

# Pre-Adoption of KMS: User Acceptance from Knowledge Worker Perspectives

Setiawan Assegaff  
Program Pasca Sarjana  
Magister Sistem Informasi  
STIKOM Dinamika Bangsa  
Jambi, Indonesia  
E-mail: asetiawan2@live.utm.my

Ab Razak Che Hussin  
Faculty of Computer and  
Information System  
Universiti Teknologi Malaysia  
Johor, Malaysia  
E-mail: abrazak@utm.my

Halina Mohamed Dahlan  
Faculty of Computer and  
Information System  
Universiti Teknologi Malaysia  
Johor, Malaysia  
E-mail: halina@utm.my

**Abstract**— Non-technological problem has been identified as main barriers in knowledge management implementation. Culture and people have been identified as main barriers. Lack of understanding the benefit of using knowledge management system (KMS) makes people unaware about KMS. There are two types of knowledge workers which have different belief in KMS benefit. Benefit from the knowledge seekers perspective will be different with knowledge contributors. Current KMS acceptance model focus in evaluate and understand the user acceptance from knowledge seeker perspective. There is a lack of models that can be used to evaluate and understand user from both knowledge seeker and contributor perspective. Thus, this study proposes a modified model to understand both knowledge worker acceptances of KMS.

**Keywords** — Knowledge Management, KMS, Technology Adoption, Knowledge Workers.

## I. INTRODUCTION

In order to implement effective knowledge management (KM), an organization needs to consider developing KMS. KMS is an IT system to support KM activities in an organization. A survey conducted by KPMG in 2001 revealed that most of organization in Europe and United States interested to adopt and implement KMS in their organization. In addition only 7 percent of that companies mention that technology as a barrier to successful implementation of KM. KMS by nature is IT-base system, but there is a unique issue about KMS make its different with others Information System.

Problems related with people or employee have been identified as main barriers in KMS implementation such as, employee don't have enough time to share their knowledge, they don't feel will get benefit from doing so, and employee afraid to share their knowledge, because they believed their knowledge is their personal competitive advantages. If the employee did not want to share their knowledge it means they would not use KMS as tools for knowledge sharing. When the employee did not have intention to use KMS, the mission of KMS to support leverage knowledge would fail.

User would use KMS if they are willing to share or want to seek knowledge. Furthermore they also will not use KMS if did not get benefit from it. Employee in organizations is main actors in knowledge sharing. KS is a key component of KMS [1].

There are two actors in KM initiative knowledge seeker (people who consider using or reuse knowledge) and knowledge contributor (people who contribute knowledge). Benefit gains from knowledge seeker perspective will be different with knowledge contributor.

Existing KMS model has limitation in understand different belief from knowledge workers. The model use general perspective in understand knowledge workers. There is a need of a model that can use to explain different factors influence seeker and contributor in acceptance KMS which lead organization develop effective intervention in KMS acceptance success. This paper will fill that gap.

This paper consists of seventh sections. In section two KM, and KMS will be defined and the state-of-art of KM, KS and KMS, KMS acceptance research will be discussed. Section three explains about discussion in past research in KS, the limitation, and potential research can be done. Section four will explain our propose solution in KMS acceptance research limitation. Section Five discusses how TAM can be used to understand KS activities through KMS. Section Six explains how TAM is adapted in KMS acceptance. The last sections propose a recommendation solution in KS and KMS problem, and highlight some further works of the research.

## II. LITERATURE REVIEW

### A. Knowledge Management

KM initiative is about approaches and programs that company is undertaking to achieve the KM mission in their organization. Knowledge management refers to changing corporate culture and business procedures to make sharing of information possible. Knowledge worker as part of an organization are the key source of knowledge acquired and manage by KMS.

## B. Knowledge Sharing

Berthold & Srivastava defined KS as individuals sharing organizationally relevant information, ideas, suggestions, and expertise with one another [2]. In this paper we use definition of knowledge sharing from Kurkarni [11] KS to mean both contributing and using available knowledge.

