The Organizational Outcomes of Computer Supported Cooperative Work Systems: Knowledge Management System Assimilation Study

ผลลัพธ์ต่อองค์กรของการใช้ระบบคอมพิวเตอร์สนับสนุนการทำงานร่วมกัน
การศึกษา การซึมซับระบบการจัดการความรู้

Sureena Matayong*

Management of Information Technology, Faculty of Engineering,

Prince of Songkla University, Hat Yai Campus

Ahmad Kamil Mahmood

Department of Computer and Information Sciences,

University Teknologi PETRONAS, Malaysia

*e-mail: sureena.m@psu.ac.th

สูรีนา มะตาหยง
สาขาวิชาการจัดการเทคโนโลยีสารสนเทศ คณะวิศวกรรมศาสตร์
มหาวิทยาลัยสงขลานครินทร์ วิทยาเขตหาดใหญ่
อะห์มัด กามิล มะห์มูด
ภาควิชาวิทยาการคอมพิวเตอร์และสารสนเทศ มหาวิทยาลัยเทคโนโลยีปิโตรนาส ประเทศมาเลเซีย

Abstract

Knowledge Management System (KMS) has long been examined by Computer Supported Cooperative Work (CSCW) researchers to understand how technologies could support collaborative work and their impacts toward organizations. In this study, we are interested to discover the effects of KMS assimilation in terms of organizational outcomes when the system becomes embedded into the process of collaboration work in a form of Knowledge Management (KM) activities. In fact, the practice of collaborative work in the KM activities form could improve organizational performance, which ultimately contributes to organizational competitive advantage if the system is fully assimilated. However, these relevant benefits of organizational outcomes have not been established in the existing literature. Therefore, we conduct a qualitative research by designing the application of Grounded Theory (GT) to investigate the case study. Data were collected from participants including senior managers, managers, and executives were recruited through criterion and theoretical based purposive sampling. The data collected from three suggested techniques; namely, interviews, observations, and documentations were analyzed according to GT analytical process of data analysis using ATLAS.TI software. The findings reveal two levels of organizational outcomes. The performance efficiency, development of staff proficiency, and responsibility stimulation are the outcomes at the individual level. On the other hand, KM culture, unity establishment, and organizational growth are outcomes at the organizational level.

Keywords: Organizational Outcomes, Computer Supported Cooperative Work (CSCW), Knowledge Management System (KMS), Assimilation

บทคัดย่อ

นักวิจัยด้านระบบคอมพิวเตอร์สนับสนุนการทำงานร่วมกัน ได้ศึกษาเพื่อทำความเข้าใจกับเทคโนโลยีซึ่งสามารถสนับสนุนการปฏิบัติงานร่วมกันและผลกระทบของเทคโนโลยี ต่อองค์กรมาเป็นเวลานานแล้ว ในงานวิจัยนี้ผู้วิจัยต้องการศึกษาเกี่ยวกับผลกระทบในด้านผลลัพธ์ต่อองค์กรเมื่อพนักงานมีการซึมซับ ระบบการจัดการความรู้ ผ่านกระบวนการทำงานร่วมกันในกิจกรรมการจัดการความรู้ต่าง ๆ ซึ่งการทำงานร่วมกันผ่านระบบการจัดการความรู้นั้นสามารถปรับปรุงประสิทธิภาพขององค์กรซึ่งสุดท้ายก็จะนำไปสู่ความได้เปรียบในการแข่งขันหากระบบนั้นได้มีการปรับใช้ในกระบวนการทำงานขององค์กรอย่างสมบูรณ์อย่างไรก็ตามการศึกษาผลลัพธ์ต่อองค์กรในเรื่องการใช้ระบบคอมพิวเตอร์เพื่อสนับสนุนการทำงานร่วมกันโดยเฉพาะการซึมซับระบบในองค์กรในงานวิจัยที่ผ่านมายังไม่ได้มีการบันทึกในวรรณกรรมที่มีอยู่ปัจจุบันอย่างชัดเจน ดังนั้นงานวิจัยนี้ผู้วิจัยได้ออกแบบวิจัยเชิงคุณภาพและประยุกต์ใช้ทฤษฎีฐานราก เพื่อศึกษาผลลัพธ์ต่อองค์กรเมื่อพนักงานมีการซึมซับระบบดังกล่าว มีผู้เข้าร่วมในงานวิจัยทั้งหมด 21 คน ประกอบด้วย ผู้จัดการอาวุโส ผู้จัดการ และผู้บริหารที่ได้คัดเลือกโดยการสุ่มตัวอย่างแบบเจาะจงทั้งแบบมีเกณฑ์และทฤษฎี ข้อมูลที่ได้จากการสัมภาษณ์ การสังเกตการณ์ และเอกสาร ได้ถูกนำมาวิเคราะห์ตามกระบวนการของทฤษฎีฐานราก โดยใช้ซอฟต์แวร์อัตลัส ผลจากการวิจัย พบว่า การซึมซับระบบการจัดการความรู้มีผลลัพธ์ต่อองค์กรในระดับบุคคลและระดับองค์กร ผลลัพธ์ในระดับบุคคล คือ ประสิทธิภาพในการปฏิบัติงาน การพัฒนาความสามารถ และการกระตุ้นความรับผิดชอบ ส่วนผลลัพธ์ในระดับองค์กร คือ วัฒนธรรมการจัดการความรู้ การสร้างความเป็นหนึ่งเดียว และ การเติบโตขององค์กร

