Online knowledge sharing procedures: A systematic review of the state of the art literature from 2006 to 2016

Saada Abdel gawad Mohamed Khadragy

s.jawad@cuca.ae

The British University in Dubai, Dubai, UAE

Abstract. The process of knowledge sharing refers to exchanging knowledge such as information and experiences among people from the same organizations or from different places. While the importance of social media became doubled, sharing knowledge through online applications became wider and more common. Undeniably, using different online methods to share knowledge is significant but the number of comprehensive and systematic studies is limited in covering such techniques. This paper aims to reveal the importance of online knowledge sharing in organizations and to present a comprehensive, systematic literature review with a survey of the state-of-the-art about the activity of knowledge sharing in online settings. Moreover, the literature will be systematically reviewed up to the end of 2017. 411 articles have been recognized, that are decreased to 255 basic studies, this number is filtered to be minimized and the final number of reviewed articles is 42. Additionally, the paper will present a clear view of past studies in the area of knowledge sharing. Through the literature survey, an overall idea would be introduced to the researchers in order to perfectly understand the history and the development of online knowledge sharing technique.

Keywords: Knowledge, Knowledge management, Knowledge sharing, Challenges, and Systematic review.

1. Introduction

Recently the concept of knowledge sharing became one of the basic areas of knowledge management. In order to improve the performance of any academic or non-academic institution, a lot of efforts could be done to determine the most effective tool for sharing knowledge between individuals and institutions. However, a number of obstacles had been illustrated through literature for knowledge sharing such as the gap between senders and receivers cultures, the institution structure, and the shortage of technology in some fields. The higher education sector as an international source of knowledge, it needs to reach the highest level of efficiency by improving the ways of knowledge sharing. Both the cost and time wasting could be reduced by using the step of knowledge sharing and the institutions would be able to save their lost data and information as well.

As a result, the recent study aims to investigate the approach of knowledge sharing through the literature as an effective way to improve individuals socially and academically. In order to achieve the objectives of this article, the following questions were addressed:

1. What are the benefits of online knowledge sharing in different organizations from the literature?

2. Is online knowledge sharing considered as an appropriate approach for communication between people in all fields?

3. What are the main obstacles that face online knowledge sharing in different domains?

2. Literature Review

The concept of knowledge management is considered as a broad and common concept, it is essential for many and different fields as knowledge could be produced everywhere (Al-Emran, Mezhuyev, Kamaludin, & Shaalan, 2018). For instance, the higher education sector is one of those fields, it generates a lot of knowledge which needs to be managed and organized (Desiree Joy, 2008). While there are different definitions for knowledge management referring to its deep history. Davenport et al. (1998) defined Knowledge management as it is slanted towards the utilization and growth of the knowledge which is produced by any institutions with a view to considering the institution's goals. In order to manage the knowledge with both explicit; recorded knowledge and tacit; personal knowledge, it requires all of these methods linked with recognition, sharing and formation of knowledge. This needs methods for the construction and preservation of knowledge sources, to support and assist the knowledge sharing process in organizational learning. Institutions and projects that flourish in knowledge management are similar to see knowledge as an asset and to improve institutional standards with customs which reinforce the formation, therefore sharing of knowledge (Rowley, 2000).

All of the above points indicated that KM tends to clarify the method of knowledge creation, usage, and sharing with different institutions and projects. As education is a global project (Ball, 2013), it needs to follow the mentioned stages of KM.

On the other hand, Knowledge management is defined as a management system that appeared in the 1990s(Park, 2005). Knowledge Management (KM) includes a variety of attempts used by institutions to categorize, design, signify, and allocate knowledge to be reused with consciousness and learning. That would be a launched regulation 23 years ago with a formation of university subjects and both specialized and practical journals devoted to it (Park, 2005).
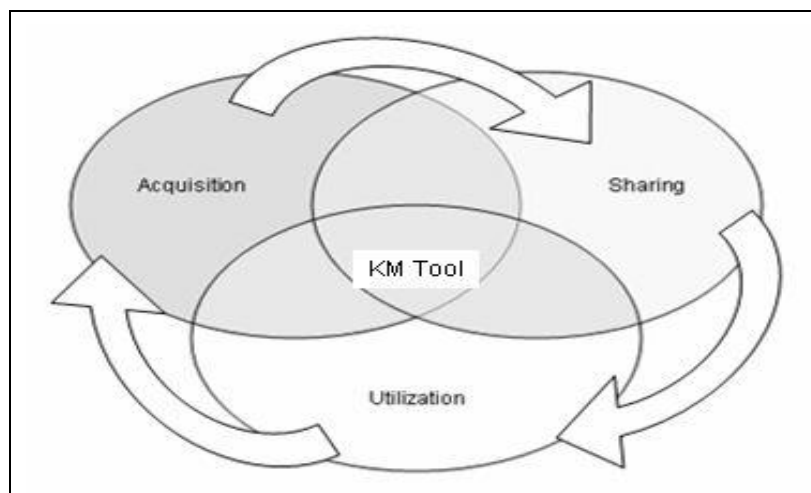

Figure1. KM steps

Many organizations have their own sources donated for Knowledge Management, usually as a part of "Information Technology" or "Human Resource Management" sectors, and in some cases stating directly to the manager of the institution (Alavi & Leidner, 2001). As efficiently dealing with information which is a must in any organization, Managing the knowledge is a multi-billion dollar universal market (Shakerian, Dehnavi, & Shateri, 2016). In the area of education, knowledge management is a group of all types of official knowledge, which distorted from different instructional sources and combined as net-structure(Whittaker, Llinares, & McCabe, 2011).