TABLE I  
FACTORS CONTRIBUTE IN KS FROM ORGANIZATIONAL CONTEXT

Focus	Researcher	Result
Organization Culture and Climate	De long and Fahey (2000)	<ul style="list-style-type: none"> <li>The Benefits of new technology infrastructure were limited if long-standing organization values and practices were not supportive of knowledge sharing process.</li> <li>A culture that emphasized trust has been found to help alleviate the negative effect of perceived cost on sharing</li> <li>A culture linked with Implementation of intranet-based KMS, individual knowledge sharing, and firm's capability of knowledge exchange and combination</li> <li>Organization with cultures emphasizing innovation are more likely to implement intranet KMS</li> </ul>
	Kankanhalli, Tan, Wei (2005); Chiu, Hsu, & Wang (2006)	
Management Support	Ruppel & Harrington (2001)	
Reward and incentives	King and Marks (2008)	<ul style="list-style-type: none"> <li>They failed to find significant effect for perceived organizational support after controlling for ease of use and usefulness of KMS.</li> </ul>
	Kankanhalli et al (2005) Cabrera et al (2006) Kulkarni et al (2006) Block & Kim (2002) Block et al (2005) Kwok & Gao (2005) Lin (2007)	
Organizational Structure	Liebowitz (2003) Leibowitz & Megbolugbe (2003) Yang & Chen (2007)	<ul style="list-style-type: none"> <li>In General results of the studies suggest that organization should create opportunities for employee interactions to occur and employee rank, position in the organizational hierarchy, and seniority should be deemphasized to facilitate knowledge sharing</li> </ul>

Scholars have been identified factors contribute to KS success as described in Tables 1-4. The Factors consist of: organizational context, interpersonal and team, Individual and cultural characteristic and motivational factors. Factors contribute in organizational context are describes in table 1 are: organizational culture and climate, management support, reward and incentives and organizational factors.

TABLE II  
FACTORS CONTRIBUTE IN KS FROM INTERPERSONAL AND TEAM CHARACTERISTIC

Focus	Researcher	Result
Team characteristic and processes	Bakker et al (2006) Sawng, Kim & Han (2006)	<ul style="list-style-type: none"> <li>The result of studies suggest that team characteristics and processes influence knowledge sharing among team members (e.g. communication style, agreeable, and extravert style)</li> </ul>
Diversity	Sawng, et al (2006) Philips, Mannix, Neale, & Gruenfeld (2004) Larson & Harmon (2007)	<ul style="list-style-type: none"> <li>Research has investigated how minority status of team members relates to knowledge sharing. Minority base on gender, marital status, or education were less likely to share knowledge with team members.</li> </ul>
Social Network	Chiu et al (2006), Wasko and Faraj (2005)	<ul style="list-style-type: none"> <li>In virtual communities both the number of direct ties and personal relationships an individual has with other members have been shown to be positively related to quantity and perceived helpfulness of knowledge share</li> <li>Existence of network connections and associated social capital can facilitate knowledge sharing within community of practice</li> </ul>
	Kankanhalli, et al (2005) Nahapiet & Ghosal (1998)	

TABLE III  
FACTORS CONTRIBUTE IN KS FROM INDIVIDUAL AND CULTURAL CHARACTERISTIC

Focus	Researcher	Result
Cultural characteristic	Ford & Chan (2003); Minbaeva (2007); Hwang and Kim (2007)	National cultures and language can pose challenge for knowledge sharing
Individual characteristic	Constants et al (1996) Wasko & Faraj (2005) Cabrera et al (2006) Lin (2007) Constant et al (1994) Cabrera et al (2006) Lin (2007)	<ul style="list-style-type: none"> <li>Individual with higher expertise were more likely to share useful knowledge when other employees asked question using KMS</li> <li>Did not find individuals self rated expertise to be related to knowledge sharing</li> <li>Individual who are more confident in their ability to share their knowledge are more likely to express intentions to share knowledge</li> <li>Openness, ability to use computer, higher level education have positive attitude toward knowledge sharing</li> </ul>

Team characteristic and process, diversity and social networks are important factors influences people in KS, as describe in table 2.

Researchers believe culture is the main drive for KM success; some factors related to culture are cultural characteristics and individual characteristic. Factors in cultural and individual are described in table 3.