คำสำคัญ: ผลลัพธ์ต่อองค์กร ระบบคอมพิวเตอร์สนับสนุนการทำงานร่วมกัน ระบบการจัดการความรู้ การซึมซับ

Introduction

The advent of technology has changed the way people communicate and share information. The people in organizations are depending more on the computer to get connected with each other. In the working environment, the help of Computer Supported Cooperative Work (CSCW) systems allow the communications among workers could be taken placed regardless of geographical distance and time space (Majchrzak, Rice, King, Malhotra, & Ba, 2000; Farshchian, 2019). Generally, the CSCW systems have been designed into several applications, which enable the group of people to engage in collaborative work and recently become very famous systems for organizations to manage their knowledge (Correia Jameel, Schneider, Fonseca , & Paredes, 2019). In fact, the technology may play a major role in influencing KM in organizations. As Sher, & Lee's (2003) empirical findings revealed that KM with computer applications effectively develops dynamic capabilities. The dynamic capabilities refer as an organization's ways of responding in a rapidly changing environment. Therefore, they suggested that to help organizations to achieve competitive advantage and business excellence, organizations should facilitate KM through the development of technology such as internet and database.

The CSCW group plays a significant role in developing the technology especially in providing the system to support KM activities known as KMS. Botha, & Fouche (2002) stressed that to develop KM is to be concerned with both the technological and managerial aspects. Kruger, & Johnson (2010) conducted a study to find out the maturity of technology as enablers of KM. Their findings suggest that for KM success there should be a support by technology. Although technology is an enabler of KM, it is actually considered the most effective means of capturing, storing, transforming and disseminating information. Leug (2001) argued that KM building is dependent upon technology. Technology can enable rapid search, access and retrieval of information, support collaboration and communication among organizational members, and create, share, and transfer KM processes within the organization (Alavi , & Leidner, 2001). With the use of technology for KM development such as groupware, online databases, intranets, etc. organizations will be able to improve the quality of their products and services thereby leading to profits and competitive advantage. In

recent studies of KM with a perspective on dynamic capabilities, technology is identified as a fundamental dimension for KM practices (Lee, & Choi, 2010).

Moreover, there are few studies conducted to understand the role of technology in supporting KM practices. Hoadley, & Kilner (2004) discussed how technology offers value-spanning learning for knowledge creation. They offered a framework for building Communities of Practices (CoPs) to enhance collective knowledge. Therefore, their framework was able to explain both the processes of knowledge in CoPs and the role of technology in groups. Lin, & Hsueh (2006) proposed a knowledge-map management system to support CoPs sharing explicit knowledge. They developed knowledge-map, management system architecture, and provided components of a knowledge map manager that could make the dynamic KM of CoPs on the internet possible. The empirical study of Pan, & Leidner (2003) summarized the circumstances surrounding applications to support CoP groups. Their summary report is very useful for managers and KM practitioners to consider as a guideline for implementing systems effectively in order to support CoPs.

On the other hand, another few studies have evaluated the impacts of KM related CSCW systems. Kock, & Davison (2003) investigated email-conference use to understand how lean media facilitates knowledge sharing in the process of improving groups. Their findings proved the positive impact of lean media for knowledge sharing instead of a negative impact claimed by previous researchers (Neilson, 1997; Bibri, 2019). Kock, & Davison (2003) persisted that the combination of lean media with appropriate social processes fosters knowledge sharing. Novak, & Wurst (2004) proposed a model for social and learning theories for technology development to support knowledge sharing in informal social networks. They presented a model of personalized knowledge maps to capture, visualize, and share groups' knowledge. The creation of semantic representations within the model reflects the communities shared understanding, knowledge, cooperation and individual users, personal views. Ann et al., (2000) examined two collaborative

systems for knowledge sharing: email and internet notebook. Notebook is an application-based on the HTML browser. It serves as a knowledge repository for the team to access to knowledge, discuss ideas, online meeting, etc. Their study focused on understanding how interorganizations design team share and reuse their knowledge using collaborative systems.

The assimilation study is originated from an innovation study in organizations. Generally, there are two different concepts related to this type of study, adoption and assimilation. The adoption refers to decision-making of discrete organization and individual regarding to accepting or rejecting the innovation (Rogers, 2003; Makkonen, 2008). On the other hand, the assimilation refers to the process involves when the initial requirement of the system started through till the last step of widespread deployment in exploiting and evaluating the system (Kouki, Pellerin, & Poulin 2010; Lee, & Choi, 2010). As suggested by researchers, the full benefits of potential systems will be achieved when it is successfully assimilated in the firms (Hossain, Junghoon, Jin, & Young, 2011; Vaidya, Sajeev, & Gao 2010; Vaidya, Campbell, Soar, & Gardner, 2012). Nonetheless, the system will be fully assimilated when it is integrated and embedded into a work process as a daily routine practiced by all of its members (Chatterjee, Grewai & Sambamurthy, 2002; Kouki, Pellerin, & Poulin 2010; Lee, & Choi, 2010). The system assimilation in organizations has been of increasing interest to researchers for more than decades (Chatterjee et al., 2002). This research field has considered computer system assimilation to be a central objective and essential outcome of technology implementation efforts in organization.

