when interacting with IS. For example, Hassan and Nevo (2009) indicated social computing tools, although perceived as distracting tools by some organizations, are characterized by a hedonic dimension that has the potential to enhance employees' satisfaction and improve job performance. They recommended adopting tools that accentuate perception of enjoyment at the work environment to decrease the work stress and add a sense of enthusiasm and passion among employees.

3.2.2 Personal Productivity

As indicated before, TAM normally is used to explain and predict users' acceptance of IT. TAM suggests perceived usefulness and perceived ease of use of IT are determinant of IT use. Perceived usefulness is defined as the degree of which a user believes using an information system would improve his/ her job performance. Although TAM is widely used in IT adoption, its constructs does not reflect the variety of users' task environments. Dishaw and Strong (1999) indicated TAM lacks the task focus. They recommended investigating specific influences and use-context variables that might induce users' acceptance of IT. Consistent with Dishaw and Strong, this thesis uses Davis' (1989) concept of perceived usefulness but in the context of enterprise social tagging tools. Perceived usefulness is replaced by the concept of personal productivity, which in turn covers two constructs: Information Retrievablity (IR) and Information Re-findablity (IRF). The definition of both IR and IRF is based on Davis' definition of perceived usefulness. IR is defined as the degree to which a person believes that using a tagging tool would enhance his/her information retrievability performance; while IRF is defined as the degree to which a person believes that using a tagging tool would enhance his/her information refindability of previously found resources.

Personal productivity refers to the capability of the system to offer benefits to help users become productive in their daily tasks. There are several recent studies on using social tagging to enhance users' productivity as described in prior chapters. Ames and Naaman (2007) ran a comprehensive study on users' incentives to tag in Flickr and ZoneTag. The result of their study showed participants were motivated by the usefulness of tags to self promote their photo collections; and by self-organization, to organize their photos for future retrieval. Velsen and Melenhorst (2009) found users mainly tag their video material for indexing and personal organizational purposes. Suchanek et al. (2008) indicated tags can help users browse, categorize, and find items. Further, tags are used as a form of information discovery, sharing, and social ranking. Melenhorst et al. (2008) stated tags help users conduct serendipitous browsing when they are displayed in the form of a tag cloud; and when presented along with the content items, they helped users decide quickly on items' relevance. In Sinha's (2005) blog titled "A cognitive analysis of tagging", she indicated social tagging has an advantage to users over traditional indexing engines by not adding cognitive load on users while choosing keywords to tag objects. Further, Golder and Huberman (2005) indicated users tend to trust others' tags and then use them to properly tag their own resources. They confirmed their finding with Cialdini's (2001) view of imitation as a means for "social proof", suggesting people will choose what others have already considered safe and secure. John and Seligmann (2006) indicated collaborative tagging tools help employees collect and identify expertise, assuming that when tagging an item, a tagger reveals his/her own expertise. Accordingly, this study proposes users would use the tagging tools if they are beneficial for users and if they help them achieve their information retrieval tasks efficiently.

Hence, this research proposes that employees' pursuit for personal productivity will have an influence on their enterprise social tagging activities. In this thesis, personal productivity is represented by two constructs: information retrievablity and information refindability. In other words, if employees perceived that interacting with the enterprise social tagging tool will help them improve their information retrieval process, they are likely to use such tools. Similarly, if employees perceive that creating and sharing tags will help them to re-find their previously tagged resources, they are likely to contribute more tags to ESTTs.

3.2.3 Knowledge Sharing Factors

Knowledge sharing has been explored most often at the organizational and task-oriented levels (Hsu et al., 2007). While ESTTs are considered a means of knowledge sharing, there is a paucity of research investigating factors that affect enterprise participants' attitudes towards enterprise social tagging tools. Understanding such issues would not only expand the researchers' horizon in knowledge sharing within the enterprise, but also would allow enterprise managers to provide more effective strategies in managing successful social tagging and social media practices.

Contrary to economic exchange theory, social exchange theory views human behavior as a series of social exchanges indicating no clear economic benefit. In other words, people may do favors for each other not because they expect direct and near future economic benefit, but for a relatively long term intangible return (Molm, 1996). Prior research on knowledge sharing (e.g. Bock et al., 2005; Kankanhalli et al., 2005; Fulk et al., 1996) viewed knowledge sharing as a form of social exchange between knowledge contributors and knowledge seekers. Knowledge contributors can be engaged in a knowledge sharing process with no expectation of near future tangible benefits. This is due to the difficulty of measuring the amount and the value of the knowledge being shared, which makes it difficult to accurately decide on the value of the return. Therefore, knowledge contributors are mostly likely to engage in a long term benefit (Kankanhalli et al., 2005).

In enterprise social tagging, employees may participate in contributing metadata tagging content to receive future reciprocal benefits. These reciprocal benefits could be in the form of future tagged resources that other users post and may facilitate information retrieval for the current contributors. Accordingly, this research proposes reciprocity as a potential motivator for employees' tag sharing activities. Prior research used the concept of reciprocity to measure its influence on knowledge sharing behavior. For example, through a field study of 154 managers, Bock et al. (2005) investigated factors inhibiting individuals' knowledge sharing intentions. Using TRA, augmented with social psychological factors, they confirmed that anticipated reciprocal benefits have a positive influence on managers' attitudes towards sharing knowledge. Similarly, there is evidence that people who contribute and share knowledge in online communities have strong feelings of reciprocity (Wasko, 2000).

Since knowledge sharing is a voluntary act that costs individual time and effort, personal beliefs and intrinsic motivation are expected to have a major influence on knowledge sharing behavior (Bock et al., 2005). Prior research viewed knowledge sharing as a process to exchange knowledge for altruistic reasons (Hsu and Lin, 2008; and Kankanhalli et al., 2005). Altruism refers to the willingness of an individual to increase the welfare of others through sharing knowledge with no expectation of any personal returns (Kankanhalli et al., 2005). Kollock (1999) indicated that people may contribute knowledge in online electronic networks of practice because they feel good helping others with their challenging problems. Previous research confirmed this notion by indicating people are motivated intrinsically to contribute and share knowledge by a feeling of satisfaction and joy when engaging in an intellectually challenging pursuit to solve others' problems (Wasko and Faraj, 2005). Hence, this thesis proposes that altruism could work as a major motivator for employees to share knowledge with their colleagues.

3.2.4 Organizational Factors

Organizational knowledge is considered as a strategic asset that can create a competitive advantage for an organization (Spender, 1996). Organizational knowledge is composed of the collective power of individuals' efforts and activities over years (Kogut, 1992). Hence, companies strive to effectively encourage employees to share their knowledge to build collective knowledge repositories. Previous studies have indicated organizations can encourage a knowledge sharing culture in two ways: by infusing knowledge sharing in their business strategy and by moderating employees' attitude and behaviors to motivate their employees through willing and sustainable knowledge sharing (Lee and Choi, 2003; Moffett, 2003). Although organizations compete to motivate employees to share knowledge with others, it is difficult to change employees' personal views and attitudes on knowledge sharing because these views are structured based on employees' daily interaction with their colleagues and on formal and informal knowledge sharing (Smith and Saint-Onge, 1996). Given the difficulty of forcing knowledge sharing beliefs on employees, companies must find ways to motivate employees to share knowledge with their colleagues at work.

Previous research demonstrated some approaches companies can use to motivate their employees to share their knowledge. Some companies adopted a team- based management culture to help utilize employees' knowledge. For example, Alvesson (1993) used the team-based approach in a computer consulting company to help establish a culture of sharing among employees. After applying this approach, management felt the company operated efficiently because this approach enhanced the feeling of community among employees. In addition, previous studies on knowledge sharing showed that organization climate and culture have a major influence on employees' knowledge sharing activities (.e.g. He and Wei, 2009; Bock et al., 2005; and Vankatesh et al., 2003).

Other views advocate the positive effect of extrinsic motivation, especially in the work environment. Extrinsic motivation comes in different forms such as monetary incentives, praise, and public recognition (Lin, 2007). In the work environment, previous studies showed extrinsic motivation positively correlates with knowledge sharing behavior among employees (Bock et al, 2005, Kankanhalli et al, 2005). Rewards are considered important motivators for people to contribute and share knowledge (He and Wie, 2009). Kankanhalli et al. (2005) showed that employees engage in knowledge exchange based on a cost–benefit analysis through comparing the rewards expected from an exchange with the costs associated in that exchange. Other studies indicated that to motivate organizational members to contribute and share their knowledge, organizations may provide various forms of rewards such as salary raises, bonuses, job security, and opportunities for promotion (Bock et al., 2005; Kankanhalli et al., 2005).

Consistent with these studies, the current study proposes organizational influence can play a major role in affecting employees' motivation to seek, contribute, and share tagging content through ESTTs. In this research study, organizational factors include the constructs of managerial support, organizational recognition of employees' effort to contribute metadata tagging content, and pro-sharing norms.

The next section will cover the theoretical model for both the tag seeking and tag contributing/sharing sub-models.

3.2.5 Initial Proposed Theoretical Model

The above theoretical background demonstrates the viability of integrating other constructs into TAM as a means for offering insight into employees' decisions to seek, contribute, and share tags in ESTTs. The proposed model (shown in Figure 3-4) describes an integrative view of the forces influencing users' willingness to seek, create (contribute), and share tags. To achieve that integration, the model adopted TRA (Fishbein and Ajzen, 1975), TAM (Davis et al, 1989), and extended TAM (Moon and Kim, 2000) as an initial theoretical framework. The proposed model has three main dimensions:

1. Users' acceptance including perceived enjoyment, perceived ease of use, attitude, and perceived usefulness, which is manifested through the constructs of information retrievability and information refindability.
2. Knowledge sharing and social dimension including social presence, altruism, and reciprocity.
3. Organizational dimension including managerial influence, pro-sharing norms, and recognition.

The proposed model is divided into two sub-models shown in Figures 3-4 and 3-5: users' tag seeking, tag contribution, and sharing behavior. With regard to the seeking sub-model and consistent with TAM, users' actual tag seeking behavior is influenced by their intention to seek tags, which in turn is affected by users' attitude to seek metadata tagging content and subjective norms. Further, users' attitude to seek tags is affected by their perception of the following aspects in social tagging tools: perceived enjoyment, perceived ease of use, usefulness of the tagging systems (which is manifested into the concept of information retrievablity) and content generation.

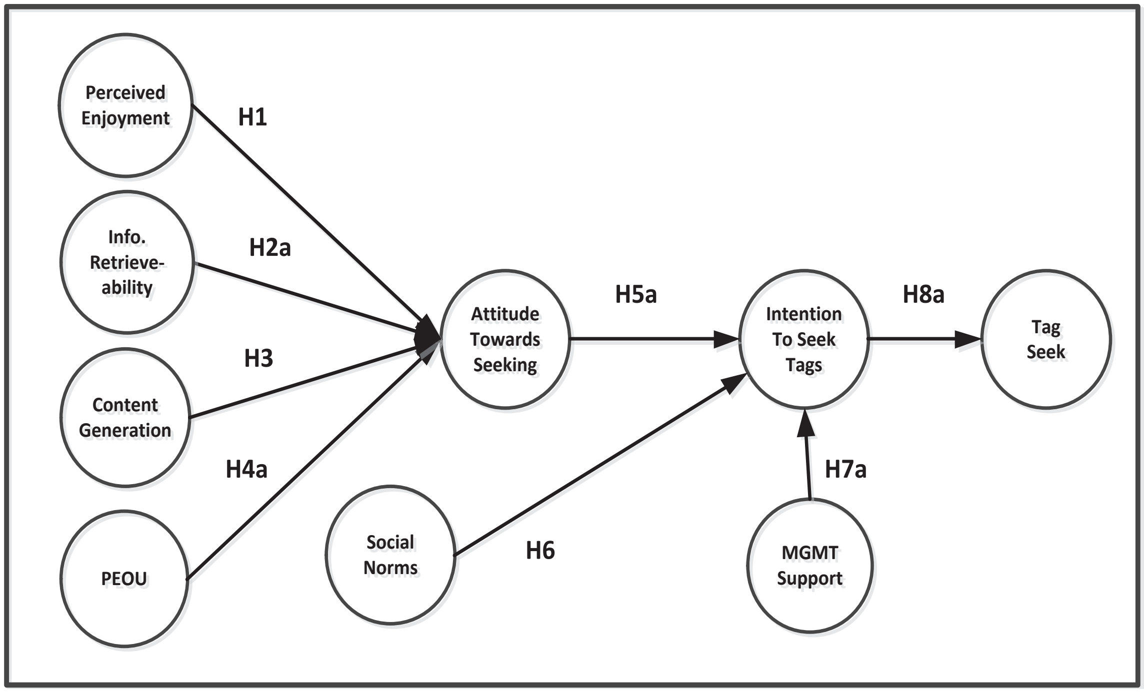

Figure 3-4: First Theoretical Model of Factors Affecting Users' Intention to Seek tags in Enterprise Social Tagging Tools

The second proposed sub-model shown in Figure 3-5 also is consistent with TAM in that it proposes users' actual behavior with regard to tag creating and sharing is influenced by intention, which is, in turn, is affected by employees' attitudes toward contributing and sharing tags. Further, the model suggests users' intention to contribute and share tags is influenced by factors such as subjective norms. The potential influence of subjective norms on users' social tagging behavior is consistent with previous studies on technology acceptance and on knowledge sharing (e.g. Loa et al, 2008, He et al, 2009; and Vankatesh et al., 2003). Finally, the second sub-model proposes that users' attitude towards creating and sharing tags is influenced by their' perception of the following aspects in the enterprise social tagging tool: PEOU, information retrievablity, information re-findablity, and reciprocity.

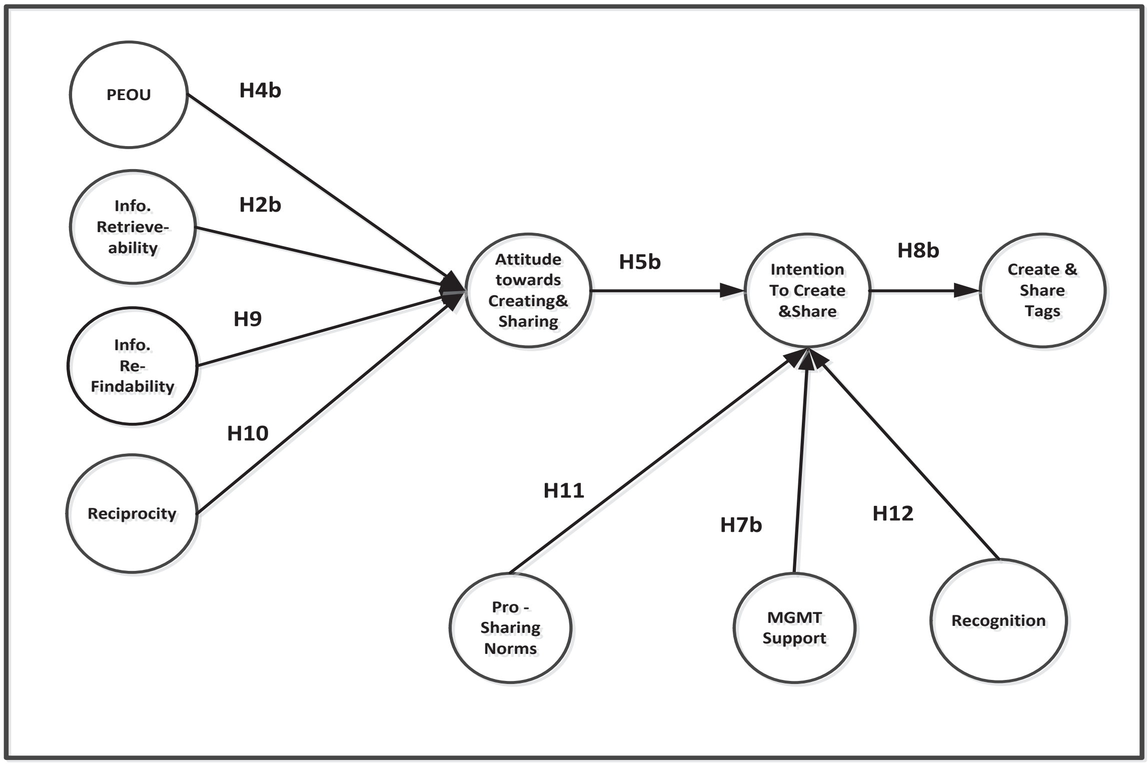

Figure 3-5 First Theoretical Model of Factors Affecting Users' Intention to Create and Share tags in Enterprise Social Tagging Tools

3.2.6 Perceived Enjoyment

Perceived enjoyment is defined as the degree to which the activities of using the tagging systems are perceived to be enjoyable regardless of the anticipated performance of the system (Van-der Heijden, 2004). An online user is likely to participate (i.e. seek, contribute, and share tags) in tagging tools because the process of browsing and clicking through tags is enjoyable. It has been confirmed that perceived enjoyment is a critical factor in user acceptance of technology and has great implication for hedonic applications (Fang et al., 2006; Sun and Zhang, 2006; Van der Heijden 2004). Accordingly, it is hypothesized:

H1: *Perceived enjoyment is positively related to attitude towards seeking tags.*

3.2.7 Information Retrievability

According to this research, information retrievability (IR) is defined as the degree to which a person believes using a tagging tool enhances his or her information retrieval performance. It should be noted IR is a task-specific operationalization of the concept of PU that was used in TAM. This study proposes that the traditional PU is not a good fit for social tagging tools and needs to reflect specific benefits related to social media applications. Hammond et al. (2005) described the reasons users perform tagging in Flickr and Delicious as ranging from “selfish”, where users tag their own content for their own easy retrieval as is the case with Flickr, to “altruistic”, where users tag other users' content for easy retrieval by anyone using that system, as is the case with Delicious. It was noted that when tags are presented along with the content items, they help users decide quickly on item relevance (Melenhorstet al., 2008). Suchanek and Vojnovic (2008) analyzed the semantic properties of tags and the relationship between the tags and the content of the tagged page. The analysis was based on a corpus of search keywords, content, titles, and tags applied to several thousand popular webpages. They noted tags helped users browse, categorize, and find items. Further, tags are used as a form of information discovery and sharing artifacts and as tools for search, navigation, or even information extraction. In an analysis of Delicious tags, Lee (2006) concluded that collaborative tagging systems offer users two features: “filter information at the most aggregate level”; and, with its implanted social networks, it offers some guided sharing which may aid in the discovery of information resources. In line with the discovery of new and relevant topics, Melenhorst et al. (2008) analyzed users' information retrieval behavior in a video tagging system. They indicated tags helped users conduct serendipitous browsing when they are displayed in the form of a tag cloud. They also showed that tags helped users decide quickly on the relevance of items, especially when presented along with the content items. Becker (2007a) noted that social tagging is an effective technique for users to find and re-find the products they are looking for. In their comparison of the search information retrieval performance of folksonomies (social tagging systems) against search engines and subject directories, Morrison et al. (2008) indicated through their Web search comparison that folksonomies have the potential to be an effective tool for information retrieval on the Web and should be given the same importance as traditional search engines. Accordingly, it is hypothesized:

H2a: *Employees' positive perception of system's information retrievability is positively related to their attitude to seek tags; and*

H2b: *Employees' positive perception of the system's information retrievability is positively related to their attitude to create and share tags.*

3.2.8 Content Generation

Content generation refers to the content that users of online social networks create and generate by sharing resources and interacting with social media applications. For the current study, content generation refers to the tags/metadata and categories that are generated by users of the tagging tools. In online knowledge sharing networks the creation and consumption of other users' generated content is a key aspect of socially oriented systems (Lyons and Lessard, 2012). Further, people use online sharing tools mostly to build social ties and communities that facilitate transmission of information and that increase generation of collaborative content (Chai et al., 2010). Ames and Naama (2008) studied users' incentives to tag in Flickr and ZoneTag—a camera phone capture tool that helps users post images on Flickr. They studied users' personal and social motivations and whether users are tagging items for individual or public use. The study showed that participants were motivated to use tagging as a tool to add more content for their friends, family and the general public. In their study of users' media tagging, Cunningham and Nichols (2008) indicated that one of the reasons individuals use tags in media sites is to be updated on Mainstream Media from other users' tags contents. Rainie (2007) noted social tagging offers an ideal opportunity for people to generate new ideas and information across the ever-increasing Web information stream. Rainie stated social tagging allows millions of users to publicly express their opinions about online information resources, which helps create new ways of thinking and new creative methods to extract collaborative knowledge. This leads to the following hypothesis:

H3: *Employees' positive perception of the system's ability to generate content is positively related to their attitude to seek tags.*

3.2.9 Perceived Ease-of-Use

Perceived ease-of-use (PEOU) is the extent to which an individual perceives that using a particular system would be effortless (Davis et al., 1989; Venkatesh, 2000). Accordingly, PEOU is defined as the degree to which a person perceives using a tagging tool is free of effort. Davis et al. (1989) indicated "an application perceived to be easier to use than another is more likely to be accepted by users" (p. 2). Subsequently, a connection between PEOU and intention to use social tagging tools is included in the proposed model of this study. Notably, many empirical studies of the TAM found a significant relationship between users' perception of how easy a system is and their attitudes to use such systems (Allam et al., 2012; Adamset al., 1992; Moore and Benbasat, 1991). These observations lead to the following:

H4a: *Perceived ease-of-use is positively related to the attitude towards seeking tags .*

H4b: *Perceived ease-of-use is positively related to the attitude towards creating and sharing tags.*

3.2.10 Attitude toward Knowledge Seeking and Sharing

In TRA, the attitude factor has been tested and shown to be a significant predictor of users' behavioral intentions. Many IS studies confirmed a strong association between users' attitudes to use a technology and their intentions to use that technology. For example, He and Wei (2009) studied users' motivation for knowledge sharing in an organization. They confirmed attitude has a positive impact on employees' intention to share knowledge. Similarly, Hsu and Lin (2008) investigated the role of technology acceptance and social influence on users 'acceptance of blog use. Their study found users' attitudes toward using a blog significantly influenced their behavioral intention to participate in blogs. Moreover, Bock et al. (2005) investigated the role of extrinsic motivation, psychological forces, and organizational climate on mangers' knowledge sharing behavior. The results confirmed that attitudes toward knowledge sharing significantly affected managers' intention to share knowledge within their organizations. Based on TRA and consistent with the above assertions regarding employees' attitudes toward knowledge sharing and behavioral intentions, the following hypothesis was formulated:

H5a: *Employees' sattitudes toward seeking tags will positively affect their intention to seek tags.*

H5b: *Employees' attitudes towards contributing and sharing tags will positively affect their intention to contribute and share their tags.*

3.2.11 Subjective Norm

Based on Vankatesh et al. (2003), subjective norm is defined as the person's perception that most people who are important to him/her think he/she should or should not use a particular information system. As indicated in the beginning of this chapter, subjective norms are confirmed to be a direct determinant of behavioral intention in TRA, TAM2, and TPB. Subjective norms contain the notion that users' behavior is influenced by the way in which they believe important others will view them as a result of having used the technology (Vankatesh et al. 2003). Ellis and Fisher (1994) noted subjective norm plays a major role in users' socialization. They noted subjective norm is a common standard for group members' behavior. When people participate in a social system, they assume a role in it and they usually behave as expected by other members. Vankatesh et al. (2003) confirmed people are affected by the way they believe others will view them in relation to their use of the technology. Teo et al. (2003) conducted an empirical study on the adoption of a WAP-enabled mobile phone and they found a strong connection between subjective norms and users' behavior in using technology.

H6: Subjective norms has a positive impact on users' intention to seek tags.

3.2.12 Perceived Managerial Influence

Managerial influence is the degree of influence a direct manager would have on his/her subordinates to adopt new technology (Wattal et al., 2009). Although TAM was quite equivocal about managers' role in adopting technology, IS research showed support for the fact managers impact adoption through their own adoption of technology (Karahanna and Straub, 1999), through being visible and watching employees' participation (Brzozowski et al., 2009), through persuasive communication (Leonard-Barton and Deschamps, 1999), and through employees' perception of the managers' views on new IT ventures (Davis et al., 1989). Koh et al. (2007a) indicated that since virtual networks are characterized by voluntary addition of social context, leaders of these communities play a major role in cultivating social context to encourage members' participation. A comprehensive study by Wattal et al. (2009) indicated usage and influence of managers is highly correlated with the number of blog posts created by the corporate employees. A study at HP found that bloggers are likely to participate in the companies' blog if they see managers as active participants in the corporate blog (Yardi et al., 2009). Rouibah et al. (2009) investigated organizational factors and human motivations influencing information systems and information technology usage and user's satisfaction in the Middle East. Their findings showed technology use and users' satisfaction are positively correlated with perceived usefulness and top management influence, with the latter having the strongest effect on IS use.

H7a: *Perceived managerial influence will affect employees' intention to seek tags.*

H7b: *Perceived managerial influence will affect employees' intention to create and share tags.*

3.2.13 Intention to Seek, Contribute, and Share Tags

The next hypothesis relates to the effect of users' behavioral intention to participate in tagging activites on the actual behavior of seeking, contributing, and sharing tags. Previous research strongly confirmed behavioral intention is a major factor driving the actual use of technology (Davis, 1989, Bhattacherjee, 2001; Venkatesh et al., 2003). Although research on knowledge sharing behavior was confined to the prediction of intention (e.g. Bock et al., 2005), this research study proposes a direct link between users' intention and their actual behavior of tag seeking, contributing and sharing. It is expected that employees' seeking, creating and sharing behavior will be positively affected by their intention to seek, contribute, and share tags. Accordingly, the following hypotheses are stated:

H8a: *Behavior intention will positively affect employees' tag seeking behavior*.

H8b: *Behavior intention will positively affect employees' tag conributing and sharing behavior.*

3.2.14 Information Re-findability

Consistent with information retrievability (defined earlier), information re-findability (IRF) is defined as the degree to which a person believes using a tagging tool enhances his or her chances of finding previously tagged and found resources of their own. This contrasts the definition of IR, which refers to finding information tagged by other system users. Ames and Naaman (2007) ran a comprehensive study on users' incentives to tag in Flickr and ZoneTag. The study's result showed participants were motivated by the usefulness of tags to organize their photos for future retrieval and finding. In their studies on tag usage in CiteULike and Connotea, Santos et al. (2009) noted users' instances of reusing tags are considerably higher than their re-tagging behavior. In their analysis of users' information retrieval behavior on video tagging systems, Melenhorst et al. (2008) indicated tagging offers users more maneuverability to organize content of interest, which in turn leads to an easy content and tag retrieval relevant to users' needs. Rainie (2007) pointed out that while a folksonomy enables users to add their own tags to a shared pool of tags, it can categorize users' own tags in a better way for future retrieval. This leads to the following hypothesis:

H9: *Employees' positive perception of system's information re-findability positively affects their attitude to create and share tags.*

3.2.15 Reciprocity

Individuals are usually engaged in an exchange relationship based on both economic resources (e.g. money, goods, and services) and socio-emotional resources (e.g. status, devotion, and trust). Reciprocity behavior has been highlighted as a benefit of individuals engaging in social exchange process (Blau, 1964). Following Wasko and Faraj (2005), this research defines reciprocity as the degree to which a person believes he or she could obtain mutual benefits through knowledge and tag sharing. Prior research showed a strong sense of reciprocity influence knowledge sharing in online communities (Wasko, and Faraj, 2005). Additionally, researchers have observed reciprocal benefits can provide an effective motivation to facilitate knowledge sharing and thus achieve long-term mutual cooperation (Kollock, 1999). In their study of why people participate in commerce sites, Wasko and Faraj (2005) suggested online users expect to share their knowledge because they believe in reciprocity. Bock et al. (2005) indicated reciprocal relationship among online users has a positive impact on their attitudes toward contributing to the system. In their empirical study of how to motivate users to contribute to blog systems, Hsu and Lin suggested that expected reciprocal benefits have a positive impact on the attitude toward using a blog system (Hsu and Lin, 2008). Further, rreciprocity is viewed as a motivator for users for sustainable information sharing continuance (He and Wei, 2009). Thus, this thesis proposes employees are more likely to favor the act of creating and sharing tags if they can acquire reciprocal benefits when interacting with this tool. The following hypothesis is proposed:

H10: *Reciprocal benefits will positively affect employees' attitudes toward creating and sharing tags.*

3.2.16 Pro-sharing Norm

Pro-sharing norm is defined as the prevalence of norms that are intended to facilitate knowledge sharing in an organization (Nahapiet and Ghoshal, 1998; Orlikowski, 1993). Norms can moderate human's behavior in accordance with the expectations of the group or community (Kankanhalli et al., 2005). Pro-sharing norm is regarded as an important contextual factor affecting users' knowledge contribution and sharing behavior (Bock et al., 2005; He and Wei, 2009; Hsu and Lin, 2008). Goodman and Darr (1999) suggested organizations should nurture a sharing culture prior to the implementation of a knowledge sharing information system. VanDamme (2008), in proposing an approach to use enterprise social tags as a business intelligence tool, suggested the tagging process should be integrated into the working processes of employees to help get the tagging contribution and sharing going. Hence, the following hypothesis is proposed:

H11: *Pro-sharing norm will positively impact employees' intention to create and share tags.*

3.2.17 Recognition

Contribution and sharing behavior can be regulated by the outcome of social factors such as social recognition, monetary reward, power, and applause (Bandura, 1986). Organizational reward is defined as the importance of economic incentives provided for knowledge contributors and knowledge seekers (Kankanhalli, 2005). Organizational recognition of employees' contribution refers to the extrinsic incentives provided by an organization to entice employees to contribute content to the organizational knowledge repositories (Kankanhalli et al.,2005). Hence, incentive mechanisms such as career advancement or supervisors' recognition of employees' efforts play an important role in driving employees to contribute and share their knowledge with their colleagues in the organization (Bock and Kim, 2002; Kankanhalli et al., 2005; Wang et al., 2009). Several studies demonstrated appropriate incentive mechanisms such as bonuses or career advancement can motivate employees to share their knowledge (Bock et al., 2005; He and Wei, 2009; Wang et al., 2009). VanDamme (2008) suggested some strategies companies should take to encourage their employees to participate in the tagging activities. One of the recommendations is giving employees incentives, since the personal benefits to share tags are sometimes missing.

To encourage their employees to share their knowledge with their co-workers, several organizations have introduced reward systems. For example, Buckman Laboratories recognized its 100 top knowledge contributors through treating them to an annual conference at a resort. Further, in IBM Lotus Connection Unit, managers based 25 % of employees' total performance on their knowledge sharing interactions (Bartol, 2002). Thus, this thesis expects that if employees believe they can receive organizational recognition by offering their knowledge, they will develop more positive intentions regarding tag sharing. The following hypothesis is then proposed.

H12: *Organizational recognition will positively affect employees' intention to create and share tags.*

After surveying the literature on potential factors affecting employees' social tagging seeking and creating/sharing behavior in chapter 2, chapter 3 discussed these factors from the standpoint of common users' behavioral and adoption theories. The theories that were discussed are as follows: theory of reasoned action, theory of planned behavior, technology acceptance model, social exchange, and social capital. Other standpoints regarding social media and users' online information sharing behavior also were discussed to include factors that concern users' social tagging behavior. Based on the previous theoretical background, a theoretical model is proposed for factors impacting employees' participating behavior in enterprise social tagging tools. The proposed model is divided into two sub-models: (1) a model for employees' tag seeking behavior; and (2) a model for employees' tag creating and sharing behavior. The next step is running a pilot study and testing these factors on social tagging systems to verify their influence on users' tagging behavior and to extract new factors that were not accounted for in the literature review.

CHAPTER 4 METHODOLOGY

This study uses a deductive approach to answer the research questions introduced earlier in chapter 1.The deductive approach will be used to empirically test a theoretical model of users' acceptance and use of ESTTs. Based on the theories were covered in chapter three, this approach will test the hypotheses that were proposed in the final model by using Structural Equation Modeling (SEM). Results from the deductive approach will be used to ensure the validity of the scientific findings.

4.1 METHOD FOR DATA COLLECTION

4.1.1 Deductive approach

This section describes the method used for testing the previously identified hypotheses, which may serve as the basis for accepting or rejecting the proposed model.
The study employed a survey method to validate the proposed model through questions that formulate the concepts or constructs that frame the theoretical model proposed earlier. Survey method is one of the broad research strategies available in social science research. Unlike a census, where all members of the population are studied, surveys gather information from only a portion of a targeted population (Aldridge and Levine, 2001). This research study followed steps recommend by Pfleeger, and Kitchenham (2001) in desiging the survey process:

1. Setting specific and measurable objectives
2. Planning and scheduling the survey
3. Ensuring appropriate resources are available
4. Designing the survey
5. Preparing the data collection instrument
6. Validating the instrument
7. Selecting participants

8. Administering and scoring the instrument
9. Analyzing the data
10. Reporting the results

4.1.2 Response Rate and Recruitment Strategies

The proposed model was tested using a web-based survey. In the past two decades, web surveys have gained significant popularity (Couper, 2000). Using web-based surveys has several advantages:

1. The chances of dealing with respondent's unexpected data is minimized.
2. Online surveys allow for greater control over respondents.
3. Unlike the limited space that paper-based survey may impose, online surveys handle more respondents at one time slot.
4. Online surveys allow for more complex but time-saving structure (Lindsay and Sel, 2011).
5. Completing an online survey is believed to be more convenient for technology savvy users.
6. Online surveys give the researcher the privilege of receiving the complete response immediately after respondents finish the survey (Lindsay and Sel, 2011).

Although web-based surveys gained popularity among researchers, they may face the challenge of low response rate if they are not planned for appropriately (Couper, 2000). According to the American Association for Public Opinion Research, the response rate is generally defined as the number of completed responses divided by the number of eligible responses in the sample (Fan and Yan, 2010). Response rate is considered the most widely used and commonly computed statistic to point out the quality of surveys. The consideration of response rate is important because low response rate may indicate the survey questions are not appropriate to the population, or respondents are not interested in the survey. Further, low response rate may bring in less data, which negatively affects how rigorous the data analysis of the study is (Pfleeger and Kitchenham, 2001).

Although they are convenient for many users, web-based surveys may not yield a higher response rate. A recent meta-analysis of 45 studies examining differences in the response rates between web surveys and other survey modes showed the response rate of web-based surveys is 11 % lower than other survey approaches. Several techniques normally are used to increase survey response rate, such as the use of pre-notifications, reminders, and incentives (Manfreda, 2008).

Incentives often are used to increase response rates in both mail and web surveys. Prior survey literature has noted various effects of using incentives that vary in type, timing, and amount (e.g. Goritz, 2006; Fox et al., 1988). Incentives could be in various forms such as gifts, checks, or cash. However, in web-based surveys it is recommended offering transferable incentives that can be used in the electronic environment such as redeemable loyalty points, gift certificates, and sharing survey results (Goritz, 2006). For security and convenience purposes, some studies recommended the use of gift certificates because they do not require participants' personal information such as home addresses or bank accounts (Kraut et al., 2004). Accordingly, it was decided to use incentives in the current study to motivate users' to participate and hence increase response rate. Participants were given a chance to enter an optional drawing to win Amazon gift certificates upon completing the survey.

4.1.3 Survey Design Strategies

Regarding the survey design strategies, prior research noted factors such as topics, length, ordering, and formatting of web surveys can affect the response rate (Fan and Yan, 2010; Kitchenham and Pfleeger, 2002c).These studies also recommended the use of pre-survey procedures such as a panel of experts or pilot studies to assess the quality of the survey. For the current study, a decision was made to ask a panel of experts for their views regarding the survey. Seven graduate students and three professors who are experts in social tagging tools were asked to review the survey questions in detail to match the concept of each construct with its intended items. Further, this study used a pilot study to test the model constructs in a practical context. The pilot study included 174 respondents using six different social tagging tools. Details about the pre-pilot study will be provided in the coming section of this chapter.

Other factors affecting the response rate are the web survey delivery, and the accessibility of the survey link. Respondents should be able to actually open a web survey via a hyperlink rather than eventually receive the survey notice that asks them to go to a certain site and type in the survey's address (Fan and Yan, 2010). With respect to this study, an invitation was sent to the contact person with the targeted company with a hyperlink to the survey. To increase the response rate, it was decided to eliminate technical issues that may hinder responding to the survey. The survey link was tested using three different web browsers: Internet Explorer version 7-9, Firefox, Chrome, and Opera.

4.2 MEASURES DEVELOPMENT

This section describes the process of converting the proposed model into operational survey questions that participants can answer about their experience using ESTTs. First, the final proposed model will be revisited to give an overview of the constructs that have been operationalized into questions. Second, each construct will be discussed along with its adaptive items. Lastly, a validity check will be conducted to ensure each set of questions are measuring their own constructs.

4.2.1 Model Constructs

Figure 4-1 shows the initial proposed model for factors impacting employees' social tagging seeking and create/share behavior. Recall the proposed model has two subsets: seeking and creating/sharing sub-models. The independent variables for the seeking model are management influence, social norms, perceived enjoyment, perceived ease of use, and information retrievablity. The dependent variables are attitude, intention to seek tags, and the actual seeking behavior. With regards to the creating tag model, the model employed the following independent variables: perceived ease of use, information re-findability, information retrieveability, reciprocity, pro-sharing norms, management influence (or management support as shown in Figure 4-1), and recognition. The dependent variables for the creating sub-model are attitude, intention, and the actual behavior of tag creation and sharing.

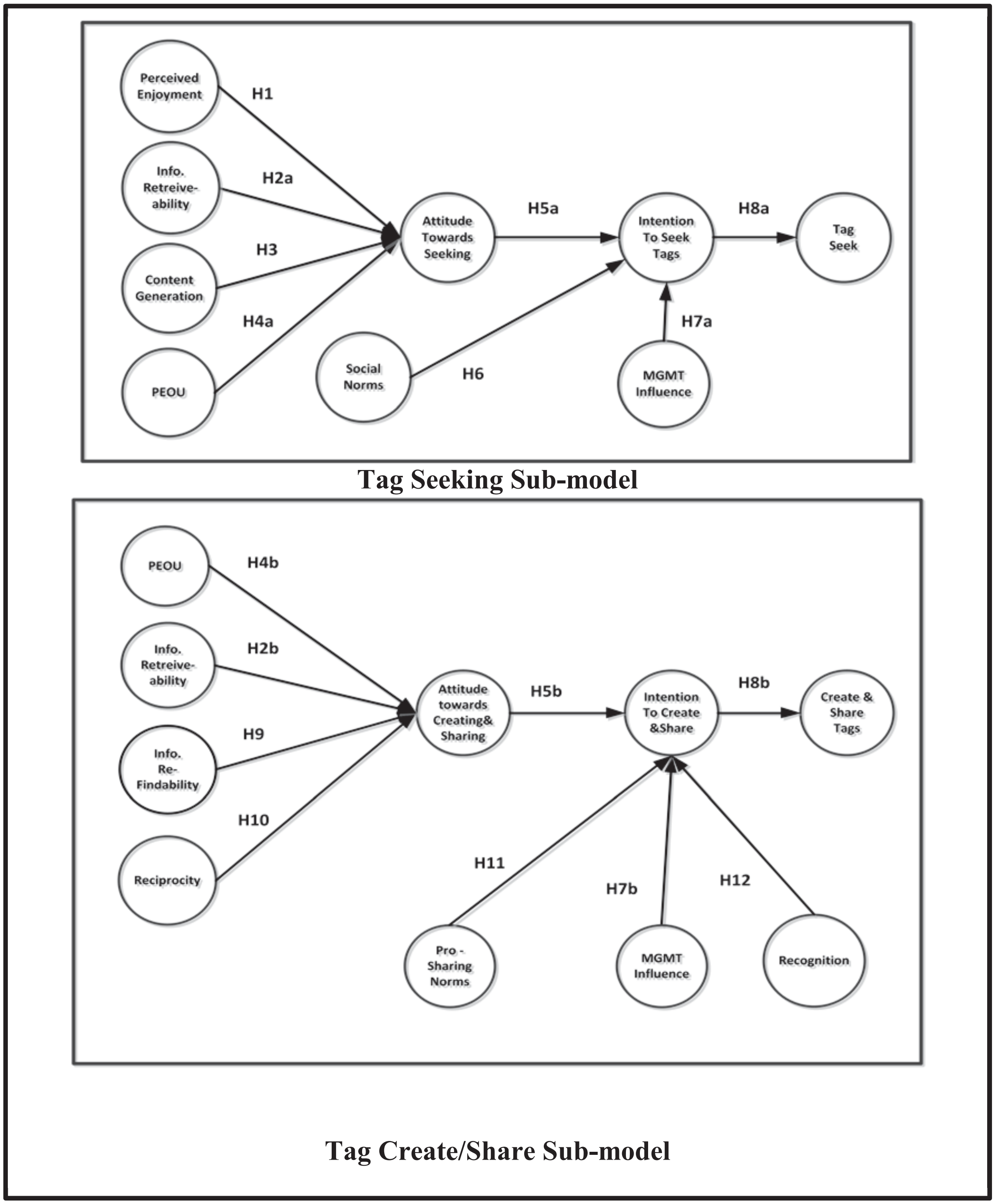

Figure 4-1 Initial Proposed Model for Factors Impacting Employees' Social Tagging Seeking/Creating Behavior

4.2.2 Operationalization of Constructs

Two theoretical sub-models were proposed to identify factors impacting employees' tagging behavior. To test the concepts used in the sub-models, a survey was designed to ask participants about their perception and experience on seven different aspects of the tagging tools. Some of the survey questions were extracted from constructs used in previous IS studies, while other new constructs were self-developed based on their definition in previous literature. Questions that were extracted from prior IS research were exposed to slight modifications to fit the context of social tagging. The construct of ease of use was measured using three items (PEOU1-3); information retrievability was measured by four items (IR 1-4); information refindability was measured by two items (IRF 1-2); reciprocity was measured by three items (Recp1-3); subjective was measured by two items (SN1-2); and attitude was measured by four items (ATT1-4). The five constructs comprised 17 survey questions. The list of items used in the pilot study is displayed in Appendix B. The scaled items for PEOU and ATT were based on studies from Davis et al.(1989) and Liao et al. (2008). Reciprocity was measured by items adapted from Hsu and Lin (2008) and subjective norm was measured by items adapted from Venkatesh et al.(2003). Each item was measured on a seven-point Likert scale, ranging from ‘‘Strongly Disagree’’ (1) to ‘‘Strongly Agree’’ (7).