Developing a culture and environment that support knowledge sharing is challenging for an organization. KS is a complex situation. Scholars consider using various theories of management, sociology, psychology and others have been applied to that problem. Factors that believe can encourage people involve in KS culture is motivational factors such as belief of knowledge ownership, perceived benefits and cost of KS, interpersonal trust and justice, and individual attitudes as described in table 4.

From studies conducted in perceived benefit and cost shows, benefits are positively associated with KS while perceived costs and time has negative influences. More benefit gets from KS would encourage people to do so.

TABLE IV  
MOTIVATIONAL FACTORS CONTRIBUTE IN KS

Focus	Researcher	Result
Beliefs of Knowledge ownership	Constant, et al (1994); Kolekofsi & Haminger (2003) Constant et al (1994); Jarvampa & Staples (2000)	<ul style="list-style-type: none"> <li>Only a few studies have considered individuals' believe regarding knowledge ownership (organization or employees own knowledge)</li> <li>Research has shown that when employees believed they owned information (rather than organization) they were more likely to report that they would engage in knowledge sharing</li> </ul>
Perceived benefit and costs	Lin (2007); Haw & Hara (2007); Wasko & Faraj (2000, 2005) Bordia, et al (2006) Kankanhalli et al (2005)	<ul style="list-style-type: none"> <li>Research shows that perceived benefits are positively associated with knowledge sharing while perceived cost have negative influences.</li> <li>Participating in knowledge sharing in online community of practices has been found related to increased internal satisfaction, perceived obligation reciprocate the knowledge gain from forum, enhanced professional reputations, and helping advance the community. Positive influence of benefits on knowledge sharing only for technology-aided sharing but not in a face-to-face context.</li> <li>The more time and effort employees perceived as necessary to codify knowledge in order to share knowledge the less likely they would use electronic repositories for knowledge sharing especially when there was a weak trust of other employees contributing and reusing knowledge.</li> </ul>
Interpersonal trust and justice	Wu, Hsu & Yeh (2007)	<ul style="list-style-type: none"> <li>Trust and justice is important because knowledge sharing involving providing knowledge to another person or a collective such as team or community of practices with expectation for reciprocity</li> </ul>
Individual attitudes	Bock & Kim (2002) Ryu, Ho, & Han (2003) Lin & Lee (2004)	<ul style="list-style-type: none"> <li>Individual expectations of usefulness of their knowledge sharing and that through sharing they can improve relationships with others have been shown to be related to positive knowledge sharing attitudes which in turn were related to knowledge sharing intentions and behaviors</li> </ul>

### C. Knowledge Management System

In common, knowledge management systems (KMS) are IT that enables organizations to manage effective and efficient knowledge. Alavi and Leidner [1] defined KMS as a class of information systems applied for managing organizational knowledge. In general KMS would not have many differences from other information systems, instead of content and activities by users [1].

Another perspective of KMS comes from Ericsson and advic [8]. They defined KMS as a system that increase organizational performance by increase the better decision by employee when they use knowledge in daily work activities [8].

### D. Knowledge Management System Acceptance

User technology acceptance model has contributed to our understanding of user technology acceptance factors and their relationship. Money and Turner [13] conducted study and found preliminary evidence that previous information technology acceptance research base on the Technology acceptance model (TAM), may serve as a foundation for research of knowledge Management system user acceptance [13].

However TAM also has limitations, Sun and Zhang [14] identified there are two limitations of TAM: the relatively low explanatory power and inconsistent influences of the factors across studies. They suggested that moderating factors may account for both limited explanatory power and the inconsistencies between studies, the nature of the task and the nature of the technology both can use as moderating factors affect the user in technology acceptance. A systematic examination of significant moderating factors should contribute to better understanding of the dynamic of the users technology acceptance [14].

In addition TAM has been widely use to examine KMS user acceptance, and proved can use to understand user behavior in KMS acceptance [5,8,13,16]. Most of researchers found that Perceived usefulness is the most influences factors in user KMS Acceptance. The researchers had integrated TAM with other theories to improve TAM power to explore user behavior in KMS acceptance. The theories that usually use are TRA, SCT, SNT, DOI, SET, etc.