Research Objectives

To discover the organizational outcomes factors of KMS assimilation process according to participants' perspectives and experiences.

Methodology

This study was conducted as a part of a research project to explore the process model of KMS assimilation in organizations. KMS assimilation

is a new and complex phenomenon, which requires an in-depth and holistic investigation within the context. In fact, the studying outside the context is not appropriate (Benbasat, & Markus, 1987). Since the main interest herein is exploratory in nature therefore, the employment of an inductive approach instead of a deductive, hypothesis-testing approach is most suitable (Yin, 2003). The investigation of concepts and categories that build the theoretical model will be generated from the participant's viewpoint (Razavi, & Iverson, 2006). The research design of application of GT into the case study offers the possibility for the researcher to be in the field gaining insight and a depth understanding about subjectivity and variations related to the subject of the study. The design can allow the researcher to attain the richness of the data from multiple perspectives, to focus on meaning, and holistically make interpretation (Charmaz, 2006). The GT details each step of the analytical process from data collection and analysis towards the development, refinement, and interrelation of emerging concepts and categories. These procedures are structured and organized which lead the researcher to develop the theory rigorously and with trustworthiness (Charmaz, 2006).

According to this study, the participants were recruited for data collection, which was purposive for both criterion-based and theoretical sampling. Criterion-based sampling is the selection of a sample according to preconceived criteria relevant to the subject area of study (Yin, 2003). The preconceived relevant criteria such as educational background, internet experience, work experience, position etc. are considered to select participants of this study in order to make sure on the person's knowledge of the context, expertise and information rich to the subject area of assimilation study. Concurrently, the literature review was performed and the interviews of key informants were conducted by the company. The interviews at this stage were unstructured and open-ended question type to allow the participants reveal the relevant information of KMS in their context. The themes had been derived to establish

the sources, which directed the researcher towards the next data collection of theoretical sampling. Theoretical sampling refers to the collection of data based upon concepts and categories as themes that are derived from the data (Strauss, & Corbin, 2008). To reiterate its importance, the sampling focused on participants who had expertise in terms of knowledge and experience with the KMS assimilation rather than the size of the population known as key informants (Green, & Thorogood, 2005). Key informants are those who are most likely to provide information that can lead to the provisional concepts and direct the researcher to further theoretically identified samples, locations, and forms of data in order to develop the theory as it emerges (Goulding, 2005). The theoretical sampling guided the content for interviews and selection of the interviewees. The data were able to be gathered from the main persons, which were relevant to the subject of the study. Therefore, it reflected the understanding of the nature of KMS assimilation and everything that was relevant to it. The interviews were conducted and achieved saturation state where there were no new properties, dimensions, and or relationships emerged to category development in responses to Strauss, & Corbin (2008). When the sufficient convergence was reached and the data were saturated, additional interviews were not added. Overall, 21 participants including senior managers, managers, and executives participated in the study. They came from different OPUs varying in size from 200 to over 500 employees. The differences in participants' position levels, work functions, and business operations represent the broad spectrum of key informants. The broad spectrum of key informants provides the opportunities to explore wider emerging concepts and the broader theoretical development. Interviews were conducted at their offices, recorded, and then transcribed. The interview is one of the most important techniques to generate empirical evidence in the case study context (Yin, 2003; Creswell, 2009). A brief description of the research study was sent to participants via e-mail to ask for research participation. Once the participants

replied with their interest, the appointment was set for interviews.

Both case study and GT are suggested to be used with multiple sources to collect evidence from data including interviews, observations, documentations, archival records, and physical artifacts (Creswell, 2003; Yin, 2003). Therefore, the relevant issues are investigated with supplementary information to allow cross checking, which consequently yields a stronger ability to construct evidences (Glaser, & Strauss, 1967).

The observation was considered as an essential technique to determine what actually happen. It was encouraged by a range of studies that have successfully used the technique by the following authors (Goulding, 2005). The observations had allowed the researcher to ask questions for clarification and to engage in an informal discussion with participants. During the observations, the researchers were asking the questions for interviewees to explain in order to reflect and support the interview data.

The purpose of documentations of this research study is to provide an additional source of evidence in order to complement and confirm the data that were obtained from interviews and observations. The study of documents offered knowledge about the setting by providing some interesting information that might be missed. Consequently, the comprehensive data about the subject studied was provided. The documents were in the form minutes of meetings, newsletters, administrative documents, company archives, stored information, web pages, and annual reports. Most of the materials gathered were broadly related to the background of the company.

Data analysis were prepared by transcribing the interviews recorded using MP3 recorder. The researcher then typed and input the transcripts into qualitative analytical software known as ATLAS. TI. Although, ATLAS.TI software has facilitated the management of the data, the intellectual processes like interpretation were completed solely by the researcher. The researcher was in total control when it came to the intellectual process.