The following section describes the definition of each additional construct, and the intended items associated with it.

4.2.3 Perceived Enjoyment

Perceived Enjoyment (PE) is defined as the degree to which the activities of using a tagging tool(s) are perceived to be enjoyable regardless of the system’s anticipated performance (Davis, 1992). Measures of PE were adapted from Liao et al. (2008) and Van Der Heijden (2004). These two studies mainly used Davis et al. (1992) as basis for their PE items.

Table 4-1 Adapted Survey Questions for Perceived Enjoyment

Scale Items 7-Items agree/disagree Likert scale		
Perceived Enjoyment		
Item Identifier	Adapted Survey Questions	Source
PE1 PE2 PE3	The process of using the tagging tool(s) is interesting. My experience of using the tagging tool(s) is pleasant. I find using the tagging tool(s) to be enjoyable.	Liao et al. (2008); and Van Der Heijden (2004)

4.2.4 Information Retrievability

Based on Davis' (1989) definition of perceived usefulness, this thesis defines Information Retrievability as the degree to which a person believes using a tagging tool would enhance his/her information retrievability performance (Davis, 1989).

Table 4-2 Adapted Survey Questions for Information Retreivablity

Scale Items 7-Items agree/disagree Likert scale		
Information Retrievability		
Item Identifier	Adapted Survey Questions	Sources
IR1 IR2 IR3 IR4	Using the tagging tool(s) enables me to accomplish my information search tasks more quickly. Using the tagging tool(s) makes it easier to perform my information search tasks. Using the tagging tool(s) helps me become more effective in my information search tasks. Using the tagging tool(s) helps me become more productive in my information search tasks.	Adapted from Davis et al. (1989)

4.2.5 Information Re-findability

Davis (1989) defines perceived usefulness as the degree to which a person believes using a particular system would enhance his/her job performance. Based on Davis' (1989) definition of perceived usefulness, this research defines information re-findability (REF) as the degree to which a person believes using a tagging tool would enhance his/her information refindability performance. The items used for the construct of information re-findability (shown below) are self-developed based on the definition of the construct of information re-findability.

Table 4-3 Adapted Survey Questions for Information Re-findability

Scale Items 7-Items agree/disagree Likert scale		
Information Re-findability		
Item Identifier	Adapted Survey Questions	Sources
REF1	I use the tagging tool(s) to search for my own information resources.	Self developed based on Davis' definition of the construct of perceived usefulness (1989).
REF1	Tagging tools allow me to re-find my own information resources tagged by me.	

It should be noted these two items were used only in the pilot study. In the full study, two more items were added to measure the construct of re-findability based on the significant effect of two original items in the pilot study.

4.2.6 Perceived Ease of Use

Perceived ease of use is defined as the degree to which a person believes that using a tagging tool(s) would be free of effort (Davis 1989).

Table 4-4 Adapted Survey Questions for Perceived Ease of Use

Scale Items 7-Items agree/disagree Likert scale		
Perceived Ease of Use		
Item Identifier	Adapted Survey Questions	Sources
PEOU1 PEOU2 PEOU3	I find learning to use the tagging tool(s) easy. I find using the tagging tool(s) easy. I find it easy to become skilful at using the tagging tool(s).	Adapted from Davis (1989) and Hsu and Lin (2008)

4.2.7 Subjective Norms

Subjective norms are defined as the person's perception that most people who are important to him/her think he/she should or should not perform the behavior in question (adapted from Vankatesh et al., (2003).

Table 4-5 Adapted Survey Questions for Subjective Norms

Scale Items 7-Items agree/disagree Likert scale		
Subjective Norms		
Item Identifier	Adapted Survey Questions	Sources
SN1 SN2	People who are important to me think that I should seek/create and share tags. People who influence my behavior think that I should seek/create and share tags.	Venkatesh et al.(2003)

4.2.8 Content Generation

Content generation refers to the content that users of online social networks create and generate by sharing resources and interacting with the system. In this study, it refers to the tag and tag categories generated by users of the tagging tools. The content generation construct is a newly developed construct based on measures used by Ali-Hassan and Nevo (2009).

Table 4-6 Adapted Survey Questions for Content Generation

Scale Items 7-Items agree/disagree Likert scale		
Content Generation		
Item Identifier	Adapted Survey Questions	Sources
CG1 CG2	The tagging system(s) helps generate new tags and ideas. The tagging system(s) enables collaborative generation of tags.	Adapted from Ali-Hassan and Nevo (2009)

4.2.9 Reciprocity

Reciprocity is the degree to which a person believes he or she could obtain mutual benefits through contributing to a tagging tool(s) (adapted from Kankanhalli et al, 2005).

Table 4-7 Adapted Survey Questions for Reciprocity

Scale Items 7-Items agree/disagree Likert scale		
Reciprocity		
Item Identifier	Adapted Survey Questions	Sources
REC1 REC2 REC3 REC4	My public tags are useful for others users' tasks. I create public tags that are applicable to other users' tasks. Other users' public tags are appropriate for my tasks. Other users create public tags that are applicable to my tasks.	Based on Arakji et al.(2009)

4.2.10 Management Influence

Management Influence is defined as the degree to which an employee perceives the management believes he or she should contribute or seek tags via ESTTS (adapted from Venkatesh et al, 2003).

Table 4-8 Adapted Survey Questions for Management Influence

Scale Items 7-Items agree/disagree Likert scale		
Management Influence		
Item Identifier	Adapted Survey Questions	Sources
MGMT1	The senior management of this business has been helpful in the use of the tagging tool(s).	Based on Venkatesh et al. (2003)
MGMT2	My supervisor is very supportive of the use of the tagging tool(s) systems for my job.	
MGMT3	In general, the organization has supported the use of the tagging tool(s).	

4.2.11 Organizational Reward

Organizational reward is defined as the importance of economic incentives provided for tag contributors (adapted from Kankanhalli et al..2005).

Table 4-9 Adapted Survey Questions for Organizational Reward

Scale Items 7-Items agree/disagree Likert scale		
Organizational Reward		
Item Identifier	Adapted Survey Questions	Source
	It is important for me to … at work for contributing my knowledge through the tagging tool(s).	Adapted from Kankanhalli et al. (2005)
REW1	Be appreciated	
REW2	Get a better work assignment	
REW3	Be recognized by my supervisor	
REW4	Get more job security	
REW5	Get recognized by my organization when I share my knowledge with the group	

4.2.12 Pro-sharing Norms

Pro-sharing norms refer to the prevalence of norms intended to facilitate metadata tag sharing in the organization (adapted from Nahapiet and Ghoshal 1998; Orlikowski 1993).

Table 4-10 Adapted Survey Questions for Pro-Sharing Norms

Scale Items 7-Items agree/disagree Likert scale		
Pro-Sharing		
Item Identifier	Adapted Survey Questions	Sources
   PSN1 PSN 2 PSN 3 PSN 4 PSN 5	There is a norm (or culture) of … in my organization Cooperation Collaboration Teamwork Willingness to value and respond to diversity of opinion Tolerance for mistakes	Adapted from Kankanhalli et al. (2005)

4.2.13 Attitude Towards Seeking Tags

Attitude Towards Seeking Tags (ATST) refers to an individual's positive or negative feelings about using metadata tags (adapted from Fishbein and Ajzen ,1975; Bock et al., 2005).

Table 4-11 Adapted Survey Questions for Attitude Towards Using Tags

Scale Items 7-Items agree/disagree Likert scale		
Attitude to Seek Tags		
Item Identifier	Adapted Survey Questions	Sources
ATTS1 ATTS2 ATTS3	I feel positive about clicking on tags to find information resources. Clicking on tags to locate information resources is a good idea. In general, I like clicking on tags to find information.	Adapted from He and Wei (2009); Liao et al. (2008); and Moon and Kim (2001)

4.2.14 Attitude Towards Creating/Sharing Tags

Attitude towards creating and sharing tags refers to an individual's positive or negative feelings about creating and sharing metadata tags (adapted from Fishbein and Ajzen, 1975; Bock et al., 2005).

Table 4-12 Adapted Survey Questions for Attitude To Creating/Sharing Tags

Scale Items 7-Items agree/disagree Likert scale		
Attitude towards Creating and Sharing Tags		
Item Identifier	Adapted Survey Questions	Sources
ATTC1 ATTC2 ATTC3	I feel positive about creating and sharing tags using the tagging tool(s). Creating and sharing tags is a good idea for me. In general, I like creating and sharing tags**.**	Adapted from He and Wei (2009); Liao et al.(2008); and Moon and Kim (2001)

4.2.15 Intention to Use Tags

Intention to seek tags refers to the extent to which the user would like to use tags in the future in terms of browsing and clicking through tagged resources (adapted from Fishbein and Ajzen, 1981; Bock et al. , 2005).

Table 4-13 Adapted Survey Questions for Intention to Seek Tags

Scale Items 7-Items agree/disagree Likert scale		
Intention to seek		
Item Identifier	Adapted Survey Questions	Sources
INTU1 INTU 2	I intend to use tags to search for content. My intentions are to continue using tags to search for information resources in the next month.	Adapted from He and Wei (2009); Liao et al.(2008); Hsu and Lin (2008), and Moon and Kim (2001)

INTU 3	It is worth using tags in the tagging tool(s).	
INTU 4	I will continue to use tags on a regular basis in the future.	

4.2.16 Intention to Create and Share Tags

Intention to create and share tags refers to the extent to which the user would like to add and share tags in the future (adapted from Fishbein and Ajzen, 1981; Bock et al., 2005).

Table 4-14 Adapted Survey Questions for Intention to Create and Share Tags

Scale Items 7-Items agree/disagree Likert scale		
Intention to create and share tags		
Item Identifier	Adapted Survey Questions	Sources
INTC1	I intend to create and share tags.	Adapted from He and Wei (2009); Liao et al.(2008); Hsu and Lin (2008), and Moon and Kim (2001)
INTC 2	My intentions are to continue creating and sharing tags in the next month.	
INTC 3	It is worth creating and sharing tags to the tagging tool(s).	
INTC 4	I will continue to create and share tags on a regular basis in the future.	

4.2.17 Tag Seek Frequency

Based on Davis' definition of IT usage behavior (Davis, 1989), tag seeking is defined as the act of clicking, browsing, and navigating through social tags within the enterprise environment.

Table 4-15 Adapted Survey Questions for Tag Use Adapted Survey Questions

Scale Items 7-Items Disagree (Strongly)-(Strongly) Agree		
Tag Seek		
Item Identifier	Adapted Survey Questions	
Tag Seek1 Tag Seek 2	I often use the tagging tool(s) to click on tags. On average, how many times do you use tags *for any purpose*? (Few times a year, once a month, a few times a month, few times a week, about once a day, several times a day)	Developed Based on Moon and Kim (2001)

4.2.18 Tag Create and Share

Based on Davis' definition of IT usage behavior (Davis, 1989), tag create and share is the act of creating, editing, and sharing tags with others within the enterprise social tagging environment.

Table 4-16 Tag Creation Adapted Survey Questions

Scale Items 7-Items Disagree (Strongly)-(Strongly) Agree		
Tag Creation		
Item Identifier	Adapted Survey Questions	Sources
Create1 Create 2	I often use the tagging tool(s) to create tags. On average, how many times do you create tags?	Developed Based on Moon and Kim (2001)

4.3 VALIDATION MEASURES

4.3.1 Content Validity

As indicated by Straub et al. (2004), content validity attempts to answer the following question: do the survey items pull in a representative manner to measure the content of a given construct ? In other words, content validity deals with how representative and comprehensive the items are in creating the scale for a specific construct (Hsu and Lin, 2008). Straub et al. (2004) stressed the importance to apply content validity on constructs by indicating "the way to having valid content is desirable in instruments for assuring that constructs are drawn from the theoretical essence of what they propose to measure." [p.9].In this research, definitions of perceived ease of use, perceived usefulness, and perceived enjoyment were proposed based on the review of theory and research in IS and other disciplines. In generating scales for perceived ease of use and personal productivity, attitude towards create and share, items were selected and adapted from TAM research. The survey items are shown in shown in Appendix A. This dissertation adapts the original scales from previous IS literature because these scales produce comparable Cronbach' alpha coefficient which implies these scales are equivalent to each other in terms of their internal consistency. Some of the questions were slightly adjusted to reflect the social tagging nature within the organizational context.

4.3.2 Conceptual Validity

Given that the questions for measuring the constructs were adapted from various sources or developed for this study, all of the questions were subjected to a two-stage conceptual validation exercise based on procedures prescribed by Moore and Benbasat (1991). Particularly, that included questions were measuring newly developed constructs such as information retrievability, information re-findablity, and social presence. Four graduate students from the school of information management participated in the first stage (unstructured sorting) as sorters. Each sorter was given the set of questions printed and randomly mixed up. They had to sort the questions by marking related questions together with a different marker and giving a label to each set of related questions (which made up a construct). This process helped to identify ambiguously worded questions. The labels given by the four sorters for the constructs corresponded very closely to the names of the actual constructs. Overall, the four sorters correctly placed more than 80 percent of the questions onto the intended constructs.

The second step was refining the questions for better wording and better construct fit. Three university professors who are experts on social tagging systems collaboratively worked on sorting the questions for further refinement. Unlike the previous stage, they were given the names and definitions of the constructs. They had to sort the questions by placing each question into a construct category or an "other" (no fit) category. The second set of sorting resulted in adding more questions to some constructs given that it is desirable to have a minimum of three questions per construct as recommended by Kim and Jueller (1981). Some constructs that needed more items were intention to use tagging tools, intention to create tags, and reciprocity. Some additional questions were added to some constructs such as perceived usefulness (6 items in total for one construct) to further improve measurement properties for that construct. All 77 questions were then consolidated into an instrument for survey administration.

Before running the pilot study survey, it was decided to run a pre-test and further validate the instrument. Seven graduate students, who have substantial experience in using social tagging sites, participated in the pre-test. They were asked to report their experience with the instrument in terms of questions' wording, instrument design, the length and time taken to answer the survey, and on the scales used for each item. The respondents tested the instrument and reported positive responses regarding the survey.

4.4 ONLINE SURVEY DESIGN

A link for the survey was given to the contact persons in the companies selected for the full study, along with an invitation to respond to the survey. The two compaies that were contacted are IT companies and the thesis refers to them as company A and B. About 2,000 eligible system users were invited to answer the survey. The survey questions were divided into two branched set of questions concerning tag seeking and both seeking and creating. The survey participants chose to answer either of the two sets of questions according to their own use experience with the ESTT. A detailed definition of social tagging tools was given on the survey's first page to help participants understand the specific behavior and elicit its corresponding beliefs. Further, a detailed illustration of tag seeking versus tag creating was given at the beginning of the survey to help participants decide which question set to choose from. Moreover, an image of a social tagging cloud was given as a cue on the first page to help respondents know what was meant by social tagging. Participation in this survey was voluntary, with an incentive to enter a drawing to win an Amazon gift certificate if participants decide to leave their email address. The email addresses were separate from the data and they were used mainly for reward purposes.

4.5 USER BACKGROUND QUESTIONS

Since this study claims to present the first survey of employees' perception and usage behavior with enterprise social tagging tools, it is important to establish the understanding of those presumably pioneer individuals by soliciting information on their background. Such information is vital for managers who manage such collaborative suites and for developers because the findings may give them a chance to develop and deliver a user population that potentially adopts these tools. Accordingly, several multiple-choice questions and open-ended questions about user background were asked. Table 4-17 shows the questions. Appendix A offers the complete questionnaire.

Table 4-17 Background Questions

N	Question	Format
1	Experience	< year- 6+ years
2	Other motivational factors	open ended
3	Age	18-65+, increment by 5
4	Gender	Male/female
5	Education	Several categories
6	Occupation	Several categories
7	Work Unit	Several categories
8	Region	North and South America, Europe, Asia, Australia, and Africa

4.6 STUDY PARTICIPANTS

4.6.1 Respondent Selection

In general, probabilistic and non-probabilistic methods usually are used when selecting study participants and collecting data samples. Probabilistic sample methods include simple random, stratified random, systematic, and cluster-based sample. Non-probabilistic sample methods include convenience, snowball sampling, and focus group (Kitchenham and Pfleeger, 2002d). Due to difficult logistics of obtaining data from all companies using enterprise social tagging tools, this thesis uses convenience sampling method. Specifically, the study targeted those employees who have using enterprise social tagging tools for at least six month within the two compaies chosen by the researcher. a probabilistic sample method recommended by Kitchenham and Pfleeger (2002). Accordingly, the results of this study will only apply to ESTTs within these two companies.

In Kitchenham and Pfleeger's series *Principle of Survey Research* (Kitchenham and Pfleeger, 2002b, 2002c, 2002d), they recommended the following criteria for survey subjects for an effective survey design:

- Selected from a valid sample that is representative of a subset of the target population.
- Knowledgeable enough to answer the questions.
- Have enough motivation to provide accurate response.
- From a target population and selected randomly.

Accordingly, the study targeted employees of company A and B where enterprise social tagging tools are used. Further, the study targeted only those employees who have experience using enterprise collaborative suites but who were not necessarily expert with the social tagging tool. Since the study's goal is investigating factors that affect employees' participation in ESTTs , it was decided to ask those who use the tool to understand what motivates them to use it, and those who are reluctant to use it to understand why they are not using it. It should be noted that adoption for ESTTs in general is made by management, however, the use behavior of individual employees is entirely voluntary.

Two managers in the two targeted IT companies were contacted through an email message which described the research project and were asked for an opportunity to survey employees' experience with ESTTs. A detailed description of the study and its research goals was sent to two lead managers in the two companies. The two managers responded with their willingness to help out to distribute the survey among their employees who are using social computing tools such as wikis, blogs, social tagging and bookmarking, and RSS.

The following information about companies A and B is based on an interview with two IT managers from company A and company B. The interview took place when the researcher initiated the research study.

4.6.2 Company A

Company A employs more than 80,000 people worldwide. The company has headquarters on five continents. Company A is a knowledge-intensive company with a major focus on social computing and social collaborative tools. The company uses Microsoft SharePoint as their social computing platform to engage people in collective activities via the Internet and intranet to create business value. The company has used Microsoft SharePoint since 2006. Currently, the company uses SharePoint 2010 which comes with collaborative tools such as Web. Blogs (blogs), wikis, social networks, micro-blogging, social tagging and bookmarking features, and other social activities. SharePoint also features collaborative tools such as the use of internal podcasting systems to help employees share tacit knowledge through brief audio clips and shared conversations.

With regards to blogs, company A allows employees to create personal blogs, which they use to capture and share their knowledge and experiences. The company SharePoint Team blog, for example, allows team members to provide expert information via guest blog entries that may be used as resource material by others tracking related interests. In addition to blogs, company A uses other collaborative tools which are included in the SharePoint platform, such as wikis and personal profile pages. One of the main tools employees of company A use is the meta data or social tagging tools. Employees can label or tag their information resources using their own meta-data convention which are shareable publicly with other employees.

To better enable their employees to achieve a healthy balance between their personal and professional lives, company A created an internal social networking site built on the

SharePoint feature My Site, which provides the familiar features of a Web 2.0 social network within the umbrella of the enterprise. Using SharePoint My Site, employees can customize their own site by selecting one of the master templates and adding SharePoint Web Parts like photo libraries. Further, the company uses a Facebook Web Part that uses Facebook's Web API to enable secure interchange with the outside system.

4.6.3 Company B

Company B employs more than 400,000 people on six continents. In 1997, Company B actively encouraged its employees to use the Internet--at the time to increase their knowledge resources. In 2003 the company initiated the use of collaborative computing and made a strategic decision to embrace the blogosphere and to encourage its employees to participate in blog postings. The company officially started using social computing tools in the spring of 2005. The company allowed their employees to use wikis to create a set of guidelines for all employees who wanted to blog. In 2008, and again in 2010, the company turned to employees to re-examine their guidelines in light of ever-evolving technologies and online social tools to ensure they remained current to the needs of employees and the company. As per its social computing guidelines, the company encourages its employees to add value and provide worthwhile information and perspective when they share their information with their peers. Further, the scope of Company B's internal social media impact is astounding: 17,000 individual blogs, a million daily page views of internal wikis, 25,000 tweeters and 300,000 LinkedIn profiles. The company uses IBM Connections (previously known as IBM Lotus Connections) as a platform for collaboration.

4.6.4 Rationale Behind Targeting Companies A and B

The decision to choose these two companies was based on two criteria: how long the company has used collaborative suites, and how many employees are using these tools. The two IT companies have been adopting collaborative suites (including social tagging tools) for at least five years and they are large enough to provide the researcher with a large sample size that would deem less biased results. Additionally, the two companies are located on different continents with different cultural backgrounds, which adds more variability to the data collected. An agreement with the two contact managers was signed to disguise the names of the two companies. In this dissertation, these two companies will be referred to as company A and B. It should be noted, four companies were orgingally targeted to collect the data from. However, due to this study's limited research budget and the long delay from other companies in answering requests for data, only companies A and B were used toto the collect data in the end.

4.6.5 ESTTs within the Targeted Companies

As indicated, testing of the proposed model was conducted on a web-based survey using participants from two companies. Both companies A and B implemented their enterprise social tagging initiatives in 2005. The adoption of enterprise social tagging applications ran locally with an elementary version on the intranet domain and then it was launched on a full scale in 2006 and 2007. This social tagging tool then was included as part of the enterprise collaborative suites adopted in many locations worldwide. In both companies, more than 60,000 employees worldwide can log in to the system to share their knowledge, collaborate, and communicate with each other. Both companies offer employees onsite and offsite training for their enterprise collaborative suites. Most employees are IT-oriented and did not require significant support to answer the survey questions. However, two members of the collaborative suite management team were available to support any employee having difficulties responding to the questions on their experience with the ESTTs.

Some questions regarding the current use of the social tagging tools were asked of the two managers to get a sense of the employees' level of participation in the collaborative suite in general. Overall, the leveraging of knowledge resources through the enterprise collaborative suite in general and social tagging tool in particular, in terms of seeking, reusing, and creating metadata tagging content, was not found to be at a satisfactory level. This confirmed the initial argument of this thesis, indicating employees are not using ESTTs as much as needed to harvest the intended collaborative benefits that these tools were made for.

To ensure participants had enough knowledge about social tagging to answer the questionnaire, the study targeted those employees who used these ESTTs for at least six months. The researcher decided that six months was sufficient time for employees to become discerning enough about the tool and form reliable perception towards enterprise social tagging tools. The survey invitation stated the experience issue and also was articulated to the contact managers in the two companies.

4.7 COMMON METHOD VARIANCE / METHOD BIAS

Since this research data was collected using a self-reporting survey mechanism based on a construct measurement method, this mechanism could be vulnerable to method bias or common method variance, which may lead to a false conclusion (Burton-Jones, 2009; and Spector, 2006). The influence of common methods variance (CMV) has been a cited as a concern in information systems and organizational research literature (e.g. Chin et al., 2012; Bagozzi, 2011; Burton-Jones, 2009; and Podsakoff, 2003a). CMV refers to the shared variance among measured variables that arises when they are assessed using a common method (Spector and Brannick, 2009). Method bias is defined as "the difference between the measured score of a trait and the trait score that stems from the rater, instrument, and/or procedure used to obtain the score", (Burton-Jones, 2009, p. 448)**.** The main difference between CMV and CMB is that CMV implies variance in observed scores is partially attributable to a methods bias (Podsakoff et al. 2003); while CMB refers to the degree to which correlations are altered (inflated) due to a methods effect. This distinction is important because a significant effect of CMV may not be particularly problematic if the inflation (i.e., bias) in the correlations among measures is trivial in magnitude (Meade, 2007).

Although they sound similar, there is a difference between method bias and common method bias. Method bias can be caused by method components such as rater, instrument, or the procedure; while common method bias is caused solely by the measurement procedure used in the method (Burton-Jones, 2009). For example, if a researcher used one common method across measurements, this may affect the rater to consequently give a biased score.

As indicated, CMV and CMB can cause inflation and deflation of regression estimates. In the case of inflation, CMV causes regression estimates to reflect a higher value than their true population value, which can cause the researcher to conclude there is an effect when there is no effect (Type I error). With respect to deflation, CMV may lead to regression estimates to a lower value than their true population value. With deflation, a researcher cannot identify an effect which may cause them to erroneously reject the null hypothesis indicating no effect (Type II error) (Siemsenet al., 2010).

Podsakoff et al. (2003) summarized some of the CMV literature and identified a number of potential causes for CMV:

- having a common rater (e.g., social desirability, leniency)
- item characteristic effects (e.g., item ambiguity)
- item context effects (e.g., priming effects, grouping of items)
- measurement context

Although many studies have dealt with method bias, no one single study offered a complete solution for how to fully defeat the potential influence of method bias on the research results (Chin et al., 2012; Bagozzi, 2011; Burton-Jones, 2009). Most studies used strategies to achieve two goals: identify any bias effect that may occur, and minimize its effect on the results.

With regard to minimizing the bias effect, this study followed steps used by Burton-Jones (2009) to minimize rating bias in instruments and procedures:

Table 4-18 Steps to Minimize Rating Bias in Instruments and Procedure

Questionnaire	Responding to questionnaire
Questionnaire should undergo sorting exercise and pre-test to eliminate ambiguous items. Ensure that participants' responses are anonymous.	Pretest and pilot test to make sure there is sufficient time to complete the questionnaire. Ensure that instructions are clear.

(Adapted from Burton-Jones . 2009)

As discussed in the previous section, this research study followed the recommendations prescribed in Table 4-18. The second objective is detecting and minimizing the rating biases where possible through the data analysis. Some techniques are already in place to detect bias effect. Bagozzi (2011) cataloged the advantages and disadvantages associated with methods of assessing and controlling for CMV/CMB. He indicated that each method has its advantages and disadvantages and not one method has it all. Among the various methods are Harman's single factor test and partial correlation, which are based on confirmatory factor analysis (CFA) and they tend to be the most rigorous (Podsakoff et al., 2003). Harman's (1967) single-factor test analyzes whether a substantial amount of common variance exists. In this technique, all variables of the study to be loaded into a principal component factor analysis and the unrotated factor solution is to be tested. A common method bias exists if two conditions are met: "(a) a single factor emerges from the factor analysis [n]; or (b) one general factor accounts for the majority of the covariance among the measures (Podsakoff et al., 2003, p. 889)". With regard to this study, the degree of CMB will be assessed using Harman's single-factor test based on a study by Podsakoff et al. (2003). More details about this technique will be given in the data analysis section.

A partial correlation approach is an extension of Harman's one factor test. It tests whether the relationship between variables of interest still exist after the common method factors have been statistically controlled (Podsakoff and Organ, 1986). To test for common method bias, the data should be rearranged so independent data are paired with dependent data. The scores of the correlation factors for the full and partial models are then compared to decide the absence of a significant difference (Podsakoff et al., 2003). This study follows this procedure in an attempt to control a potential influence of common method factors (this procedure will be discussed in detail when analyzing the data in the following chapter).

Recall that common methods bias may occur when data are collected using one method. As suggested by Straub et al. (2004), randomizing items may reduce methods bias. Consistent with that, the survey questions were designed in such a way that offers different orders of questions to each respondent. For example, unlike most of the paper-based survey, questions that represent one construct were randomly ordered among all the constructs of the survey. A valid reason for randomizing the survey questions was presented by Straub et al. (2004) as the shuffled presentation of items can minimize mono-method and any possible survey methods bias which is a threat to both discriminant and convergent validity.

4.8 STRUCTURAL EQUATION MODELING

Technology adoption, acceptance, conditions, and success are typical research areas addressed in information Systems (IS) research. To address these areas, researchers have to define, formulate, and understand abstract constructs such as beliefs, perceptions, motivation, and attitude. Since it is difficult to measure such abstract constructs, these constructs are mostly measured as latent variables (LVs) that can only be measured through a set of questions (indicators) that attempt to reflect the concepts of constructs in hand. Structural Equation Modeling (SEM) is one of the methods commonly used by IS research to model the relationships between latent variables. Partial Least Square (PLS) algorithm is one of the techniques used to estimate the relationships between latent variables based on a given dataset (Urbach and Ahlemann, 2010). The following section presents an overview of SEM and PLS and how they fit the proposed model of this dissertation.

4.8.1 Advantages of SEM

SEM is considered a primary method when it comes to analyzing path models that involve complex relationships between latent variables with multiple indicators (Gefen et al., 2011). Unlike traditional statistical techniques, SEM features a greater flexibility in modeling theory with data. Researchers can use SEM to account for multiple predictors, build latent constructs (phenomena that cannot be measured directly such as beliefs, feelings, and intentions), account for error in measurements from observed variables, and theoretically test previous assumptions against empirical data (Chin et al., 2008; and Chin 2002). SEM's explicit distinction between observed variables and latent variables can help researchers test a wide range of hypotheses. Traditional statistical techniques such as ANOVA and multiple regressions do not offer a clear and direct way to differentiate between observed and latent variables. Traditional techniques mainly are concerned with detecting means and intercorrelations among observed variables. For example, variables x1, x2, and x3 can have a hidden relationship between them. In this case, traditional techniques are only concerned with testing the correlation between these variables against the dependent variables; however, they cannot help in higher level hypotheses by defining a common relationship between these variables, which could lead to significant latent variables (Chin, 2002).

One of SEM's major advantages is a researcher can use it to simultaneously assess two aspects of the model: (1) measurement model, relationship between constructs and their indicators; and (2) the path model, relationship between the constructs, to test theoretical relationships (Gefen et al., 2011). Having both the measurement model and the structural model in one unified view allows for better estimation of the relationship between the inner and outer relationships (Chin et al. 2008). This makes the estimates produced by SEM better than estimates provided by linear regression (Geffen et al. .2011). Further, SEM is distinguished over linear regression in that it gives the researcher the privilege of creating and estimating relationship models with multiple dependent variables and their interconnections simultaneously (Gefen et al., 2010). This advantage gives researchers a more realistic view of the results with regards to the interrelationship between factors, which may lead to more insights for the trait being examined.

Further, SEM is mainly a priori (allows researchers to think in terms of models and theory to start with) and confirmatory method (allows for testing the prior model against empirical data). This gives researchers a chance to modify the hypotheses to fit the data collected. In this case, researchers shift from the confirmatory phase to the another exploratory phase (Chin, 2002).

4.8.2 SEM Components

SEM has two components: structural and measurement models. The structural model, typically referred to as the inner model, describes the relationships between latent constructs, which is referred to as the paths' coefficient relationships. The relationship between latent constructs follows only a single direction. Latent variables in SEM can be categorized into exogenous and endogenous. Exogenous variables refer to latent constructs independent variables with no structural path relationships pointing at them. Endogenous variables refer to the dependent variables that have path relationships pointing at them (Hair et al., 2011).

The second component of SEM is the measurement model, which is referred to as the outer model. This model embodies the relationship between the empirically observable indicators (items) and their associated latent variables. The outer model does not allow multiple relationships. Hence, each indicator must be associated with only one construct.

The combination of structural model and measurement model leads to a complete structural equation model (Urbach and Ahlemann, 2010). An example of a typical SEM model is illustrated in Figure 4-2.

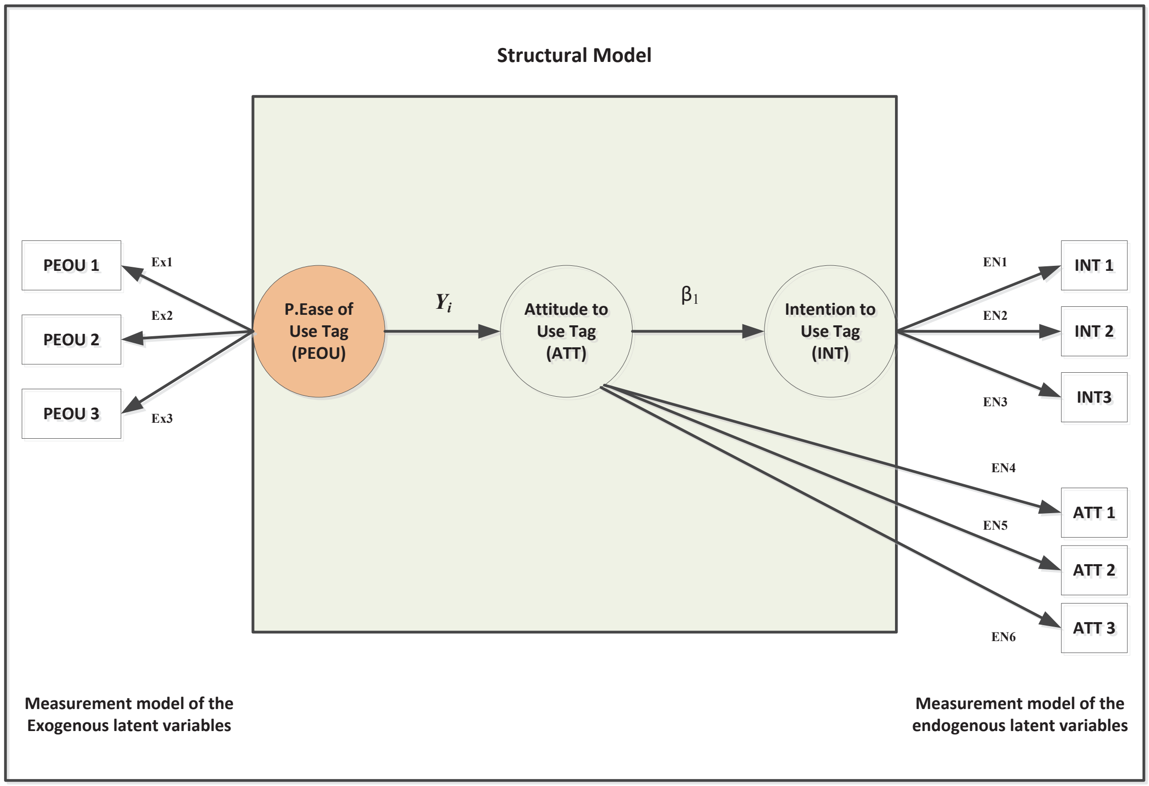

Figure 4-2 Examples of a PLS-SEM
(Adapted from Urbach and Ahlemann, 2010; and Davis ,1989).

Figure 4-2 shows an example of PLS-SEM. As shown above, the PLS-SEM consists of one exogenous (PEOU) and two endogenous variables (ATT and INT). The latent constructs are measured by indicator variables EX_i and EN_i. The relationship between the variables is quantified by path coefficients. The path coefficients EX_i and EN_i within the measurement models are determined by:

- Weight- if the model follows formative constructs procedure.
- Loadings- if the model follows reflective procedures.

The above figure also shows two path coefficients: (1) the path coefficient between latent endogenous variables which is labelled β_1; and (2) the path coefficient between exogenous and endogenous variables which is referred to Y_i.

4.8.3 Reflective and Formative Models

As indicated, one of SEM's main advantages is its capacity to cope with abstract constructs that cannot be measured and which require measurable indicators to quantify them. Two kinds of indicators are distinguished in the IS literature:

1. Reflective Indicators are affected by latent variables in that any changes in the latent construct would reflect a change in the indicators. The measurement models that validate these indicators and their latent variables are known as reflective models. Reflective indicators are characterized by a single arrow pointing from the latent construct outward to the indicators. The associated coefficient between the latent variables and their reflective indicators is referred to as the outer loadings (Chin, 2002). Further, the measures represent the underlying construct in a reflective model and are expected to be correlated. Due to the high correlations between the indicators, the indicators are also interchangeable. In other words, when leaving out an indicator, the conceptual meaning of the construct is not affected (Jarvis, 2003).

2. Formative Indicators are assumed to cause the latent variables, and any changes in the indicators will impose a change in the construct itself. Formative indicators are characterized by a single arrow pointing at the construct. Further, high correlation between the indicators is not an issue or concern affecting the formative model. However, dropping an indicator would be similar to dropping a part of the construct (Diamantopoulos and Siguaw, 2008). Accordingly, formative indicators may even be inversely related to each other. In other words, formative indicators of the same LV do not necessarily have to correlate compared to reflective indicators.

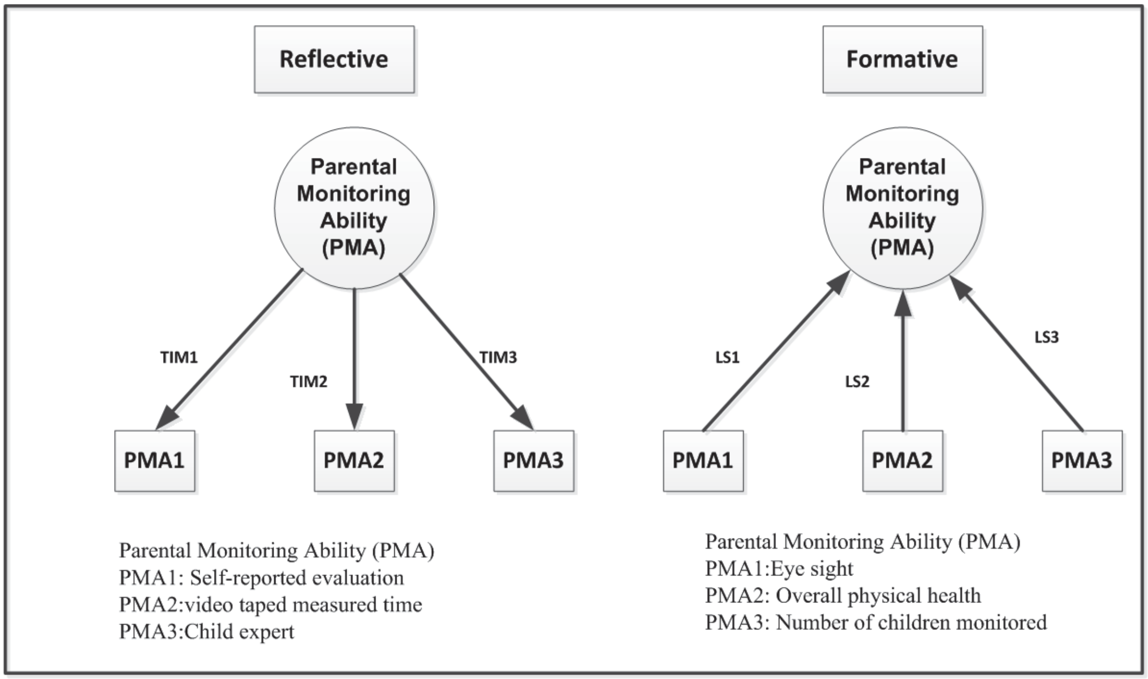

Figure 4-3 Example of a Reflective and Formative Construct
(Adapted from Chin, 2001)

Figure 4-3 shows examples of a reflective and a formative construct. For example, the reflective measures should covary with any change in construct. If a parent behaviorally increased their monitoring ability, each following measure should positively respond reactively. With respect to the formative indicators, the measures need not covary. For example, any drop in overall health need does not imply any decrease in the number of children being monitored.