Xu and Quaddus was proposed KMS acceptance model [16]. Figure 1 shows the model. The model developed by innovation stage model built on Rogers' in 1995 and with two most widely apply theory from Ajzen and Fishbein's, theory of reasoned action (TRA) and Davis, technology acceptance model. We use this model as a basis and propose the modified model. Our reason to use this model because the model in considering most important factors in KMS acceptance.

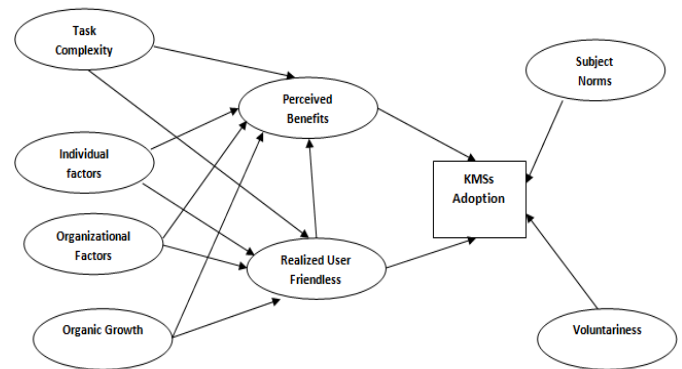


Figure 1. KMS pre-adoption acceptance mode  
(Xu and Quaddus, 2007)

### E. Gap in KMS Acceptance Research

Knowledge workers as users in a knowledge management initiative can be categories as knowledge contributor and knowledge seeker. Nevertheless, very little research has been done on KMS user acceptance in both Prespective of knowledge workers. Most of the KMS acceptance research has done studies in general perspective.

As state above, it is expected that understand both knowledge worker behaviors in the use of KMS in KM initiative is critical. The ability to identify, predict and manage both knowledge workers of KMS will facilitate implementation efforts, as acceptance of KMS by knowledge workers necessary for its ultimate success.

## III. DISCUSSION

He and Wei [9] conducted a study of continued knowledge sharing. They proposed that KMS user's belief are contextually differentiated, and thus a distinction between knowledge contributor and knowledge seeker behavior. They argued that perceived usefulness not always mean to improved work performance, because if we view from the knowledge contributor perspective it will be different view [9].

He and Wei [9] proposed new understanding about perceived usefulness, they come with question "Does perceived usefulness always mean improved work performance?" If the answer is no for knowledge contributor circumstances, what are the factors we should adopt to predict the continue usage intention of knowledge contributor?

In this study we argue that perceived usefulness should be considered another value instead of work performance, because the effect on use KMS is not only in work performance but also in a wider environment such as culture in an organization or an image to be recognized for social status in group [7]. We propose another construct for perceived usefulness that named social, economic and psychological value as shows at fig. 2.

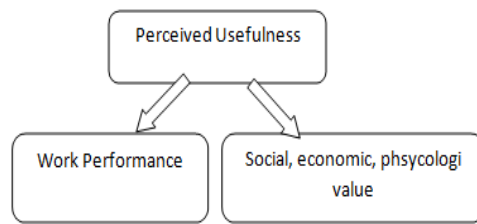


Figure 2. Propose new perspective of Perceived Usefulness

TABLE V  
FACTORS IN WORKS PERFORMANCE AND SOCIAL,  
ECONOMIC, AND PSYCHOLOGICAL

Work Performance	Social, economic and physiological value
<ul style="list-style-type: none"> <li>• Creativity</li> <li>• Productivity</li> <li>• Cost and time reduction</li> <li>• Knowledge building</li> <li>• Avoiding same mistake</li> <li>• Effectiveness</li> </ul>	<ul style="list-style-type: none"> <li>• Enjoy helping</li> <li>• Reciprocity</li> <li>• Image</li> <li>• Organizational rewards</li> <li>• altruism</li> </ul>

Table 5 shows us element of work performance consist of creativity, productivity, cost and time reduction, knowledge building and avoid mistakes. In our belief impact of KS is not only about work performance, we belief that KS also impact in cultural, social, economy and psychological element. When people in the organization do KS the benefit can or they expectation can be enjoy helping, image or organization reward. The activities of KS also impact the social norm as reciprocity, people believe when she/he do KS, in another time someone would do KS as well as she/he do.