The coding procedure is an analytical process of the GT in data analysis. The coding procedure was practiced in a form of conceptualization and categorization of the phenomenon by using the constant comparative principle (Strauss, & Corbin, 2008). The coding procedure begins with exploring concepts and categories, followed by connecting the categories for relationships, and finally developing theoretical models by integrating the related categories to discover the core-categories and refining them. The interpretation was practiced during the process to look for additional data collection by using theoretical sampling technique. The theoretical sampling could provide information for and refine the theoretical analysis. Data preparation had facilitated the coding procedure by organizing and managing the data into ATLAS.TI.
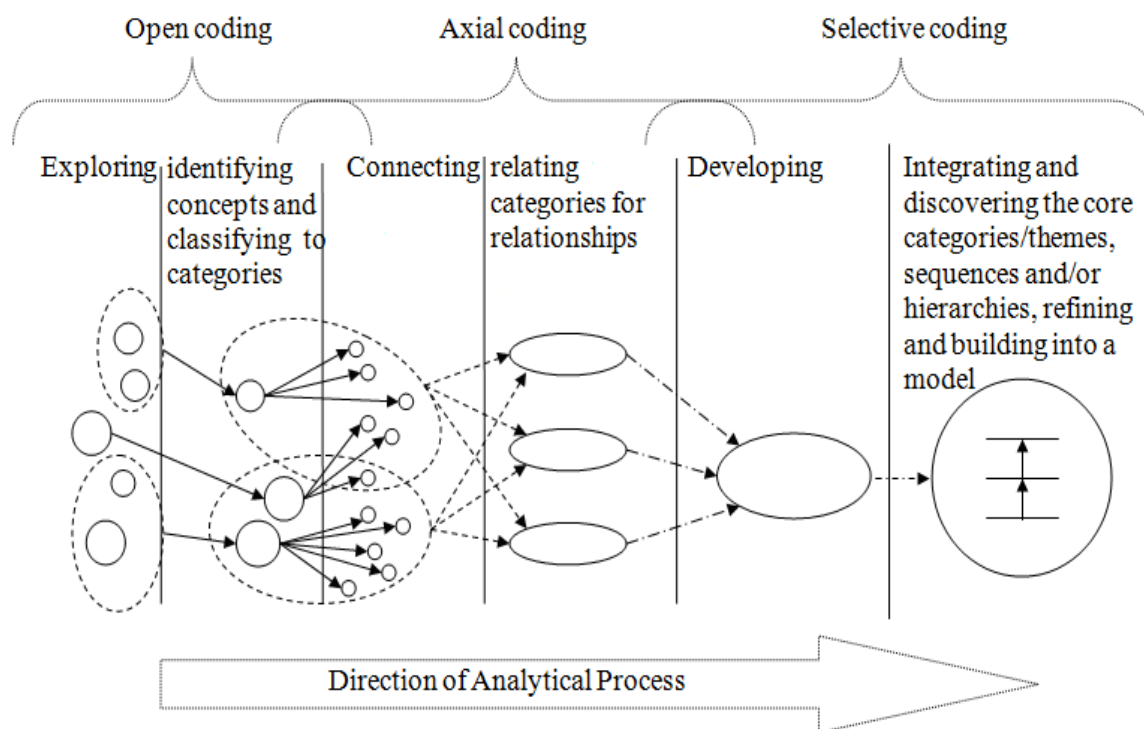
Figure 1: The Coding Procedures of the Analytical Process in GT Data Analysis

Figure 1 illustrates the coding procedures of GT according to Strauss and Corbin (2008). The principle of constant comparison was employed as the main practice to compare and contrast the data in theoretical formation and development (Strauss, & Corbin, 2008). The coding procedure was performed at three levels: open coding, axial coding and selective coding (Strauss, & Corbin, 2008). However, the researcher did not follow them strictly in a consecutive manner especially when she was already immersed in the data. At this point, the concepts, categories, relationships as well as patterns automatically came into sight. The following subsequent sections contain the discussions of the three coding levels.

Open coding was started by identifying and labeling manuscripts for concepts and categories. The concept is words stand for ideas, which resulted from the interpretation. It is the basic unit of theory development and sometimes referred to as codes (Miles, & Huberman, 1994). An invivo code denotes the participants' perspectives and nuances of language. It was codified from the essence of the data and used the participants' terminologies as much as possible (Strauss, & Corbin, 2008). The codes or concepts were conceptualized in terms of their properties and dimensions. Properties are characteristics that describe concepts while dimensions are variations that give a range of concepts (Strauss, & Corbin, 2008). The concepts were compared with each other and referred constantly to the original transcripts for similarities and differences when creating categories. The category is the concept that stands for a phenomenon at a higher level while a sub-category pertains to the category and provides further clarification and specification. The theoretical questions, namely, who, what, when, how, and why had been used to guide the researcher towards probe questions in order to stimulate the finding of properties and dimensions. The open coding was accomplished on the basis of a line by line through word, phrase, sentence, and paragraph.

Additionally, memos of emerging concepts and categories, the ideas at hand, the relationships between the concepts and categories, as well as the direction of questions for further data collection were

taken (Razavi, & Iverson, 2006; Strauss, & Corbin, 2008). The principle of continuous interplay between data collection and analysis was performed throughout. The iterative of both data collection and analysis processes gave new insights into the study. It helped in formulating new questions for the succeeding interviews as well as indicating the most appropriate participants. The interactive practice and interplaying of the data collection and analysis had allowed the researcher to continue getting feedback from participants to check whether emerging concepts and categories fit reality.