In general reflective indicators are widely used in IS literature compared to formative indicators. IS scholars used reflective models as a norm for structural equation modeling and did not question those that applied them (Urbach and Ahlemann, 2010). Accordingly, this dissertation will use reflective indicators modeling given the notion that the latent construct of the proposed model is abstract and they were built to influence their indicators. Further, the indicators of this study share common themes of their constructs. Further, each indicator for a given construct should co-vary with the covariance and its related indicators within the same construct.

4.8.4 Structural Equation Modelling Approaches

There are two approaches to conduct SEM analysis: Covariance-Based SEM (CBSEM), and Partial Least Square (PLS). There is a difference between these two approaches regarding their objectives, their underlying statistical assumptions, and the nature of their statistical output (Gefen et al., 2011; and Gefen, 2000).

4.8.4.1 Covariance-Based SEM

Covariance Based Structural Equation Modeling (CBSEM) uses a maximum likelihood function and attempts to minimize the difference between the sample covariance and those predicted by the theoretical model. The result of the parameter estimation process is an attempt to reproduce the covariance matrix of the observed measures (Chin and Newsted, 1999). The use of CBSEM demands some constraints in the sample size, model complexity, and in parametric assumptions. Mostly, CBSEM requires a large sample size beyond the range of researchers. Without the requirements, the CBSEM model might lead to poor parameter estimates and weak test statistics (Chou and Bentler, 1995).

In general, CBSEM works better with reflective indicators (versus formative indicators) which mean that latent constructs affect and influence its block of measures (Edward, 2010). It was demonstrated by MacCallum and Browne (1993) that attempts to use formative versus reflective indicators in CBSEM analysis can lead to identification problems which may lead to a zero score in covariance among indicators, and /or misleading model equivalence. Therefore, it is necessary to include three or more indicators per construct to overcome the identification problem. CBSEM is not made to produce estimates or weights for the latent variables. Hence it cannot be used as a predicting approach for the underlying indicators. Instead, it mainly aims at obtaining population parameters estimates to explain any covariance between the underlying theory and the dependent variable. CBSEM suffers from the problem of misspecification, where indicators leading to latent variables could be negatively affected by misspecification of indicators leading to other constructs in the other part of the model, which might lead to inadequate test statistics (Diamantopoulos, 2011; and MacCallum and Browne, 1993).

4.8.4.2 Partial Least Squares (PLS) SEM

The second approach for SEM is Partial Least Square (hereafter PLS). Unlike CBSEM, PLS is less demanding when it comes to measurements scales, sample size, and residual distribution (Chin et al., 2010; and Wold, 1985). PLS has an advantage over CBSEM as it can be used as confirmatory analysis technique. Iit also suggests possible relationships and potential research directions. Further, the problem of misspecification found in CBSEM is not an issue when using PLS, because PLS uses a limited estimation of procedures which gives a closer look at the data (Chin et al., 2010; and Fornell and Bookstein, 1982). This reduces the chance of mixing indicators with unrelated constructs which may lead to better parameters estimates. Additionally, PLS overcomes the identification problem detected in CBSEM. PLS-SEM works in an iterative manner to build a series of normal least squares analysis on separate blocks of indicators. The parameter estimate of PLS can be obtained from three estimates: (1) the weight estimates of the constructs; (2) the path estimates among latent variables and /or and among latent variables and their indicators; (3) the last estimate comes from the regression constants between the indicators and latent variables (Chin and Newsted ,1999). Further, PLS is more adequate than other techniques when it comes to exploratory research and it shares the modest distributional and sample size requirements of ordinary least squares linear regression (Gefen et al.,2011).

Ringle et al. (2012) reviewed IS literature published in MIS Quarterly and that used PLS-SEM and noted the following reasons for using PLS-SEM:

- Small sample size
- Non-normal data
- Use of formative measures
- For exploratory research objectives

Further, Urbach and Ahlemann (2010) analyzed the empirical studies and summarized researchers' arguments for choosing PLS as the statistical means for testing structural equation modes:

- PLS makes fewer demands regarding sample size than other methods.
- PLS does not require normal-distributed input data.
- PLS can be applied to complex structural equation models with a large number of constructs.
- PLS handles both reflective and formative constructs.
- PLS is better suited for theory development than for theory testing.
- PLS is especially useful for prediction.

This research will use PLS SEM based on recommendations made by Gefen et al. (2011), Hair et al. (2011), and Ubach and Ahlemann (2010) for the following reasons:

- Since PLS-SEM is intended for predictive modeling (Ubach and Ahlemann, 2010), it matches the goal of this study in predicting employees' participation behavior using ESTTs.
- Given that PLS-SEM is flexible with sample size (Ringle et al., 2012; and Chin et al., 2010), it is a good fit for the sample size of this study (n=481). It should be noted that the researcher expected to get smaller sample size as getting enough employees to respond to the survey was expected to be a difficult matter considering privacy issues in organizations.
- Because the constructs' measurement properties are less restrictive with PLS-SEM (Chin et al., 2010; and Chin, 2002), constructs with fewer items (e.g., one or two) can be used than with CBSEM. Some of this study's constructs are composed of only three items, which could result in only two items after the question filtering process when analyzing the data.
- Given that PLS-SEM is characterized by its capacity to handle complex sets of constructs, it is believed to be a good fit for this study considering the 6-10 constructs allocated for the two sub-models of the study.

- Finally, PLS-SEM is thought to be a good fit for exploratory studies and for developing theories (Ringle et al., 2012; Gefen et al., 2011; Urbach and Ahlemann, 2010). Such reason matches the purpose of this study in building theory concerning employees' motivation to participate (use, contribute, and share) in social media tools in general and social tagging in particular.

4.8.5 Steps in PLS-SEM Model Validation

This dissertation follows the guidelines of Straub et al. (2004), Gefen et al. (2011), and Hair et al. (2011) in validating the PLS-SEM model

4.8.5.1 Step One: Assessing Measurement Model

Since this study uses reflective PLS-SEM, several validity measures are recommended by Gefen et al. (2011) and Hair et al. (2011) to test such a model:

- *Internal consistency reliability:* defines the consistency of results provided in a test. It ensures each item within a construct delivers a consistent score (Shuttlewoth, 2009; and Cronbach ,1951).

- *Indicator reliability* describes the degree to which a variable(s) is consistent in measuring the targeted concept (Hair et al., 2011).

- Convergent validity refers to how convergent each item is from its own construct compared to other items of other constructs and it is measured using average variance extracted (AVE) (Lin et al, 2009).

- *Discriminant validity* involves the degree to which the measures of a construct are discriminant from other constructs (Lin et al., 2009).

4.8.5.2 Step Two: Assessment of Structural Model

- The first step is estimating R^2 of each endogenous latent variable. R^2 measures the explained variance (resulted from the impact from other variables) on the variable of interest compared to its original variance.

- The next step is estimating the relationships between latent variables (path coefficients) by checking algebraic sign, magnitude, and significance of the scored path coefficient.

- The last step is testing for the predictability of the structural model by using the blindfolding procedure to create estimates of residual variance. Blindfolding procedure assumes missing cases from the current data and reacts accordingly to estimate whether this prediction is successful Fornell and Cha (1994).

4.8.5.3 Step Three: Interpretation and Implications

All validation measures are interpreted based on the theoretical foundation of SEM. Hence the hypotheses presented through the theoretical model are either confirmed or rejected. Based on the final confirmed model, this study's research questions will be answered. Further, the researcher will draw conclusions, and derive implications for both theories and practice. Finally, future research will be presented based on the current study's limitations.

4.8.6 Sample Size

For descriptive statistics, a sample size of less than 100 is considered small; a sample size between100-200 is considered medium; and a sample size with more than 200 is considered large (Chin, 2002). In SEM, less than 100 cases in a sample size is considered untenable unless the underlying model is considerably simple. Kline (2005) drew on a recent study conducted by MacCallum and Austin (2000) of about 500 cases of SEM published in 16 journals from 1993 to 1997. The survey showed about 20% of the studies used sample sizes of fewer than 100 cases. In general, the inadequate sample size may affect the power of test statistics and may lead to limited generalizability (Kline, 2005). Generally, what applies to other statistical techniques applies to SEM: the more the sample size is the less sampling errors rendered from the statistical analysis. The question is: What is the appropriate sample size that can render stable results? In addition to the previous rule of thumb, sample size is relative to the complexity of the model. For example, although a sample size of 200 cases may seem an appropriate size, the research model may be complicated enough to demand a larger sample size. Accordingly, there is no clear cut standards of the relationship between the sample size and model complexity, however, there is some common rule that could help settle the sample size issue. A realistic statistical recommendation suggests having the ratio of 10:1 for the number of cases to the number of underlying parameters, respectively (Kline, 2005). Chin (2000) recommended using at least 200 cases or 10 times the number of parameters estimated when using LISREL (Linear Structural Relation) as a technique for SEM. When using PLS, Chin (2002) recommended using 10 times the greater of (1) construct with the greatest number of formative indicators; (2) construct with the greatest number of structural paths leading to it. Chin (2002) also drew on Monte Carlo Simulation for the appropriate sample size that could lead to significant results.

According to this study's theoretical model, the minimum sample size is 70 cases. This estimate comes from identifying the constructs with the highest number of structural paths, which happened to be attitude comprised of 7 path coefficient relationships. When multiplying 7 by 10, the resulting minimum cases are 70. Fortunately, this study's actual sample size is 481, which is about six times the minimum requirement for the sample size.

In summary, this chapter covered the methodology used in this research study. Particularly, the chapter described how the study participants were selected and which data collection tool was used to test the theoretical model. Further, several techniques on how to apply validity measures on the constructs of the study were discussed in detail to make sure the concepts chosen are measuring what they intend to measure before running the actual study. Chapter four also discussed some important issues that can affect the validity of the results such as common method bias, its negative influence, and described some commonly used statistical techniques for how to neutralize its potential influence on the results. Finally, the chapter was concluded with an overview of structural equation model and partial least square and how they fit this study, and the sequential procedure of working with the structural model. The next chapter will tie into this chapter by applying the methods on real data from a large pilot study and from an actual study to test and validate the proposed model.

CHAPTER 5 DATA ANALYSIS AND RESULTS

A logical next step after proposing the theoretical model and composing the survey questions in the previous chapter is testing the proposed model using real data on social tagging systems. This chapter describes the data analysis and interpretation process using two different sets of data from the pilot study and the actual study. The pilot study data was collected using online social tagging systems, while the actual data was collected from two major IT companies that feature the use of ESTTs as part of the collaborative suites they have adopted. The chapter is concluded with an assessment of the structural model using PLS and a test for the predictive power of the model's verified factors on employees' participating behavior in ESTTs. Finally, the chapter discusses the research questions as manifested through the research hypotheses.

5.1 PILOT STUDY RESULTS

One of the pilot study's purposes for this research is testing the findings of the prior literature regarding the motivating factors impacting users' knowledge seeking and contributing behavior in online information resources and social tagging tools. Once tested, these factors can be applied to employees' social tagging seeking and contributing behavior in the organizational context. Further, the pilot study aimed at finding more relevant factors that may influence employees' seeking and contributing behavior. To achieve this, it was decided to run a larger pilot study with a larger sample size in an attempt to discover more users' reported factors that could integrate the final tag participation model which will be applied to ESTTS. For logistics issues, it was decided to run the pilot study on online social tagging tools given that it was extremely hard to get one of the chosen companies to allow their employees to take the pilot study. Hence, an online questionnaire was designed to target users of online tagging systems such as LibraryThing, Flickr, Twitter and Delicious. I chose these sites because they are mainly made for users who use and create tags and socially share them with other users. The model was slightly adapted to fit the online social tagging tools by excluding all organizational factors such as management influence, pro-sharing norms, and company's recognition. As indicated in chapter three of this thesis, the study's proposed model is divided into two categories: tag seeking sub-model, and tag create (contribute) and share sub-model. The slightly modified sub-models are shown in Figure 5-1 and Figure 5-2.

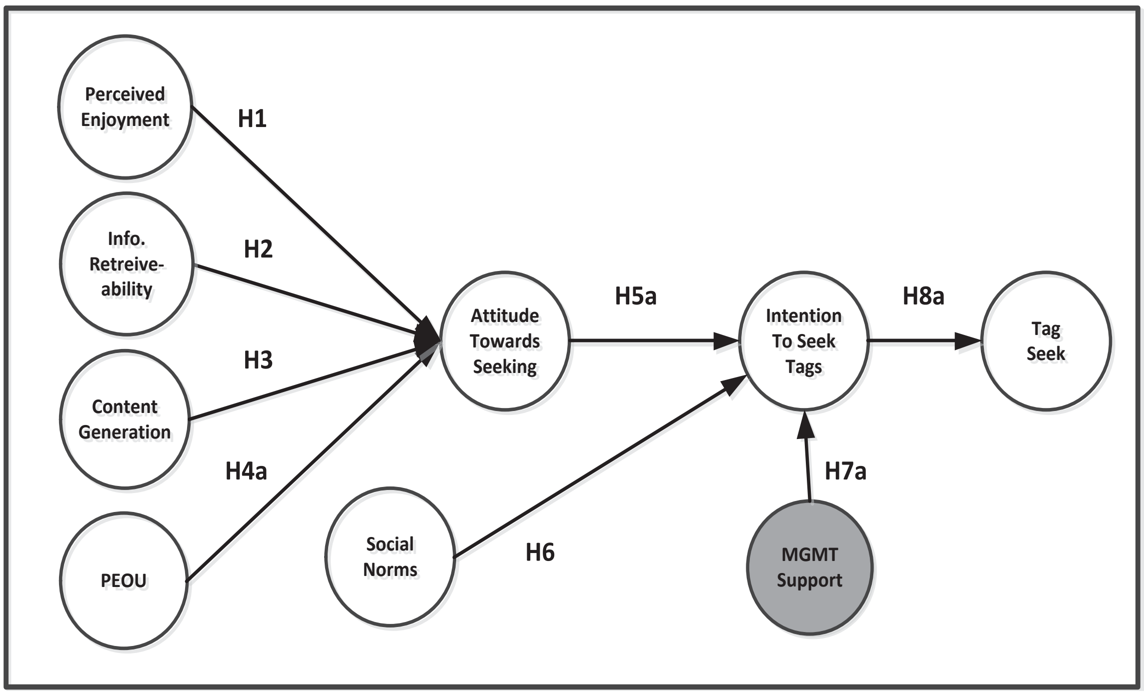

Figure 5-1 Tag Seeking Sub-Model without Organizational Factors

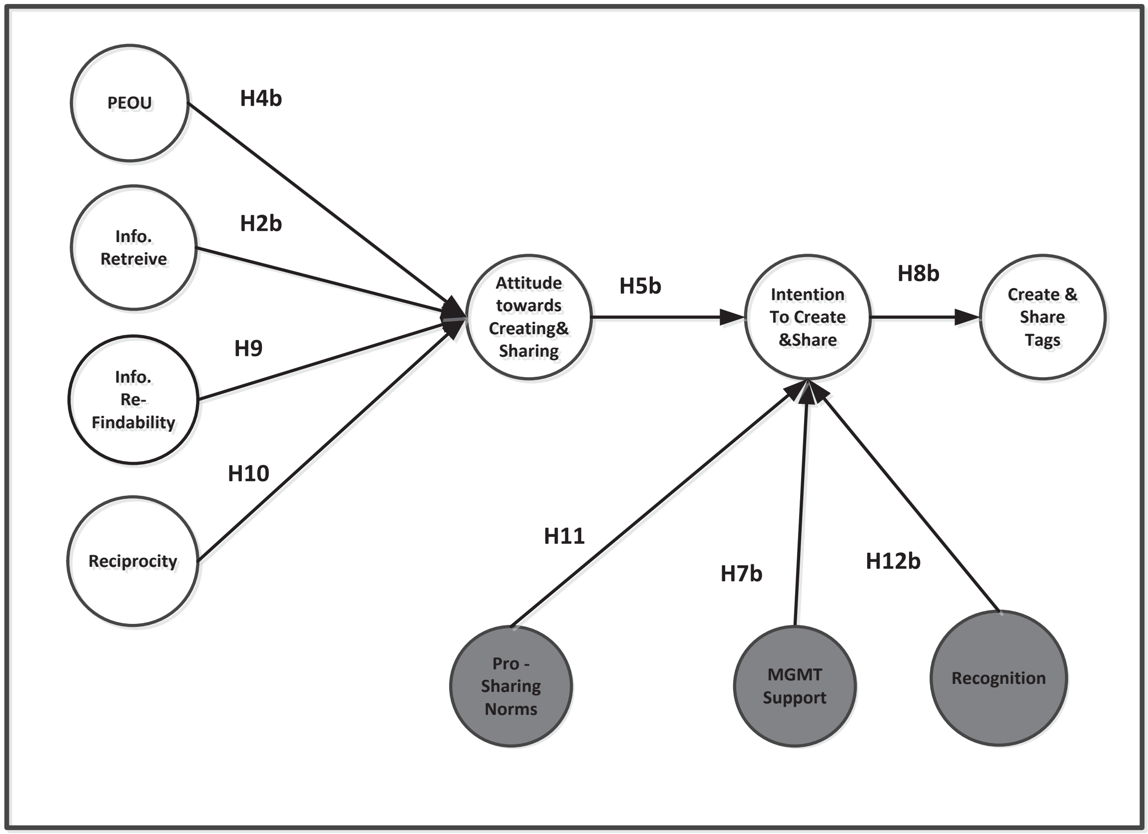

Figure 5-2 Tag Create/Share Sub-Model without Organizational Factors

As shown in the above figures, constructs that do not fit online social tagging are muted and presented in darker circles. The constructs of the pilot study were tested using items from previous literature (a detailed description of the constructs and items will be explained later in this chapter). Each item was measured on a seven-point Likert scale, ranging from ‘‘Strongly Disagree’’ (1) to ‘‘Strongly Agree’’ (7).

An invitation to participate in the pilot study was placed on the message boards of several online tagging sites with a link to the main survey, which was housed on a server at Dalhousie University. The final survey included 77 questions for a total of 16 constructs and four demographic questions. To encourage participants to take part in the study, participants took part in a drawing for $25 Amazon gift certificates upon completion of the survey. To eliminate repeated responses to the survey, browser cookies were enforced and the survey progress was monitored closely. Since participants needed to leave their email addresses to enter the drawing, e-mail addresses also were used to check for repeated entries but were separated when the data was analyzed. Table 5-1 shows the characteristics of the pilot study participants.

Table 5-1 User's Demographics of Online Social Tagging Tools

	Category	Frequency	Percentage (%)
Tagging Behaviour	Use tags	86	46
	Create tags	34	18
	Both	44	25
	Don't use tags	14	8
Gender	Male	118	66
	Female	55	31
	Prefer not to answer	5	3
Age	18-20	2	1
	21-25	14	8
	26-30	49	28
	31-35	57	32
	36-40	30	17
	41-45	12	7
	46-50	6	3
	51-55	3	2
	56-60	3	2
	61-65	1	1
	65+	1	1
Education	High School	5	3
	Community College	10	6
	Undergraduate Degree	52	29
	Graduate Degree: Master or equivalent	65	37
	Graduate Degree: PhD or equivalent	38	21
	Professional degree: Medicine Law etc	8	4

The survey resulted in 184 respondents with 174 valid responses. Ten responses were not complete and were eliminated from the pilot data.

The pilot study used the convenient sample method with an outcome of 184 participants selected as a subset of those who use social tagging tools online. Particularly, the participants come from more than 11 online tagging systems (but targeted most online social tagging systems/tools) which minimizes any bias effect. The sample also follows Kitchenham and Pfleeger (2002b,c,d)'s outline of good survey design provided that it only targeted those users with experience in using online social tagging systems. Additionally, the participants were already using online tagging systems to click on, browse through, and create their own tags which could have positively affected their motivation towards participating in the pilot study.

Based on table 5-1, the number of users who only seek social tags exceeds the number of users who create tags (130 versus 78). This confirms this study's initial assumption that users of tagging tools usually are reluctant to create and share tags with others (this was reported by participant through the two open-ended questions), which may result in fewer users using the tagging tools as a result of the lack of tagging content. The table also shows that more males (N=118) are using the tagging tools either for seeking or creating compared to the number of females (N=55). With respect to the age categories, 77% of users are between 26 and 40 years of age distributed in three main categories: 26—30 (28%), 31-35 (32%), and 36-40 (17%). Further, only 8% of users come from 21-25 and 7% come from 41-45. With regard to education, users who seek and create tags come from three main categories: 29% have an undergraduate degree; 37% have a master's degree or equivalent, and 21 % have a Ph.D or equivalent. Accordingly, it can be argued that users with higher education are more likely to value the benefits of social tagging tools and hence are using them to achieve their daily tasks.

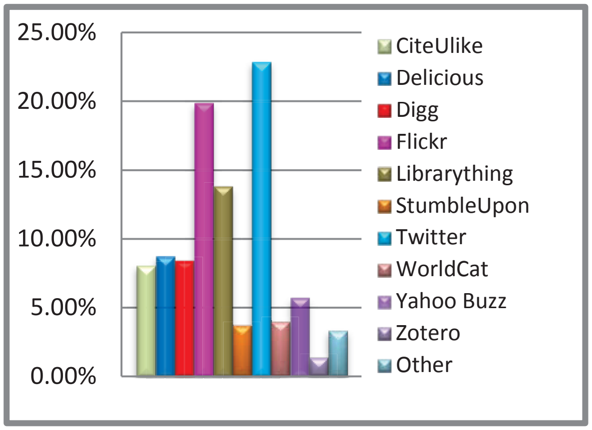

Figure 5-3 Tagging Systems Used

Although pilot study participants reported using eight different tagging tools, only three of these tools attracted the most number of users. Figure 5-3 shows users reported three main tagging tools used: Twitter (38%), Flickr (33%) and LibraryThing (23%). Further, 14 % of users reported using Digg, 10% reported using Yahoo Buzz, 7% reported using WorldCat, and 6% used StumbleUpon. It should be noted that most users reported using more than tagging tools.

5.1.1 Tag Seeking: Testing the Relationship Using SEM

The next step after collecting enough data from the pilot study is running a structural model to test the relationships between the constructs of the proposed model using the structural modeling procedure described in the previous chapter. Figure 5-4 shows the results of the constructs relationships.

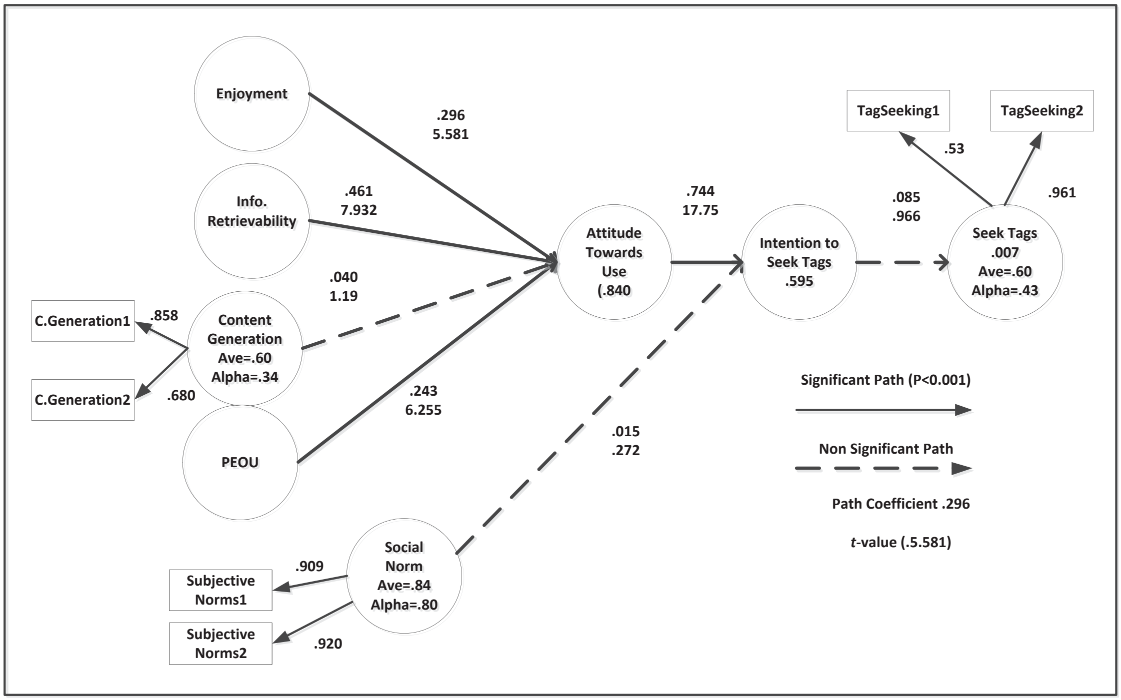

Figure 5-4 First Proposed Tag seeking Sub-Model

Figure 5-4 shows the structural model for the tag seeking sub-model after adding the items for constructs with problematic items. The model shows the path coefficient and the t-value for each latent construct on the dependent variables: attitude, intention and tag seeking. Each latent variable has an R^2 value that shows the degree of influence of constructs on each dependent variable. Items for each construct are shown in rectangle shapes along with their outer loadings values. Figure 5-4 shows only the items whose loading power is weak and that will undergo a modification or an elimination procedure. Solid arrows signify significant relationships, while dotted arrows signify insignificant relationships ($P < 0.05$). Five statistically significant relations are shown in the above structural model: perceived enjoyment, information retrievability, perceived ease of use, attitude, and intention to seek tags.

Bootstrapping technique was used to assess the *t*-values significance. Based on the recommendation by Hair et al. (2011), the bootstrapping technique used 5,000 samples with a number of cases equal to the observations of 174. The critical *t*-values for a two-tailed test were calculated as 1.65 (for $p \leq 0.10$), and 1.96 (for $p \leq 0.05$), and 2.58 (for *p*≤0.01). According to Hair et al. (2011), an R^2 value of .75, 0.5, or .25 for the affected constructs in the structural model is described as substantial, moderate, or weak, respectively. In the above seeking sub-model, attitude (the first endogenous latent variable) scored a substantial R^2 of .84, while intention to seek tags scored a moderate R^2 of .59. Surprisingly, the last dependent variable, tag seeking, scored a very low R^2 (.07) indicating no significant influence from intention to use. The path coefficients for this inner model are shown along with their perspective *t*-value in parentheses. Four out of seven hypotheses were supported with strong statistical significance. As hypothesized, perceived enjoyment had a strong impact on the users' attitude toward using social tagging with a path coefficient of .296 and a t-value of 5.58; information retrievablity had the strongest impact on attitude with a path coefficient of .461 and a t-value of 7.9; and perceived ease of use had a strong impact on attitude with a path coefficient of.243 and t-value of 6.25. Finally, there is a strong relationship between attitude and intention to use with a path co-efficient of .744 and a t-value of 17.5. In addition to intention to seek and the actual behavior of users' tag seeking, two constructs show no significant relationship on attitude and intention to use: content generation has almost no effect on attitude with a path coefficient of .026 and a t-value of .593, while subjective norms also scored a low path coefficient of .015 and a t-value of .272.

According to Figure 5-4, there are three non-significant relationships: content generation on attitude to seek tags with a path coefficient of .040, subjective norms on intention to seek tags with a path coefficient of .015, and intention on the actual tag seeking behavior with a path coefficient of .085. The three insignificant relations of the previous model can be justified by the weak outer loadings of the three constructs: content generation, subjective norms, and tag seeking. Looking at the above model, it is noticeable that two items were used to measure the construct of content generation; two items were used to measure the construct of social norm; and two items were used to measure the construct of tag seeking. Specifically, the outer loadings for content generation were fairly inconsistent, scoring .85 and .68. Similarly, tag seeking had only two items with inconsistent outer loadings of .96 and .53. It should be noted that although the construct of social norms has only two items, the two items scored significant outer loadings of

.910 and .919 with an alpha of .80 and AVE of .83 based on recommendations by Hair et al. (2011). This means the relation between social norms and intention to seek tags is not a misleading one, and hence I can proceed with its current result provided the construct is not significant on the dependent variable. Additionally, the construct of tag seeking (one of the main variables of this study) seems to have inconsistent items measuring users' tag seeking behavior with outer loadings of 53, and .96 and low AVE of .59 with a low Alpha of .43. This is considered a weak loading based on recommendations by Gefen and Straub (2005). This might explain why there is such a weak association between intention and the actual behavior of seeking, which is not consistent with previous studies on technology acceptance that confirmed significant correlation between these two constructs (See Davis, 1989, and Davis et al., 1989). Such weak loadings may indicate these particular measures are not effective in measuring what they are intended to measure, which means they might need to be replaced by more accurate measures that assess the definition of the construct of tag seeking.

5.1.2 Modifying Tag Seeking Sub-Model

Based on the results from the structural model in Figure 5-4, it was decided to modify items from constructs that showed potential influence on the dependent variables and exclude constructs that showed no influence. Selecting items that had potential impact on users' tagging behavior was decided by the results of the structural model from the pilot study and based on feedback on a few open-ended questions that were added to the pilot study's survey. The following section discusses the process of modifying the selected constructs for both the tag-seeking and tag/create sub-models.

5.1.2.1 Modifying the Construct of Content Generation

The construct of content generation was proposed in the model as a new potential factor that may explain users' preference to use social tagging tools if these tools offer new tagging content. In other words, an attempt was made to add the social content as an element that differentiates social media applications from other static ones in that these applications give users the privilege to add and share tags that may entice users to use them. My rationale was based on Wikipedia as an example of social applications. If users do not find new content in Wikipedia, they are less likely to use it as much. Using the same rationale, if users of social tagging systems, and possibly in social media in general, do not find these tools offer new social content, they are less likely to use them. After an in-depth analysis of the construct of content generation and after getting the feedback from social tagging experts, it was decided to change it to the construct of social presence to reflect the social interactivity of social tagging tools which allow users to add tagged resources that can be used by other users. According to this study and based on definitions adapted from Short et al. (1976) and Zanbaka et al, (2007), social presence is defined as the perception of other person(s) being there in the tool as the result of the interaction and the consequent implication on an individual's performance and on the interpersonal relationship.

5.1.2.1.1 Original Items for the Construct of Content Generation

The original items for the construct of content generation were adapted from Ali-Hassan and Nevo (2009)

- The tagging system(s) helps generate new tags and ideas.
- The tagging system(s) enables collaborative generation of tags.

5.1.2.1.2 Replacing the Construct of Content Generation with the construct of Social Presence

The new items for the construct of social presence were self-developed based on the definition of social presence that was extracted from Short et al. (1976) and on Zanbaka et al., (2007).

- There is a sense of social interaction in the tagging tool(s).
- There is a sense of social collaboration in the tagging tool(s).
- There is a sense of sociability in the tagging tool(s).

5.1.2.2 Modifying the Construct of Tag Seeking

The construct of tag seeking encountered insignificant relationship with the construct of intention to seek tag which contradicts TAM established principles (see David, 1989; David et al., 1989; Venkatesh et al., 2003). This led to adding more items and more refinement to the items used to measure users' actual behavior or tag seeking. The new items focused on clarifying the seeking behavior by adding other words such as "click on", "others' public tags", "retrieve", and "locate". This is shown in the next section.

5.1.2.2.1 Original Items for Tag Seeking

The original items for the construct of tag seeking were adapted from usage measures used by Phang et al. (2009)

- I often use the tagging tool(s) to click on tags.

Disagree1 (Strongly)-(Strongly) Agree7

- On average, how many times do you use tags?

Few times a year
Once a month
A few times a month
A few times a week
About once a day
Several times a day

5.1.2.2.2 Modified Items for the Construct of Tag Seeking

The modified items for the construct of tag seeking are adapted from measures used by Phang et al. (2009) and Moon and Kim (2001).

- I often click on other users' public tags to search for/locate information resources.
  Disagree1 (Strongly)-(Strongly) Agree7

- How frequently do you use other users' public tags to retrieve information?

Infrequent (Extremely)-(Extremely) Frequent

- On average, how many times do you use tags *for any purpose*?

  Few times a year
  Several times a year
  A few times a month
  Several times a month
  A few times a week
  Several times a week
  About once a day
  Several times a day

5.1.2.3 Excluding the Construct of Social Norms from Tag Seek Sub-Model

Although, the construct of social norm does not seem to have outer loading issues, it did not seem to have an influential factor on users' intention to use tags. In other words and according to the result of the pilot study, peer effect seems to have no effect on the act of seeking and clicking on tags. Hence, the final proposed model will exclude the construct of social norm as a potential drive for tag seeking for ESTTs given the fact that the construct of pro-sharing norms might work better in an enterprise environment.

5.1.3 Testing Create/Share Sub-Model Using SEM

To test the first sub-model of users' tag create and share behavior, the proposed model should undergo a relationship test through a structural model analysis. Figure 5-5 shows the results of the initial structural model for the tag contributing and sharing sub-model.

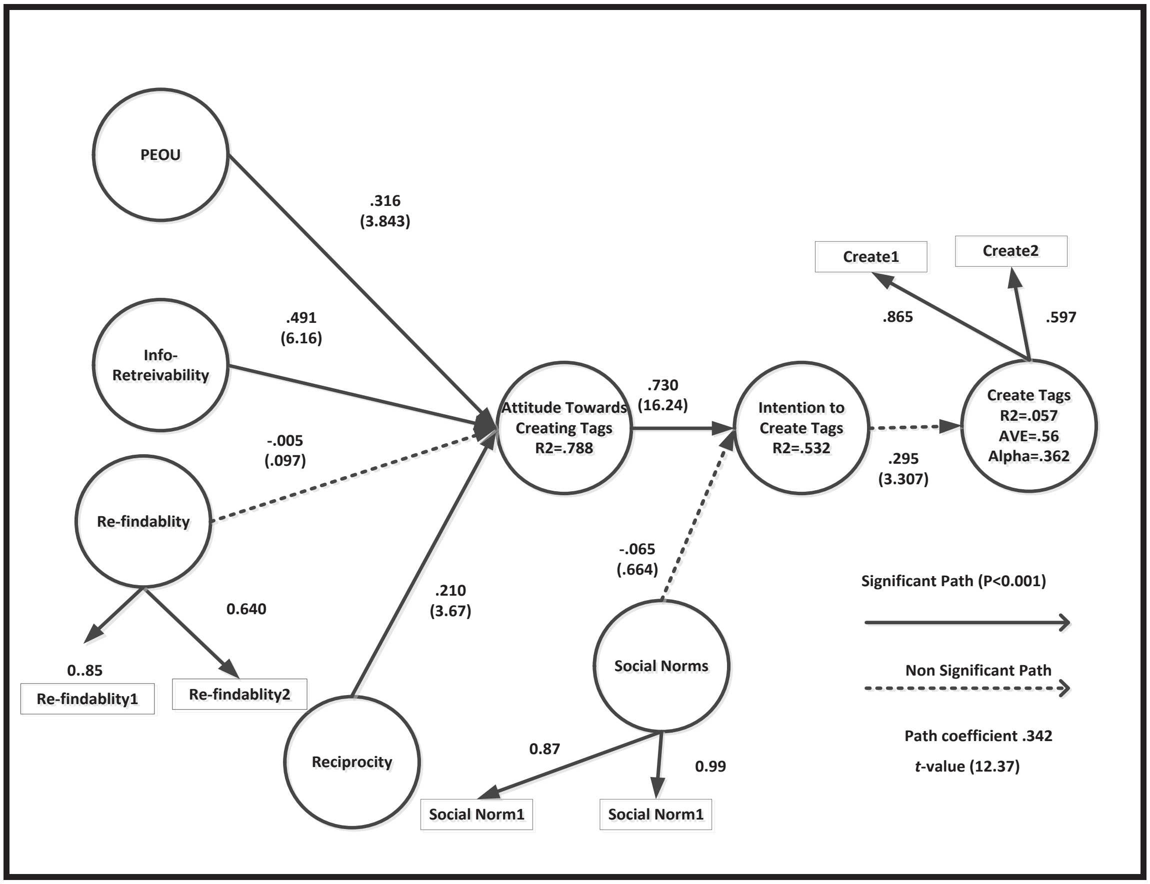

Figure 5-5 First Proposed Sub-Model: Tag Creating and Sharing

Figure 5-5 shows the weighted effect of the independent variables on each dependent variable and the path coefficient of each variable. Four variables reported significant relationship on users' attitude to contribute and share tags: perceived ease of use, information retrievablity, reciprocity, and attitude with significant path coefficients of .316, .496, .21 and t-values of 3.84, 6.16, and 3.67, respectively, significant at the 0.001 level. Further, attitude scored a significant effect on intention to create tags with a path coefficient of .730 and a t-value of 16.24. Although, intention to create and share seems to have a significant impact on the actual behavior of tag creating and sharing with a path coefficient of .295, this relation is not statistically significant given that the R^2 of the create tag construct is relatively low scoring .052. Finally, re-findability and subjective norms did not show significant influence on attitude and intention to create tags. Particularly, the construct of re-findability scored a path coefficient of .005 and a t-value of .097, which is considerably low. Similarly, the construct of subjective norm showed a fairly low impact on intention to create and share tags with a path coefficient of .065 and a t-value of .664.

Looking at the above model, it is noticeable that the constructs of information re-findability and tag create and share have only two items by which each construct is measured. Nevertheless, the items of each construct are not consistent in their outer loadings. For example, the items of the construct of information re-findability have outer loadings of .64 and .853 with a very low alpha of .25 and AVE of .56, while the construct of create/share tags has two items with outer loadings of .86 and .59 and a low alpha of .36 and AVE of .59. This concludes that both information re-findability and create/share tags need to be refined and supported by more questions to reflect the real meaning of their concepts. Although the construct of social norm has only two items, the two items scored significant outer loadings of .882 and .990 with an alpha of .89 and AVE of .87. This means the two items of the construct of social norm are enough to measure it and the insignificant relation between this construct and intention to create is not misleading. Further, the construct of tag create and share has two inconsistent items with outer loadings of .56, and .86, while the AVE of this construct is only .56 and a low Alpha of .36. This means the low significance between the constructs of intention and tag creating/sharing is possibly due to weak outer loadings of the construct of tag create/share. This may also indicate the need for more refinement and addition of items to better measure the actual behavior of tag creation and sharing.

5.1.4 Modifying the Construct of Re-findablity

According to Figure 5-5, the construct of information re-findablity does not have a significant influence on the construct of attitude to create/share tags with a low .005 path coefficient. This may be justified as the construct of refindability only included two items to measure its concepts. Further, the two items were not in line in operating the meaning of the construct with inconsistent outer loadings of .85 and .640. This may indicate that these measures are not effective enough to measure the content of the construct, which may lead to replacing them with better items. Although the construct of refindability showed no significant effect on users' attitude with regards to their tag contributing and sharing behavior, some users reported positive perception toward the refindability functions of tagging tools in the pilot study's open-ended questions. Hence, it was decided to include this construct with possible modifications for its items in the actual study. Based on users' feedback from the pilot study and from another construct refining process, new items were added to fit the nature of social tags. The following section shows the original items and the modified items that represent the construct of re-findability.

5.1.4.1 Original Items of Information Re-findability

The original items of the construct of re-findability were adapted from measures used by Phang et al. (2009).

- I use the tagging tools(s) to search for my own information resources.
- Tagging tools allow me to re-find my own information resources that were tagged by me.

5.1.4.2 Modified Items of Information Re-findability

The new items for the construct of information re-findability were adapted from Davis (1989).

- The tagging tool(s) helps me to remember my tagged resources.
- The tagging tool(s) allows me to re-find resources I had tagged.
- The tagging tool(s) enables me to search for my previously found resources.
- The tagging tool(s) makes it easier for me to locate my tagged resources.

5.1.4.3 Modifying the Construct of Tag Create/Share

5.1.4.3.1 Original Items of Tag Create/Share

The original items for the construct of tag create/share were adapted from measures used by Phang et al. (2009).

- I often use the tagging tool(s) to create tags.

  Disagree1 (Strongly)-(Strongly) Agree7

- On average, how many times do you create tags?
  - Few times a year
  - Once a month
  - A few times a month
  - A few times a week
  - About once a day
  - Several times a day

5.1.4.3.2 Modified Items of Tag Create/Share

The modified items for the construct of tag create/share are adapted from measures used by Phang et al. (2009), Moon and Kim (2001), and Davis (1989):

- I often use the tagging tool(s) to create and share tags.
  Disagree1 (Strongly)-(Strongly) Agree7

- How frequently do you create/share tags?
  Infrequent (Extremely)-(Extremely) Frequent

- How many times do you create/share tags for any reason?
  Few times a year
  Several times a year

A few times a month

Several times a month

A few times a week

Several times a week

About once a day

Several times a day

5.1.4.4 Excluding the Construct of Subjective Norms

Although the construct of subjective norms did not seem to have items' outer loadings issue, it did not show significance on users' intention to contribute/share tags with a low path coefficient of .065 as shown in Figure 5-5. Taking its low significance into account, it was decided to exclude the construct of subjective norms from the final contribute/share sub-model. Further, considering the construct of pro-sharing norms may carry the peer effect concept and work better when applied in an organizational context, it was decided to add the construct of pro-sharing norms to replace the construct of subjective norm when testing tagging employees' behavior in ESTTs.