It is important for us understand the role of people/employee as actors in KS. An employee who works in organization that implement KM recognize as a knowledge worker, knowledge worker who contribute their experiences to communities known as knowledge contributor, on the other hand knowledge worker who use or reuse the organization knowledge known as knowledge seeker. People who as act as knowledge contributor have special characteristic. They usually have good motivation to help others, and expert in one area.

The employee would not share what they know to other people in communities if they did not understand the benefit of doing so, or because they did not have enough time and effort to share their experiences [4]. Knowledge contributor is believed about image, enjoyment helping and reciprocity as a benefit of doing knowledge sharing. This study gives us opportunity to come up with an idea how to understand knowledge contributor and knowledge seeker belief from their own perspectives.

TABLE VI: KNOWLEDGE CONTRIBUTOR AND SEEKER BELIEF  
IN KS

Knowledge Seeker	Knowledge Contributor
<ul style="list-style-type: none"> <li>• Creativity</li> <li>• Productivity</li> <li>• Cost and time reduction</li> <li>• Knowledge building</li> <li>• Avoiding same mistake</li> <li>• Effectiveness</li> <li>• Organizational rewards</li> </ul>	<ul style="list-style-type: none"> <li>• Enjoy helping</li> <li>• Reciprocity</li> <li>• Image</li> <li>• Organizational rewards</li> <li>• altruism</li> </ul>

TABLE VII  
KNOWLEDGE CONTRIBUTOR AND SEEKER HABIT

Knowledge Contributor	Knowledge Seeker
<ul style="list-style-type: none"> <li>▪ Have good motivation to help</li> <li>▪ Have good motivation to sharing knowledge</li> </ul>	<ul style="list-style-type: none"> <li>▪ Have a good motivation to learn something new</li> <li>▪ Hve a good motivation in explore hew method and procedure</li> </ul>

As well as knowledge contributor knowledge seeker also have unique characteristic/habits in KM activities. Table 7 describes the habits from the seeker and contributor. Knowledge seekers have habits such as good motivation to learn something new, good motivation in exploring the new method / procedure. Some knowledge seeker barriers are they don't have time to doing it, too busy to finish job in office, and they did not get support from organization to explore the new method or procedure [4].

#### IV. SOLUTION

Outcome from literature review has shown that most of the current KMS acceptance models focus only on knowledge seeker perspective. There is a need a KMS model that takes into account not only knowledge seeker but also knowledge contributor. Thus, this study will propose an enhanced model of the KMS acceptance model to solve the problem. This model incorporates both perspectives of knowledge worker, we believe this model can be used to examine and understand the knowledge worker behavior of KMS acceptance.

The original KMS acceptance model as suggested by Jun and Quaddus has been divided into two separate models [16] First model is used to understand knowledge seeker, and the other one is used to understand contributor behavior as described in figure 3. Second model can use to understand seeker behavior as shown in figure 4.

The researcher proposes to the richness scope of perceived of usefulness, and consider perceived usefulness not only about task performance but also about social, economical and psychological impact as we discuss in the previous section. We propose a new explanation about perceived usefulness / benefits for seeker and contributor and new user friendless for seeker and contributor.

Elements consider for seeker in this model consist of:

- *Seeker Realized User Friendliness*--This constructs of perceived user friendliness reflect the perspectives of end-user focus on the KMSs and is made up of simple to learn and use, cheap to learn and use, speed, accessibility, quality of knowledge, security, complexity, and risk of knowledge
- *Seeker Realized User Friendliness*--This constructs of perceived user friendliness reflect the perspectives of end-user focus on the KMSs and is made up of simple and cheap to use, speed, accessibility, security, and risk of knowledge.