Axial coding performs the coding around the axis of a category. It offers a deeper analysis by comparing each category and its sub-category for similarities and differences in terms of property aspects and dimensional levels. The distinctions between the category and sub-category become clearer when axial coding is performed. The category explains what is going on while the sub-category gives answers to the related questions like who, what, when, where, why, how, and with what consequences of the phenomenon. The true patterns were discovered by moving through the data to look for constant or repeated occurrences of categories then were compared and contrasted for similarities and differences. As a result, the credibility was developed to establish a reality based on various participants (Glaser, 1978). In the practical aspect, both the open coding and axial coding were not sequential or discrete. They were performed as proceeding together instead. When the categories, their properties and dimensions started to appear, the relationships were sorted out. In axial coding, analytical systems had been applied to link the categories and sub categories. The loose arrays of concepts, categories and sub-categories during open coding were united into patterns by asking the questions of who, what, where, why, how, and with what consequence (Strauss, & Corbin, 2008). Additionally, the paradigm model was applied to help the researcher to conceptualize the data. The paradigm model is an analytical tool that is composed of causal conditions, contextual conditions, intervening conditions, actions/ interactions, and consequences. It helps the researcher to be able to contextualize the phenomenon, which relates to its components. According to this study, the findings of organizational outcomes were displayed at the last component of this paradigm model. However, we did not use the paradigm model to look for the terms of those components but to explain and attain an understanding of the phenomenon instead. Apparently, it is not unusual for the GT approach to reveal categories more than what has been expected at the outset of the study. GT is based on the principle of inductive logic. It provides the nature of exploration, which gives the strengths for the researcher to search for unusual and unexpected results. The interesting results are presented as categories, sub-categories, and core-categories, which have emerged as the themes of the research findings (Shannak, & Aldhmour, 2009). Furthermore, axial coding develops the basics for selective coding. The increasing of concreteness and density had linked the categories and eventually the core-category arose. The researcher began writing memos regarding the relationships of the main categories then the analysis had moved to the next level.

Selective coding involves the integration of categories at the highest level of conceptualization to discover the core-categories (Razavi, & Iverson, 2006). The core-category represents the main themes of the research findings. It allows a theoretical model to be constructed and the theory to be developed. Integrating, discovering and refining are three activities involved at this level (Figure 2). The integration of the categories leads to the discovery of core-categories, then to the refining of its boundary. The refined boundary is achieved by relating the core-categories systematically with other related categories surrounding it and then authenticating that relationship. The memos were used as references for the naturally emerged core-category.
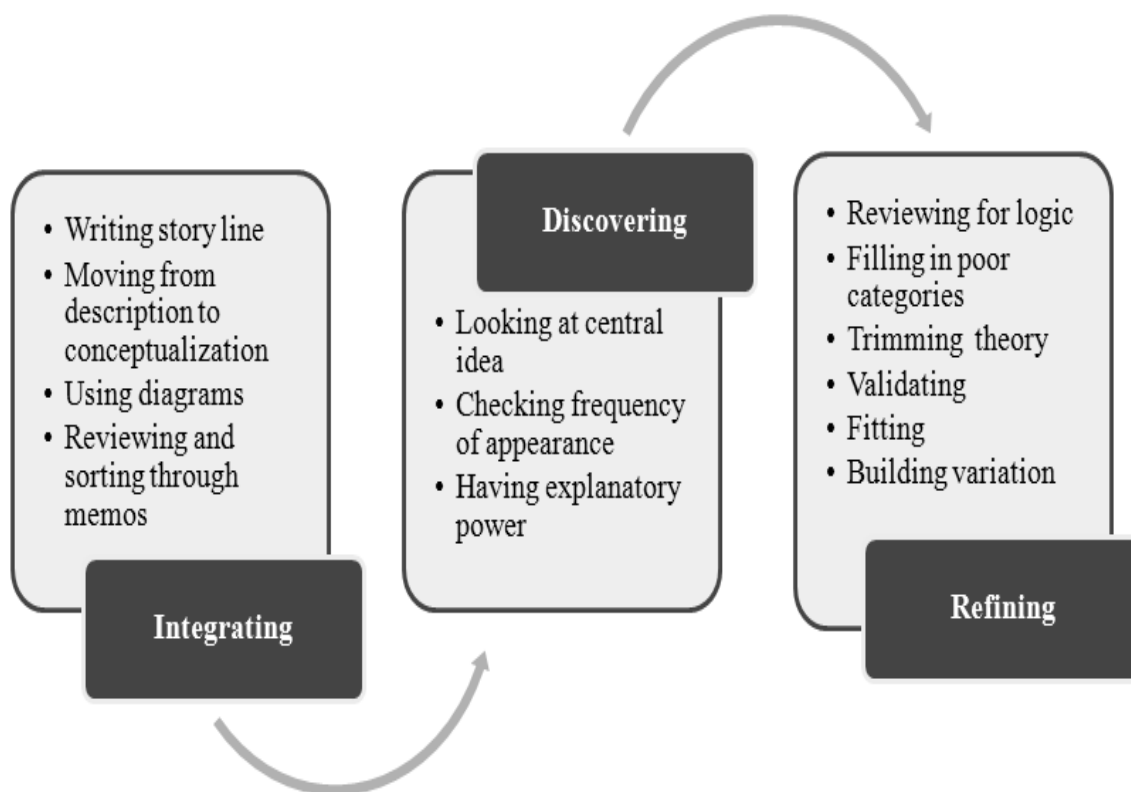
Figure 2: The Descriptions for Selective Coding

According to Glaser, & Strauss (1967), a researcher stops data analysis when "no additional data are being found whereby the researcher can develop properties of the category. As he sees similar instances over and over again, the researcher becomes empirically confident that a category is saturated. "when one category is saturated, nothing remains but to go on to new groups for data on other categories, and attempt to saturated these categories also" (Glaser, & Strauss, 1967). In fact, the difference of the researchers' experiences and theoretical sensitivity levels affect how they have perceived the level of theoretical saturation. Nevertheless, this discrepancy did not differentiate the central point of the saturation state where the gap in the new knowledge was diminished (Strauss, & Corbin, 2008). At this point, there were no new insights to generate categories. Then, the data collection and analysis came towards the end. The example emergence of core-categories, categories and sub categories at their saturation state is illustrated in Figure 3.