5.1.5 Other Potential Factors

In addition to the constructs questions asked in the pilot study, I asked some open-ended questions to seek potential factors that were not accounted for in the initial proposed model. After reviewing respondents' open-ended questions, it was noticed that users' of social tagging tools are motivated to create and share tags to help other people find information resources. Examples of the open-ended questions are as follow:

Please indicate other reasons why you create and add tags to the tagging system(s)?

- *sharing information*
- *share opinions*
- *share my view*
- *I hope it is helpful to others.*
- *I like to help others*

- *My tags could be beneficial to others….that is why I do it*
- *Help people classify resources*

Accordingly, I added the construct of altruism ,along with its measures, as a potential factor influencing employees' tag creating/sharing behavior based on the pilot study feedback and based on previous studies that indicated the significance of this construct in the enterprise context (e.g. Kankanhalli et al., 2005; and Wasko and Faraj, 2000). Altruism is defined as the degree to which a person is willing to increase other people's welfare without expecting returns (Hsu and Lin, 2008).

5.2 RESULTANT SET OF MOTIVATIONAL DRIVERS

The synthesis of the motivational drivers, identified from both prior literature and the pilot study, that influence employees' willingness to seek, and contribute/share tags in the organizational environment results in three broad categories that resonate with the intellectual streams most often used to explain technology acceptance (Davis et al., 1989) and social action (Coleman 1988), and organizational context (Kankanhalli et al., 2005; Venkatesh et al., 2003):

1. Users' acceptance including perceived enjoyment, perceived ease of use, perceived usefulness (which is manifested through the construct of information retrievablity and re-findablity), attitude, and intention.
2. Knowledge sharing and social dimension including social presence, altruism, and reciprocity.
3. Organizational dimension including managerial influence, pro-sharing norms, and organizational reward/ recognition.

5.3 FINAL PROPOSED MODEL

After testing the initial hypotheses and after extracting new factors through the pilot study, the final proposed model for factors impacting employees' tag seeking and contribution behavior will be proposed in the following section. The final model is divided into two sub models as shown in Figures 5-6 and 5-7: employees' tag seeking and employees' tag contribution and sharing behavior.

5.3.1 Tag Seeking Sub-Model

As discussed in the previous section, the initial proposed tag seeking sub-model included the constructs of content generation and subjective norms which showed no significant influence on users' attitude and intention to seek tags. Accordingly, these two constructs were eliminated from the final tag seeking sub-model.

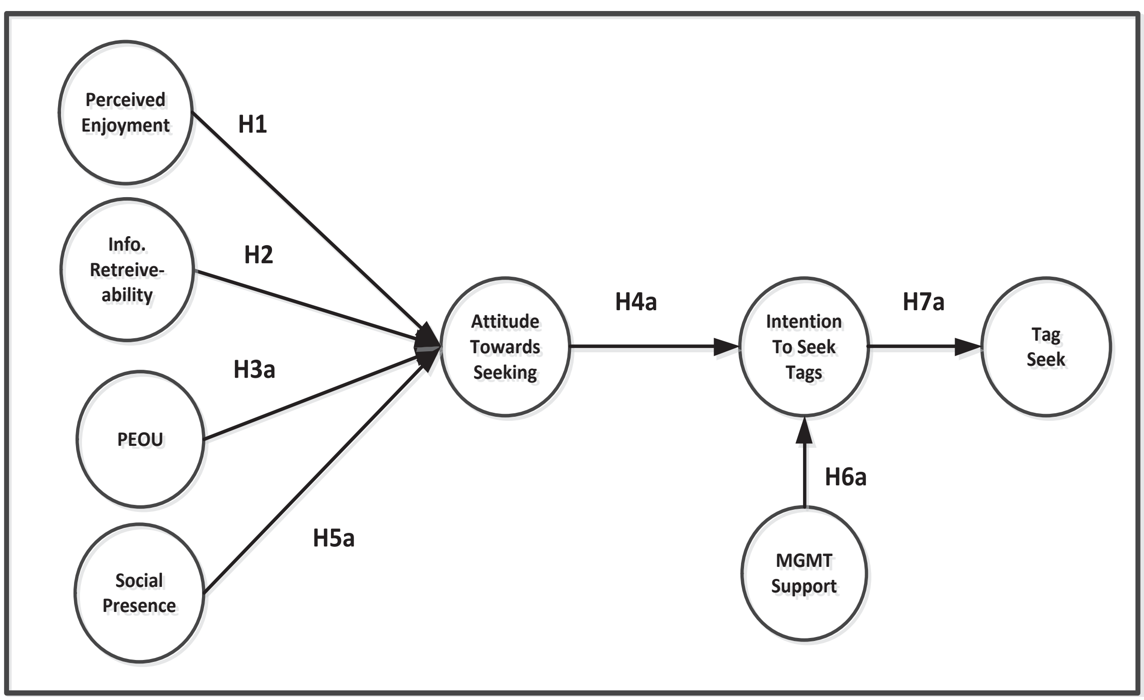

Figure 5-6 Final Theoretical Model of Factors Affecting Employees' Tag Seeking in Enterprise Social Tagging Tools

Figure 5-6 shows the final proposed sub-model for employees' tag seeking behavior. Different from the initial proposed sub-model, the final seeking sub-model does not include the construct of subjective norms since it did not show significant influence on users' attitude to seek tags. Similarly, the construct of content generation was eliminated for the same reason and was replaced with the construct of social presence with more items reflecting the social tagging context. According to the seeking sub-model and consistent with TAM, employees' actual tag seeking behavior is influenced by their intention to seek tags which in turn is affected by employees' attitude to seek metadata tagging content. Employees' intention to seek tags also is affected by management influence. Further, employees' attitude to seek tags is affected by employees' perception of the following aspects in the enterprise social tagging tool: social presence of others, perceived enjoyment, perceived ease of use, and usefulness of the enterprise tagging systems, which is manifested through the construct of information retrievablity.

5.3.2 Tag Create/Share Sub-model

The initial proposed sub-model for tag create/share behavior included the constructs of subjective norms and information retreivablity. Based on the results of the pilot study that showed no statistical significance of the constructs of subjective norm, the construct of social presence was added to reflect the sociability aspect of social tagging applications. Further, the constructs of information retrievablity and information refindability were merged into the construct of information refindability after re-defining the construct of refindability which showed potential impact in the pilot study, especially with those who create and share social tags. Further, the construct of altruism was added to impact employees' attitude to contribute and share tags since. Adding the construct of altruism was based on the positive feedback from the open ended questions reported by the pilot study participants. Finally, the construct of tag contribute/share was modified by adding one more item to match users' differences in understating the act of create and share social tags. Figure 5-7 shows the final proposed sub-model of tag create/share behavior.

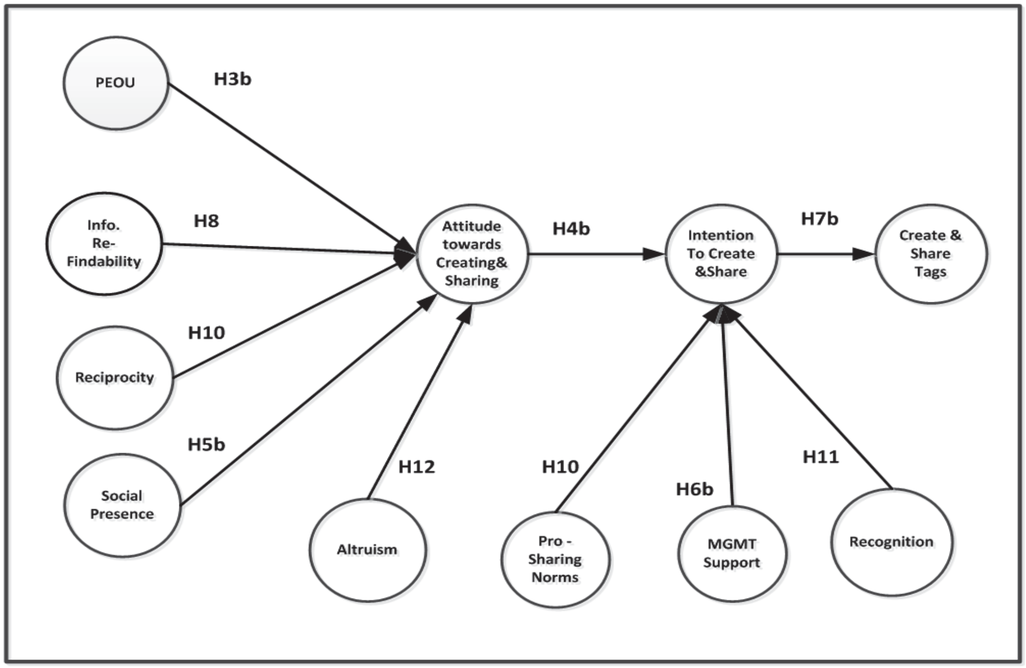

Figure 5-7 Theoretical Model of Factors Affecting Employees' Tag contribution and Sharing in ESTTs

The final proposed sub-model also is consistent with TAM in that it proposes employees' actual behavior with regard to tag contributing (creating) and sharing is influenced by intention, which is in turn is affected by employees' attitude toward creating and sharing tags. Further, the model suggests employees' intention to contribute and share tags is influenced by organizational factors such as pro-sharing norms, managerial influence, and recognition. Finally, tag contributing and sharing sub-model proposes that employees' attitude towards creating and sharing is influenced by employees' perception of the following aspects in the enterprise social tagging tool: social presence, PEOU, information re-findablity, reciprocity, and altruism. The next step after proposing the final model is to show the definition of each construct along with their operational items that will be used in the survey. Table 5-2 and 5-3 show the constructs definition, and the items for each construct, respectively.

Table 5-2 Formal Definitions of Constructs

Construct (Abbreviation)	**Definition**
Perceived Enjoyment (PE)	The degree to which the activities of using computer systems are perceived to be enjoyable regardless of the anticipated performance of the system (adapted from Davis, 1992).
Information Retrievability (IR)	The degree to which a person believes using a tagging tool would enhance his/her information retrievability performance (adapted from Davis, 1989).
Information Re-findability (REF)	The degree to which a person believes using a tagging tool would enhance his/her information re-findability of previously found resources (adapted from Davis, 1989).
Perceived Ease of Use (PEOU)	The degree to which a person believes using a social tagging tool system would be free of effort(adapted from Davis 1989).
Reciprocity (RECP)	The degree to which a person believes he or she could obtain mutual benefits through tag sharing(adapted from Kankanhalli, 2005).
Altruism (ALT)	The degree to which a person is willing to increase other people's welfare without expecting returns(Hsu and Lin, 2008).
Organizational Reward/ Recognition (REW)	The importance of economic incentives provided for tag contributors and tag seekers(adatped from Kankanhalli, 2005).
Pro Sharing Norm (PSN)	The prevalence of norms that are intended to facilitate tag sharing in the organization (adapted from Nahapiet and Ghoshal 1998; Orlikowski 1993).
Management Influence (MGMTI)	The degree to which an employee perceives the management believes he or she should contribute or seek tags via ESTTs (Venkatesh et al., 2003).
Social Presence (SP)	a "sense of being with another in a mediated environment, social presence is the moment-to-moment awareness of co-presence of a mediated body and *the sense of accessibility* of the other being's psychological, emotional, and intentional states" (Biocca and Harms, 2002, p.3).
Attitude towards Using tags (ATTU)	An individual's positive or negative feelings about using and clicking on tags (adapted from Fishbein and Ajzen ,1975; Bock et al., 2005).
Attitude towards creating and sharing tags (ATTC)	An individual's positive or negative feelings about creating and sharing tags (adatped from Fishbein and Ajzen ,1975; Bock et al, 2005).

Construct (Abbreviation)	Definition
Intention to use tags (INTU)	The degree to which one believes one will engage in clicking and using tags (adatped from Fishbein and Ajzen (1981; Bock et al. ,2005).
Intention to create and share tags (INTC)	The degree to which one believes one will engage in clicking and using tags (adapted from Fishbein and Ajzen, 1981; Bock et al. ,2005).
Tag Usage (USE)	The degree of tagging tool(s) usage to click on tags. Adapted from Davis (1989)
Tag Contribution (CRE)	The degree of tagging tool(s) usage to create and share tags. Adapted from Davis (1989).

Table 5-2 shows the constructs used in the final model and the definition of each construct. There are fifteen constructs based on fifteen factors including twelve independent factors and three dependent factors: attitude, intention, and tag seeking, contributing and sharing behavior. Some of the constructs' definitions are original from previously tested studies with slight modifications to match the nature of ESTTs. Table 5-3 shows the final operational items for each construct as they will be used in the actual study.

Table 5-3 Constructs and Item Operationalization

Construct	Items Code and Wording	Sources
Perceived Enjoyment (PE)	• My experience of using the tagging tool(s) is pleasant. • I find using the tagging tool(s) to be enjoyable. • The process of using the tagging tool(s) is interesting.	Adapted from Liao et al. (2008); and Van der Heijden (2004)

Construct	Items Code and Wording	Sources
Information Retrievability (IR)	• Using the tagging tool(s) enables me to accomplish my information search tasks more quickly. • Using the tagging tool(s) makes it easier to perform my information search tasks. • Using the tagging tool(s) helps me to become more effective in my information search tasks. • Using the tagging tool(s) helps me become more productive in my information search tasks.	Self-developed based on Davis (1989)
Information Re-findability (REF)	• The tagging tool(s) helps me to remember and locate my tagged resources. • The tagging tool(s) allows me to re-find resources *that I had tagged.* • The tagging tool(s) enables me to search for my previously found resources. • The tagging tool(s) makes it easier for me to find my tagged resources.	Self-developed based on Davis (1989)
Perceived Ease of Use (PEOU)	**Use Tags** • I find using the tagging tool(s) to click on/seek tags easy to use. • I find it easy to become skillful at clicking on/seeking tags. • I find learning to use the tagging tool(s) to click on/seek tags easy. **Create Tags** • I find creating tags through the tagging tool(s) easy to do. • I find it easy to become skillful at creating tags through the tagging tool(s). • I find learning to create tags through the tagging tool(s) easy.	Adapted from Davis (1989) and Hsu and Lin (2008)

Construct	Items Code and Wording	Sources
Reciprocity (REC)	• My public tags are useful for others users' tasks. • I create public tags that are applicable to other users' tasks. • Other users' public tags are appropriate for my tasks. • Other users create public tags that are applicable to my tasks.	Adapted from Arakji et al. (2009)
Altruism (ALT)	• I create public tags for information resources because I think users will find them useful. • I create public tags for information resources because I think those resources should be discovered by other users. • I create public tags for information resources so other users will be able to find those resources.	Based on Arakji et al. (2009)
Organizational/ Management Influence (MGMTI)	• The senior management of this business has been helpful in the use of the tagging tool(s). • My supervisor is very supportive of the use of the tagging tool (s) system for my job. • In general, the organization has supported the use of the tagging tool(s).	Adapted from Venkatesh et al. (2003)
Organizational Reward/ Recognition (REW)	• It is important for me to … at work for contributing my knowledge through the tagging tool(s). • Be appreciated. • Get a better work assignment. • Be recognized by my supervisor. • Get more job security. • Get recognized by my organization when I share my knowledge with the group.	Adapted from Kankanhalli et al. (2005)

Construct	Items Code and Wording	Sources
Pro Sharing Norm (PSN)	• There is a norm (or culture) of … in my organization • Cooperation. • Collaboration. • Teamwork. • Willingness to value and respond to diversity of opinion. • Tolerance for mistakes.	Kankanhalli et al. (2005)
Social Presence (SP)	• There is a sense of social interaction in the tagging tool(s). • There is a sense of social collaboration in the tagging tool(s). • There is a sense of sociability in the tagging tool(s).	Adapted from Gefen and Straub (1997;2003)
Attitude towards Using tags (ATTU)	• I feel positive about clicking on tags to find information resources. • Clicking on tags to locate information resources is a good idea for me. • In general, I like clicking on tags to find information.	Adapted from He and Wei (2009); Liao et al. (2008); Moon and Kim (2001); and Davis (1989)
Attitude towards creating and sharing tags	• I feel positive about creating and sharing tags using the tagging tool(s). • Creating and sharing tags is a good idea for me. • In general, I like creating and sharing tags.	Adapted from He and Wei (2009); Liao et al. (2008); Moon and Kim (2001); and Davis (1989)
Intention to use tags (INTU)	• I intend to use tags to search for content. • My intentions are to continue using tags to search for information resources in the next month. • It is worth using tags in the tagging tool(s). • I will continue using tags on a regular basis in the future.	Adapted from He and Wei (2009); Liao et al. (2008); Moon and Kim (2001); and Davis (1989)
Intention to create and share tags (INTC)	• I intend to create and share tags. • My intentions are to continue creating and sharing tags in the next month. • It is worth creating and sharing tags to the tagging tool(s). • I will continue creating and sharing tags on a regular basis in the future.	Adapted from He and Wei (2009); Liao et al. (2008); Moon and Kim (2001); and Davis (1989)

Construct	Items Code and Wording	Sources
Tag Usage (USE)	• I often click on other users' public tags to search for/locate information resources. Disagree (Strongly)-(Strongly) Agree • How frequently do you use other users' public tags to retrieve information? Infrequent (Extremely)-(Extremely) Frequent • On average, how many times do you use the tagging tool(s) to click on tags *for any purpose*? (Few times a year-Several times a day)	Developed Based on Phang et al. (2009); and Moon and Kim (2001)
Tag Contribution (CRE)	• I often use the tagging tool(s) to create and share tags. Disagree (Strongly)-(Strongly) Agree • How frequently do you create and share tags? Infrequent(Extremely)-(Extremely) Frequent • On average, how many times do you use the tagging too(s) to create and share tags? (Few times a year-Several times a day)	Developed Based on Phang et al. (2009); and Moon and Kim (2001)
Experience (EXP)	• EXP1. How long have you been clicking on tags? • EXP2. How long have you been creating tags?	Developed Based on Phang et al. (2009); and Moon and Kim (2001)

5.3.3 Research Questions

Recall this study's main objective was identifying factors which impact employees' tag participation on ESTTs. To achieve this objective, employees' tag participating will be divided into two streams: (1) employees' tag seeking behavior; (2) and employees' tag contributing and sharing behavior. Hence, this study's objective can be summarized in the following general question:

What motivates employees to seek, contribute and share tags using ESTTs?

This question is subdivided into sub-questions pertaining to the proposed theoretical model which outlines the hypotheses of the study:

- What is the effect of the hedonic aspect on employees' tag motivation to participate in ESTTs?
- What is the effect of system ease of use on employees' tag motivation to participate in ESTTs?
- What is the effect of the social aspects on employees' tag motivation to participate in ESTTs?
- What is the effect of organizational factors on employees' tag motivation to participate in ESTTs?

The following are the hypotheses of the sub-models with the construct of social presence and altruism added based on findings from the pilot study. Since the constructs of social presence and altruism were not covered in the theory chapter, an overview of the new constructs of social presence and altruism will precede their hypotheses.

H1: *Perceived enjoyment is positively related to attitude toward seeking tags.*

H2: *Employees' positive perception of system's information retrievability is positively related to their attitude to seek tags; and*

H3a: *Perceived ease-of-use is positively related to the attitude towards seeking tags.*

H3b: *Perceived ease-of-use is positively related to the attitude towards creating and sharing tags.*

H4a: *Employees' attitudes toward seeking tags will positively affect their intention to seek tags.*

H4b: *Employees' attitudes toward creating and sharing tags will positively affect their intention to contribute and share their tags.*

5.3.4 Social Presence

Social presence is defined as (1) “the degree of salience [awareness] of the other person in the interaction” and (2) “the consequent salience [outcome/result] of the interpersonal relationships” (Short et al., 1976, p.65). According to the social presence theory, awareness of the online presence of fellow members can influence online community activity (Fulk et al., 1990; Fulk, et al., 1989). Social presence is considered a major design principle in computer-mediated communication and an important determinant of online community participation. Sehn and Khalifa (2008) investigated the role of social presence on the interaction of online communities. They proposed three social presence dimensions (i.e., awareness, effective social presence, and cognitive social presence) to analyze users’ social behavior online. The results showed a strong support for the role of social presence in encouraging users’ participation in online communities. Nov et al. (2008) studied the motivations associated with the tagging behavior on Flickr and how it affects the level of users’ tagging activity. Basing their work on a qualitative study conducted by Ames and Naaman (2007), they confirmed social presence works as a main motivator for users to add tags to information resources. Further, some tagging motivations come from a group contribution perspective. When users get the feeling their contribution is important to groups, they are more likely to contribute more to the system. Conversely, if they feel their contribution is less effective, they are less likely to contribute (Karau and Williams, 1993). Lee (2006) stated although tag posts are largely directed towards personal organizational reasons, social presence plays an important role in getting users to tag resources. Beenen et al. (2004) conducted a study on the “under contribution” of some users on the movie recommender system MovieLens. They found that users, when reminded their tag contribution will help others to choose the right movie, perceived a sense of uniqueness to their tags and hence added more movie tags to help the group. A study at HP found bloggers are likely to participate in a company's blog if they feel the presence of others through visual feedback responding to their posts (Yardi et al., 2009). An empirical study done by Brzozowski et al, (2009) showed that coworkers' contribution and attention to posts played an important role in employees participating behavior in organization's virtual communities.

H5a: *Perceived social presence will positively affect employees' tag seeking activities.*

H5b: *Perceived social presence will positively affect employees' tag creating and sharing activities.*

H6a: *Perceived managerial support will affect employees' intention to seek tags.*

H6b: *Perceived managerial support will affect employees' intention to create and share tags.*

H7a: *Behavior intention will positively affect employees' tag seeking behavior.*

H7b: *Behavior intention will positively affect employees' tag creating and sharing behavior.*

H8: *Employees' positive perception of system's information re-findability positively affects their attitude to create and share tags.*

H9: *Reciprocal benefits will positively affect employees' attitudes toward creating and sharing tags.*

H10: *Pro-sharing norm will positively impact employees' intention to create and share tags.*

H11: *Organizational recognition will positively affect employees' intention to create and share tags.*

5.3.5 Altruism

The benefit of enjoying helping others is originated from the concept of altruism (Kankanhalli et al., 2005). Altruism is defined as the degree to which a person is willing to increase other people's welfare without expecting returns (Hsu and Lin, 2008). Individuals may contribute knowledge in an electronic network of practice because they perceive that helping others with challenging problems is interesting, and because it feels good to help other people (Kollock, 1999). Empirically, Wasko and Faraj (2000) found a correlation between enjoyment in helping others and knowledge sharing behavior. Palmer (1991) confirmed the important role altruism played in the information sharing environment where users were motivated by an internal feeling of satisfaction for helping others. In investigating the idea of a virtual knowledge sharing community based on decentralized P2P technology, Kwok and Gao (2004) focused on altruism as a motivator for users to contribute and share knowledge. The following hypothesis is thus proposed:

H.12 *Altruism will positively affect employees' intention to create and share tags.*

5.4 FULL STUDY (STUDY2)

5.4.1 Survey Administration

Data collection took place during the period from December 5th, 2011 to February 7th, 2012. The survey received few responses in December but most respondents replied to the survey in late January and early February when more contacts in the targeted companies became available. Two IT companies were contacted through two managers who sent the survey invitation to their employees using enterprise social media in general.

In total, 481[4] usable responses were collected and 53 responses were partially completed and were eliminated from the data collected. The eliminated responses were missing answers to major questions intended to establish main concepts in the study. Table 5-4 presents the number of responses received in the full study and Figure 5-8 offers the breakdown of responses by phase and round.

Table 5-4 Full Study Results

Date	**Phase**	**# of responses**
December 5th, 2011	Initial invitation	10
January 10th, 2012	Reminder 1	15
January 17th, 2012	Reminder 2 sent to two head managers	150
January 27th, 2012	Reminder 3	180
January 28th-February 6th, 2012		179
Total		**534**

Table 5-4 breaks down the data collection process that lasted 60 days starting from December 5th, 2011 and ending February 6th, 2012. It should be noted the survey invitation survey took place on a friendly basis by unofficially contacting two managers

[4] These responses do not include the pilot study data, which represented online tagging versus enterprise tagging tools, which is the scope of the full study.

in the two chosen companies A and B. Getting approval from these two companies to run the survey internally was a difficult process and demanded a lengthy timeframe.

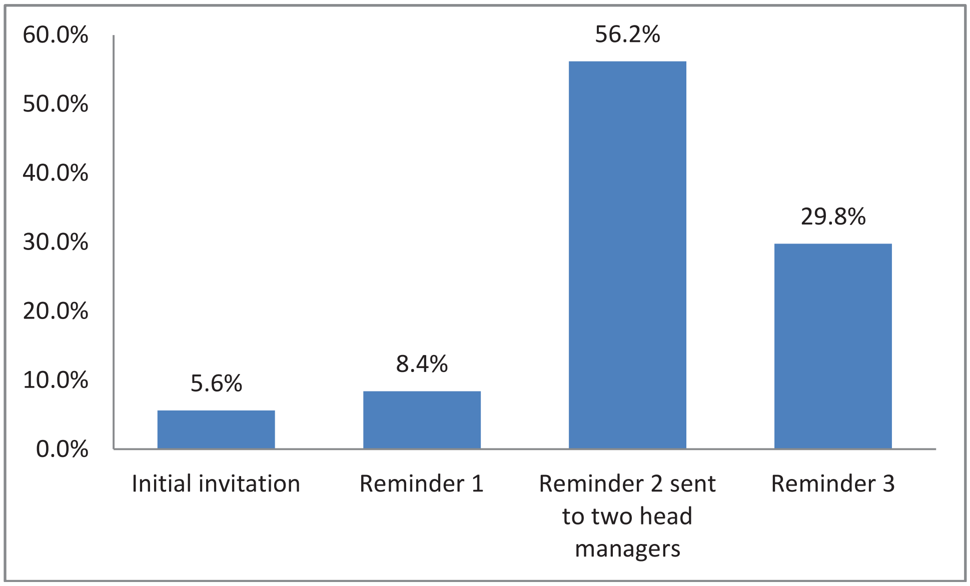

Figure 5-8 Breakdown of Responses

Figure 5-8 shows about 86 % of all responses came after reminder 2, which was sent to the two IT contact managers who forwarded it to their employees. There was an obvious increase in employees' response rate after the second reminder. It is believed that employees in both companies took the survey invitation seriously after the invitation was emailed to them from their managers. Further, most of the responses came after the holiday season in December 2011 and January 2012.

5.5 DATA ANALYSIS

5.5.1 Enterprise Social Tagging Software Used

Figure 5-9 shows ESTTs used by the study participants. As shown in the Figure 5-9, Microsoft SharePoint was used by 57 % of respondents, while IBM Lotus Connection was used by 43% of respondents. Since the data collected from two ESTTs, namely SharePoint and Lotus Connection, which generated two sets of data, a paired sample t-test was required to check if the data collected from the two applications can be pooled together for a general data analysis. In other words, a paired sample t-test can help judge if it is statistically safe to pool the two sets of data together. This will be shown in the next section.

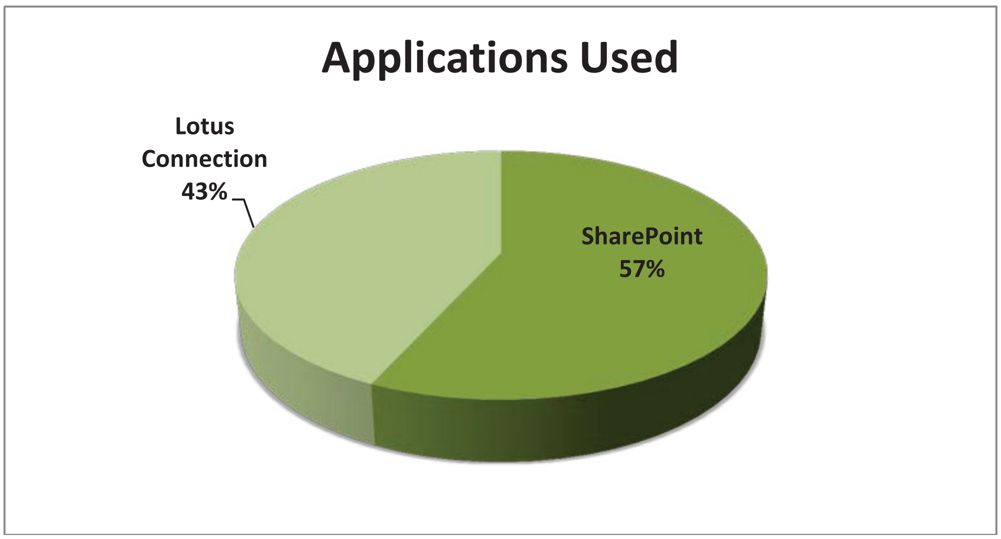

Figure 5-9 Tagging Tools Used

5.5.2 MANOVA

Since the data was collected from two different IT companies using two different tagging applications, a test for statistical difference in responses was needed to make sure the two sets of data can be pooled together in one analysis. In other words, the following question needed an answer: Is there any difference between enterprise social tagging use in the two sets of data collected from the two tagging tools (i.e. participants who used SharePoint, and participants who used Lotus Connection)? If the answer is “yes”, this means the proposed model needs to be tested twice: once for users who reported using SharePoint and once for those reporting using Lotus Connection. If the answer is “No”, this means the proposed model can be used on both software and we can expect a generalized proposed model without any bias effect. The test's rationale involves comparing two samples of participants who were given the same treatment under the same conditions to see if there is any difference between their uses in the two mentioned software applications.

To run comparisons between the data sets, the data was categorized into two parts: data collected from employees who used SharePoint and from employees who used Lotus Connections. Using SPSS, a multivariate analysis of variance (MANOVA) test was conducted on the two sets of data. MANOVA is an extension of ANOVA in which main effects and interactions are assessed on a combination of dependent variables. MANOVA tests whether mean differences among groups on a combination of dependent variables are likely to occur by chance. Each item in each construct of the dependent variable was compared with itself when it was answered using SharePoint and Lotus Connections.

Based on MANOVA results, no statistically significant difference in the two sets of data was found in the degree of employees' perceptions regarding ESTTs. Table 5-5 shows the comparison between the means of the two groups, standard deviation, and the number of responses for each item pertaining to the dependent variables. The table is divided into two parts: dependent variables pertaining to the tag seeking behavior and tag creating behavior. As illustrated in Table 5-5, the means for items are shown twice: one for Lotus Connection and one for SharePoint. The table also shows the means for each question pairs are almost similar, and the standard deviation almost falls in the same area. This suggests there is homogeneity between the two groups.

Table 5-5 Descriptive Statistics for Mean Differences for Tag Seeking Sub-Model

		Tagging System	**Mean**	**Std. Deviation**	**N**
Tag Seek	Use1	Lotus Connections	5.1	1.466	206
		SharePoint	5.35	1.325	269
		Total	5.24	1.392	475
	Use2	Lotus Connections	4.97	1.28	206

		Tagging System	Mean	Std. Deviation	N
		SharePoint	5.09	1.335	269
		Total	5.04	1.312	475
Attitude towards Seeking	ATTU1	Lotus Connections	5.43	1.042	206
		SharePoint	5.46	1.16	269
		Total	5.45	1.109	475
	ATTU2	Lotus Connections	5.35	1.204	206
		SharePoint	5.54	1.167	269
		Total	5.46	1.185	475
	ATTU3	Lotus Connections	5.42	1.165	206
		SharePoint	5.51	1.19	269
		Total	5.47	1.179	475
	ATTU4	Lotus Connections	5.46	1.048	206
		SharePoint	5.48	1.202	269
		Total	5.47	1.137	475
Intention to Seek	INTU1	Lotus Connections	5.32	1.286	206
		SharePoint	5.51	1.135	269
		Total	5.43	1.205	475
	INTU2	Lotus Connections	5.29	1.243	206
		SharePoint	5.46	1.186	269
		Total	5.39	1.213	475
	INTU3	Lotus Connections	5.38	1.219	206
		SharePoint	5.4	1.179	269
		Total	5.39	1.195	475

Table 5-6 MANOVA Descriptive Statistics for Mean Differences For Tag Creating/Sharing Model

		Tagging System	Mean	Std. Deviation	N
TAG Create/ Sharing	CREAT1	Lotus Connections	5.4	1.012	121
		SharePoint	5.4	1.059	176
		Total	5.4	1.038	297
Attitude to Create/Share Tags	ATTC1	Lotus Connections	5.68	0.896	121
		SharePoint	5.74	1.111	176
		Total	5.71	1.028	297
	ATTC2	Lotus Connections	5.55	0.876	121

		Tagging System	Mean	Std. Deviation	N
		SharePoint	5.49	1.305	176
		Total	5.52	1.148	297
	ATTC3	Lotus Connections	5.68	0.915	121
		SharePoint	5.65	1.053	176
		Total	5.66	0.998	297
Intention To Create/share Tags	INTC1	Lotus Connections	5.45	1.04	121
		SharePoint	5.69	0.931	176
		Total	5.59	0.983	297
	INTC2	Lotus Connections	5.6	0.988	121
		SharePoint	5.78	1.095	176
		Total	5.71	1.055	297
	INTC3	Lotus Connections	5.6	0.98	121
		SharePoint	5.59	1.081	176
		Total	5.59	1.039	297
	INTC4	Lotus Connections	5.64	0.965	121
		SharePoint	5.73	1.113	176
		Total	5.69	1.054	297

Table 5-7 Inter-Item Covariance Matrix for Tag Seeking Sub-Model

Tagging System		Use1	Use2	ATTU1	ATTU2	ATTU3	ATTU4	INTU1	INTU2	INTU3
Lotus Connections	Use1	2.151	1.076	.522	.612	.406	.406	.645	.414	.707
	Use2	1.076	1.638	.588	.801	.524	.653	.785	.550	.767
	ATTU1	.522	.588	1.086	.836	.658	.731	.690	.547	.741
	ATTU2	.612	.801	.836	1.449	.666	.772	.827	.804	.863
	ATTU3	.406	.524	.658	.666	1.357	.709	.685	.853	.756
	ATTU4	.406	.653	.731	.772	.709	1.098	.783	.670	.842
	INTU1	.645	.785	.690	.827	.685	.783	1.653	.804	.784
	INTU2	.414	.550	.547	.804	.853	.670	.804	1.544	.795
	INTU3	.707	.767	.741	.863	.756	.842	.784	.795	1.486
SharePoint	Use1	1.757	.928	.621	.687	.639	.649	.614	.522	.605
	Use2	.928	1.783	.605	.571	.730	.677	.794	.649	.561
	ATTU1	.621	.605	1.346	.859	.873	.890	.867	.951	.821

Tagging System		Use1	Use2	ATTU1	ATTU2	ATTU3	ATTU4	INTU1	INTU2	INTU3
	ATTU2	.687	.571	.859	1.362	.866	.729	.760	.709	.831
	ATTU3	.639	.730	.873	.866	1.415	.844	.962	.884	.859
	ATTU4	.649	.677	.890	.729	.844	1.445	.794	1.013	.964
	INTU1	.614	.794	.867	.760	.962	.794	1.288	.882	.659
	INTU2	.522	.649	.951	.709	.884	1.013	.882	1.406	.837
	INTU3	.605	.561	.821	.831	.859	.964	.659	.837	1.390

Table 5-8 Inter-Item Covariance Matrix Tag Create Sub-Model

Tagging System		CREAT1	ATTC1	ATTC2	ATTC3	ATTC4	INTC1	INTC2	INTC3	INTC4
Lotus Connections	CREAT1	1.025	.529	.523	.579	.738	.496	.554	.604	.459
	ATTC1	.529	.804	.502	.512	.645	.612	.610	.468	.435
	ATTC2	.523	.502	.767	.477	.605	.471	.431	.406	.404
	ATTC3	.579	.512	.477	.837	.662	.587	.602	.493	.451
	ATTC4	.738	.645	.605	.662	1.083	.691	.599	.674	.602
	INTC1	.496	.612	.471	.587	.691	1.083	.649	.582	.560
	INTC2	.554	.610	.431	.602	.599	.649	.976	.551	.422
	INTC3	.604	.468	.406	.493	.674	.582	.551	.960	.497
	INTC4	.459	.435	.404	.451	.602	.560	.422	.497	.931
SharePoint	CREAT1	1.121	.767	.894	.684	.607	.588	.698	.672	.743
	ATTC1	.767	1.234	1.101	.776	.579	.746	.926	.641	.934
	ATTC2	.894	1.101	1.703	.884	.590	.847	1.056	.809	1.067
	ATTC3	.684	.776	.884	1.109	.557	.632	.712	.684	.812
	ATTC4	.607	.579	.590	.557	1.025	.590	.447	.573	.485
	INTC1	.588	.746	.847	.632	.590	.868	.686	.643	.697
	INTC2	.698	.926	1.056	.712	.447	.686	1.199	.591	.872
	INTC3	.672	.641	.809	.684	.573	.643	.591	1.169	.688
	INTC4	.743	.934	1.067	.812	.485	.697	.872	.688	1.239

Another way to check for the difference between groups' means is checking the covariance of different variables in the two different groups. Tables 5-7 and 5-8 show the inter-item covariance matrices of both dependent variables belonging to tag seeking and tag contributing and sharing behavior. For example, in Table 5-7, the covariance between Use1 in the first group is 1.076, which is very close to the covariance of use in the second group, which is .928. This applies to almost all the dependent variables in the study as shown in Tables 5-7 and 5-8. Accordingly, it can be argued that there is homogeneity between the first and second group, which means they can be pooled together into one set of data to test the study's model.

Table 5-9 Multivariate Tests(c) with Wilks' Lambda' Procedure

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power(a)
Tagging Systems	Tag Seek	.976	1.25	9.000	465.00	.263	.024	11.25	.616
	Tag Create	.953	1.78	8.000	288.000	.082	.047	14.2	.759

Table 5-9 shows the scores extracted by applying Wilks' Lambda's Procedure. Wilks' Lambda is a test used in MANOVA to examine whether there are differences between the means of identified groups of subjects on a combination of dependent variables. Further, Wilks' Lambda directly measures the proportion of variance in the combination of dependent variables that is unaccounted for by the independent variables (Everitt, 1991). If the independent variable accounts for a large portion of the effect on the dependent variables, it suggests there is an effect from the grouping variable and that the groups (those who used SharePoint and those who used Lotus Connection) have different mean values. In this case, the two groups should be separated when testing the proposed model through the structural model.

Table 5-9 shows the effect of the independent variable (in this case the tagging tool) on the dependent variables (use1, use2, PEOU1…etc). Recall the null hypothesis for the MANOVA test states two groups are the same, while the alternative hypothesis states that two data sets are different. With regard to the dependent variables of the tag seeking behavior, F value is 1.249 with a non- significant p-value of .263; while the F value scored 1.79 with a non-significant p value of .082 for tag creating behavior. Accordingly, the null hypothesis is supported based on a MANOVA derived and combined seventeen dependent variables. Such findings indicates the two groups of data are similar. Based on results from Partial Eta Squared illustrated in Table5-9, it can be concluded the difference in software use accounted for only .024 percent of the variability in employees' tag seeking behavior, and .047 percent for the employees' tag creating behavior. In other words, the difference between the two groups of data is too insignificant to impose data separation to test the study's model.

Table 5-10 Levene's Test of Equality of Error Variances

	F	df1	df2	Sig.

	F	df1	df2	Sig.
Use1	0.043	1	473	0.835
Use2	0.758	1	473	0.384
ATTU1	0.228	1	473	0.633
ATTU2	0.004	1	473	0.952
ATTU3	0.132	1	473	0.716
ATTU4	0.986	1	473	0.321
INTU1	1.047	1	473	0.307
INTU2	0.029	1	473	0.864
INTU3	0.086	1	473	0.769
CREAT1	0.069	1	295	0.794
ATTC1	3.13	1	295	0.078
ATTC2	6.774	1	295	0.01
ATTC3	1.121	1	295	0.291
ATTC4	3.33	1	295	0.69
INTC1	1.138	1	295	0.287
INTC2	0.071	1	295	0.79
INTC3	2.499	1	295	0.115
INTC4	0.266	1	295	0.606

Table 5-10 shows Levene's test for the null hypothesis that the error variance of the dependent variable is equal across groups. Since the independent variable was tested against the combined 17 dependent variables and no significant difference at the .005 level between the groups was detected, it was decided to test the independent variable against each single dependent variable. According to the above table, the p-values for all the variables are above .05. Hence, the homogeneity assumption is satisfied for all the dependent variables except for ATTC2 whose P-value is .01.