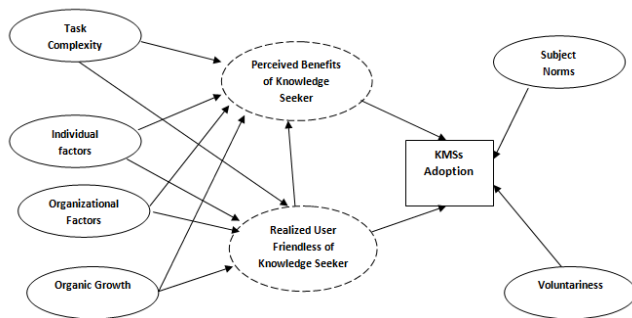


Figure 3: KMS Acceptance model (knowledge seeker perspectives).

Element considers both (Seeker and contributor):

- *Continued Used of KMSs*--The construct of continued use of KMSs is represented by future uses of KMSs in the areas of knowledge and expert information search; communication with knowledge holders; knowledge sharing; contribution to the system; codifying and storing knowledge; knowledge creation; and KMS habit
- *Perceived Voluntariness*--Perceived voluntariness is the degree to which the use of KMSs is perceived as being voluntary, or free will. The construct of perceived voluntariness is reflected in three dimensions: (1) voluntary use, (2) superior request, and (3) job description
- *Subject Norm*--Subject norms refer to the person's perception that most people who are important to him/her thinks he/she should or should not use KMSs to perform a task. End users' use of KMS can be influenced by others, such as leader, peers, respected people, superiors and subordinates.
- *Organizational Factors*--Organizational factors in the proposed research model are represented by organizational structure, organizational culture, IT infrastructure, business processes, IT/IS department, and top management support
- *Task Complexity Factors*--Task complexity factors consist of multidisciplinary project, overload knowledge, and effective knowledge reuse.
- *Organic Growth factors*--The concept of organic growth is made of three factors: (1) enticement and education, (2) training and (3) individual learning

Element consider for Contributor:

- *Contributor Perceived Benefits*--This constructs are presented by six dimensions of potential benefit and driving forces of KMSs. The five dimensions are: (1) reciprocity, (2) altruism, (3) incentive, (4) reputation (5) enjoy helping
- *Contributor Realized User Friendliness*--This constructs of perceived user friendliness reflect the perspectives of end-user focus on the KMSs and is made up of simple and cheap to use, speed, accessibility, security, risk of knowledge, perceive of Knowledge ownership.

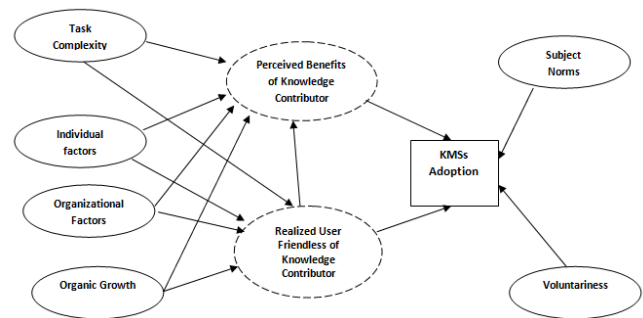


Fig.4. KMS Acceptance model (knowledge contributor perspectives)

## V. CONCLUSION AND FUTURE WORK

This paper enhanced KMS acceptance model from Xu and Quaddus [16] by integrating two different perspectives of knowledge worker. The perspective was based on their different belief in KS benefit. This is because in the end individual will use KMS if they receive the benefit from their activities. The decision whether the user will use or not the KMS is based on their willingness to share their knowledge. The further work is to develop KMS acceptance model, and test the model in real practices.

## ACKNOWLEDGMENT

The authors wish to thank to the reviewers for their constructive comments. We also would like to thanks to Universiti Teknologi Malaysia for supporting this work.