Figure 3: The Emergence of the Core-Categories

Findings

The organizational outcomes of CSCW systems presented the outputs and products as consequences of KMS assimilation process, which was found to have two categories which were classified from a number of concepts. The two categories are (1) individual effects and (2) organizational effects. The sub categories that were associated with the individual effects are (1)

performance efficiency (2) proficiency development and (3) responsibility stimulation. The sub categories that are related to the organizational effects are (1) KM culture (2) unity establishment and (3) organizational growth.

Performance efficiency refers to a decrease of the learning curve; shortened response time and greater ease of use. The following quotations denote the performance efficiency. "By having this

system, I can search for relevant information that can actually shorten my time, my work and I do not need to duplicate the work again. For example, I want to use an MPEG file for my presentation, I do not need to create the file because it is already there, what I need to do is just download it and use it."

Proficiency development refers to the development of people skills in the organizations. The following quotations denote proficiency development. "When I join CoPs, it is a kind of accelerating of my capability. This is because CoPs help me to discuss and learn something online which I do not need to go to the person directly, it can actually help me to work faster and save my time and money. I have learned a lot from Miss A, B, C those who are experts in the KM practices. I always seek for consultation from them."

Responsibility stimulation refers to the enthusiastic act of duty and job. The following quotations denote responsibility stimulation. "By exchanging ideas between colleagues, you are bonding with friends. Other people can help you out when you have problems. When there is distance geographically, you can help out your friends."

KM culture refers to the practices of KM as a culture in the organizations. When KMS is assimilated, the processes of knowledge sharing and knowledge creation could be performed. In fact, the consistence of performing knowledge sharing and knowledge creation built KM culture in the company. The following quotations denote the KM culture. "We work to institutionalize KM as a habit and culture in the organization. We take it in small chunks then, a smaller and smaller chunk rather than a big thing. Though we think very big, we take it in small steps. We phase it in."

Unity establishment refers to the state of being joined together in an agreement; it is the process of starting or creating something, for example a CoP group. The following quotation denotes the unity establishment. "By exchanging

ideas between colleagues, you are bonding with friends. Other people can help you out when you have problems. When there is distance geographically, you can help out your friends."

Organizational growth refers to the process of the development of the organization. The following quotations denote the organizational growth. "It is important for me to share. We have different perspectives and in the end the organization will benefit. It can grow."

Discussion

According to this study, the CSCW systems has been introduced as KMS to 11,000 people who have registered into the system of a total 32,000 staff members. In terms of utilization, active users who accesses the system regularly are about 5,000 or about 50 percent. The potential value of computer systems cannot be fully recognized until they are extensively assimilated in organizations by embedding the systems into business process in the form of daily routines (Liang, Saraf, Hu, & Xue, 2007; Wang, 2008). There has been no study clearly published about the consequences of KMS assimilation process in the literature. This current study makes the first attempt to investigate the consequences and is the original founder of the organizational outcomes. The performance efficiency, development of proficiency, and responsibility stimulation are outcomes of the individual level. KM culture, unity establishment, and organizational growth are outcomes of the organizational level. The findings of this current study are additional facts to the value of computer system assimilation. Although, all assimilation of computer system contributes value to individuals and organizations, their unique characteristics and value creation are significantly different from each other. The relevant discussion begins with the individual outcomes and is followed by the organizational outcomes.

The ultimate goal of KMS assimilation is to create value by enhancing organizational performance. As pertains to the individual level,

the effects are direct when users start utilizing the system to perform their related activities such as knowledge sharing. The results show that using the system to share knowledge had helped the users to enhance their performance efficiently because the creativity in the decision-making was done in a timely manner. This finding is consistent with published literature, which suggested that KMS improves the individual performances and productivity in terms of time and speed of the knowledge sharing process (Lee, Lee, & Kang 2005; Maier, 2007). Additionally, the finding adds some contextualization to the discussion of how computer technology helps the firms improve performance such as by enhancing process efficiency and employee productivity (Mahmood, & Soon, 1991). Although, the momentum of computer system is considered as an accelerator rather than a creator, more often than not it provides the most effective means for KM to be successfully practiced in organizations. The main objective of adoption and implementation of KMS is supporting KM activities. The organization encourages people to use the system, which is aimed at creating new knowledge by sharing and learning to improve their abilities and skills. In this way, individuals are able to develop their proficiency. The sharing and learning from each other could enhance an individual's proficiency in performing his/her own work. As this current study has found, most of the people who are involved with knowledge sharing revealed that their abilities and skills were further developed by connecting and interacting with the experts. The participation of the members in the community contributes to the best practice. Thus, it is able to be performed to achieve the organizational goal effectively. Knowledge sharing could bring the foundation of collaboration, which allows the members to help each other for the purpose of sharing and learning. This finding provides evidence that the responsibility will be stimulated and pushed to a higher degree when KMS is

successfully assimilated by targeted users in the form of knowledge sharing. This can be achieved through the sense of community developed by CoP groups, which cultural norms reinforce the idea of responsibility for ongoing learning and professional development.