Overall, and based on results from MANOVA, it can be concluded there is no difference in score means of groups who used SharePoint and those who used Lotus Connections. This confirms there was no response bias in data collection. It also confirms the two sets of data produced from these two tagging applications can be pooled together in one set of data to validate the proposed model.

5.5.3 Independent Sample Test

Table 5-11 Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
		Lower	Upper	Lower	Upper	Lower	Upper
Use1	Equal variances assumed	.041	.839	-1.784	477	.075	-.228
	Equal variances not assumed			-1.760	419.260	.079	-.228
ATTC4	Equal variances assumed	3.330	.069	-2.824	301	.005	-.336
	Equal variances not assumed			-2.806	253.909	.005	-.336
INTC1	Equal variances assumed	1.414	.235	-2.277	301	.024	-.259
	Equal variances not assumed			-2.226	239.259	.027	-.259

The above table shows Levene's test for equality of variances and the t-test for mean differences. As shown in Table 5-11, only three variables showed group difference: Use1, ATTC4, and INTC1. Using the equal variances not assumed and the parallel p-value, the level of significant difference of each variable can be estimated. For example, Use1 has a group difference which is significant at the .079 level.

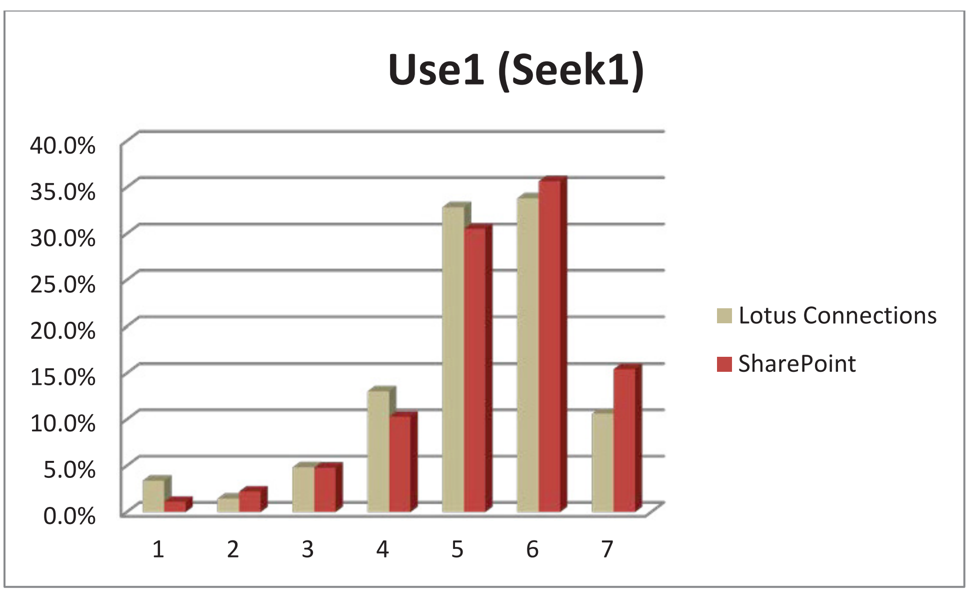

Figure 5-10 Use1 (Seek 1) Comparison

Figure 5-10 shows Use1 has a group difference which is significant at the .079 level. Regardless of the number of users who reported using the two software, the mean of Use1 in the case of SharePoint is slightly larger than Lotus Connections. This may indicate users of SharePoint reflect more usage than those who use Lotus Connections.

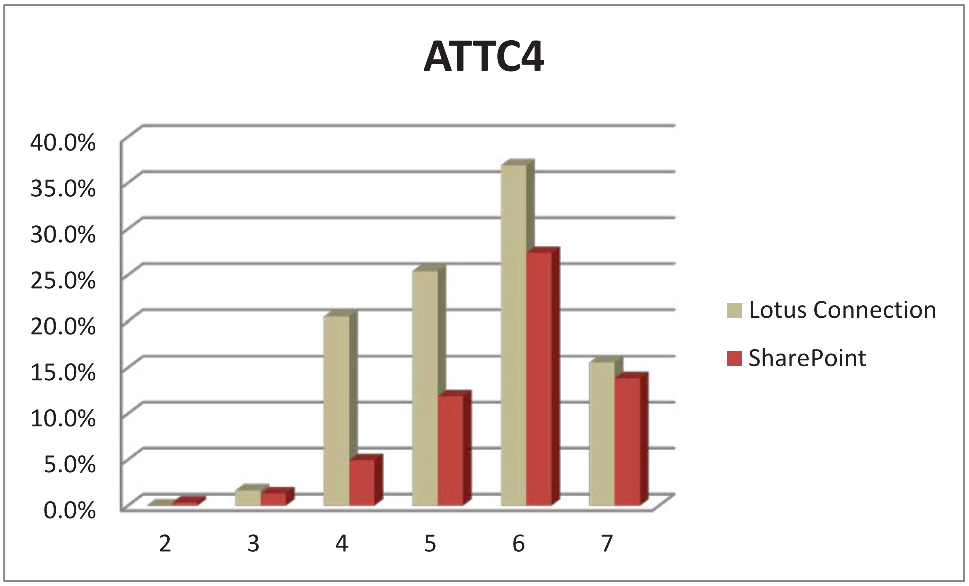

Figure 5-11 Attitude to Create Comparison

Based on Figure 5-11, attitude 4 has a group difference which is significant at the .05 levels. As shown in the graph, attitude to create tag4 has more employees in Lotus Connection than SharePoint in all the rating levels. This may indicate employees' affections lean toward Lotus Connections rather than SharePoint with regard to tag contribution. In other words, Lotus Connection is more enticing for employees to contribute and share tags. This may be due to some features or functionalities that distinguish Lotus Connections from its counterpart SharePoint. Such issue lays the grounds for future research and further discussion.

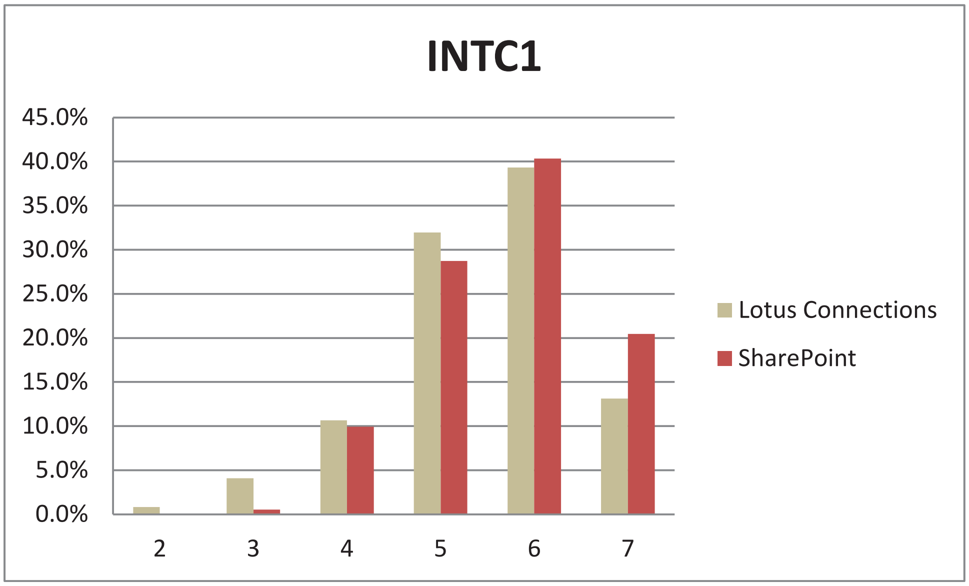

Figure 5-12 Intention to Create Comparison

Intention to create1 has a group difference which is significant at the .027 level as shown in Table 5-11. Figure 5-12 also shows that users' intention to contribute tags to the ESTTs lean toward SharePoint, especially in the higher rating scales. About 20% of users rated SharePoint with 7, while only 12% rated Lotus Connection with 7. Consistent with that, about 41% of users rated SharePoint with 6, while only 38 % rated Lotus Connection with 6. This may suggest SharePoint has an impact in directing users' intention to create and share tags; or it may suggest this particular measure for intention to create tags is problematic and needs to be refined.

5.5.4 User Background

As shown before, the study included 481 employees who used/are using ESTTs in companies A and B. This section describes respondents' background and their use of enterprise tagging tools in detail. Consistent with MIS paper presentation guidelines, data that describe users' context are presented at the beginning of the results section (e.g. . Li et al., 2009; Wasko and Faraj, 2005). Although most of the questions in the survey were required, all the demographic questions (i.e. gender, age, education,etc.) were optional to the survey respondents. However, for all the completed responses that were collected, all respondents answered demographic questions in full. The reason for making demographic questions optional was to decrease the time taken to answer the survey given that employees mostly have limited time during their work hours to answer unrelated work tasks. Further, some employees may feel uncomfortable about such questions and can submit false answers instead. To achieve that, the survey was programmed to allow respondents to leave these questions unanswered. As such, some employees responded to the survey without answering questions related to gender and age as shown in Figures 5-13 and 5-14.

5.5.4.1 Gender

Numerical properties and graphs are likely to be used when presenting descriptive statistics for a given data. Figure 5-13 shows the gender distribution of the survey respondents. Sixty two percent of respondents were male and thirty six were female. The gender findings of this study are consistent with its counterpart in the pilot study that shows most participants were male. A non-parametric test is recommended in cases where the null hypothesis connotes the two categories are equally likely to occur (such as a coin toss) (Howell, 2007). In the current case, the null hypothesis is to have an equal number of male and female. Using SPSS, the binominal test with the parameter P= .05 was conducted, where P is the test proportion of male and female in general. The Z approximation of the test confirmed the statistical significance of population difference where the P-value is significant at the .0001 level.

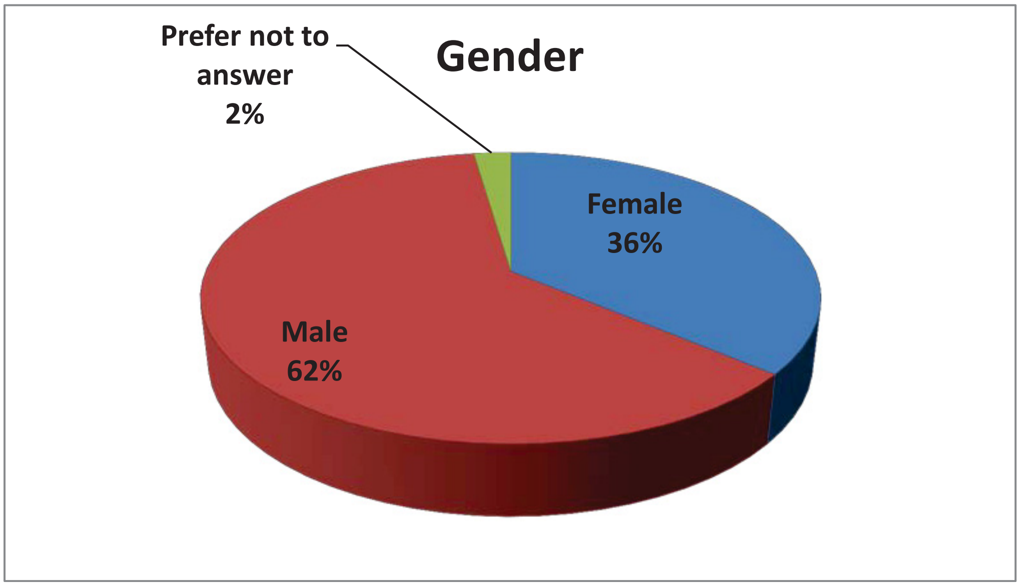

Figure 5-13 Gender Distribution

5.5.4.2 Age

Survey respondents were asked to report their age on a ten-point scale ranging from 18 to over 65 years old with increments of five years. Figure 5-14 shows the age distribution of the survey respondents. The figure demonstrates most respondents were between 21-40 years old with the category of 36-40 as the most dominant age group. Further, the three age categories of 51-64 had the least number of respondents with only 3.5 % of the respondents all together.

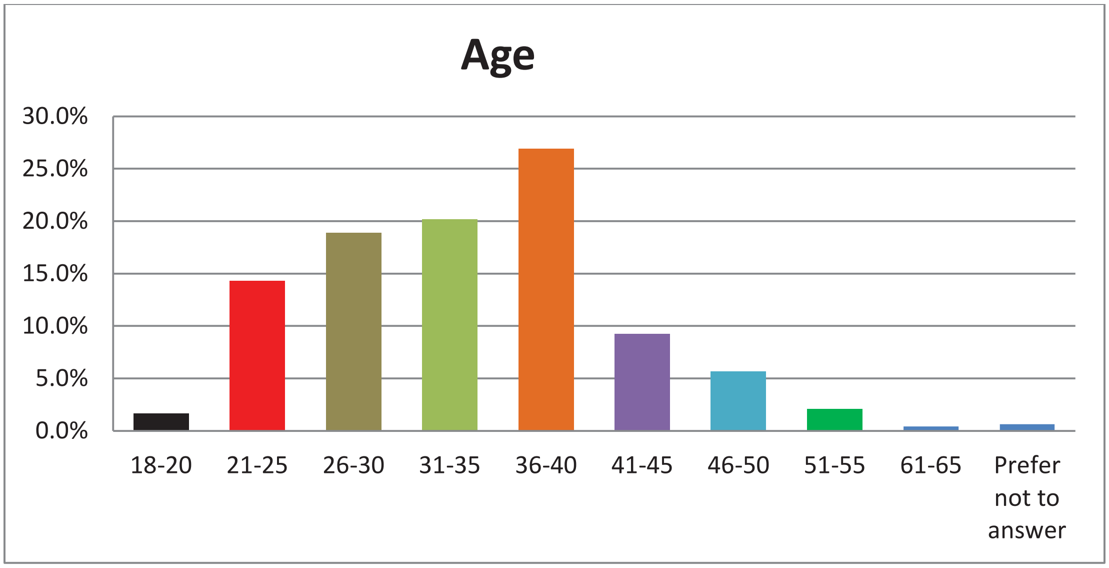

Figure 5-14 Age Demographics

5.5.4.3 Work Unit

Since the respondents come from two large IT companies (named by the researcher as company A and company B), information pertaining to their functional unit was solicited to identify units that have the most use for enterprise social tagging and if this can be associated with the nature of the unit reported. Figure 5-15 demonstrates the survey respondents' job categories. Not surprisingly, most of the respondents come from the information technology area. This can be justified as those employees are more comfortable using new IT applications than other employees belonging to other work units. The management unit had the second highest number of survey respondents with a little above a 20% share.

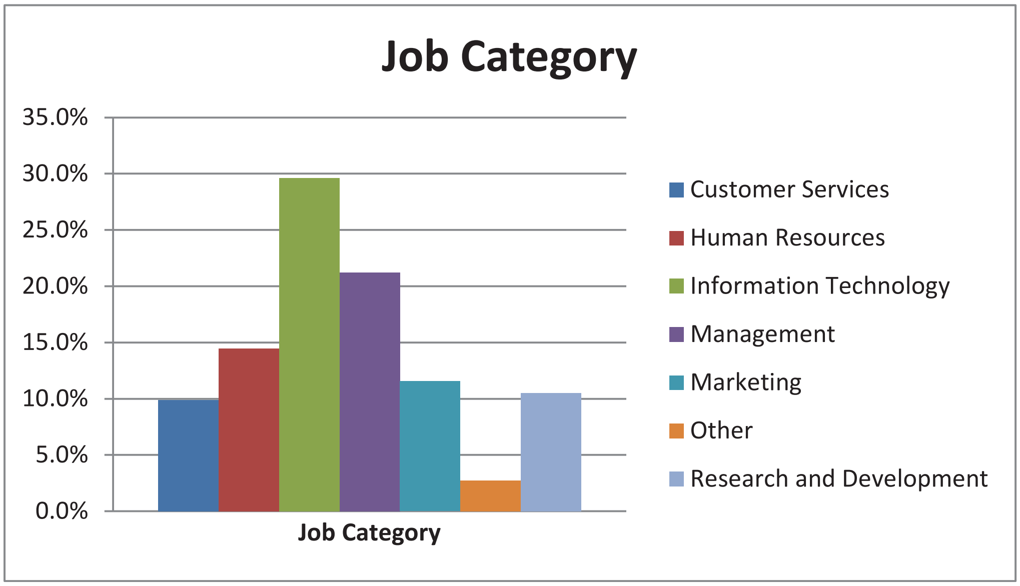

Figure 5-15 Job Categories

Further, the customer service and others categories showed the least number of respondents. Under the *others* category, respondents reported the following work units, which were not listed in the given options of the question:

- Data entry worker
- Computer
- Training
- Maintenance
- Entertainment
- Administration
- Quality control

5.5.4.4 Education

Figure 5-16 shows the education categories reported by the survey respondents. The majority of the respondents were highly educated. As shown in Figure 5-16, 48.5 % had a graduate degree, while about 24% had an undergraduate degree. Only 11 % had a doctorate degree, 5% had a professional degree, and finally, 5% graduated with a college degree.

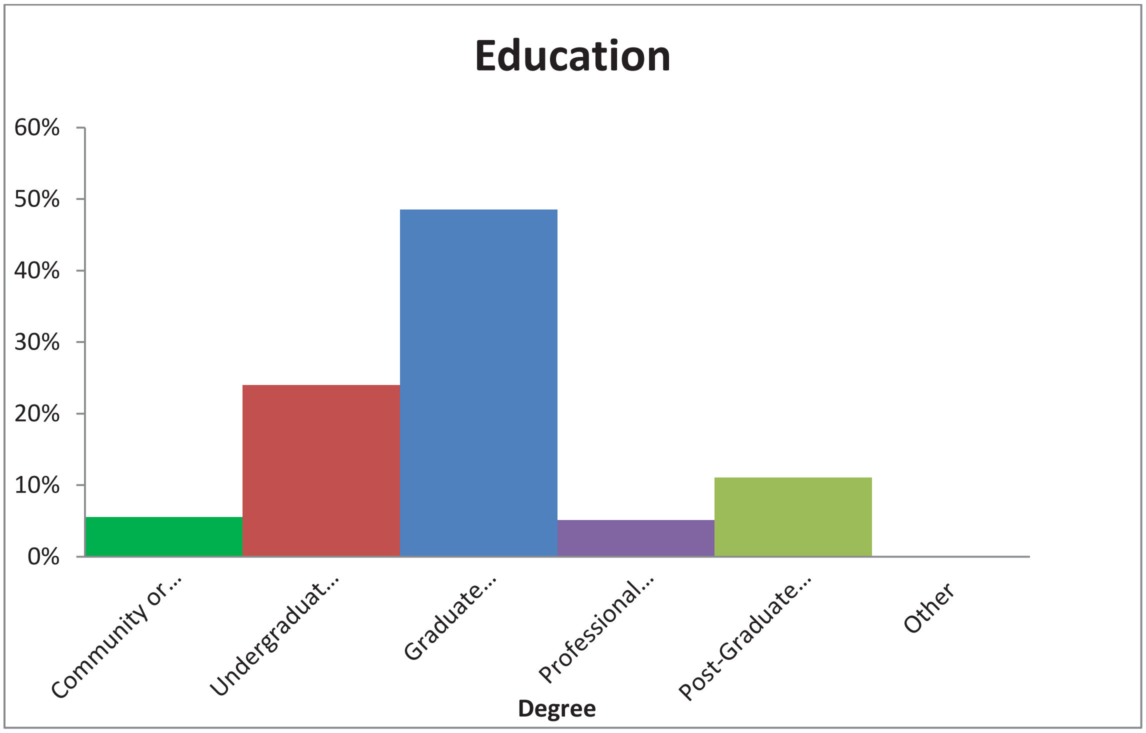

Figure 5-16 Education Distribution

5.5.4.5 Region

Figure 5-17 shows the regions (continents) where the respondents reside. Most respondents come from Asia (46%) and North America (33.4%). This can be justified as the two managers contacted for the survey distribution are located in headquarters in Asia and North America, allowing most respondents to come from those areas. The rest of the respondents resided in South America (11.6%), Europe (8%), and Africa (% 0.8).

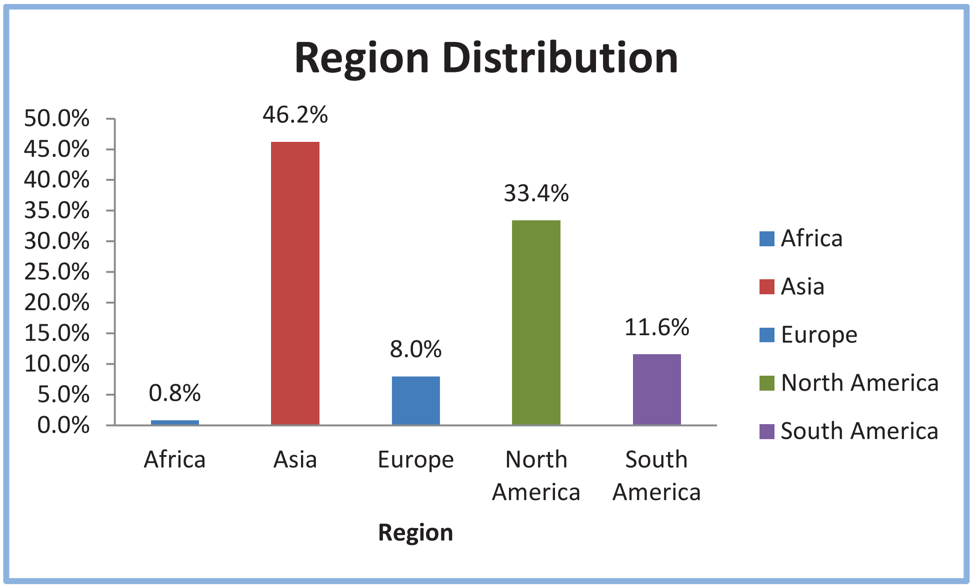

Figure 5-17 Region Demographics

5.5.5 Tagging Actions

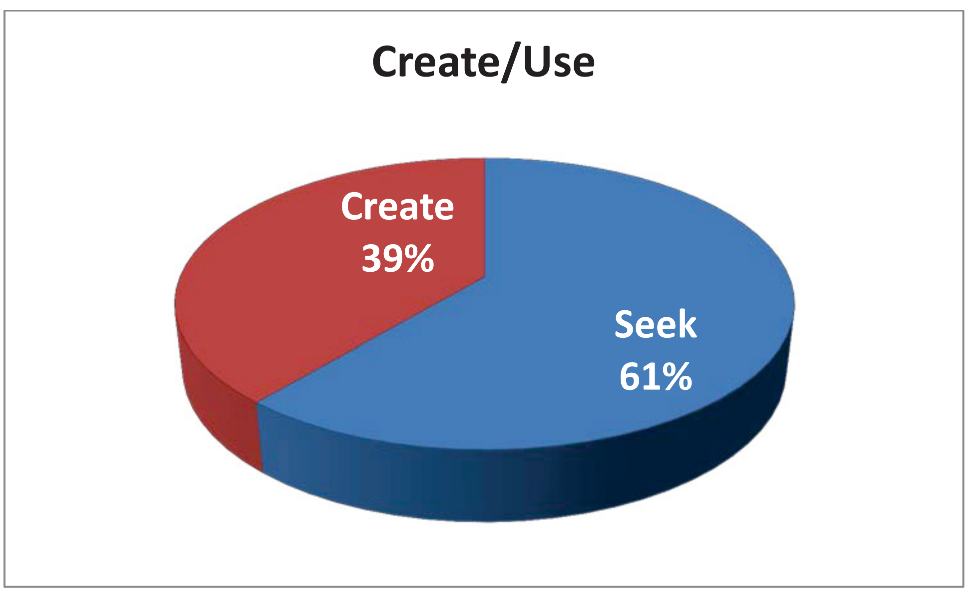

Figure 5-18 Seeker VS. Contributors

Figure 5-18 shows the type of tag use within ESTTs. To classify employees' use of enterprise tagging tools, the following question was asked:

How do you use organizational social tagging/bookmarking tool(s) (e.g. SharePoint, Lotus Connections, LibraryThing,etc.)?

- I use but don't create tags (e.g. searching. clicking pre-existing tags created by others).
- I both use and create tags (e.g. create original tags, re-name existing tags, sort tags, and add tags from the suggested list of tags provided by tagging systems).

Figure 5-18 demonstrates the majority of survey respondents are tag users. 61[5] % of respondents reported using the tagging tools to seek, browse, click on and navigate through tags created by others, while 39% reported creating and sharing tags with other users. The imbalance between tag seeker and tag contributors is consistent with this study's main argument in that it warns against the lack of tagging content in ESTTs that may discourage users from using the tool. In other words, and depending on the number of users, if users are more than creators, this would leave tagging tools with not enough tagging content and, hence, few users. A good example of such rationale is Wikipedia. If users do not find content in Wikipedia, they may abandon using it which may negatively affect its main purpose of being a widespread reference.

Table 5-12 shows the respondents' characteristics according to the type of tools used and the functional units to which they belong. It should be noted users who create tags are automatically seeking tags[6] since one of the main purposes of tagging is allowing users to organize information resources through the tagging tool for easier seeking and future uses. However, those who reported only using the enterprise tagging tool to seek and click on tags do, in fact, seek and browse through others' tags without necessarily being creators based on the two options presented by this study's survey.

[5] Tag users were calculated by adding respondents who only reported seeking tags and those who reported both seeking and creating.

[6] This might be different in cases where employees are dedicated to create tags for organization and categorization purposes for others users to click on and browse through. In such cases, individuals who create tags do not necessarily seek tags.

Table 5-12 Tag Seek/Create Descriptive Statistics

Descriptive Statistics of the Respondents					
Use Type	**Frequency (Freq.)**				
Seek Category					
Seeking	481.00				
Seek and Create	303.00				
Functional Unit					
Unit	**Seek andCreate**		**Seek Only**		**Total**
	Freq.	%	Freq.	%	
Customer Services	26	8.5%	27	15	53
Human Resources	50	16.3%	18	10	68
Information Technology	86	28.1%	55	31	141
Management	82	26.8%	19	11	101
Marketing	35	11.4%	20	11	55
Other	4	1.3%	9	5	13
Research and Development	23	7.5%	27	15	50
Total	306	100%	175	100	481

In addition to respondents' type of tag use, the above table shows a pivot view of the functional units within companies A and B and the number of employees who used ESTTs either for only seeking or seeking and contributing and sharing. This is also visualized in Figure 5-19.

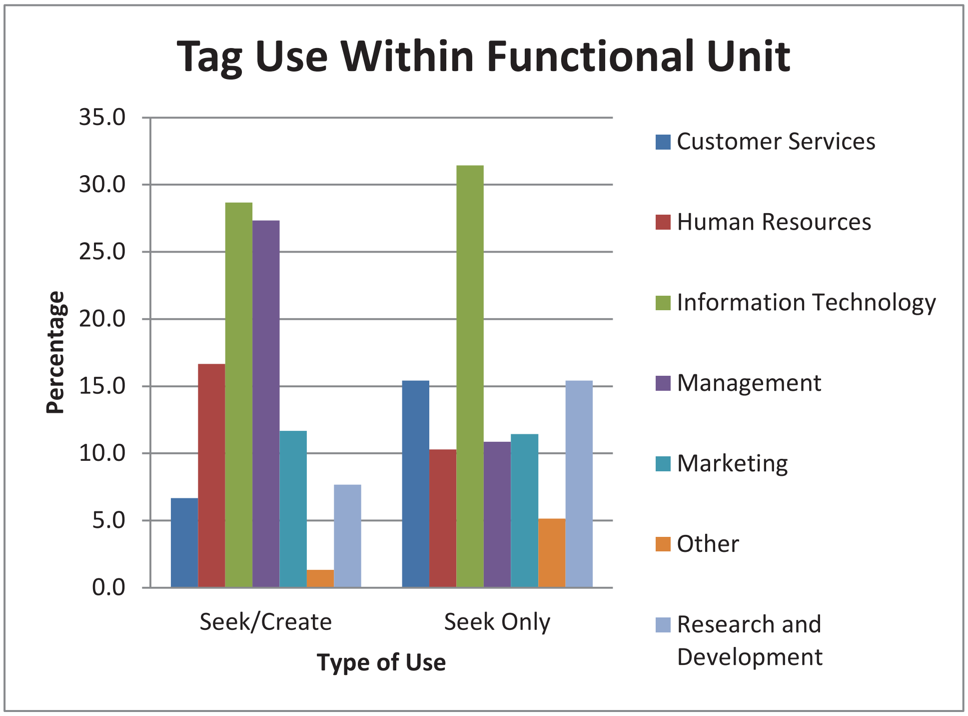

Figure 5-19 Tag Use Type within Functional units

Figure 5-19 shows the number of taggers versus seekers distributed across the different departments in companies A and B. According to the above figure, there is an equal number of tag creators and tag seekers among employees working in the IT area. As indicated before, respondents coming from the IT department are seemingly comfortable using social media applications in general and they not only seek and look for tags, but also add and contribute tags to the tagging tool. Further, employees who are coming from the management department scored the second highest unit in contributing and adding tagging content to the tagging tools. This can be justified as those employees are more aware of the organization and classification features that social tagging tools offer and they are more likely to use them in creating tags to effectively manage their information resource. Further, employees coming from the customer service department are more tag seekers than creators. A possible explanation may be customer service employees tend to do more browsing and looking for resources and they are less interested in creating tags. Moreover, employees belonging to the human resources department tend to do more creating and sharing of tagging activities than seeking[7]. Finally, employees who belong to the research and development department tend to do more browsing and clicking on tags than creating and sharing tags.

5.5.6 Experience with Enterprise Tagging tools

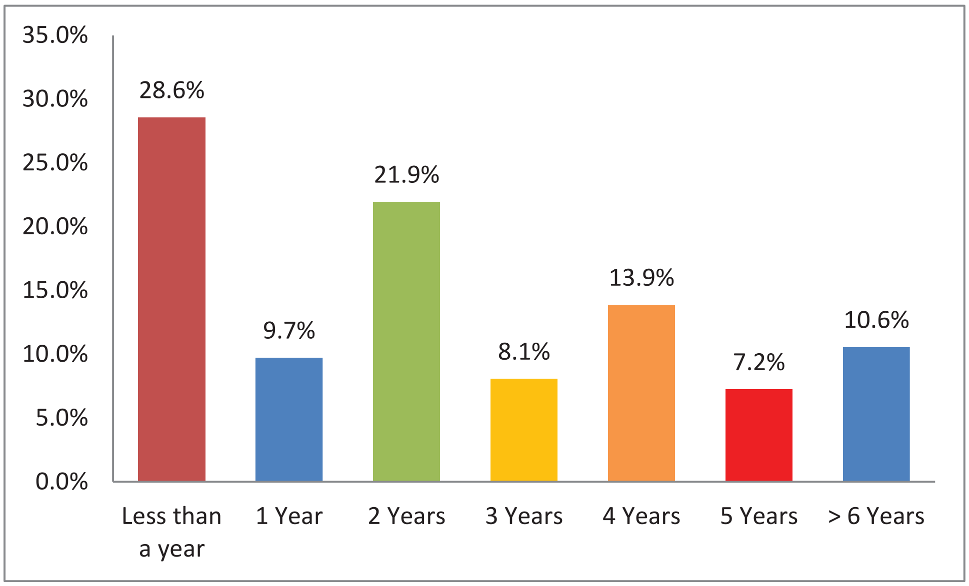

Figure 5-20 Users' Experience Demographics

Figure 5-20 shows respondents' experience in using enterprise social tagging tools. The above figure shows the majority of users had little experience with social tagging applications, but based on their answers to the rest of the survey questions, they still were able to use them through their tag seeking and adding. Such finding can be justified as ESTTs are easy to use and users do not need extensive experience to learn how to use them. As seen in the above figure, 28.6 % of users used enterprise tagging applications for only a year, while close to 22 % used it for two years. Finally, about 14% of respondents reported using these applications for four years.

[7] This only applies to this study and it does not mean all employees who belong to a human resource department create more than they seek tags.

5.6 DEDUCTIVE ANALYSIS

5.6.1 Common Method Bias Assessment

Harman's single-factor test is commonly used to measure the common method bias effect by applying principal component analysis (PCA). This test requires all factors to be entered into principle component analysis and run for unrotated factor solution to evaluate the factors that cause most of the variance on the variables. Generally, evidence of common method bias exists when a general construct is responsible for the majority of the covariance among all constructs. The question that needs to be asked is: does each principal construct explain roughly equal variance (Podsakoff, 2003)?; Or is there only one factor responsible for more than 50% of the variance?

Before running PCA, SPSS was used to run Kaiser-Myer-Olkin (KMO) and Bartlett's test to measure the proportion of common variance in the allocated variables. If KOM is greater than .50, this means the principal component analysis to test common methods bias is applicable. The Bartlett's Test of Sphericity shows whether the correlation matrix is factorable (i.e., are variables interrelated?). If the P-value is significant, this means PCA is acceptable and then Harman's single-factor test is applicable and the data has to undergo a single factor analysis.

Table 5-13 KMO and Bartlett's Test for Tag Seeking Model

Kaiser-Myer-Olkin Measure of Sampling Adequacy	.965
Bartlett's Test of Sphericity	
Approx. Chi-Squre	11032.88
Df	435
Sig.	.000

Table 5-14 KMO and Bartlett's Test for Tag Create/Share Model

Kaiser-Myer-Olkin Measure of Sampling Adequacy	.944
Bartlett's Test of Sphericity	
Approx. Chi-Squre	11242.71
Df	990
Sig.	.000

In Tables 5-13 and 5-14, KOM is above .5 and the p-value is significant at the .000 level. This indicates there is enough variance detected in the data and it is safe to proceed with the CPA.

5.6.2 Principal Component Analysis

The extent of common method bias was assessed using Harman's single-factor test based on recommendations by Podsakoff et al. (2003). PCA is a statistical method used to conduct Harman's single factor test. PCA is based on the notion that if there is a common method variance, there would be: (1) a single factor emerging from the factors analysis; or (2) one general factor will account for the majority of the covariance in the independent and dependent variables Podsakoff *et al.* (2003).

All variables of the study were loaded into a PCA and the unrotated factor solution was examined. With regard to the tag seeking sub-model, four components accounted for 65.4 % of the total variance. The first component (comprised of 28 different variables) was responsible for 31% of the variance explained. The rest of the variance came from the other three components with the following weights respectively: 19%, 8%, and 7%. With regard to the total variance explained for the contributing/sharing sub-model, seven components explained 68.37 % of the total variance of the model. The first component (comprised of 45 variables) was responsible for about 18 %, followed by components 2-7 contributing 15%, 12%, 10%, 7%, and 6 % of the variance. Based on the common variance rule explained before, no significant common method bias was detected in the data and hence, the data analysis can be safely followed with no common methods bias issues.

5.6.3 Using Latent Marker Technique

Although the Harman single factor test showed no significance common method bias effect on the data collected, it was decided to use the unrelated marker construct method recommended by Lindel and Whitney (2011). The latent marker technique is used with PLS based on recommendation by Ylitalo (2009)[8]. This method involves employing a theoretically unrelated construct which is called *marker latent variable* to adjust the correlation among the principal constructs. Any high correlation between the main constructs and the *marker variable* would indicate common method bias.

A factor representing the source of variance due to common method was added to the structural model in both the seeking and creating/sharing sub-models (an example is shown in Figure 5-21). This was achieved by adding an additional latent variable that is unrelated to any of the construct of the study and naming it *Marker Latent Variable*. The latent method factor was set to be correlated only with the dependent variables but uncorrelated with all the other latent variables. The *Marker Latent Variable* had three indicators which were constrained to equal loadings to model generic method variance, thus reflecting the similar effect of the measurement method for each item. With this approach, the latent method factor produced equal, systematic variance in all of the indicators, thus simulating common method variance. After running the model in both tag/seeking and creating sub-models, there was no correlation between the *Marker Latent Variable* and the three main constructs of the structural model. Figure 5-21 shows the structural model of the tag seeking sub-model after adding the *Marker Latent Variable*.

[8] This method is usually used in Covariance-based Structural Equation Modeling (CBSEM), but Ylitalo (2009) designed a new approach to apply the latent marker technique on PLS-based models.

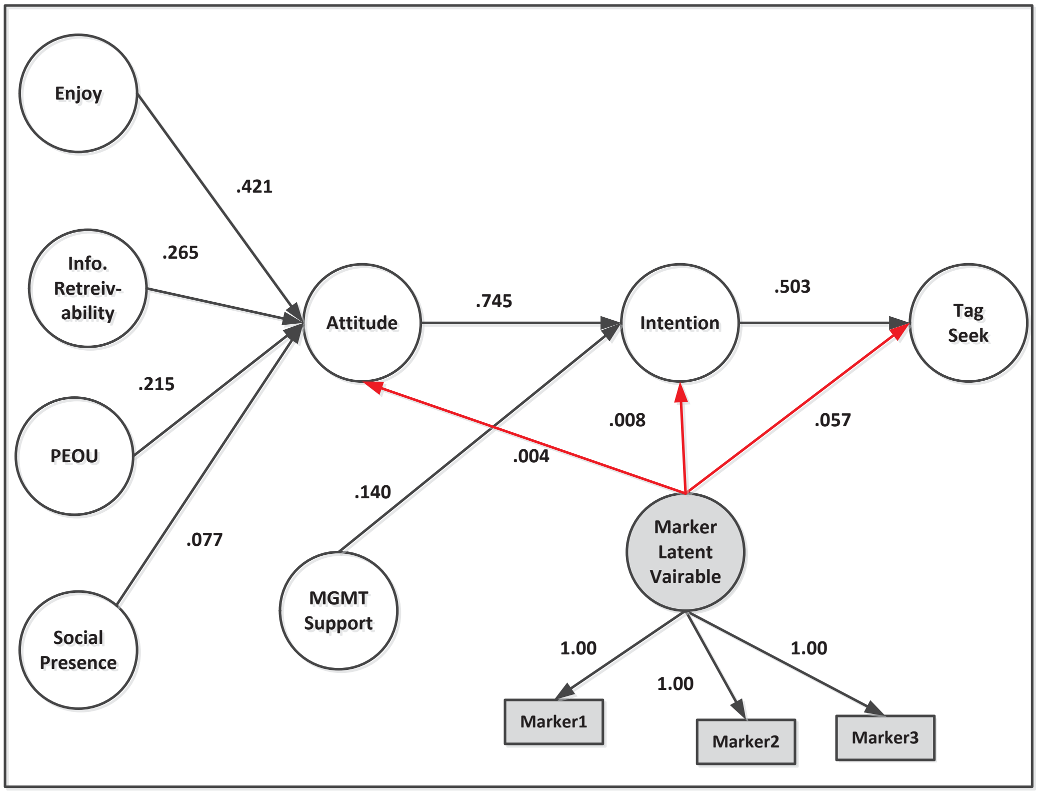

Figure 5-21 Latent marker variable with PLS

As shown in Figure 5-21, the three path coefficients (colored in red) starting from the *Marker Latent Variable* and ending on attitude, intention, and tag seeking, scored significantly low coefficients of .004, .008, and .057. This shows no correlation and hence there is no sign of biased variance in the data collected. Accordingly, there is no bias effect in the model and the model is reliable enough to proceed with the results.

5.7 SOFTWARE TOOLS

There are several software for PLS path modeling: LVPLS (Lohmöller, 1987), PLS-Graph (Chin, 2001), PLS-GUI (Li, 2005), SmartPLS (Ringle, 2005), SPAD PLS Path Modeling and (SPAD, 2009). There are several criteria for choosing a PLS path modeling application such as availability, ease of use, methodological capability, output quality, and statistical accuracy. Temme et al. (2006) have conducted a comprehensive comparison of various PLS software tools and indicated no significant difference in performance. Accordingly, this study uses SmartPLS (Ringle, 2005) since it is available for free and fulfills this study's purpose.

The assessment of the proposed theoretical model followed three steps as described in Figure 5-22. First, the validity of the outer model was estimated by evaluating the construct validity of the outer variables. The next step involved measuring the validity of the inner model by evaluating coefficient determination (R^2), the relationship between endogenous variables, path coefficients, and the model's predictive power. It is only logical to estimate the inner model if the calculated latent variables of the outer model show statistical evidence of sufficient reliability and validity (Henseler et al., 2009).