## REFERENCES

- [1] M. Alavi and D. E. Leidner, "Review: Knowledge Management and Knowledge Management Systems Conceptual Foundations and Research Issues," *MIS Quarterly* vol. 25(1), pp. 107-136, 2001.
- [2] K. M. Bartol and A. Srivastava, "Encouraging Knowledge Sharing: The Role of Organizational Reward Systems," *Journal of Leadership & Organizational Studies*, vol. 9, pp. 64-76, Summer 2002 2002.
- [3] G. D. Bhatt, "Knowledge management in organizations: examining the interaction between technologies, techniques, and people," *Journal of Knowledge Management*, vol. Vol. 5 pp. pp.68 - 75, 2001.
- [4] A. Cabrera and E. F. Cabrera, "Knowledge-Sharing Dilemmas," *Organization Studies*, vol. 23, pp. 687-710, September 1, 2002 2002.
- [5] P. F. Clay, *et al.*, "Factors Affecting the Loyal Use of Knowledge Management Systems," in *System Sciences, 2005. HICSS '05. Proceedings of the 38th Annual Hawaii International Conference on*, 2005, pp. 251c-251c.
- [6] F. D. Davis, *et al.*, "User Acceptance of Computer Technology: A Comparison of Two Theoretical Models," *Management Science*, vol. 35, pp. 982-1003, 1989.
- [7] A. R. Dennis and B. A. Reinicke, "Beta versus VHS and the Acceptance of Electronic Brainstorming Technology," *MIS Quarterly*, vol. 28, pp. 1-20, 2004.
- [8] F. Ericsson, & Avdic, A., "Knowledge Management Systems Acceptance," In E. Coakes (Ed.), *Knowledge Management: Current Issues and Challenges*, pp. (pp. 39-51), (2003).
- [9] W. He and K.-K. Wei, "What drives continued knowledge sharing? An investigation of knowledge-contribution and -

- seeking beliefs," *Decision Support Systems*, vol. 46, pp. 826-838, 2009.
- [10] A. Kankanhalli, *et al.*, "Contributing Knowledge to Electronic Knowledge Repositories: An Empirical Investigation," *MIS Quarterly*, vol. 29, pp. 113-143, 2005.
- [11] U. R. Kulkarni, *et al.*, "A Knowledge Management Success Model : Theoretical Development and Empirical Validation," *Journal of Management Information Systems*, vol. 23, No.3, pp. 309-347, 2006.
- [12] R. Maier, "Information and Communication Technologies for Knowledge Management." vol. 3rd ed, ed, 2007, p. 125 illus.
- [13] W. Money and A. Turner, "Assessing knowledge management system user acceptance with the Technology Acceptance Model," *International Journal of Knowledge Management*, vol. 1 pp. 8-26 2008.
- [14] H. Sun, and P. Zhang "“Applying Markus and Robey’s Causal Structure to Examine User Technology Acceptance Research: A New Approach”," *Journal of Information Technology Theory and Application (JITTA)* vol. 8:2 pp. 21-40., 2006.
- [15] M. M. Wasko and S. Faraj, "Why Should I Share? Examining Social Capital and Knowledge Contribution in Electronic Networks of Practice," *MIS Quarterly*, vol. 29, pp. 35-57, 2005.
- [16] J. Xu, & Quaddus, M "Exploring the Factors Influencing End Users' Acceptance of Knowledge Management Systems: Development of a Research Model of Adoption and Continued Use," *Journal of Organizational and End User Computing (JOEUC)*, vol. 19(4), pp. 57-79, (2007).

## I. BIOGRAPHIES



**Setiawan Assegaff** was born in Tanjung Karang, Indonesia, on May 23, 1978. He graduated from the Gunadarma University, Indonesia, and now as PhD student at the Universiti Teknologi Malaysia, Malaysia. His special fields of interest included Knowledge Management, Technology Adoption and Computer and Society.



**Ab Razak Che Hussin** was born in Malaysia on September 9, 1973. He graduated from the University of Manchester, UK in 2006 after completed his PhD in Trust in e-Commerce. He is now senior lecturer at Universiti Teknologi Malaysia, Malaysia. His special fields of interest included Information System, Web Application, and Trust and Privacy in e-Commerce. For further information please visit <http://www.is.fsksm.utm.my/razak/>



**Halina Mohamed Dahlan** was born in Malaysia on November 1974. She graduated from the University of Manchester UK in 2008 after completing her PhD in Intelligent Decision Support Systems. She is now senior lecturer at Universiti Teknologi Malaysia, Malaysia. Her special fields of interest included business intelligent, evolutionary computing, and fuzzy logic. For further information please visit <http://www.is.fsksm.utm.my/halina/>