Next, the effects at the organizational level are pertained through effects of direct users, which later contributes as organizational advantages as a whole. According to this current study, the assimilation of KMS has proven the unity establishment when people used the system for their knowledge sharing activities. The unity refers to the feeling of belonging and oneness (McMillan, & Chavis, 1986). In fact, knowledge sharing among CoP members creates interactions to increase their relationship to the sense of community, which demonstrates the common identity of the group to exist (McMillan & Chavis, 1986; Blanchard, & Markus, 2004). The unity is established when the group members have reached the sense of community. Though, this outcome does not directly relate to organizational performance, it will lead to the business performance in the long run. The spread of using KMS has energized intangible resources by enabling individuals and organizations to improve their learning and decision-making process, which finally contributes to an enhance the performance of the organization as a whole. This finding is consistent with the literature that suggests KMS usage actually enhances organizational performance (Malhotra, 2005; Lee et al., 2005). The enhancement of the organizational performance improves the operational efficiency and proficiency thereby contributing to the organizational growth. This supports the assertion in the literature that managing knowledge with KMS efficiently develops dynamic capabilities in terms of individual improvement and performance development, which finally lead to organizational growth (Kiessling, 2009; Fugate, Stank, & Mentzer 2009; Han, & Kang, 2007).

Conclusion

This study has provided a significant finding which is beneficial to managers, executives, and the highest echelon of the company to understand the impacts of CSCW systems through KMS assimilation in organizations. The findings give clear insights into the organizational outcomes at both individual and organizational levels, which are considered as original. The performance efficiency, development of proficiency, and responsibility stimulation are outcomes of the individual level. KM culture, unity establishment, and organizational growth are outcomes of the organizational level. These positive impacts of technology are additional facts to the value of technology use through system assimilation. The study has corroborated the positive impacts of technology use for collaborative work and emphasize that technology plays an important role for managing knowledge in organizations. It is suggested that the future research should focus on various stakeholders like vendors, consultants, subsidiary companies and so forth to give further insights and expand the findings of this study. On the other hand, the involvements of various environmental backgrounds such as culture and organizational types, which may provide different findings, are suggested for further exploration. Finally, an ambitious research project that involves with a longitudinal study of across different industries is recommended.

References

Alavi, M., & Leidner, D. (2001). Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly, 25*(1), 107-136.

Bibri, S. E. (2019). Awareness aspects and effects on coordination and information sharing in the domain of software engineering as CSCW: An ethnographic study. *Augmented Human Research, 4*(1), 6.

Blanchard, A., & Markus, M.L. (2004) The experienced "Sense" of a virtual community: Characteristics and processes. *The DATA BASE for Advances in Information Systems, 35*(1), 65-79.

Botha, D.F., & Fouche, B. (2002). KM practices in the South African business sector: Preliminary findings of a longitudinal study. *South African Journal of Business Management, 33*(2), 13-19.

Charmaz, K. (2006). *Constructing Grounded Theory: A Practical Guide Through Qualitative Analysis*. India: Sage.

Chatterjee, D., Grewai, R., & Sambamurthy, V. (2002). Shaping up for E-commerce: institutional enablers of the organizational assimilation of web technologies. *MIS Quarterly, 26*(2), 65-89.

Correia, A., Jameel, S., Schneider, D., Fonseca, B., & Paredes, H. (2019). *The Effect of Scientific Collaboration on CSCW Research: A Scientometric Study.*

Creswell, J. W. (2003). *Research Design: Qualitative, Quantitative, and Mixed Methods Approach* (2nd ed.). Thousand Oaks, CA: Sage.

_____. (2009). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Los Angeles: Sage Publications.

Farshchian, B. A. (2019). *Collaboration as Commodity: What does CSCW have to offer?*. In Proceedings of 17th European Conference on Computer-Supported Cooperative Work. European Society for Socially Embedded Technologies (EUSSET).

Fugate, B.S., Stank, T. P., & Mentzer, J. T. (2009). Linking improved knowledge management to operational and organizational performance. *Journal of Operations Management, 27*, 247-264.

Glaser, B., & Strauss, A. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research.* Chicago: Aldine.

Goulding, C. (2005). Grounded theory, ethnography and phenomenology: A comparative analysis of three qualitative strategies for marketing research. *European Journal of Marketing, 39*(3/4), 294-309

Green, J., & Thorogood, N. (2005). *Qualitative Methods for Health Research*. London: Sage.

Han, K. H., & Kang, J. G. (2007). A processbased performance measurement framework for continuous process improvement. *International Journal of Industrial Engineering, 14*(3), 220–228.

Hoadley, C. M., & Kilner, P. J. (2004). Using technology to transform communities of practice into knowledge-building communities. *SIGGROUP Bulletin, 25*, (1), 31-40.

Hossain, D., Junghoon M., Jin K., & Young, C. (2011). *Ele*ctronic commerce research and applications impacts of organizational assimilation of e-government systems on business value creation: A structuration theory approach. *Electronic Commerce Research and Applications, 10*(5), 576-594.