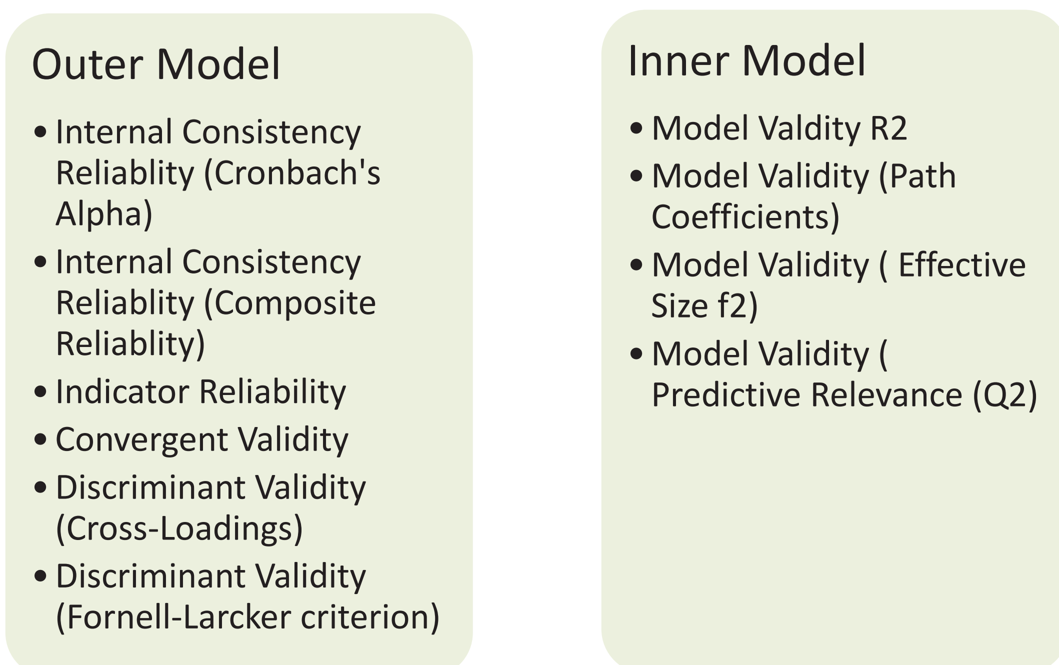

Figure 5-22 Process of PLS Path Model Assessment
(Adapted from Henseler et al., 2009)

5.8 ASSESSMENT OF MEASUREMENT MODELS (OUTER MODEL)

Following the validation guidelines of Straub et al. (2004) and Urbach and Ahlemann (2010), it was decided to test the measurement model with regard to their reliability and validity. As shown in the above figure, to test the construct validity of the outer model, the researcher tested the reliability of the exogenous model through internal consistency, indicator reliability, convergent reliability, and discriminant validity. The following section will cover these validity measures in detail.

5.8.1 Internal Consistency

Two methods were used to assess the internal consistency of the measurement model: the traditional Cronbach's Alpha (CA) (Cronbach, 1951), and composite reliability (Hari et al., 2011; Werts, 1974). Internal consistency that uses CA is aimed at measuring the extent to which manifest variables (indicators) load simultaneously with the loading of their latent construct (Urbach and Ahlemann, 2010). A high CA indicates all indicators of one single construct have the same range and meaning. Alpha values range from 0 to 1, referring to completely unreliable to completely reliable. Proposed threshold value for more advanced stages of research should be around .800 or .900; and for exploratory research should exceed .700 (Nunnally, 1994). Tables 5-15 and 5-16 show the CA values for seeking and creating sub-models. For the seeking sub-model, all the constructs meet the CA threshold for advanced stages of research. With regard to the Tag/Creating sub-model, all constructs scored a completely reliable CA except for the following constructs: reciprocity, and organizational reward/recognition scoring .77, 78, and 77, respectively. In spite of its wide use in IS research, CA is critiqued by its assumption that all indicators have the same reliability. Some research recommended using composite reliability as a replacement for CA (e.g. Hair et al., 2011, and Urbach, 2010).

Hair et al. (2011) indicated composite reliability (CR), the second recommended measure for internal consistency, yields more reliable results than CA because of its statistical nature. CR attempts to offer more reliable internal consistency validity by measuring the sum of latent variable loadings relative to the sum of the factor loadings plus error variance. The resultant value ranges between 0 (unreliable) to 1 (completely reliable). Unlike CA, composite reliability is considered a more reliable measure in two ways: (1) it considers the difference and magnitude of reliability among indicators of the same construct; and (2) it prioritizes items according to their loadings during model estimation. Composite reliability values of .60 and .70 are considered satisfactory in exploratory research, while values of 70 to 90 are considered satisfactory for more advanced stages of research (Hair et al., 2011). According to Tables 5-15 and 5-16, both tag/seeking and tag/contributing sub-models meet the advanced threshold for composite reliability, indicating high reliability of the all the constructs of the model.

Table 5-15 Composite Reliability and Cronbachs Alpha for the Tag Seeking Model

	Composite Reliability	**Cronbachs Alpha**
Enjoyment	0.89	0.82
Attitude	0.90	0.84
Intention	0.86	0.82
Info. Retrievablity	0.92	0.88
Social Presence	0.90	0.83
PEOU	0.90	0.83
MGMT Support	0.92	0.87
Exp.	1.00	1.00

Table 5-16 Composite Reliability and Cronbachs Alphas-Tag contributing /Sharing Model

	Composite Reliability	**Cronbachs Alpha**
Attitude	0.91	0.87
PEOU	0.89	0.82
Altruism	0.9	0.83
Create	0.9	0.85
Intention	0.9	0.86
Pro-Sharing Norm	0.88	0.84
Refindability	0.91	0.88
Social Presence	0.89	0.82
Reciprocity	0.86	0.78

	Composite Reliability	Cronbachs Alpha
Recognition	0.85	0.77
MGMT Support	0.92	0.87

5.8.1.1 Indicator Reliability

Indicator reliability concerns the consistency of a construct in measuring what it intends to measure. Each construct is measured independently from other constructs based on its reflective indicators value. For an indicator to be reliable, its loadings should be higher than .70. Indicators between .4 and .7 should be eliminated, if their deletion would increase the composite reliability of the construct above the suggested threshold value (Hair et al., 2011). However, some voices advocate lower loadings for exploratory research stages. For example, Straub (1989) and Lewis et al. (1995) recommended threshold values of .5 and .45 to be acceptable indicator loadings when it comes to exploratory research design (Urbach and Ahlemann, 2010).

The estimated loadings of the total set of measurement for tag/seek and tag/contribute (or create) and share sub-models are summarized in Tables 5-17 and 5-18. All the items exceeded the cut off value of .70, which demonstrates acceptable indicator reliability. It should be noted the experience construct in both models has a loading value of 1 because it was measured using only one item.

Table 5-17 Estimated Loadings for the Total Set of Measurement Items: Tag/Seeking Sub-Model

Items	Mean	Std. Deviation	Loadings	Error
ATTU1	5.48	1.03	0.86	0.05
ATTU2	5.51	1.05	0.81	0.05
ATTU3	5.51	1.08	0.81	0.05
ATTU4	5.50	1.07	0.82	0.05
ENJ1	5.34	1.11	0.84	0.05
ENJ2	5.45	1.10	0.88	0.05
ENJ3	5.38	1.14	0.85	0.05
Experience/Use	2.55	1.80	1	0.08
INTU1	5.45	1.09	0.82	0.05

Items	Mean	Std. Deviation	Loadings	Error
INTU2	5.43	1.09	0.83	0.05
INTU3	5.42	1.11	0.81	0.05
IR1	5.51	1.15	0.86	0.05
IR2	5.54	1.11	0.87	0.05
IR3	5.54	1.07	0.86	0.05
IR4	5.48	1.22	0.84	0.06
MGMTS1	5.31	1.29	0.88	0.06
MGMTS2	5.36	1.36	0.89	0.06
MGMTS3	5.40	1.20	0.91	0.05
PEOU1	5.43	1.07	0.9	0.05
PEOU2	5.38	1.14	0.83	0.05
PEOU4	5.42	1.08	0.86	0.05
SP1	5.46	1.05	0.85	0.05
SP2	5.33	1.20	0.85	0.05
SP3	5.38	1.16	0.89	0.05
Use1	5.28	1.25	0.8	0.06
Use2	5.06	1.25	0.81	0.06
Use3	4.65	2.07	0.76	0.06

Table 5-18 Estimated Loadings for the Total Set of Measurement Items: Tag Create / Share Sub-Model

Items	Mean	Standard Deviation	Loadings	Standard Error
ATLRUSIM1	5.70	0.97	0.87	0.06
ALTRUISM2	5.56	1.05	0.82	0.06
ALTRUISM3	5.61	0.95	0.89	0.05
ATTC1	5.72	1.02	0.89	0.06
ATTC2	5.54	1.11	0.87	0.06
ATTC3	5.68	0.99	0.85	0.06
ATTC4	5.65	1.03	0.77	0.06
CREAEXP	3.25	1.75	1	0.10
CREAT1	5.42	1.04	0.89	0.06
CREAT2	5.19	1.19	0.82	0.07
CREAT3	5.31	0.91	0.97	0.05
INTC2	5.72	1.05	0.88	0.06
INTC3	5.60	1.04	0.87	0.06
INTC4	5.71	1.05	0.86	0.06
MGMTS1	5.58	1.10	0.89	0.06
MGMTS2	5.63	1.18	0.88	0.07

Items	Mean	Standard Deviation	Loadings	Standard Error
MGMTS3	5.60	1.07	0.91	0.06
PEOU1	5.63	0.94	0.92	0.05
PEOU2	5.61	1.08	0.81	0.06
PEOU3	5.65	0.94	0.85	0.05
PRO-SHAR1	5.61	1.15	0.76	0.07
PRO-SHAR2	5.57	1.08	0.83	0.06
PRO-SHAR3	5.60	1.01	0.84	0.06
PRO-SHAR4	5.48	1.14	0.82	0.07
PRO-SHAR5	5.35	1.26	0.80	0.07
RECP1	5.71	0.94	0.78	0.05
RECP2	5.52	1.08	0.78	0.06
RECEP3	5.50	1.03	0.80	0.06
RECEP4	5.50	1.04	0.77	0.05
RECOG1	5.55	1.08	0.84	0.06
RECOG2	5.52	1.07	0.78	0.06
RECOG3	5.50	1.14	0.80	0.07
RECOG4	5.66	0.96	0.79	0.05
IR1	5.69	1.08	0.87	0.06
IR2	5.70	1.00	0.81	0.06
IR3	5.70	0.99	0.86	0.06
IR4	5.68	1.09	0.87	0.06
SP1	5.69	0.93	0.79	0.05
SP2	5.54	1.10	0.89	0.06
SP3	5.60	1.02	0.89	0.06

5.8.1.2 Convergent Validity

Convergent validity refers to the extent to which each item converges with its own construct compared to other constructs. Proposed by Fornell and Larcker (1981), average variance exacted (AVE) is the method commonly used in measuring convergent validity. An AVE above .50 is considered sufficient and it indicates a latent variable explains more than half of its indicators' variance, demonstrating sufficient convergent validity. Based on the AVE values shown in Tables 5-19 and 5-20, all the constructs of the two sub-models scored higher than .50, demonstrating high convergent validity.

Table 5-19 Average Variance Extracted for Tag/Seeking

Tag/Seeking Sub-Model	
Construct	**AVE**
Enjoyment	0.74
Attitude	0.68
Intention	0.67
Info. Retrievablity	0.74
Social Presence	0.74
PEOU	0.74
MGMT Support	0.80
Mod	.70
Exp.	1.00

Table 5-20 Average Variance Extracted for Tag/Creating

Tag/Create and Share Sub-Model	
Attitude	0.72
PEOU	0.74
Mod	0.69
Altruism	0.74
Create	0.75
Intention	0.7
Pro-Sharing Norm	0.61
Refindability	0.73
Social Presence	0.74
Reciprocity	0.6
Recognition	0.6
MGMT Support	0.8

5.8.1.3 Discriminant Validity

Finally, discriminant validity refers to the extent to which measures for each latent variable differ from their counterparts which are measuring other constructs. In other words, it ensures items of a construct do not measure other constructs unintentionally. There are two methods to assess discriminant validty: (1) Item cross loadings (Chin, 1998b); and (2) Fornell and Larcker criterion (1981).

The first method, item cross loadings, postulates that an indicator's loading with its associated latent construct should be higher than its cross loadings with the rest of the constructs (comparing rows in Table 5-21 or 5-22). Further, each construct loads highest (when comparing columns) with its assigned items. If these two criteria are fulfilled, it can be inferred the indicators of each construct are not interchangeable with other constructs, demonstrating sufficient discrimiant validity (Urbach and Ahlemann, 2010).

Table 5-21 Item Correlations for the Tag/Seeking Sub-Model

	ATTU	ENJ	EXP	INTU	IR	MGM TS	MOD	PEOU	S.P	SEEK
ATTU1	0.86	0.71	0.05	0.68	0.70	0.50	0.50	0.63	0.60	0.36
ATTU2	0.81	0.72	0.13	0.64	0.65	0.51	0.51	0.60	0.63	0.41
ATTU3	0.81	0.63	0.12	0.68	0.63	0.51	0.48	0.59	0.58	0.39
ATTU4	0.82	0.69	0.13	0.73	0.58	0.43	0.56	0.67	0.60	0.38
ENJ1	0.65	0.84	0.15	0.59	0.54	0.50	0.49	0.58	0.56	0.44
ENJ2	0.71	0.88	0.10	0.61	0.61	0.53	0.53	0.63	0.61	0.37
ENJ3	0.76	0.85	0.08	0.68	0.63	0.50	0.53	0.59	0.64	0.40
Exp./Use	0.13	0.13	1.00	0.14	0.20	0.23	0.30	0.27	0.19	0.46
INTU1	0.68	0.61	0.14	0.82	0.62	0.46	0.45	0.54	0.55	0.45
INTU2	0.67	0.57	0.10	0.83	0.57	0.45	0.48	0.53	0.57	0.33
INTU3	0.68	0.62	0.09	0.81	0.64	0.51	0.46	0.56	0.57	0.40
IR1	0.72	0.61	0.19	0.66	0.86	0.55	0.52	0.62	0.68	0.45
IR2	0.65	0.61	0.16	0.63	0.87	0.61	0.45	0.56	0.62	0.43
IR3	0.68	0.61	0.17	0.64	0.86	0.57	0.47	0.55	0.64	0.40
IR4	0.60	0.57	0.16	0.62	0.84	0.57	0.44	0.53	0.62	0.45
MGMTS1	0.54	0.57	0.22	0.49	0.60	0.88	0.48	0.53	0.61	0.38
MGMTS2	0.50	0.48	0.22	0.52	0.60	0.89	0.41	0.45	0.58	0.41
MGMTS3	0.54	0.54	0.18	0.54	0.59	0.91	0.42	0.48	0.60	0.38
PEOU1	0.72	0.64	0.19	0.65	0.65	0.50	0.60	0.90	0.59	0.47
PEOU2	0.59	0.55	0.28	0.53	0.51	0.47	0.55	0.83	0.55	0.43
PEOU3	0.63	0.61	0.25	0.53	0.53	0.45	0.56	0.86	0.55	0.45
SP1	0.59	0.58	0.16	0.51	0.63	0.58	0.51	0.53	0.85	0.39
SP2	0.63	0.61	0.16	0.61	0.66	0.57	0.51	0.56	0.85	0.41
SP3	0.67	0.63	0.16	0.64	0.64	0.59	0.55	0.60	0.89	0.39
Seek1	0.42	0.42	0.30	0.41	0.45	0.36	0.40	0.46	0.38	0.80
Seek2	0.47	0.46	0.29	0.48	0.45	0.38	0.48	0.49	0.43	0.81
Seek3	0.21	0.22	0.50	0.23	0.27	0.28	0.28	0.27	0.26	0.73

Table 5-22 Item Correlations for the Tag/Create Sub-Model

	AlT	ATTC	CREAEXP	Create/ Share	Int.	MGMTS	MOD	PEOU	PRO-SHAR1	RECOG1	REF	SP	RECP
ALTRUISM2	0.87	0.62	0.11	0.50	0.63	0.49	0.45	0.48	0.51	0.53	0.57	0.55	0.67
ALTRUISM3	0.82	0.58	-0.02	0.55	0.55	0.55	0.39	0.48	0.59	0.47	0.53	0.54	0.71
ATLRUSIM1	0.89	0.66	0.06	0.55	0.68	0.49	0.45	0.56	0.52	0.51	0.55	0.56	0.65
ATTC1	0.66	0.89	0.07	0.62	0.80	0.54	0.49	0.62	0.54	0.55	0.67	0.68	0.59
ATTC2	0.64	0.87	0.04	0.61	0.76	0.56	0.50	0.64	0.55	0.63	0.69	0.69	0.58
ATTC3	0.59	0.85	-0.10	0.55	0.73	0.58	0.47	0.57	0.51	0.54	0.64	0.63	0.59
ATTC4	0.53	0.77	-0.18	0.62	0.62	0.55	0.40	0.56	0.58	0.51	0.61	0.62	0.56
CREAEXP	0.06	-0.04	1.00	-0.07	0.07	0.07	0.15	0.09	0.07	0.05	0.01	0.00	0.12
CREAT1	0.57	0.71	-0.16	0.91	0.64	0.56	0.47	0.57	0.51	0.54	0.61	0.64	0.59
CREAT2	0.46	0.43	0.10	0.75	0.44	0.41	0.47	0.50	0.46	0.40	0.49	0.43	0.53
INTC1	0.64	0.76	0.01	0.59	0.88	0.52	0.49	0.56	0.57	0.53	0.64	0.65	0.60
INTC2	0.56	0.75	0.02	0.58	0.87	0.49	0.50	0.58	0.51	0.53	0.62	0.73	0.54
INTC4	0.68	0.74	0.15	0.54	0.86	0.50	0.51	0.63	0.59	0.51	0.61	0.67	0.62
MGMTS1	0.50	0.62	0.03	0.56	0.52	0.89	0.50	0.57	0.64	0.67	0.64	0.62	0.61
MGMTS2	0.54	0.56	0.10	0.50	0.53	0.88	0.35	0.48	0.67	0.70	0.60	0.59	0.59
MGMTS3	0.55	0.58	0.06	0.53	0.50	0.91	0.40	0.45	0.65	0.68	0.61	0.58	0.62
PEOU1	0.55	0.67	0.03	0.64	0.62	0.53	0.65	0.92	0.50	0.55	0.66	0.61	0.57
PEOU2	0.51	0.59	0.11	0.54	0.58	0.46	0.54	0.81	0.51	0.50	0.58	0.57	0.53
PEOU3	0.45	0.55	0.10	0.46	0.54	0.45	0.59	0.85	0.47	0.50	0.61	0.58	0.50
PRO-SHAR1	0.51	0.58	0.11	0.46	0.60	0.54	0.43	0.49	0.76	0.62	0.55	0.56	0.51
PRO-SHAR2	0.48	0.52	-0.04	0.48	0.48	0.63	0.41	0.46	0.83	0.56	0.59	0.57	0.56
PRO-SHAR3	0.52	0.53	-0.06	0.50	0.50	0.61	0.44	0.46	0.84	0.60	0.62	0.56	0.54
PRO-SHAR4	0.51	0.52	0.03	0.47	0.49	0.56	0.37	0.43	0.82	0.56	0.56	0.51	0.51
PRO-SHAR5	0.41	0.31	0.25	0.32	0.39	0.51	0.40	0.39	0.64	0.48	0.43	0.37	0.46
RECOG1	0.52	0.58	0.06	0.50	0.58	0.65	0.43	0.49	0.60	0.84	0.53	0.55	0.55
RECOG2	0.43	0.40	0.12	0.41	0.39	0.60	0.45	0.42	0.53	0.72	0.45	0.47	0.51
RECOG3	0.44	0.55	-0.01	0.44	0.47	0.63	0.42	0.47	0.54	0.80	0.56	0.55	0.51
RECOG4	0.39	0.48	-0.01	0.41	0.38	0.47	0.43	0.49	0.58	0.71	0.52	0.50	0.52
REF1	0.62	0.72	-0.01	0.61	0.69	0.61	0.54	0.63	0.59	0.61	0.87	0.72	0.59
REF2	0.41	0.57	-0.03	0.46	0.48	0.56	0.36	0.49	0.58	0.48	0.81	0.63	0.48
REF3	0.57	0.69	0.04	0.57	0.64	0.62	0.58	0.65	0.62	0.61	0.86	0.70	0.64
REF4	0.56	0.63	0.02	0.59	0.62	0.59	0.54	0.67	0.64	0.58	0.87	0.71	0.58
SP1	0.47	0.60	-0.02	0.59	0.59	0.61	0.49	0.55	0.58	0.52	0.65	0.79	0.59
SP2	0.55	0.69	0.03	0.55	0.73	0.54	0.54	0.60	0.56	0.58	0.71	0.89	0.59
SP3	0.61	0.70	0.00	0.56	0.70	0.57	0.54	0.61	0.58	0.62	0.73	0.89	0.55
RECP1	0.62	0.49	0.05	0.50	0.45	0.54	0.41	0.39	0.53	0.47	0.50	0.49	0.78
RECP2	0.75	0.63	0.17	0.55	0.63	0.48	0.55	0.56	0.52	0.54	0.57	0.53	0.78
RECEP3	0.56	0.50	0.14	0.50	0.51	0.59	0.44	0.43	0.51	0.58	0.50	0.55	0.80
RECEP4	0.44	0.47	-0.01	0.53	0.45	0.51	0.46	0.53	0.49	0.50	0.50	0.49	0.74

Tables 5-21 and 5-22 show the cross-loadings for constructs indicators for both the tag/seeking and tag/create and share sub-models. As shown in the tables above, all indicators of the same construct correlate higher among each other than with other indicators belonging to other constructs. Further, each construct (when looking at the column values) loads highly with its own indicators than with other constructs. This fulfills the first condition for discriminant validity.

The second measure for discriminant validity is Fornell-Larcker's criterion (1981), which postulates that a latent variable is to share more variance with its own indicators than with any other latent variable to be valid. Statistically, the square root of the AVE of each latent variable should be greater when correlated with itself than the levels of correlations involving other constructs.

Table 5-23 Construct Correlations for Tag/Seeking Sub-Model

	Construct	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	Attitude	**.83**								
2	Enjoyment	.80	**.86**							
3	Experience	.13	.13	**1.**						
4	Information Retrievability	.77	.7	.2	**.86**					
5	Intention	.78	.74	.14	.74	**.82**				
6	MGMT Support	.59	.59	.23	.67	.58	**.89**			
7	PEOU	.75	.7	.27	.66	.66	.55	**.86**		
8	Social Presence	.73	.7	.19	.75	.69	.67	.61	**.86**	
9	Tag Seeking	.47	.47	.46	.5	.48	.44	.49	.52	**.78**

Table 5-24 Construct Correlations for Tag/Create/Share Sub-Model

	Construct	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1	Altruism	**.86**											
2	Attitude	.72	**.85**										
3	Create/Share	.62	.71	**.84**									
4	Experience	.6	-.4	-.7	**1.**								
5	Intention	.78	.79	.69	.4	**.88**							
6	MGMT Support	.59	.66	.59	.7	.59	**.89**						
7	PEOU	.59	.71	.64	.9	.66	.56	**.86**					
8	Pro-Sharing Norm	.63	.64	.58	.6	.64	.73	.53	**.78**				
9	Re-Findablity	.64	.77	.66	.1	.73	.69	.6	.72	**.85**			
10	Reciprocity	.75	.69	.67	.12	.7	.68	.61	.62	.66	**.79**		

	Construct	1	2	3	4	5	6	7	8	9	10	11	12
11	Recognition	.58	.66	.57	.5	.61	.71	.56	.6	.73	.67	**.77**	
12	Social Presence	.64	.77	.66	.60	.78	.67	.61	.68	.67	.81	.67	**.86**

Tables 5-23 and 5-24 show the constructs correlation and the square root of AVE for each construct. As shown in the above tables, each square root of AVE (shown in bold face values) is higher than its correlation with any other construct. This fulfills the second condition for discriminant validity.

5.9 ASSESSMENT OF THE STRUCTURAL MODEL (INNER MODEL)

5.9.1 Endogenous Variables Coefficient of Determination

The first step in testing the structural model is assessing the endogenous variables through R^2 values. R^2 reflects the difference of a latent variable's explained variance compared to its total variance (Urbach and Ahlemann, 2010). Tables 5-25 and 5-26 illustrate the structural model for tag seeking and tag create and share sub-models. According to Chin (2008 and 1998b), an R^2 value of .67, .333, or .19 for the affected constructs in the structural model is described as substantial, average, and weak, respectively.

Table 5-25 R Square Significance for Tag/Seeking Sub-Model

Construct	R^2	Significance
Attitude	.77	Substantial
Intention	.7	Substantial
Seek	.26	Weak

Table 5-26 R Square Significance for Tag/Contribute/Share Sub-Model

Construct	R^2	Significance
Attitude	0.77	Substantial
Intention	0.72	Substantial
Create/Share	0.36	Moderate

With regard to the seeking sub-model, the first two endogenous latent variables, attitude and intention to seek, scored substantial R^2 of .77 and .7, while the last endogenous variable, tag seeking, scored a moderate R^2 of .26. It can be concluded that values for attitude, intention, and tag seeking are sufficiently high for the tag seeking sub-model to have a minimal level of explanatory power. With regard to the tag create and share sub-model, both attitude and intention have a substantial R^2 of .73 and .77, while create/share scored a moderate R^2 of .36. It can be concluded that R^2 values for attitude, intention, and tag create/share are sufficiently high for the sub-model to have a minimal level of explanatory power.

5.9.2 Path Coefficients

The next step of the structural model assessment involves the evaluation of the path coefficients among latent variables. Three checks are recommended for assessing path coefficient relationships: algebraic sign, magnitude, and significance. A path coefficient's magnitude shows the strength of the relationship between latent variables. Paths that show contrary signs to the theoretical model do not support the hypotheses of the model. Path coefficients should be significant at least at .05 levels (Urbach and Ahlemann, 2010). To determine the significance of the model, recent studies (e.g. Hair et al., 2011; and Urback et al., 2011) recommend applying re-sampling techniques such as bootstrapping (Efron and Tibshirani, 1993). The bootstrapping approach is used to assess the *t*-values significance.

The path coefficients for both tag seek and tag create and share sub-models are sumarized in Tables 5-27 and 5-28, along with their rspective *t*-values in parentheses. As indicated, this study used bootstrapping procedure to assess the t-value. Based on the recommendation by Hair et al. (2011), 5,000 samples were used with a number of cases equal to the observation of 481 in the tag seeking sub-model, and 303 in case of tag create and share sub-model. The critical *t*-values for a two-tailed test are shown in Tables 5-27 and 5-28.

Table 5-27 T-Value Parameters for the Tag Seeking Sub-Model

Confidence (P-value) N=481	T-Value
.1	1.64
.05	1.96
.01	2.5

Table 5-28 T-Value Parameters for the Tag Creating/Sharing Sub-Model

Confidence (P-value) N=303	T-Value
0.1	1.64
0.05	1.96
0.01	2.6

5.9.2.1 Tag/Seeking Sub-Model

Figure 5-23 shows the structural model for the tag/seeking sub-model with path coefficients and t-values. The significant paths are shown with solid lines, while the insignificant paths are shown as dotted lines. Six out of eight hypotheses were supported by the structural model. Respectively, perceived enjoyment, perceived ease of use, and information retrievablity scored high path coefficients of .42, .216, and .264 with t-values scores of 9.751, 4.564, and 5.328 significant at the .1 level. Management influence scored a path coefficient of .14 with a t-value of 2.0 significant at the .05 level. Further, attitude and intention to use had path coefficients of .745, and .513 with t-values of 23.5 and 14.48 significant at the .1 level. However, social presence had a low path coefficient of.077 with a t-value of 1.34, demonstrating no significant relationships with a conclusion to reject its hypothesis.

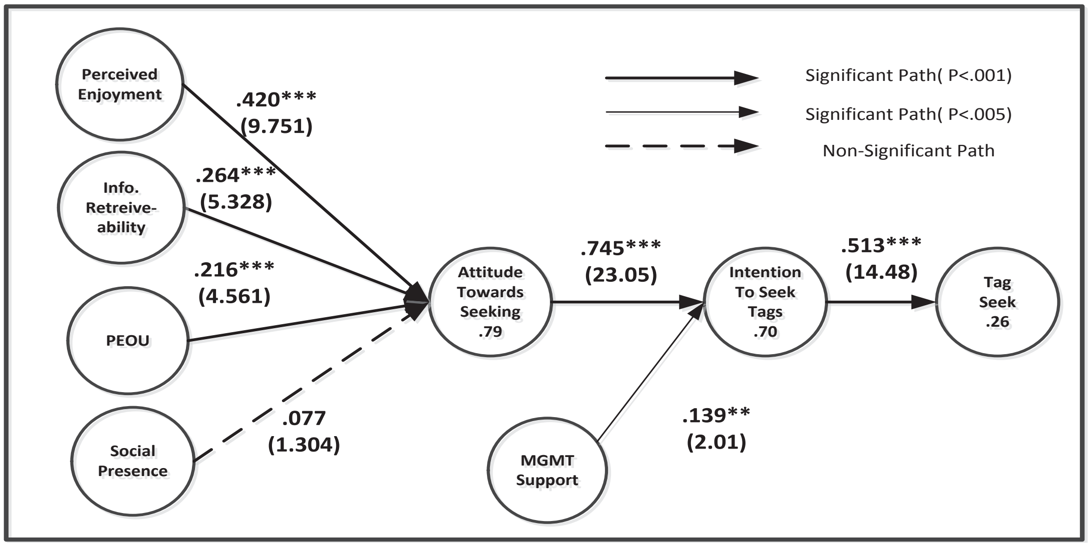

Figure 5-23 Tag/Seek Structural Model

5.9.2.2 Tag/Create and Share Sub-Model

Figure 5-24 shows the structural model for the tag/creating sub-model. As shown in the figure, there are three endogenous variables: attitude, intention to create/share tagging content, and the actual behavior of creating social tags.

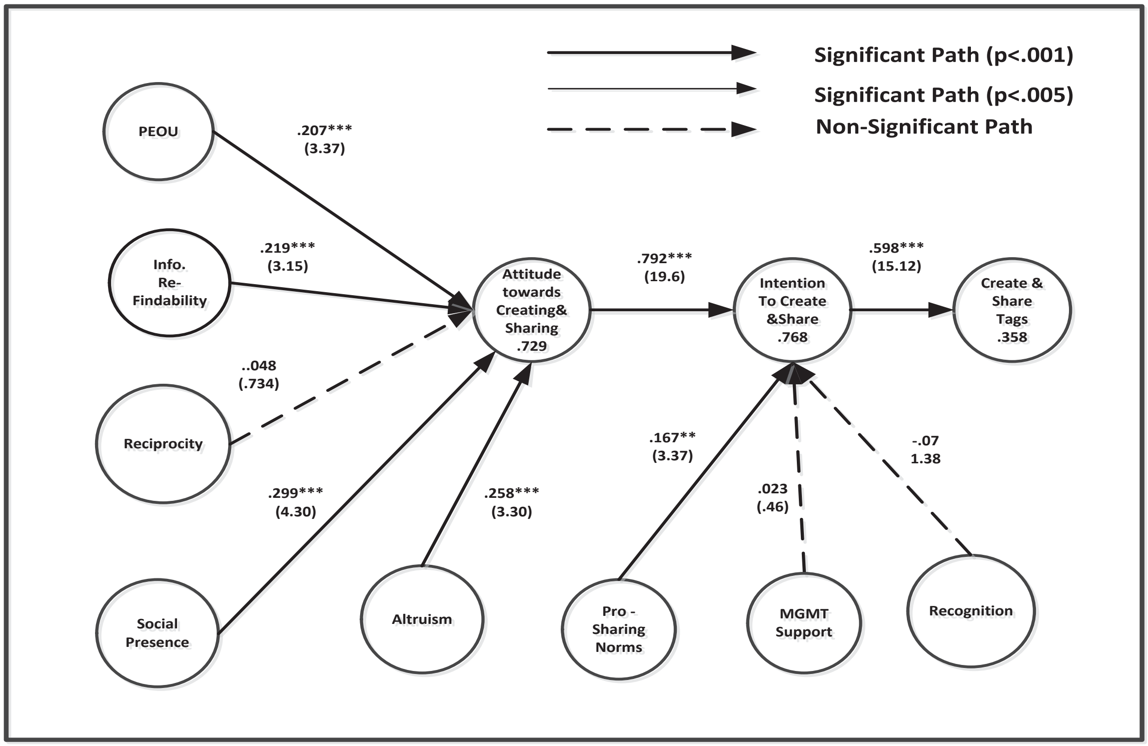

Figure 5-24 Path Coefficients of the Create/Share Sub-Model

According to Figure 5-24, seven out of eleven hypotheses were supported by the structural sub-model. Respectively, social presence, perceived ease of use, information refindability, and altruism scored path coefficients of .299, .207,.219, and .258 with t-values scores of 4.30, 3.37 , 3.15, and 3.30 significant at the .01 level. Further, attitude and intention to create and share had path coefficients of .792, and .598 with t-values of 19.6 and 15.12 significant at the .01 level respectively. Pro-sharing norms scored a moderate path coefficient of .167 with a t-value of 1.97 significant at the .05 level. However, the constructs of reciprocity, recognition, and managerial influence scored low path coefficients of .065, .048, .023, and -.07, respectively, with corresponding low t-values demonstrating no significant relationships with a conclusion to reject their hypotheses.

5.9.3 Testing for Effect Size

Chin (1998) recommended using the effect size (Cohen, 1988) as a measure for the model's predictive power. The effect size explains if an independent latent variable has a substantial impact or a statistical power on a dependent variable (Straub et al., 2004; and Chin, 1998). The effect size is estimated based on the following formula:

$$f^2 = \frac{R^2_{included} - R^2_{excluded}}{1 - R^2_{included}}$$

Figure 5-25 Effect Size Equation

Where f^2 is the effect size of an independent construct, R^2_{included} is the R-square value of a dependent variable when the tested independent variable is included in the model, and R^2_{excluded} is the R-square value of a dependent variable when the independent variable is not included. Values for f^2 between .02 and .15, between .15 and .35, and exceeding .35 indicate an exogenous LV has a small, medium, or large effect on an endogenous LV (Chin,1998b; Cohen, 1988; Gefen, 2000). The following tables show the effect size of significant latent independent variables on the latent dependent variables of the two sub-models.

Table 5-29 Effect Size and Significant of Latent Variables for the Seek Sub-Model

Actual R2= 0.79	**R^2 excluded**	***F^2***	**Effect**
Social Presence	0.78	0.05	small
Enjoyment	0.726	0.36	large
Info. Retrievability	0.74	0.24	medium
PEOU	0.744	0.22	medium

Table 5-30 Effect Size and Significant of Latent Variables for the Create/Share Sub-Model

Actual R2=0.73	**R2 excluded**	**F2**	**Effect**
PEOU	0.714	0.17	small
Re-findability	0.652	0.37	large
Altruism	0.69	0.19	medium
Social Presence	0.7	0.13	small

Tables 5-29 and 5-30 above show enjoyment and information re-findability have large statistical power and significant effect on users' attitude to seek tags and their attitude to create/share tags respectively. In other words, the main reason tag users seek social tags inside organizations is for enjoyment. Further, the main reason taggers contribute and share tags is enhancing their productivity in re-finding their previous information resources. The next factors in their statistical power are PEOU, and altruism. The rest of factors come out small in their effect on employees' attitude to seek and create/share tags. This will be discussed later in the study's findings section.

5.9.4 Testing for Predictive Relevance of the Sub-Model

Henseler et al. (2009) recommended using the blindfolding procedure to test for the model's predictive power. Blindfolding is an approach used to calculate the cross validated R^2 between the measurement model and latent variables. It gives a relatively small standard deviation, which leads to systematic significant parameters (Tenenhaus, 2005). Blindfolding was used to obtain cross-validated redundancy measures for each construct. The relative impact of the predictive relevance can be assessed by the value of q2: values of .02, .15, and .35 reveal a small, medium, or large predictive relevance of a certain latent variable, thus explaining the resulting variance of the endogenous latent variable (Henseler et al., 2009).

As recommended by Hair et al. (2011), a precaution was taken to make sure the number of valid observations is not a multiple integer number of the omission distance *d*. Table 5-31 shows the results of the blindfolding approach. SSE is the sum of squares of prediction errors, and SSO is the sum of squares of observations. Q^2-values above zero shows confirmation the observed values are well reconstructed and the model has predictive relevance (Henseler et al., 2009). The value of d=5 was chosen and the number of observations were 481. The resulting Q^2 values (calculated by dividing 1-SSE/SSO) being larger than zero indicates the exogenous constructs have predictive relevance for the endogenous construct (attitude and intention) (Henseler et al., 2009). In this case, and as shown in Table 5-31, the results are not negative; rather Q^2 is .56 for attitude which is considerably large, and .11, and .19 for, intention and tag seeking. With regard to the tag/create and share sub-model, attitude scored a large Q^2 of .45, while intention scored a small Q^2 of .08. Further, the tag create and share construct scored a medium Q^2 of .15. These Q^2 results indicate a substantial predictive impact from the exogenous constructs on endogenous constructs which fortifies the overall predictive relevance of the two sub-models.

Table 5-31 Q^2 Scores for Predictive Relevance Tag Seeking Model

	SSO	**SSE**	**1-SSE/SSO**	**Significance**
Attitude to seek	339.69	149.46	.56	Large
Intention	254.23	226.87	.11	Small
Seek	187.9	151.51	.13	Small

Table 5-32 Q^2 Scores for Predictive Relevance/Tag Create/Share Model

	SSO	**SSE**	**1-SSE/SSO**	**Significance**
Attitude to Create	199.69	109.45	0.45	large
Create	104.79	88.65	0.15	medium
Intention Create	172.46	159.35	0.08	small

5.10 OPEN-ENDED QUESTION ANALYSIS

In addition to the scaled questions asked to measure users' motivation toward seeking and creating tags, respondents were asked an open-ended question to list any other motivations not mentioned in the survey questions. Respondents were asked to provide an answer to the following open-ended question:

Please indicate other reasons why you create and add tags to the tagging tool(s)?

5.10.1 Altruism and Helping Others

Consistent with one of the study's hypotheses regarding altruism and the enjoyment in helping others, respondents indicated they create tags to help others find useful information resources. The following are the answers that pertain to such a theme. Out of 43 answers, six were consolidated because they reflected the same meaning:

- I try to help other users easily find useful information relevant to their jobs.
- Help to many people.
- For helping other users.
- Help other users to find information.
- Its very helpful to all.
- To let others know about it easily and get information.

5.10.2 Communication

Some respondents indicated they create tags as a means to communicate with others as shown in the following comments:

- To communicate with others.
- It's an easy way for me to communicate the events and what's going on within the organization.

- I like to communicate as well as cooperate with my fellow users.

5.10.3 Make Contacts

Other respondents showed they create tags to make new contacts with others:

- To get more contacts and information.
- To make new contacts.

5.10.4 Efficiency/Findablity

Many respondents indicated they create tags for easier findablity of information resources and for overall efficiency in their daily tasks:

- For my job improvement and social knowledge.
- Improve my job knowledge and social knowledge.
- To make my work, i.e. searching for required information, easier.
- To speed up my browsing activities.
- The main reason for creating short tags is accessing the data I wish to see anywhere in any computer.
- To find things easier.
- To help searching.
- Searching engins [engines].
- For information.
- It saves time.
- Makes job easier.
- Searching the particular subject gets easier .
- Help me do my work.
- To help with information research, and to make it quicker to find what I am looking for.
- It helps me complete my task quickly.
- I like to come back to what I found before.

5.10.5 Enjoyment

Although the theoretical model included enjoyment as a main motivator for employees to use (i.e. clicking, browsing, navigating,etc.) social tags, some respondents indicated they enjoy the act of creating and adding tags.

- For fun.
- For relaxation and tension.
- I enjoy working in these tags.
- I am really enjoying creatinge tags.
- Enjoyment.
- I enjoy it and also it is a part of my duty in my organisation.
- I am really enjoying tags.
- I enjoyed tagging.
- I enjoy doing them.
- It is fun.
- I like it.
- It is interesting and useful.

5.10.6 Memory Aid

Although the thesis claims to have scouted most of the motives for creating tags, respondents indicated new motivational factors that were not found in the previous literature. For example, two respondents indicated they create tags mainly to help them memorize attributes to information resources:

- It keeps typing long very minimal and it's also very easy to remember.
- It helps me to remember.

5.10.7 Organizing Resources

Consistent with the social tagging categorizing feature, some respondents noted they create tags to organize their information resources:

- To be organized.
- Organize my stuff, easy search.
- Organize my resources.
- Organize my memory.
- Organize my docs.
- Document organization and photo tagging.
- Keep my resources categorized.
- Tags are mainly used as identifiers.

5.10.8 Promote Resources

Two respondents indicated they create tags to promote their links or to get others' attention to specific information resources.

- Promote my links.
- Direct attention to some important resources (similar to altruism).

5.10.9 Sharing Resources

Other stated they create tags to share ideas and other information resources.

- To share my ideas.
- Just information sharing.
- Easy to share in this Internet era.

5.10.10 Show Off

Three users indicated they create tags to show off and announce their own idea:

- To get publicity.

- To show off finding good stuff.
- To expose my idea.

5.10.11 Other Motivations

Finally, three users noted they create and add tags to learn from others, get updates on work projects, and for verification purposes.

- Taking good experience by reading others tags.
- In my office, we used to create tags if any new updates came to the project. Other than that we usually tag the valuable source of information to verify here and there while working on a project.

5.11 ANSWERS TO RESEARCH QUESTIONS

The previous section offered a description of the factors motivating employees to seek and contribute tags using ESTTs. That chapter's main objective was demonstrating the research methods, techniques, and instruments that were successfully implemented to empirically investigate employees' acceptance behaviors toward ESTTs. The current section answers the research questions presented earlier in chapter four.

5.11.1 Tag Seeking Sub-Model

This section starts with the Tag Seeking sub-model by testing the proposed hypotheses and discussing the findings. Recall the Tag Seeking sub-model has three main dependent variables: attitude, intention to seek tags, and the actual behavior of tag seeking. Further, the proposed sub-model included the following factors to influence employees' attitude toward seeking tags: social presence, perceived enjoyment, perceived ease of use, and information retrievablity. Moreover, attitude was proposed to have a positive influence on intention, which is in turn positively correlated with the actual tag seeking behavior.

5.11.1.1 The Role of System Characteristics and Beliefs

RQ1: *What is the effect of employees' perceptions of system-related characteristics of enterprise social tagging tools on their attitudes toward tag seeking?*

This question concerns the effect of system characteristics such as social presence, perceived enjoyment, perceived ease of use, and information retrievablity on employees' perceptions of ESTTs. The following hypotheses were proposed:

H1: *Perceived enjoyment will positively affect employees' attitudes toward seeking tags.*

With respect to the role of enjoyment on attitude, H1 was strongly supported. It was theorized that employees' perception of enjoyment features in ESTTs would positively affect their attitudes. Based on the current set of data, employees found ESTTS to be enjoyable and hence, their attitude favored seeking and browsing through tags. In general, intrinsic motivation, manifested in enjoyment, may be the most significant antecedent of attitude toward using IT (Hsu and Lin, 2008). The findings confirmed this notion and showed that employees who find the tool enjoyable they also seek tags. Hence, it can be argued that if employees did not perceive tagging as enjoyable, they are unlikely to seek and browse though them. These results concerning enjoyment are not surprising, especially for social tagging and social media in general, which include rich, social, and collaborative features designed to appeal to millions of users. Such findings also suggest other hedonic factors could affect adoption of social media (Allam et al., 2012 and 2011; Nov et al., 2009; Hsu and Lin, 2008). Examples of such factors are curiosity, explorability, and discoverability. With further study subtleties of the hedonic dimension of enterprise social applications could be distilled.

H2: *Employees' positive perceptions of system's information retrievability will positively affect employees' attitudes toward seeking tags.*

Regarding the influence of ESTTs feature of information retrievablity on employees' attitudes, it was found that employees favor ESTTs if these tools improve the information retrieval process. Accordingly, hypothesis 2 was supported. Although the concept of information retrievability is based on the concept of perceived usefulness associated with the TAM, these results are in line with previous IS studies (Hsu and Lin, 2008; Moon and Kim, 2001) which found perceived usefulness played a critical factor only in work-related environments. Further, these results are in line with the motivation theory which posits that if an individual perceives an activity to be beneficial to achieve valued outcomes, he or she will be more likely to accept the new technology (Liao et al., 2008).

H3a: *Perceived ease of use will positively affect employees' attitudes toward seeking tags.*

Consistent with TAM, it was theorized ease of use will have a positive impact on employees' attitudes toward seeking tags. H3a was supported. Indeed, an easy-to-use application could influence users' preference, while difficulties could be largely responsible for users' resistance. This notion reinforces the general belief that providers of tagging applications should continue to develop tools requiring minimum effort to learn and use.

H5a: *Perceived social presence will positively affect employees' attitudes toward seeking tags.*

Regarding the role of social presence on employees' attitudes to seek social tags, H5 was rejected. As theorized, employees' perceptions of the sociability features in ESTTs may affect their attitudes toward seeking tags. This notion was not supported. It can be concluded that employees' perception of social presence features offered by the ESTTs does not make their attitudes in favor of seeking tags. As shown before, the definition of social presence is: The perception of other person's interaction on the social tagging tool and the consequent implication on an individual's performance and on the interpersonal relationship (adapted from short et al., 1976; Zanbaka et al., 2007). In other words, the social interaction that has taken place while using ESTTs does not affect employees' attitudes to seek tags. This could be justified as the act of seeking or clicking on tags does not stimulate any social feedback (negative or positive) from the social community on the social tagging tools which may either reinforce or discourage the seeking behavior. Further, given that most seeking activities take place anonymously, users' tagging activites are not tracked by others, which negates the power or social presence. Such finding also could indicate social tag seekers may overlook the social presence element in return for their own personal benefit from tags. This will be accounted for when discussing productivity factors in an upcoming hypothesis.

RQ2 *What is the effect of employees' attitudes on their intention to seek tagging content?*

This research question's goal was examining the effect of employees' attitudes on their future tag seeking behaviors. It should be noted the relationship between attitude and intention was confirmed in TAM (Venkatesh et al., 2003; Davis et al., 1989). Accordingly, the following hypothesis is presented:

H4a: *Employees' attitudes toward seeking tags will positively affect their intention to seek tags.*

With respect to the effect of employees' positive attitudes on their future seeking behavior, H4 was strongly supported with a high beta coefficient of .745 and a t-value of 23.05. This is consistent with previous TAM studies, and also consistent with the pilot study. In other words, if employees like the act of tag seeking, they will intend to conduct more seeking and browsing of social tags.

5.11.1.2 The Role of Organizational Context

RQ3: *What is the effect of managerial influence on employees' intentions to seek tagging content on ESTTs?*

H6a: *Perceived managerial influence will affect employees' intentions to seek tags.*

H6a proposes that if managers influence the use of ESTTs, employees are more likely to seek tags. This hypothesis was not supported. It can be argued employees intend to seek tags whether or not it is supported by their managers. These findings contradict previous findings which argued that individuals use IT applications if they are supported by their superiors (e.g. Karahanna and Straub, 1999; and Brzozowski et al., 2009). This can be justified since these previous studies focused on static IT applications within organizations that were not easy and enjoyable to use, which required management influence to motivate users to use them. In comparison, employees may find social media applications easy, useful, and interactive to use without the need from manager to entice employees to use them.

5.11.1.3 The Predictive Power of the Tag Seeking Sub-Model

RQ4*: How appropriate is the proposed theoretical model in explaining employees' tag seeking behavior in ESTTs?*

The goal of this research question is analyzing the relationship between employees' behavioral intentions and the actual tag seeking behavior in ESTTs. This question is important in answering the first part of the study's main research question: What motivates employees to participate (i.e. seek) in ESTTs? If the answer to this question is positive, it can be concluded the thesis is successful in predicting employees' seeking behavior in ESTTs. Accordingly, the following hypothesis was theorized:

H7a: Employees' b*ehavioral intentions to seek tags will positively affect their tag seeking behavior*.

Hypothesis 7a pertains to the impact of employees' behavioral intentions on their actual tag seeking behavior. Unlike the pilot study's findings, this hypothesis was supported with a significant beta coefficient of .513 (p-value < .001) and a moderate R^2 of .26 on the seek construct. This is consistent with previous studies in TAM (e.g. Vankatesh et al, 2003, Moon and Kim, 2003, and He and Wei, 2008) that showed correlation between users intentions and the actual use behavior. It can be concluded the proposed seeking sub-model of this study is successful in predicting employees` seeking behavior.

5.11.2 Tag Contribution and Sharing Sub-Model

This section of the study discusses the second proposed sub-model, Tag Contribution and Sharing, by testing the proposed hypotheses and discussing the findings. As indicated before, the Tag create/share sub-model had three main dependent variables: attitude, intention to create /share tags, and the actual behavior of creating and sharing tags. Further, the proposed sub-model included the following factors to influence employees' attitudes toward creating and sharing tags: social presence, perceived ease of use, re-findablity, reciprocity, and altruism. Besides, three independent variables are theorized to impact employees' intention to create and share tags: pro-sharing norms, recognition, and managerial influence. Lastly, employees' intention was proposed to impact employees' actual behavior of creating and sharing metadata tagging content. This section will discuss the proposed hypotheses and attempt to answer the second part of the study's main question: What motivates employees to participate in ESTTs by contributing and sharing tags?

5.11.2.1 Beliefs and Systems on Tag Create Sub-Model

RQ5: *What is the effect of employees' perceptions of system related characteristics of enterprise social tagging tools on their attitudes toward contributing tags in ESTTs?*

H3b: *Perceived ease-of-use will positively affect employees' attitudes toward contributing and sharing tags.*

Consistent with TAM (Davis, 1989), H3b suggests perceived ease of use will affect employees' preference to create and share tags. H3b was supported with a beta coefficient of .207, which is significant at the .01 level. This suggests perceived ease of use, consistent with the findings of ease of use influence in the tag seeking sub-model, plays an important role in impacting employees` attitudes to add tagging content. If employees find ESTTs easy to use, they are more likely to favor the act of creating and sharing tags.

H5b: *Perceived social presence will positively affect employees' attitudes toward contributing and sharing tags.*

With regard to the role of social presence, H5b was supported with a beta coefficient of .299 which is significant at the .01 level. It should be noted the concept of social presence was a modification of the concept of content generation in the pilot study. It was decided to refine the questions to better reflect the definition of social presence. Contrary to the pilot study's results that showed no statistical significance of the construct of content generation on attitude, the findings of this subsequent study show employees' attitudes are linearly affected by the perception of social presence that the ESTTs offer. This finding might indicate that employees would prefer creating tags if it helps them become more social and if it helps them to connect with others. Accordingly, it can be argued the sociability features in social media tools make employees like and favor these tools. Such finding is consistent with recent studies (Phang et al., 2009, and Nov et al., 2009) that stressed the role of sociability in encouraging users to contribute in online forums. If the concept of social presence showed significance with social tagging, it could very well be true with other social media applications such as YouTube, Facebook, and Twitter, which may justify why such social networking tools attract million of users.

H8: *Employees' positive perceptions of system's information re-findability will positively affect employees' attitudes toward contributing and sharing tags.*

With respect to the role of system features of information re-findablity on employees' attitudes to create and share tagging content, H8 was supported with a beta coefficient of .219, significant at the .001level. This direct relationship between usefulness (manifested in the concept of re-findablity) and attitude suggests that when employees perceive ESTTs are useful in allowing them to re-find previous information resources, they tend to like adding and sharing tags. These results also are in line with previous studies in TAM which argued that perceived usefulness played a critical factor only in work-related environments (e.g. Venkatesh et al., 2003, Wasko and Faraj, 2005).

H10: Reciprocal benefits will positively affect employees' attitudes toward contributing and sharing tags.

Regarding the effect of reciprocity on employees' attitudes, H10 was rejected. Although previous research argued a strong sense of reciprocal benefits influences knowledge sharing in work related communities (e.g. Wasko and Faraj, 2005, and Bock et al, 2005), the current results argue employees may contribute and share tags without expecting reciprocal benefits from others.

H12: Altruism will positively affect employees' intentions to create and share tags.

H12 proposes employees' beliefs of altruism may affect their attitudes to create and share tagging content. This hypothesis was supported with a significant path coefficient of .258 and a t-value of 3.30 significant at the .001 level. Generally, previous studies emphasized the importance of egoistic motives but contrary to expectations, this study showed people actively participated in ESTTs to increase the welfare of others. In other words, people who are adding tagging content did not expect to receive direct rewards; rather, they were motivated intrinsically to contribute knowledge to others because they enjoy helping others.

5.11.2.2 The Role of Attitude on' Intention To Create/Share

RQ6 *What is the effect of employees' attitudes on their intention to contribute and share tagging content?*

H4b: *Employees' attitudes will positively affect their intention to contribute and share tags.*

H4b suggests individuals' attitudes will positively impact their intention to create and share tags through the ESTT. The positive influence of attitude on intention, as confirmed by TAM (Davis et al., 1989) was supported in this study. It is found that employees' attitudes will impact their intentions to contribute and share tagging content. Hypothesis 4b was strongly supported with a beta coefficient of .792 with a t-value of 19.6, which is highly significant at the .001 level.

5.11.2.3 Organizational Role on Intention to Create tags

RQ7: *what is the effect of organizational context on employees' attitudes toward creating and sharing tags?*

H6b: *Perceived managerial influence will affect employees' intentions to create and share tags.*

Based on the final proposed tag create and share sub-model, it was hypothesized that employees' perception of managerial influence will impact their intention to contribute and share tagging content. H6b was not supported. Hence, it can be argued employees' future tag sharing behavior will not be affected by whether managers push for metadata tagging contributions.

H10: *Pro-sharing norm will positively impact employees' intentions to contribute and share tags.*

H10 proposes that pro-sharing norms can positively affect employees' intentions to add and share tagging content. Although the direct relationship between pro-sharing norms and attitude was shown to be weak, this hypothesis was supported with a path coefficient of .167, which is significant at the .05 level. It was found that if companies adopt a culture of collaboration and sharing, it boosted employees' future contribution to the ESTTs. These results are in line with previous studies (e.g. Kankanhalli et al., 2005, Goodman and Darr, 1999) that argued that pro-sharing norms are key factors in employees' knowledge contribution and sharing behavior.

H11: *Organizational recognition will positively affect employee' intentions to contribute and share tags.*

Regarding the influence of organizational recognition on employees' intentions to create metadata tagging content, H11 was not supported. Although previous organizational IS research advocates the power of social recognition and monetary reward on organizational knowledge sharing (e.g. He and Wei, 2009; Kankankalli et al., 2005, Bock et al., 2005), this study's results showed no significant relationships between recognition and employees` future behavior of creating and sharing tags.

5.11.2.4 The Predictive Power of the Tag Create Sub-Model

RQ8*: How appropriate is the proposed theoretical model in explaining employees' tag contribution and sharing behavior in ESTTs?*

The goal of this research question is analyzing the relationship between employees' behavioral intention and actual tag creating and sharing behavior in ESTTs. Accordingly, the following hypothesis was theorized:

H7b: Employees' behavioral intention will positively impact employees' tag creating and sharing behavior.

With regards to H7b, it was found that employees' behavioral intentions have a strong and significant effect on employees' actual tag creating and sharing behavior. The results demonstrate the intention → create relationship is .598 (p-value < 0.001), which supports

H19. This finding is consistent with previous TAM and IS research (Hsu and Lin, 2008; Kim and Moon, 2001; Davis et al., 1998).

5.12 COMPARING TAG SEEKING AND CREATING SUB-MODELS

Table 5-33 summarizes and compares the results of the hypothesis in the tag seeking and tag contributing /sharing sub-models. For the hypotheses related to knowledge seeking and contribution, the results show the factors of perceived usefulness, and perceived ease of use are significant predictors for attitudes to seek and contribute tags (see Table 5-33). Additionally, intention to seek and create tags seems to affect users' actual seeking and contributing behavior. Further, social presence seems to affect users' tag contributing behavior and does not affect their seeking behavior. Lastly, managerial influence seems to affect employees' tag seeking and not tag contributing behavior.

Table 5-33 Results of Hypotheses Testing and a Comparison between Tag Seeking and Contributing and Sharing

Hypotheses	Coefficient		t-value		Outcome	
	Seeking	**Contribution**	**Seeking**	**Contribution**	**Seeking**	**Contribution**
PU →ATT	.26***	.22***	5.32	3.15	Supported	Supported
PEOU→ATT	.22***	.21***	4.56	3.37	Supported	Supported
SP →ATT	.077	.30***	1.30	4.30	Not supported	Supported
ATT →INT	.74***	.79***	23.05	19.6	Supported	Supported
INT → Use	.51***	.59***	14.48	15.12	Supported	Supported
MGMTI→INT	.14**	.023	2.1	.46	Supported	Not supported
PE → ATT	.42***		9.75		Supported	
REC→ ATT		.048		.734		Not supported
ALT → ATT		.26***		3.30		Supported
PSN→INT		.17**		3.37		Supported
REW→INT		.07		1.38		Not Supported

(*P< 0.05; **P<0.01; *** P<0.001)
PU is Perceived Usefulness (in this research the constructs of information retrievability and information Refindability)
PEOU is Perceived Ease of Use; SP is Social Presence; ATT is Attitude to seek/create and share; INT is Intention to seek/create; MGMTI is Management Influence; PE is Perceived Enjoyment; REC is Reciprocity; PSN is Pro-Sharing Norms; and REW is organizational Reward/Recognition

5.13 SUMMARY

This chapter's objective was describing both the process and the data analysis process. The results shown were based on quantitative techniques. First, the chapter illustrated how the study was administered. Second, the data was split and checked for any mean differences that may constrain pooling the two sets of data together. Third, it described the descriptive statistics of users' backgrounds such as their demographic information, general tagging use, and tagging applications used. Fourth, the data was checked against common method bias effect. Fifth, it described a two-stage procedure to verify the proposed model that started with examining the outer measurement model followed by a detailed analysis of the inner relational model. Sixth, the chapter categorized respondents' answers to the open-ended question regarding additional motivational factors for creating and sharing tags. Finally, the chapter outlined research questions presented earlier in chapter four and presented a detailed discussion on users' acceptance and use of enterprise social tagging applications and enterprise media tools in general. Overall, this chapter outlined a comprehensive set of findings. The following chapter discusses the implications of the findings on theory and practice.

CHAPTER 6 CONCLUSION

Chapter six offers a summary of findings pertaining to the motivations for employees' tag and seeking and tag contribution and sharing. Second, the chapter discusses the implications for theory and practice. Lastly, the chapter highlights the limitations of the thesis study, and suggests areas for future research.

6.1 SUMMARY OF FINDINGS

Chapter one presented a general question outlining the study's purpose: What factors impact employees' participation using ESTTs? To answer this question, this study theorized and empirically tested a model of potential factors affecting employees' seeking, contributing and sharing behaviour in ESTTs. The following factors were proposed to affect employees' tag seeking behavior: perceived enjoyment, perceived ease of use, social presence, information retrievability, and attitude and intention to seek tags. With regard to tag contributing and sharing behavior, the following factors were proposed to affect employees' contributing and sharing behavior: social presence, perceived ease of use, information refindability, altruism, pro-sharing norms, organizational reward, managerial influence, and attitude and intention to create and share tags. Data from two large IT companies were collected and analyzed to test the study's hypotheses. The study results demonstrate a strong support for the proposed model regarding employees` motives for participating in ESTTs. The following section provides a summary of the findings followed by implications for theory and practice.

6.1.1 The Role of Personal Productivity

Successful Social Tagging Participation Is Closely Associated with the Personal Benefits Employees Gain from these Tools.

This study's findings show tag seeking and contribution are highly correlated with employees' perception of the tools' usefulness in helping them achieve their daily information retrieval tasks. Specifically, information retrievablity is shown to highly impact employees' tag seeking behavior, while information refindablility is shown to have a significant impact on employees' attitude to contribute and share tags. In other words, users prefer to seek, click on, and browse through their tags because it helps them increase and enhance their personal productivity when retrieving information resources. Such rationale is consistent with previous studies on IS research that stressed the importance of personal productivity in getting users to accept and use IT applications (e.g Phang et al.,2009; Vankatesh et al., 2003). This finding is parallel with the meaning of the construct of information retrievability that was developed specifically to fit the nature of social tagging tools: to accomplish information search tasks more quickly, improve the performance of information search tasks, and enhance the effectiveness of information search tasks. Similarly, employees create and share tags to improve the refindability of information resources. This also is consistent with a function of tagging systems which enable users to find information resources, tag or label them, and re-find them again when needed. Hence it can be concluded users will intend to use ESTTs if they fulfill their functions in allowing users to organize their information resources for future re-findability. Since the two relatively new concepts successfully predicted employees` attitudes to seek and contribute tags, they support an earlier argument made by this study about TAM`s generic concepts of perceived usefulness and the need to identify context-specific benefits of modern applications to reflect their true usefulness. Accordingly, it can be concluded TAM's basic concept of technology adoption still can partially explain users' technology acceptance behavior in the context of ESTTs, provided its concept of personal productivity reflects the actual benefits of tagging tools and not the general definition of usefulness as used in previous IS research. As such, this thesis is one of the first studies (if any) to examine the validity of TAM in ESTTs. Further, it is the first study to offer context specific measures for the concept of perceived usefulness introduced by TAM.

6.1.2 The Role of Ease of Use on Tag Participation

Employees' Use of ESTTs Is Affected By How Easy These Applications Are to Use

In both the pilot study and the actual study, the results show users' perception of the ease of use of the ESTTs impacted their metadata seeking and contributing behavior. This is consistent with previous IS studies that confirmed the significant effect of system ease of use on users' adoption of technology (e.g. Allam et al., 2012, Venkatesh et al., 2003, Davis, 1989). Notably, an easy-to-use interface could influence a user's preference while difficulties can create user resistance. This finding reinforces the general beliefs that ESTTs service providers should continue to add more enhancement to such tools to minimize users' efforts to learn and use them. It should be noted the measures used for perceived ease of use were developed based on previous TAM research. Such measures may be too generic to reflect the true meaning of perceived ease of use when it comes to social media applications, including ESTTs. In other words, there may be a need to use newer and context-based measures that articulate and show more shades of the concept of perceived ease of use to match today's IT sophisticated users and the sophistication of web-base tools. Developing such measures should be worthwhile provided that TAM measures of perceived ease of use were developed in 1989 to fit static applications and may not work as effectively as they did when applied to newer dynamic social media applications.

6.1.3 The Role of Social Presence

Social Presence Is a Major Motivator for Employees' Tagging Contributing and Sharing Behavior

As expected and hypothesized, the social element in social tagging applications (and possibly in social media applications in general) is shown to play a major role in attracting employees to contribute metadata tagging content. Social motivations, manifested in the concept of social presence used in this study, were shown to have the most significant influence on employees' attitude to create and share tags, while it shows non-significant impact on employees' attitude to seek tags. This echoes previous studies that found a strong correlation between the social attributes and individuals' attitudes to create and share knowledge (Bock et al., 2005; and Chiu et al., 2006; Nov et al., 2009 and 2008). The significance of social presence also may suggest employees tend to create and share tags because it connects them with others. Further, such significance could indicate employees tend to contribute tags because they sense there are other employees on the ESTTs who can benefit from their tags and hence they feel they enjoy the act of helping others with their tags. This is consistent with one of the hypotheses of the study proposing a positive influence of altruism on employees' attitudes to create and share tags. Thus this study advances the understanding of how social presence, one of the most prominent features in social media, affects users' attitudes and intentions, and eventually determines users' contributing behavior. Further, this study not only echoes the emphasis of the social aspect reflected in prior studies (e.g. Preece and Shneiderman, 2009; Phang et al., 2009; Krichmar and Preece, 2005; and Preece, 2001), but also quantifies and empirically tests the social aspect in modern IT tools. Further, the study highlights the importance of the social component in knowledge-contribution scenarios in one of the social media applications. Although the social element in social media applications seems to be a logical component in attracting users to use such tools, very few studies examined the true influence of such component using quantified measures. Accordingly, it can be concluded this study is one of the few (if any) to venture and test the influence of social presence in ESTTs using quantitative methods.

6.1.4 The Role of the Hedonic Motivations

Hedonic Aspect Plays an Essential Role in Enticing Employees to Use Enterprise Social Tagging Tools.

Hedonic motivations, as manifested through the construct of perceived enjoyment in the tag seeking sub-model, are shown to be the most significant factors for attitude toward seeking social tags in the enterprise context. The current study's findings echo previous IS research on social media tools (e.g. Hsu and Lin, 2008; and Moon and Kim, 2001; Nov et al., 2009) and show that if users do not perceive social tagging as an enjoyable application, they are unlikely to seek, browse and click on tags. Although this study targeted social tagging users within the organizational context, the hedonic element is more likely to affect other social media applications given that other social media applications seem to be more attractive and enjoyable than social tagging tools. This may explain why social media mega-sites such as YouTube, Facebook, and Twitter attracts millions of users given that they feature a richer multimedia content which could stimulate more fun and enjoyment feelings. These results also suggest other hedonic factors could affect adoption of social media. Examples of such factors are curiosity, explorability, and discoverability. With further study, subtleties of the hedonic dimension of online social applications could be distilled.

6.1.5 The Role of Management on Tag Participation

Managers Play an Important Role in Encouraging Employees to Use Enterprise Social Tagging Tools.

An interesting finding of this study is management influence may exert different effects on employees' tag contribution and seeking behaviors. As will be shown in the literature review, the common argument is management can greatly influence employees' attitudes and intentions so as to promote knowledge seeking and sharing behavior. However, this study's findings show no significant correlation between management influence and employees' intentions to contribute tagging content. Surprisingly, management influence showed moderate effect on employees' intentions to seek tags. Interestingly, although it was not proposed in the study model, management influence had a moderate but direct impact on employees' actual behavior of tag seeking with a path coefficient of .15 and a strong impact on tag contribution with a path coefficient of .29. In other words, employees are more likely to increase their tag contribution when managers support such endeavors whether employees like the act of contributing and sharing or not. The significant impact of the construct of managerial influence on employees' tag contributions suggests management can directly increase employees' participation in ESTTs without the need to go through the traditional process of working on the attitude with the hope to elevate the intention to perform the intended action as indicated in TAM studies (e.g. Davis et al., 1989, Hossain, and Silva, A. d. , 2009). The new direction of users' adoption may suggest these two middle stages of attitude and intention that were heavily researched and used in IS (e.g. Venkatesh et al., 2000 and 2003; Hsu and Liln, 2008; Liao et al., 2008; Igbaria et al., 1994) research can be marginalized with social media technologies that are naturally liked and enjoyed by users. In other words, the traditional stages of users' adoption of technology starting from attitude and intention leading to the actual users' behavior can have a newer route that could possibly eliminate the stages of attitude and intention when it comes to social media applications. This new route may suggest that IS researchers should design modeling factors to directly impact users' actual behavior and may put less focus on what's in between (i.e. attitude followed by intention) to have a more crystallized view of users' actual behavior when plugged into factors directly. A potential elimination of the stages of attitude and intention may question previous studies that dwelled on attitude and intention as two necessary stages of modelling users' IT behavior. The questions now aredoes this hold strong for other social media applications, including YouTube, Twitter, and Flickr? Can this impose a new model that may change the heavily used and researched Technology Acceptance Model (TAM) to Technology Usage Model (TUM) when it comes to explaining social media usage behavior? These questions can open new areas for future research.

6.1.6 The Role of Altruistic Motives

Employees' Tag Contribution and Sharing is Affected by Altruistic Motives

Before discussing altruism as a potential motivator for employees' tag contribution, a definition of reciprocity (which is the opposite of altruism) should be recalled. Reciprocity was defined as the degree to which a person believes he or she could obtain mutual benefits through knowledge and tag sharing (Wasko and Faraj, 2005). Further, altruism was defined as the degree to which a person is willing to increase other people's welfare without expecting returns (Hsu and Lin, 2008). According to the pilot study, reciprocity has no significant influence on employees' metadata knowledge sharing when it comes to online social tagging tools such as Flickr and LibraryThing. It should be noted reciprocity was shown to have an influence on users' sharing behavior in early IS adoption research (e.g. Kankanhalli et al., 2005; Bock et al., 2002). Hence, it can be argued the effect of reciprocity has been weakening with the emergence of modern and untraditional social media applications that aim at nurturing users' intrinsic motives and hedonic instincts. Comparatively, the results of the actual study, using ESTTs, demonstrated altruism had a significant impact on employees' attitudes to contribute and share tags. Such findings suggest employees are motivated intrinsically by their belief in altruism but not extrinsically by expected outcome such as reciprocal benefits, or by organizational reward as will be shown in the coming section. A possible rationale for the insignificance of extrinsic motivations could be that employees (or users in general) exceeded the post adoption stage where intrinsic motivation, such as altruism and enjoyment in helping others, becomes the salient beliefs that drive users' to contribute and share information artifacts with others. Further, the low significance of extrinsic motivation on users' intentions to add tags may indicate users of social media applications are enjoying tagged resources contributed by others and hence, would enjoy sharing their tagged resources with others in return. In other words, information sharing is becoming a norm due to the open concept of social media architecture which encourages and facilitates information sharing. It can also be argued that receiprocity is not anticipated but already received and felt so people want to give back.

6.1.7 The Role of Pro-Sharing Norms

Pro-sharing Norms Attract Employees' Tag Contributing and Sharing Behavior

This study's findings provide moderate support for pro-sharing norms which were found to be significant on employees' metadata knowledge contribution and sharing. Employees tend to do more contribution and sharing when they perceive their work culture encourages contributing and sharing information resources. The significance of pro-sharing norms also may indicate social media applications, including social tagging, may have the social effect of allowing people to contribute when they see their peers contributing and adding tagging content. Facebook is an example of such behavior where friends tend to imitate their peers in adding photos and status updates because they saw their friends doing that. I would call this the social mimicking phenomenon that gets people to replace their unsociable traditions with sociable habits to share what they think is useful with other people.

6.1.8 The Role of Organizational Reward

Organizational Reward is Irrelevant to Employees' Tag Contributing and Sharing Behavior

IS literature experienced a controversy regarding the effect of organizational reward on employees' knowledge contribution and seeking behavior. Previous work has found reward to be a significant determinant of knowledge contribution (see Wang et al., 2009; and Kankanhalli et al., 2005). However, other work has found reward has a negative effect on knowledge-sharing attitudes (see Bock et al., 2005). This study's results show no significant effect from organizational reward on employees' intentions to contribute and share tags. This could be justified as employees use the ESTTs to boost their information retrieval process, which is a reward by itself, rather than waiting for their company to reward them. Such finding also is consistent with this study's earlier findings which showed employees are driven intrinsically to contribute by their salient beliefs of helping others without waiting for an extrinsic reward in the form of expected benefits or rewards from their peers or their organizations.

6.1.9 The Role of the Department Type

Employees' Participation in Enterprise Social Tagging Tools is Affected by the Type of Department to which they belong.

Another interesting finding of this study regarding employees' seeking and contributing behavior is employees' contribution of tags is affected by the type of department they belong to within their organization. For instance, the results of this study showed employees who work in the management department tend to contribute the most tags in comparison to their peers in other departments. This was justified as employees who work in the management department seem to be more aware of the functions and benefits of social tagging tools in organizing information resources for future retrieval and hence they use the tool to manage their resources. It also was found employees in the IT department seem to score the highest in both tag seeking and tag creating equally. This was justified as those employees are information technology savvy and are more aware of the technical functions these ESTTs may bring to make their information retrieval task more effective. Hence, such tools are easy for them to use and help them to discover, explore new information resources, and they prefer to bookmark these resources for a later use.

6.2 FULL MODEL OF THE STUDY

This section's purpose is presenting a grand model summarizings the factors pertaining to employees' participation in ESTTs. The new model triangulates the key findings from the previous dissertation sub-models that were empirically tested. It is believed the model accurately identifies a variety of important factors, and that it may potentially serve as a model for other social media applications. The model also may also serve as a guide for future researchers and practitioners. Figure 6-1 outlines this model.

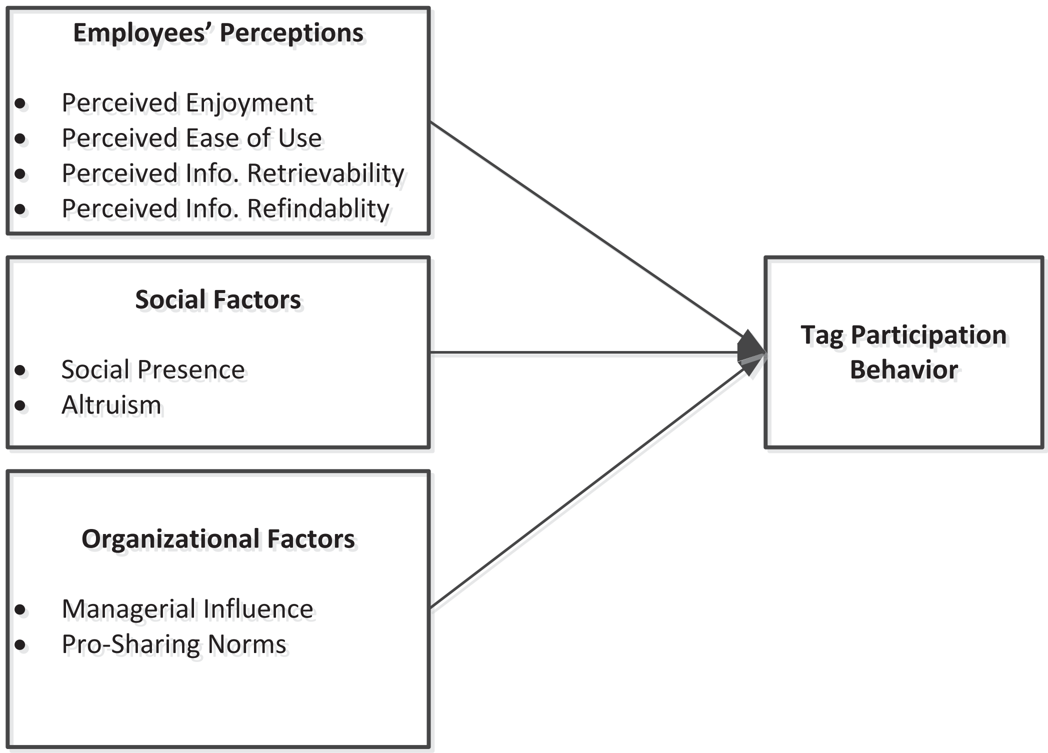

Figure 6-1 A Holistic Validated Model for Factors Impacting Employees' Tag Participating Behavior

The constructs of this model are based on the dissertation sub-models and on the most frequently reported categories provided by respondents in the pilot and the actual study. According to Figure 6-1, three general factors emerged: employees' perceptions, social factors, and organizational factors.

Employees' perception refers to the positive or negative impression of employees about specific characteristics of ESTTs. Employees' perception includes perceived enjoyment, perceived ease of use, perceived information retrievability, and perceived information refindability. As shown in chapter 3, the theoretical model of employees' tag participation in ESTTs was based on factors extracted from IS literature such as perceived enjoyment and perceived ease of use. **Perceived enjoyment** referred to the degree to which the activities of using computer systems are perceived to be enjoyable regardless of the anticipated performance of the system (adapted from Davis, 1992). Users of enterprise social tagging tools, and possibly social media in general, seem to enjoy the act of browsing and clicking through social tags. With regards to **perceived ease of use**, it was defined as the degree to which a person believes using a social tagging tool system would be free of effort (adapted from Davis 1989). **Information retrievability** was defined as the degree to which a person believes using a tagging tool would enhance his/her information retrievability performance (adapted from Davis, 1989), while **information refindability** referred to the degree to which a person believes using a tagging tool would enhance his/her information re-findability of previously found resources (adapted from Davis, 1989). The results of both the pilot and the actual study showed users of ESTTs use such tools to improve their information retrieval and information finding process.

Additionally, the model used social exchange theory and respondents' feedback from the pilot study to extract the construct of altruism and social presence as potential playing factors concerning employees' contributing, and sharing behavior. **Altruism** refers to the degree to which a person is willing to increase other people's welfare without expecting returns (Hsu and Lin, 2008). The newly developed construct of **social presence** was defined as the perception of other persons' interaction on the social tagging tool and the consequent implication on an individual's performance and on the interpersonal relationship (adapted from Short et al., 1976; Zanbaka et al., 2007).

With respect to organizational factors, the factors of pro-sharing norms and managerial influence seem to be influential factors for employees to participate in ESTTs. Recall that **pro-sharing norms** refers to the prevalence of norms intended to facilitate tag sharing in the organization (adapted from Nahapiet and Ghoshal 1998; Orlikowski 1993). **Managerial influence** was defined as the degree to which an employee perceives the management believes he or she should contribute or seek tags via ESTTs (Venkatesh et al., 2003). The results showed employees use ESTTs when mangers motivate them to do so. Further, employees are motivated to contribute and share their tags with others because they enjoy helping others. The following section splits the grand model of social tagging participation into two final grand sub-models representing tag seeking, contributing, and sharing.

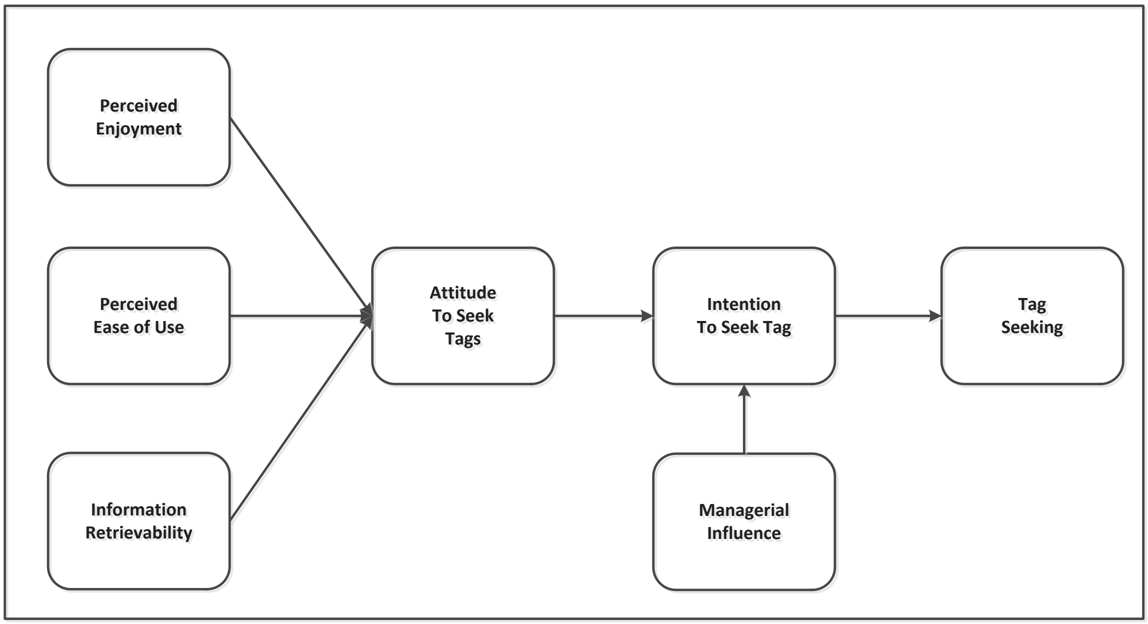

Figure 6-2 Tag Seeking Model

As shown in Figure 6-2, employees are motivated to seek tags because of their perception of enjoyment, the ease of use, and information retrievability they experience through the ESTTs. Additionally, employees intend to seek and use the tool if their managers interfere in motivating them to do so. Both employees' attitudes and intentions to seek tags have a strong impact on employees' actual tag seeking behavior.