Johnson, C.M. (2010). A survey of current research on online communities of practice. *Internet and Higher Education, 4* (1), 45–60.

Kiessling, T. S., Richey, R. G., Meng, J., & Dabic, M. (2009). Exploring knowledge management to organizational performance outcomes in a transitional economy. *Journal of World Business, 44*, 421-433.

Kock, N., & Davison, R. (2003). Can lean media support knowledge sharing? investigating a hidden advantage of process improvement. *IEEE Transaction on Engineering Management, 50*(2), 151-163.

Kouki, R., Pellerin, R., & Poulin, D. (2010). Investigating the determinants of effective enterprise resource planning assimilation: A cross-case analysis. *International Journal of Business Information Systems, 5*(1), 58-83.

Kruger, C. J., & Johnson, R.D. (2010). Information management as an enabler of knowledge management maturity: A South African perspective. *International Journal of Information Management, 30*, 57-67.

Lee, K.C., Lee, S., & Kang, I. W. (2005). KMPI: Measuring knowledge management performance. *Information Management, 42,* 469-482.

Lee, N. J., & Choi, B. (2010). Determinants of Knowledge Management Assimilation: An Empirical Investigation. *IEEE Transactions on Engineering Management, 57*(3), 430-449.

Lee, S. M., & Hong, S. (2002). An enterprise-wide knowledge management system infrastructure. *Industrial Management and Data Systems, 102*(1), 17-25.

Leug, C. (2001). Information knowledge and networked minds. *Journal of Knowledge Management, 5*(2), 151-160.

Liang, H., Saraf, N., Hu, Q., & Xue, Y. (2007). Assimilation of enterprise systems: The effect of institutional pressures and the mediating role of top management. *MIS Quarterly, 31*(1), 59-87.

Liao, S. (2003). Knowledge management technologies and applications: Literatures review from 1995 to 2002. *Expert Systems with Applications, 25*, 155–164.

Lin, F.J., & Hsueh, C.M. (2006). Knowledge map creation and maintenance for virtual communities of practice, Information. *Processing and Management, 42*(2), 551–68.

Majchrzak, A., Rice, R., King, N., Malhotra, A., & Ba, S. (2000). Computer-mediated inter organizational knowledge-sharing: insights from a virtual team innovating using a collaborative tool. *Information Resources Management Journal, 13*(1), 44-45.

Mahmood, M. A., & Soon, S. K.. (1991). comprehensive model for measuring the potential impact of information technology on organizational strategic variables. *Decision Sciences, 22*, 869–897.

Maier, R. (2007). *Knowledge Management Systems: Information and Communication Technologies for Knowledge Management.* Verlag Berlin: Springer.

Makkonen, H. (2008). Beyond organizational innovation adoption: A conceptual and empirical analysis. *Journal of Business Market Management, 2*(2), 63-77.

Malhotra, Y. (2005). Integrating knowledge management technologies in organizational business processes: getting real time enterprises to deliver real business performance. *Journal of Knowledge Management, 9*(1), 7-28.

McMillan, D.W., & Chavis, D. M. (1986). Sense of community: A definition and theory. *Journal of Community Psychology, 14*(1), 6-23.

Miles, B.M., & Hubermann, A.M. (1994). *Qualitative Data Analysis*, (2nd ed). SAGE Publications.

Neilson, R. E. (1997). *Collaborative Technologies and Organizational Learning.* Hershey, PA: Idea Group.

Novak, J., & Wurst, M. (2004). Supporting knowledge creation and sharing in communities based on mapping implicit knowledge. *Journal of Universal Computer Sciences, 10,* (3), 235-251.

Pan, L. S., & Leidner, D. E. (2003) Bridging communities of practice with information technology in pursuit of global knowledge sharing. *Journal of Strategic Information Systems, 12,* 71–88.

Razavi, M., & Iverson, L. (2006). *A grounded theory of information sharing behavior in a personal learning space.* In proceedings of: Proceedings of the 2006 ACM Conference on Computer Supported Cooperative Work, CSCW 2006, Banff, Alberta, Canada, November 4-8, 2006.

Rogers, E. M., (2003). *Diffusion of Innovations.* New York: Free Press.

Shannak, R., & Aldhmour, F. (2009). Grounded theory as methodology for theory Generation in information system research. *European Journal of Economics, Finance and Administrative Sciences,* (15), 32-50.

Strauss, A. L., & Corbin, J. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Los Angeles, CA: Sage.

Vaidya, K., Campbell, J., Soar, J., & Gardner, S. (2012) Assimilation of Inter-Organizational Information Systems: Insight from Change Resistance Theory in Public Electronic Procurement. In: Vaidya, Kishor, (ed.) *Inter-Organizational Information Systems and Business Management: Theories for Researchers* (pp.18-32). IGI Global, Hershey, PA.

Vaidya, K., Sajeev, A.S.M., & Gao, J. (2010). E-procurement assimilation: An assessment of E -business capabilities and supplier readiness in the Australian public sector. ICEC'05, 15-17. Xian, China.

Wang, P. (2008). Assimilating IT innovation: The longitudinal effects of institutionalization and resource dependence. *Twenty Ninth International Conferences on Information Systems,* Paris 2008.

Yin, R.K. (2003). *Case Study Research: Design and Methods* (3rd ed.). Thousand Oaks: Sage Publications..