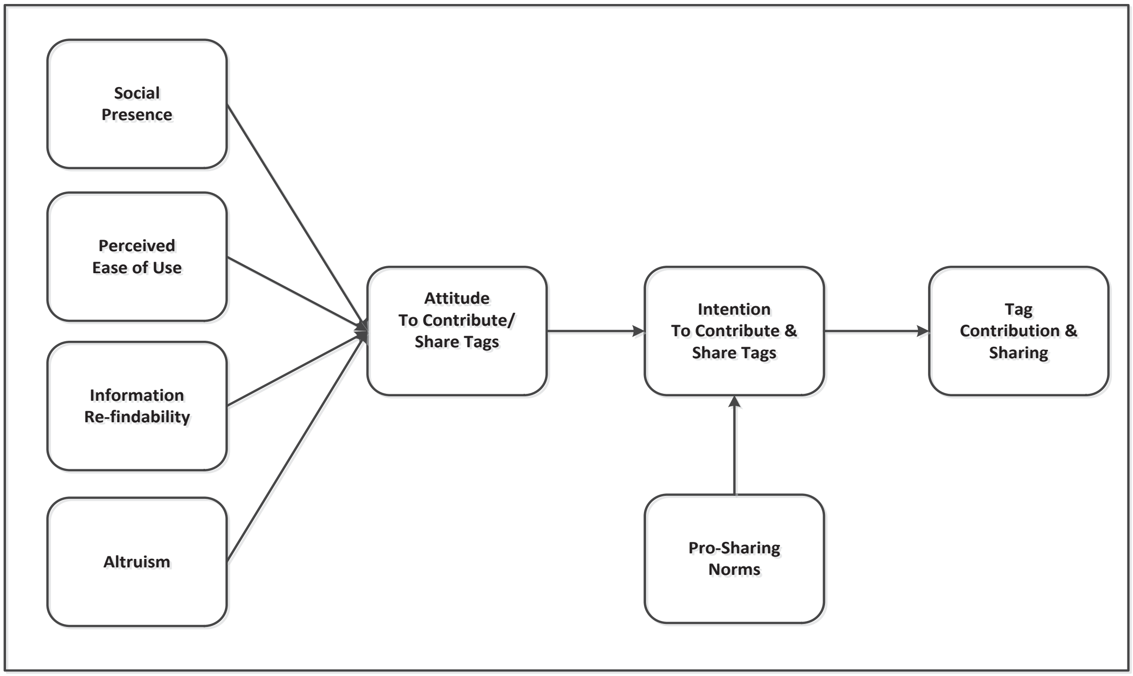

Figure 6-3 Tag Contribute and Share Model

Figure 6-3 shows employees are motivated to contribute and share tags by five factors: perceived ease of use, information re-findability, social presence, altruism, and pro-sharing norm. Further, the actual behavior of contributing and sharing tags is associated with employees' attitudes and intentions to contribute and share tags.

Overall, this study contributes a model of factors impacting employees' motivation to participate in ESTTs. The model serves two purposes. First, it confirms the selections of previously tested factors such as perceived enjoyment and perceived ease of use. Second, it offers some insights on other factors of users' seeking, contributing, and sharing behaviors for ESTTs that may be used in future investigations.

6.3 IMPLICATIONS FOR THEORY

The following section dsicusses the theory implications of the study.

First, this study contributes to existing literature investigating participation in social media tools within the corporate environment. Most of the research done in this area has focused on studying the benefits of social computing tools inside organizations and lacked a theoretical grounding in users' motivation for participation (e.g. Brzozowski, 2009; Chua, 2007; Damianos et al., 2007; Gibson and Teasley, 2006; Rowlands and Hawking, 2008; Smith, 2008; VanDamme, 2008; Warner and Chun, 2009; Cohen and Clemens, 2005). By using common motivational theories and by extracting key factors in knowledge sharing through a thorough literature review, this study theorized and validated a theoretical model of what motivates users to use and add tagging content to ESTTS. Although the study's two sub-models were meant to target ESTTs, the models can be applied to other enterprise collaborative suites such as blogs and wikis.

Second, previous research on IS acceptance behavior has suggested individuals use IS based on a set of identified factors such as perceived enjoyment, perceived ease of use, and perceived usefulness. However, these factors have never been explicitly explored within social tagging and social media in general in the organizational context. This is due to the novelty of social media applications and its new inception in the enterprise environment. This study claims to be among the pioneer studies in exploring IT adoption factors in one instance of social media applications, namely enterprise social tagging tools.

Third, research in knowledge contribution and sharing, although it is considerably abundant, may partially fit the social media applications which are distinguished by their interactive nature that accentuates layers of sociability and hedonism attracting users to use them, demanding a set of more fitting factors (Allam et al., 2012). This study claims to be among few studies that explore and validate an assorted combination of relatively new factors that fit the nature of ESTTs and explain employees' tag participating and sharing behaviors. These factors are social presence, information retrievability, and information re-findability. Such findings could lead to an intuitive rationale. Tthat is, if these factors showed positive influence on employees' tag contributing and sharing behaviors using ESTTs, they possibly could be positive on other enterprise social media applications such as wikis, blogs, and mashups. A validation of these factors on other social media applications can help improve the productivity of these applications in the enterprise context.

Fourth, this study describes a belief-based overview to understand how employees are driven to seek, contribute and share metadata tagging knowledge in ESTTs. By adapting a social media acceptance model as a theoretical framework, this study develops a comprehensive belief view and examines whether the factors used in Technology Acceptance Model (TAM) are still sustainable in social media adoption. Each factor that was proposed to affect employees' beliefs was explored with regards to its magnitude and significance in affecting employees' participating behavior in ESTTs. Identifying and evaluating the importance of such factors could be vital in designing an organizational internal KM and social media strategy and implementing a healthy system of contributions and collaboration.

Fifth, this study is the first of its kind to develop and empirically validate a theoretical model for employees' behavior in two distinct but interrelated facets of knowledge contribution in one single study: metadata tag knowledge seeking and contribution. Particularly, the study uses a theoretical foundation from theories such as theory of planned behavior (TPB), theory of reasoned actions (TRA), technology acceptance model (TAM), social exchange theory, and social capital theory to theorize a set of beliefs and examine their impact on users' seeking and contribution behavior in enterprise social media context. This study's findings challenged some previous beliefs of the positive influence of reciprocal benefits and management influence on motivating employees to increase their knowledge contribution in organizations' repositories (see Bock et al., 2005; Kankanhalli et al., 2005; Wasko and Faraj, 2005).

Sixth, since this study extensively reviewed IS research on technology acceptance and on social media knowledge seeking and contribution, it adds more grounding and support, as well as further refining of the topic of IS participation in the enterprise social media context. However, enterprise social media is a new phenomenon that requires more investigations and validation to determine the gereralizability of findings.

Seventh, this study is uniquely proposing and empirically validating new shades and layers of IT usefulness that accentuate the real benefit of social tagging applications, and possibly for social media in general. Most IS research dealt with the concept of usefulness from a general perspective that put all IT applications on one equal level of usefulness without looking at the contextual differences among such applications (e.g. Davis, 1989; Davis et al., 1998; Fang et al., 2006; Bagoozi, 2007). To offer more context-specific users' benefits, this study contextualized the concept of perceived usefulness from the standpoint of social tagging application in that it focused on the main functions that make people use such tools. Particularly, the research proposed and validated fresh constructs tailored to social tagging, namely, information retrievablity and information re-findablity. According to this study, information retreivablity refers to the degree to which a person believes using a tagging tool would enhance his/her information retrievability performance (adapted from Davis, 1989); whereas information re-findablity refers to the degree to which a person believes using a tagging tool would enhance the refindability of his/her previously found resources (adapted from Davis, 1989). The success of the new concepts of information retrievability and information refindability could open the door for using different layers of usefulness to match the real benefits of specific applications whether they are dynamic or static. Further, the significance of the multi-layered perceived usefulness identified by this study could entice IS researchers to venture into giving the good old TAM a new facelift procedure, updating its traditional concepts (e.g. perceived ease of use, perceived usefulness, attitude, and intention to use) with newer and more up-to-date constructs and measures to fit modern and complex media applications. More up-to-date measures can help TAM sustain its predictive power in explaining users' adoption of technology especially when planning on using TAM to explain users' adoption behavior in newer, faster, and more interactive social media applications.

Finally, this study is among a few studies to venture in quantifying the concept of sociability which was manifested through the concept of social presence. Previous studies suggested including the element of sociability as a major factor in knowledge contributing and sharing tools but without empirical evidence of the significance of sociability (e.g. Preece and Shneiderman, 2009; Preece , 2000). Using the definition of social presence from previous studies, the current study developed new measures that were refined through multiple content validity stages. Finally, the measures were empirically validated through a large study of 481 employees in two different IT companies. The new measures can be used to assess the concepts of sociability in other enterprise social media applications such as enterprise blogs and wikis.

6.4 IMPLICATIONS FOR PRACTICE

First, intrinsic motivation, represented in the concept of perceived enjoyment, was shown to be the most significant factor affecting employees' attitudes to seek tags. Hedonic components can be embedded in browsing tools to help increase employees' work knowledge base. For example, increasing employees' search productivity can be enhanced if their search behavior is guided systematically to serve the company's strategic objectives. Suggested tools could be custom-made browsers for different business domains that would encourage employees to explore more work-related information that eventually could increase employees' work knowledge base and overall productivity of information search. Moreover, managers can push for more use of goal-oriented systems by offering more entertaining and fun-to-use features that attract users. For example, avatar-like tools and virtual training applications, aiming at stimulating feelings of pleasure and enjoyment, can be designed in such a way that motivate employees to train on certain skills needed for work-related tasks.

Second, the results call for more attention to be paid to individuals` productivity (personal and work productivity) of tagging applications to entice users to add more tagging content. Thus, collecting, displaying, and updating tagging content are critical activites for encouraging viewing tagging activities among community members. This also suggests the need to educate users on the benefits of online tagging tools, including increased productivity in retrieving information resources, which can help increase employees' personal productivity in achieving their daily information tasks especially of these tags are relevant to their peers' target information pursuits.

Third, the findings underscore the importance of ease of use as an influential factor in determining users' attitudes toward seeking and creating metadata tagging knowledge to the tagging systems. This suggests managers of enterprise tagging tools should focus on maintaining a user friendly application to encourage taggers to add and share content, especially for new users who are not familiar with tagging features. Further, organizations should focus on offering courses and training sessions to their employees to help them be more comfortable using social applications which can be interpreted into more use and more collaboration.

Fourth, since the results showed employees are driven to contribute tagging content by their belief in altruism, management can work on stimulating the feelings of enjoyment that contributors perceive when helping others through their tags. This can be achieved through connecting knowledge contributors to knowledge recipients with a chance to express their appreciation for the tagged resources being shared. Such connections can be done through adopting positive feedback systems by which recipients can leave positive messages to the tagger that could increase their feelings of enjoyment in helping others and hence reinforce more contributing behavior.

Fifth, while reward and recognition do not seem to stimulate employees' metadata contributions in ESTTs, pro-sharing norms were shown as a potential player in motivating employees to create and share tagging content. Management can work on adopting a culture of contributing and sharing among their employees through open office space to help employees help each other on work-related tasks. Another approach to adopt a pro-sharing culture is encouraging employees to transfer across departments to help promote sharing norms. Finally, management can take advantage of the attractiveness of YouTube to show role model video segments of ideal work environments that promote the concept of pro-sharing norms.

Sixth, according to the study's findings, social presence has the highest influence on employees' attitudes to create and share tags. Interestingly, the power of social presence exceeds the power of traditionally established TAM concepts of perceived ease of use and perceived usefulness. As such, employees prefer to contribute tags mainly because of the presence of other employees on the ESTTs. In other words, if there is no audience to sing for (i.e., to add tags for), the tag contributors will lose interest in contributing tags to information resources. It also could refer to those users who would add tags if they feel their tags are useful to other users, which could work as a self-reinforcing factor to add more tags. The finding also suggests management should make sure the tagging tools have enough employees' presence to entice contributors to create and share more tags to benefit other employees and entice them to find tagged resources. This can be done by holding live events and training courses on the ESTTs features to gather enough employees to discover the tools and explore their benefits. Inviting enough crowds of employees to use ESTTs would add more activities to the tagging tools and help motivate tag contributors to add more tags to information resources. Further, to encourage taggers to add tags to information resources, ESTTs' tech staff can add rating systems of tags that get used by the most number of people. For example, a "like" feature could be checked for tags that attract the most employees. Such rating approaches can work as a rewarding procedure that encourages taggers to add more tags. Additionally, developers of social tagging tools can enhance the social presence elements by transferring ESTTs to social features. Social features refer to applications that enable users to create profiles, social connections and memberships within communities, and allow for user-generated content (Lyons, Lessard and Marks, 2011). Such features can encourage users to increase their time on ESTTs, which can be interpreted in more seeking, contributing, and sharing activities.

6.5 LIMITATIONS AND FUTURE RESEARCH

As with most studies, limitations need to be addressed in future studies. First, the data was collected from two IT companies to rule out any unnecessary bias effect that may exist when relying on one set of data from one company. However, external validity of the results cannot be generalized to most companies that use ESTTs. This study's model needs to undergo further testing and verifications in more companies. Further, the two companies used in this study are IT-oriented which may reflect higher tag usage and adding patterns compared to non-IT oriented companies. More companies with different business models are needed to thoroughly test and validate the study's model. Additionally, the study's model was tested on two IT companies in the private sector. It would be worthwhile to test the study's model on companies in the public sector to discover potential difference in users tagging behavior in the organizational context.

Second, because respondents used mainly two enterprise tagging systems (SharePoint and Lotus Connections), the results cannot be generalized to all enterprise social tagging tools. Future studies can replicate this study using data from different organizational contexts with different ESTTs to offer more generalization of the results and to ensure more validity of the two sub-models of the study.

Third, this study is consistent with most IS research using a quantitative data analysis method in measuring the impact of assorted factors on users' attitudes, intentions, and the actual use of IT applications. However, a qualitative interview with those who seek and create tags may enrich the understanding gathered from the survey data.

Fourth, the study depended mainly on survey questions to understand employees' actual use and contributing behavior of enterprise social tagging tools. A next and intuitive step is testing and validating this model on employees' actual seeking and contributing behavior using real tagging data from employees log files. Such a step could add more validity to the model used in this study and could open the road to more significant factors.

Fifth, although this model is successful in predicting employees' tag seeking, contributing, and sharing behavior in ESTTs, it should be acknowledged that it explained only 26% of the total variance in tag seeking and 38% in tag creating. Accordingly, these factors are not exhaustive and there is a possible existence of other factors that could contribute to ESTTs' variance. Other factors may include prior experience with social media in general, peer feedback, image, and so forth. Further, future research endeavours could entail investigating other utilitarian factors directly connected to social tagging functions such as *organizability*, referring to the system's capacity to allow users to organize their information in a way to decrease information and cognitive overload. This study, to some extent, succeeded to extract context-specific factors serving the nature of social tagging applications. For instance, the concepts of information retrievablity and information re-findability substituted for the concept of perceived usefulness, which is widely used in TAM literature (e.g. Hossain and Silva, 2009; Sun and Zhang, 2006; Wixom and Todd, 2005). In agreement with this, further research can be directed toward drilling into other concepts, such as perceived ease of use and perceived enjoyment, to develop new measures that can better fit the nature of social media applications.

Sixth, although the social presence factor was shown as a main motivator for employees to create and add tagging content in ESTTs, this concept needs to be tested with other social media tools that may better accentuate the concept of sociability. Examples of these tools includes enterprise wikis, blogs, and online forums.

Seventh, although the sample size used in this study (n=481) is acceptable for PLS analysis, a larger and more heterogeneous sample would bring more statistical power and allow more rigours model validation.

Finally, although the survey was thoroughly designed to decrease any method bias effect, there is a possibility some respondents did not distinguish their perception in seeking versus contributing. More rigorous design in future study can help mitigate this issue that is inherent in new IT applications.

6.6 CONCLUSION

This thesis was introduced with a general question: What motivates employees to participate in enterprise social tagging tools? To answer this question, this research proposed and empirically validated a belief-based and socio-organizational oriented model of potential factors that drive employees to seek, contribute, and share tags using ESTTs. This was achieved from two perspectives: tag seeking and tag contributing and sharing. An extensive literature review on technology acceptance models, widely used IS theories, and social media literature was conducted to compose an assorted set of factors that have the potential to answer the previous questions. The extracted factors were then distilled on two sub-models that reflected metadata seeking and contribution to predict employees' participation in enterprise social tagging tools. The two sub-models were validated using structural equation modeling as the quantitative data analysis technique of this study. One finding of this study showed employees are motivated to seek social tags by management influence and their perception of the following factors in the ESTTs: enjoyment, ease of use, and information retrievablity. Further, the results suggested employees are driven to contribute metadata tagging content by social presence, perceived ease of use, information re-findablity, and their belief in altruism. Additionally, pro-sharing norms were shown to affect employees' intentions to create tagging content. Notably, social presence, which is one of the prominent attributes of social media, seems to be the secret ingredient in invigorating employees' attitudes to share their knowledge with their colleagues. Although the effect of sociability on social media sounds logical, no study (at least to the researcher's knowledge when this thesis was written) tested this important element using empirical data. It should be noted the concept of sociability was suggested by some studies (e.g. Preece and Shneiderman, 2009; Lazar and Preece, 2006;

and Preece, 2001), but few studies (e.g. Phang et al., 2009) quantified such concept in a model format with empirical data to examine its direct influence on users' preference of social media applications. Accordingly, this study is considered one of the first attempts to test the effect of sociability (as manifested through the construct of social presence) on employees' attitudes and use of social tagging applications using empirical data.

One of this study's interesting and unique findings is that users are attracted to use social tagging tools because of the personal productivity element that such tools bring. It should be highlighted that this study ventured to develop and test two new concepts of perceived usefulness that were not used before in any other studies, namely information retrievability and information refindability. These two concepts were tailored to reflect the real benefits of social tagging tools in achieving two main functions: (1) enabling users to click and browse through tags to retrieve information resources; (2) enabling users to re-find previously found information resources. The two concepts were tested and showed strong significance in motivating employees toward preferring and using ESTTS.

Another interesting finding of this study is the positive influence of the hedonic factor in social media. Study respondents reported they enjoy the act of browsing and clicking through social tags. This easily could open the road to testing more hedonic factors that particularly concern social taggers such as curiosity, explorability, and discoverability. It also could open the road to testing the hedonic aspect in more enjoyable social media applications such as Facebook, YouTube, and Twitter and the possibility of using limited versions of these applications inside companies to the serve organizational strategies and objectives.

Finally, the study concludes TAM is still viable, but needs some of its concepts updated. The five elements tested in TAM are perceived ease of use, perceived usefulness, attitude towards use, intention to use, and the actual usage behavior. Consistent with TAM, the four factors showed statistical significance that falls between the established significance of previous TAM studies of 20%-60% as indicated by Struab et al. (2004).

This work provides a greater understanding of the issue of employees' participating behaviors (i.e. seeking, contributing, and sharing) with enterprise social tagging tools and producing guidelines for managers of this technology on how to attract users to populate content and encourage employees' collaboration. It is recommended future researchers continue investigating factors that impact employees to populate these tools with useful content to benefit others by conducting empirical investigations involving real-life users. It also is suggested companies using social computing tools recognize the importance of these research projects, provide academics with necessary assistance and support, and incorporate these findings in social media and collaborative suites. The results of this dissertation demonstrate that doing so can enhance our understanding of various aspects of social tagging and social media technology in general. Hopefully, companies and their managers also can facilitate the creation of really useful social computing applications accepted by end users and that can motivate end users to use, add, and share content in the organizational context.

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APPENDIX A: FULL STUDY SURVEY

Your Organizational Social Tagging/Bookmarking Experience

We are examining design features that may enhance users' experiences, and developing guidelines for how best to use organizational social tagging/bookmarking applications (e.g. Lotus Connections, SharePoint, or LibraryThing).

We invite you to respond to this brief survey about your experience with your organization's social tagging system(s). Respondents who complete the survey will have the chance to win one prize of a $100 gift certificate or one of 30 prizes of $20 gift certificates from Amazon.com. There is a 1 in 10 chance of winning a prize.

Your participation in this survey is voluntary and anonymous. You will not be asked to provide any identifying information and we will not be tracking any activities that you do on the Web. For the purpose of completing the survey, we ask you to answer all questions, but you may withdraw from the survey at any time by simply closing your browser. There are no known risks to participating. We will retain data and may use it to compare similar data collected in later studies.

If you have any questions or would like to learn more about this study, please contact the researcher: Hesham Allam, PhD Candidate, Dalhousie University at <hesham@dal.ca>.

Please note that this survey has received ethics approval from Dalhousie University. In the event that you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact Catherine Connors, Director of Dalhousie University's Office of Human Research Ethics Administration: +1(902)494-1462.

If you agree, please click START to run the survey

Social tagging is the practice of creating and managing tags on public or community and corporate websites to make searching (by the taggers and others) easier. Social tagging can involve annotating, categorizing, and sharing of web content (such as bookmarks, video clips, photos).

<u>General Background</u> (6 questions)
GEN1. Does your employer (company, organization) have one or more social tagging/bookmarking tools?
O Yes O No O I don't know

GEN2. How do you use organizational social tagging/bookmarking tool(s) (e.g. SharePoint, Lotus Connections, LibraryThing, etc.)?

O I Use but don't create tags (e.g. searching, clicking pre-existing tags created by others)
O I both use and create tags (e.g. create original tags, re-name existing tags, sort tags, and add tags from the suggested list of tags provided by tagging systems).
O I neither use nor create tags

GEN3. Which social tagging tool(s) do you use for work purposes?
O Lotus Connections
O SharePoint
O LibraryThing
O Other [*Text box]*

GEN4. Over the past 60 days, how many social tagging tools have you used for work purposes?
Respondent enters a whole number

Experience
EXP1. How long have you been clicking on tags?
O Less than a year
O 1 Year
O 2 Years
O 3 Years
O 4 Years
O 5 Years
O > 6 Years

GEN6. What actions do you take when using your organizational social tagging tool(s) (e.g. SharePoint, Lotus Connections, LibraryThing, etc.)? Check all that apply.

O I create tags but **don't** share them publicly with others
O I create tags and I share my tags publicly for others to use
O I edit/organize my tags
O I edit/organize tags created by others

About Tag Use (9 questions)

Tag Use

USE1 I often click on other users' public tags to search for/locate information resources
Disagree (Strongly-(Strongly) Agree

USE2 How frequently do you use other users' public tags to retrieve information?
Infrequent (Extremely)-(Extremely) Frequent

USE3. On average, how many times do you use the tagging tool(s) to click on tags *for any purpose*?

O Few times a year
O Several times a year
O A few times a month
O Several times a month
O A few times a month
O Several times a week
O About once a day
O Several times a day
O Not applicable

Perceived Ease of Use

PEOU1. I find using the tagging tool(s) to click on tags easy to use
PEOU2. I find it easy to become skilful at clicking on/seeking tags
PEOU3. I find learning to use the tagging tool(s) to click on/ seek tags easy

About Your Affective Response (13 questions)

Perceived Enjoyment

PE1. My experience of using the tagging tool(s) is pleasant
PE2. I find using the tagging tool(s) to be enjoyable
PE3. The process of using the tagging tool(s) is interesting

Attitude towards Using Tags

ATTU1. I feel positive about clicking on tags to find information resources
ATTU2. Clicking on tags to locate information resources is a good idea for me
ATTU3. In general, I like clicking on tags to find information

Intention to Use Tags

INTU1. I intend to use tags to search for content
INTU2.My intentions are to continue using tags to search for information resources in the next month
INTU3. It is worth browsing through and using tags
INTU4.I will continue to use tags on a regular basis in the future

About Your Sociability (7questions)

Social Presence

SP1. There is a sense of social interaction in the tagging tool(s)
SP2. There is a sense of social collaboration in the tagging tool(s)
SP3. There is a sense of sociability in the tagging tool(s)

About Efficiency and Effectiveness (8 questions)

Information Retrievability

IR1.Using the tagging tool(s) enables me to accomplish my information search tasks more quickly
IR2.Using the tagging tool(s) makes it easier to perform my information search tasks
IR3 Using the tagging tool(s) helps me to become more effective in of my information search tasks
IR4. Using the tagging tool(s) helps me become more productive in my information search tasks

Re-findability

REF1. The tagging tool(s) helps me to remember and locate my tagged resources
REF2. The tagging tool(s) allows me to re-find resources *that I had tagged*
REF3. The tagging tool(s) enables me to search for my previously found resources
REF4. The tagging tool(s) makes it easier for me to find my tagged resources

About Tagging in Your Employer's Company or Organization (13 questions)

Pro Sharing Norm

There is a norm (or culture) of … in my organization

PSN1. Cooperation
PSN2. Collaboration
PSN3. Teamwork
PSN4. Willingness to value and respond to diversity of opinion
PSN5. Tolerance for mistakes

Reward and Recognition

It is important for me to … at work for contributing my knowledge through the tagging tool(s)

REW1. Be appreciated
REW2. Get a better work assignment
REW3. Be recognized by my supervisor

REW4. Get more job security
REW5. Get recognized by my organization when I share my knowledge with the group

Management Influence
OI1. The senior management of this business has been helpful in the use of the tagging tool(s).
OI2. My supervisor is very supportive of the use of the tagging tool (s) system for my job.
OI3. In general, the organization has supported the use of the tagging tool(s)

<u>About Creating Tags</u> (11 questions)

Experience
EXP2. How long have you been creating tags?
O not applicable
O Less than a year
O 1 Year
O 2 Years
O 3 Years
O 4 Years
O 5 Years
O 6 Years
O >7 Years

Create and Share
CRE1. I often use the tagging tool(s) to create and share tags
Disagree (Strongly)-(Strongly) Agree
CRE2. How frequently do you create and share tags?
Infrequent (Extremely)-(Extremely) Frequent

CRE3. On average, how many times do you use the tagging too(s) to create and share tags?
O not applicable
O Few times a year
O Several times a year
O A few times a month
O Several times a month
O A few times a week
O Several times a week
O About once a day
O Several times a day

Ease of Use
PEOU1. I find creating tags through the tagging tool(s) easy to do
PEOU2. I find it easy to become skilful at creating tags through the tagging tool(s)

PEOU3. I find learning to create tags through the tagging tool(s) easy

Attitude towards Creating and sharing Tags

ATTC1. I feel positive about creating and sharing tags using the tagging tool(s)
ATTC2. Creating and sharing tags is a good idea for me
ATTC3. In general, I like creating and sharing tags

Intention to Create and Share Tags

INTC1. I intend to create and share tags
INTC2.My intentions are to continue creating and sharing tags in the next month
INTC3**.** It is worth creating and sharing tags in the tagging tool(s)
INTC4.I will continue to create and share tags on a regular basis in the future

<u>About helping others and Reciprocity</u> (7 questions)

Altruism

ALT1. I create public tags for information resources because I think users will find them useful
ALT2. I create public tags for information resources because I think those resources should be discovered by other users.
ALT3. I create public tags for information resources so that other users will be able to find those resources.

Reciprocity

REC1. My public tags are useful for others users' tasks
REC2. I create public tags that are applicable to other users' tasks
REC3. Other users' public tags are appropriate for my tasks
REC4. Other users create public tags that are applicable to my tasks

<u>Demographic Information</u> (3 questions)

DEM1. What is your gender?
O Male
O Female
O Prefer not to answer

DEM2. What is your age group?
O 18-20
O 21-25
O 26-30
O 31-35
O 36-40
O 40-45
O 46-50
O 51-55

O 56-60
O 61-65
O over 65
O Prefer not to answer

DEM3. What is the highest level of formal education have achieved?
O Little or no formal education
O High School
O Community or Technical College
O Undergraduate Degree
O Graduate Degree (Masters or equivalent)
O Professional degree (e.g. Doctor of Medicine, Bachelor of Law)
O Post-graduate degree (Ph.D. or equivalent)

DEM4. Which functional unit do you belong to at your organization?

O Research and Development
O Marketing
O Information Technology
O Customer Services
O Human Resources
O Management
O Other [Text Box]

DEM5.What is your region?

O North America
O South America
O Europe
O Asia
O Africa
O Australia

If you would like to be entered in a draw for a chance to win $100 gift certificate or one of 30 prizes of $20 gift certificates from Amazon.com, please provide you email address.

Please note: e-mail addresses are kept separately from the data, and will only be used to enter you into the draw. We appreciate your time! Hesham Allam, Principal Investigator, Ph.D. Candidate, Dalhousie University.

If you have any further questions, please contact Hesham Allam at <hesham@dal.ca>.

Your E-mail address

APPENDIX B: PILOT STUDY SURVEY

Your Social Tagging Experience

We are examining design features that enhance users' experiences. This research will help us develop design guidelines for social tagging applications. We invite you to respond to this 10 minute survey about a social tagging and bookmarking system (e.g. Delicious, Flickr, Twitter, Facebook, and Dogear). Respondents who complete the survey will have the chance to win one prize of one $100 gift certificate or one of 30 prizes of $20 gift certificates from the Amazon.com. There is a 1 in 10 chance of winning a prize.

Your participation in this survey is voluntary and anonymous. You will not be asked to provide any identifying information and we will not be tracking any activities that you do on the Web. For the purpose of completing the survey, we ask you to answer all questions, but you may skip any of them by checking 'NA'. You may withdraw from the survey at any time by simply closing your browser. There are no known risks to participating. We will aggregate all responses, and may use your comments as anonymized direct quotes in our papers. We will retain data and may use it to compare similar data collected in later studies.

If you have any questions or would like to learn more about this study, please contact the researchers: Hesham Allam, PhD Candidate, Dalhousie University (hesham@dal.ca); or Michael Bliemel, Associate Professor, School of Business Administration (m.bliemel@dal.ca).

In the event that you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact Patricia Lindley, Director of Dalhousie University?s Office of Human Research Ethics Administration: (902) 494-1462.

If you agree, please click START to run the survey

Social tagging is the practice of creating and managing tags to name, annotate, and categorize web content(bookmarks, video clips, photosetc) to a public web site for future search by the taggers and others.

Tag Use

Q1: **Which one of the following do you do when interacting with tagging systems (e.g. Delicious , Twitter, Flickr, CiteUlike , Librarything , StumbleUpon)?**

- ○ Use tags (e.g. browsing, clicking, sorting, and/or searching for others' tags and/or your existing tags)
- ○ Create tags (e.g. create original tags, re-name existing tags, and add tags from the suggested list of tags provided by tagging systems)
- ○ Both
- ○ I don't use tagging systems

Section 1: Use Tag

This section is for participants who only use tagging systems. By "using" we mean browsing, clicking, sorting, and/or searching for others' tags and/or your existing tags. Please indicate the extent to which you agree with the following statement

Q2: Which online tagging system(s) do you use to click on tags?

- ☐ CiteUlike
- ☐ Delicious
- ☐ Digg
- ☐ Flickr
- ☐ LibraryThing
- ☐ StumbleUpon
- ☐ Twitter
- ☐ WorldCat
- ☐ Yahoo Buzz
- ☐ Zotera
- ☐ Others

If you have chosen "other", Please specify

Q3: How long have you been using tags?

- ○ Less than a year
- ○ 1-3 Years
- ○ 4-6 Years
- ○ 6-8 Years
- ○ >9 Years

Q4: on average, how many times do you use tags?

- ○ Few times a year
- ○ Once a month
- ○ A Few times a month
- ○ A few time a week
- ○ About once a day
- ○ Several times a day

Q5: I intend to use tags to search for content

○ 1 (Least Likely) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Most Likely) ○ N/A

Q6: My intentions are to continue using tags to search for information resources in the next month

○ 1 (Least Likely) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Most Likely) ○ N/A

Q7: It is worth browsing through and using tags

○ 1 (Least Likely) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Most Likely) ○ N/A

Q8: I will continue to use tags on a regular basis in the future

○ 1 (Least Likely) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Most Likely) ○ N/A

Q9: I find using the tagging tool(s) easy to use

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q10: I find it easy to become skilful at using the tagging tool(s)

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q11: I find learning to use the tagging tool(s) easy

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q12: Using the tagging tool(s) enables me to accomplish my information search tasks more quickly

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q13: Using the tagging tool(s) makes it easier to perform my information search tasks

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q14: Using the tagging tool(s) helps me to become more effective in of my information search tasks

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q15: Using the tagging tool(s) helps me become more productive in my information search tasks

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q15 : I feel positive about clicking on tags to find information resources

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q16: Clicking on tags to locate information resources is a good idea for me

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q17: In general, I like clicking on tags to find information

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q18: People who influence my behavior think that I should use tags

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q19: People who are important to e think that I should use tags

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q20: My experience of using the tagging tool(s) is pleasant

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q21: I find using the tagging tool(s) to be enjoyable

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q22: The process of using the tagging tool(s) is interesting

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q23: Please indicate other reasons of why you use tags

Section 2 Creating Tags

This section is for participants who create original tags, re-name existing tags, and add tags from the suggested list of tags that some of the tagging systems provide.

Please indicate the extent to which you agree with the following statements

Q24: Which online tagging system(s) do you use to create tags to web resources? Please check all that apply

- ☐ CiteUlike
- ☐ Delicious
- ☐ Digg
- ☐ Flickr
- ☐ LibraryThing
- ☐ StumbleUpon
- ☐ Twitter
- ☐ WorldCat
- ☐ Yahoo Buzz
- ☐ Zotera
- ☐ Others

If you have chosen "other", Please specify

Q25: How long have you been creating tags?

- ○ Less than a year
- ○ 1-3 Years
- ○ 4-6 Years
- ○ 6-8 Years
- ○ >9 Years

Q26: On average, how many times do you create tags?

- ○ Few times a year
- ○ Once a month
- ○ A Few times a month
- ○ A few time a week
- ○ About once a day
- ○ Several times a day

Q27: **People who are important to me think that I should create tags**

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q28: People who influence my behavior think that I should create tags

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q29: My public tags are useful for others users' tasks

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q30: I create public tags that are applicable to other users' tasks

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q31: Other users' public tags are appropriate for my tasks

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q32: Other users create public tags that are applicable to my tasks

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q33: I find using the tagging tool(s) easy to use

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q34: I find it easy to become skilful at using the tagging tool(s)

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q35: I find learning to use the tagging tool(s) easy

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q36: I intend to create and share tags

○ 1 (Least Likely) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Most Likely) ○ N/A

Q37: My intentions are to continue creating and sharing tags in the next month

○ 1 (Least Likely) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Most Likely) ○ N/A

Q38: It is worth creating and sharing tags in the tagging tool(s)

○ 1 (Least Likely) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Most Likely) ○ N/A

Q39: I will continue to create and share tags on a regular basis in the future

○ 1 (Least Likely) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Most Likely) ○ N/A

Q40: I use the tagging tool(s) to search for my own information resources

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q41: Tagging tools allow me to re-find my own information resources that were tagged by me

○ 1 (Strongly Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 (Strongly Agree) ○ N/A

Q42: Please indicate other reasons for why you create and add tags to the tagging system(s)?

Q43: **This section is for the advantages and disadvantages of social tagging. Please indicate the extent to which you agree with the following statements**

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree	I don't know
The tagging system(s) enables access to communities of shared interest	○	○	○	○	○	○	○	○
The tagging system(s) enables sharing information and experience	○	○	○	○	○	○	○	○
The tagging system(s) enables the creation and maintenance of social relationships	○	○	○	○	○	○	○	○
Tag search brings more relevant results than general web search	○	○	○	○	○	○	○	○
The tagging system(s) enables collaborative generation of tags	○	○	○	○	○	○	○	○

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree	I don't know
I use the tagging system(s) to search for things on the web such as web links, photos, video clips ...etc.	○	○	○	○	○	○	○	○
I use the tagging system(s) for organizing things I have found on the web	○	○	○	○	○	○	○	○

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree	I don't know
I add tags to the tagging system(s) to help others find information	○	○	○	○	○	○	○	○
I use the tagging system(s) to search for my own information resources	○	○	○	○	○	○	○	○
Tags can help me understand information resources (e.g. giving hints of the content of an information resource before seeing the detailed content)	○	○	○	○	○	○	○	○
Using tags enables me to stumble upon interesting information	○	○	○	○	○	○	○	○
Using tags increases my knowledge base about topics that are important to me	○	○	○	○	○	○	○	○
Tagging helps solve information overload with its organizing features	○	○	○	○	○	○	○	○
Tagging is useful as an information management tool	○	○	○	○	○	○	○	○
Social tagging helps generate new ideas from others' tags	○	○	○	○	○	○	○	○
Social tagging allows like- minded individuals to find one another and create new communities of users around certain topics and themes	○	○	○	○	○	○	○	○

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree	I don't know
Social tagging helps me to form social networks								
Tagging can cause tag spam (people apply an excessive number of tags or unrelated tags to an item (such as a YouTube video) in order to attract viewers)								
When tagging, not everyone use the same tags for the same objects								
Clicking on tags can cause distractions (e. g. diverting users from the current relevant task to non- relevant task)								
User's generated tags are often vague								
Users' generated tags are often inadequate								
Clicking on tags can be addictive (e.g. clicking on Flickr's tags)								
Tags are easy to understand because they are done by normal users who understand the content of the resource								
With social tagging, people can find and tag web content that have not yet been noticed or indexed by web search engine								

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree	I don't know
Tagging enables group research to happen effectively with users who are geographically distributed but who share the same interests	O	O	O	O	O	O	O	O
Tagging enables group research to happen effectively with users who are geographically distributed but who share the same interests	O	O	O	O	O	O	O	O
Tagging tools enable me to find new information resources that werent tagged before	O	O	O	O	O	O	O	O
The tagging system(s) enables collaborative sharing of tags	O	O	O	O	O	O	O	O

Q44: **Please add any advantages or disadvantages of tags or tagging systems that are not covered here**

Q45: How familiar are you with social tagging?

O 1 (Not Familiar at all) O 2 O 3 O 4 O 5 O 6 O 7 (Extr.Familiar) O N/A

Q46: How familiar are you with social media?

O 1 (Not Familiar at all) O 2 O 3 O 4 O 5 O 6 O 7 (Extr.Familiar) O N/A

Q47: How useful do you think social tagging is?

O 1 (Not useful at all) O 2 O 3 O 4 O 5 O 6 O 7 (Extr Useful) O N/A

Q48: Tagging initiatives don’t seem to provide much personal value

O 1 (Strongly Disagree) O 2 O 3 O 4 O 5 O 6 O 7 (Strongly Agree) O N/A

Q49: Tags seem like a play for aggregation benefit without any real benefits for users

O 1 (Strongly Disagree) O 2 O 3 O 4 O 5 O 6 O 7 (Strongly Agree) O N/A

Q50: How interesting do you think social tagging is?

O 1 (Not Interesting) O 2 O 3 O 4 O 5 O 6 O 7 (Intersting) O N/A

Q51: I am not comfortable sharing my personal tags on the Web

O 1 (Strongly Disagree) O 2 O 3 O 4 O 5 O 6 O 7 (Strongly Agree) O N/A

Q52: I am not willing to try new things on the Web

O 1 (Strongly Disagree) O 2 O 3 O 4 O 5 O 6 O 7 (Strongly Agree) O N/A

Q53: I don't like spending so much time on the internet

O 1 (Strongly Disagree) O 2 O 3 O 4 O 5 O 6 O 7 (Strongly Agree) O N/A

Q54: I am overwhelmed about social tagging and don't know where to start

O 1 (Strongly Disagree) O 2 O 3 O 4 O 5 O 6 O 7 (Strongly Agree) O N/A

Q55: I think social tagging is another social media tool that makes me open to marketing spam

O 1 (Strongly Disagree) O 2 O 3 O 4 O 5 O 6 O 7 (Strongly Agree) O N/A

Q56: I get confused using the social tagging sites

O 1 (Strongly Disagree) O 2 O 3 O 4 O 5 O 6 O 7 (Strongly Agree) O N/A

Q57: I think social media in general is a waste of time

O 1 (Strongly Disagree) O 2 O 3 O 4 O 5 O 6 O 7 (Strongly Agree) O N/A

Q58: How difficult do you think social tagging is?

Q59: Please elaborate on why you are not using social tagging systems

Demographics

Q60: What is your gender?

Q61: What is your age group?

O 18-20
O 21-25
O 26-30
O 31-35
O 36-40
O 40-45
O 46-50
O 51-55
O 56-60
O 61-65
O over 65
O Prefer not to answer

Q62: What is the highest level of education have you been awarded?

O Little or no formal education
O High School
O Community or Technical College

O Undergraduate Degree
O Graduate Degree (Masters or equivalent)
O Professional degree (e.g. Doctor of Medicine, Bachelor of Law)
O Post-graduate degree (Ph.D. or equivalent)

Q 63: Which best describes your current employment situation?

☐ Full time
☐ Part-time/casual job
☐ Home maker
☐ Full-time student
☐ Part-time student
☐ University faculty
☐ University staff
☐ Retired
☐ Not currently employed
☐ Other

Q64: Which discipline are you primarily affiliated with?

☐ **Architecture**
☐ **Engineering**
☐ **Humanities/Social Science**
☐ **Management**
☐ **Science**
☐ **Other**

If you choose others, please specify

If you would like to be entered in a draw for a chance to win $100 gift certificate or one of 30 prizes of $20 gift certificates from Amazon.com, please provide you email address.

Note: email addresses are kept separately from the data, and will only be used to enter you into the draw. We appreciate your time!

Hesham Allam, Principle Investigator, Ph.D. Candidate; Michael Bliemel, Associate Professor of MIS, Dalhousie University

If you have any further questions, please contact Hesham Allam at :hesham@dal.ca

Your Email