Therefore, knowledge management in education offers accessible management to the educational knowledge in order to recognize the manufacture, application, and share of different experiences (Zhao, Chen, & Panda, 2014). Tom Finneran describes the model knowledge management stages (Fig.1) with the benefits of the produced knowledge (Motawa & Almarshad, 2013). Accelerating the improvement of new knowledge and notions obtain knowledge openly and painlessly, habitually categorize and correlate knowledge, let knowledge internationally available so that the correct knowledge could be found and efficiently applied by any Knowledge operative who wants it (Ersanli, 2016).
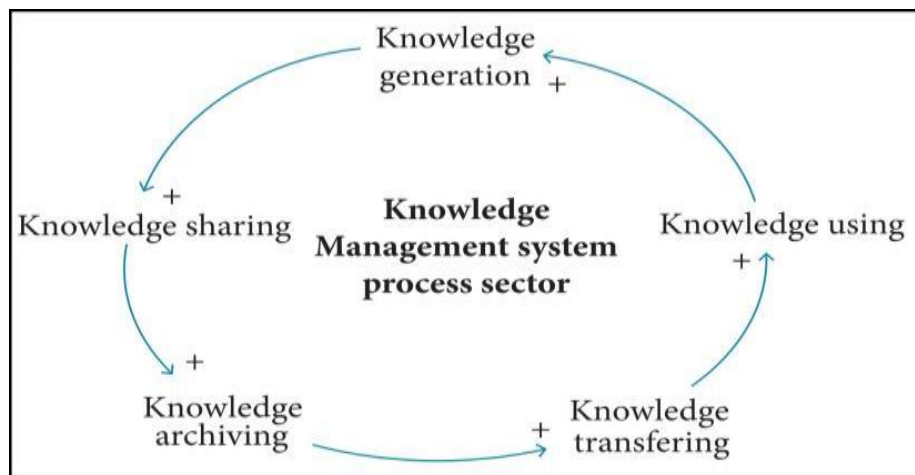
Figure2. Knowledge management cycle

From the literature and as it came clearer in figure2, knowledge management cycle consists of five stages; knowledge generation, using, transferring, achieving, and sharing.

Knowledge sharing is considered by scholars and researchers as the heart of the knowledge management process, plus being one of the exertions of knowledge management (Fudan University et al., 2011). Knowledge sharing indicates personal knowledge, and the institutional knowledge would be distributed between different persons in the organization by each sharing tools. At the same time, it recognizes the institution's knowledge growth through knowledge innovation. Therefore, the knowledge sharing could be understood from three level concerns: the knowledge sharing aim-knowledge subject, knowledge sharing way-knowledge network system, the session and teamwork, the core heart of knowledge sharing-team, and institution (Lisbôa & Coutinho, 2011).

Knowledge is one type of limited resources; it means, when an individual offers the knowledge to another individual, the sender would not, therefore, produce their personal knowledge to be decreased (Coyte, Ricceri, & Guthrie, 2012). All in all, it is not easy to recognize operational knowledge sharing in projects and institutions. The recent theories offer only divided visions into the beginning of knowledge sharing, and then offer imperfect control for knowledge management activities in universities and higher education institutions as an example. The influence of this paper is to provide a systematic review of some real situations for the practice of organizations' knowledge sharing based-on challenges considering under the background of information.

3. Method

The literature review has many strategies and techniques in the field of knowledge management; one of them is the systematic literature review (Pearson, 2014). The systematic literature review is considered as an essential tool of evaluating all research studies those had been written in a particular era or field using specific criteria in order to recommend topics for future studies (Garousi & Mäntylä, 2016). Therefore, all of the mentioned benefits assured the importance of this approach for reaching reliable results and evaluating the literature in a systematic way. Additionally, the systematic literature review had been defined as an approach which generated from the medicine area (Nkomo & Hoobler, 2014), also it is the study in the field of engineering and social science as well (York, 2010). All in all, systematic literature review is recognized by history as one of the most common approaches of reviewing the literature. Through the following section, a systematic literature review is applied to accomplish critical and systematic research of the online knowledge sharing procedures. The following points would introduce the process of this research study and would identify the classification of the online articles.

3.1 The procedures for selecting the articles

The researcher selected the reviewed articles according to the following steps:

- The first step: determining a certain keyword and making an online search with it. The selected keyword is "knowledge sharing".
- The second step: determining the required titles of the articles.

- The third step: determining the contribution of the journal and how it is ranking in the field of knowledge management.

In order to find the relevant studies for this research, in the first step, the researcher used Google scholar to search about the electronic datasets such as IEEE, knovel, ascelibrary, SpringerLink, web of knowledge, Scopus, emerald insight, Science Direct, and Web of science. This research study has basically emphasized the articles which were published in the electronic databases and all are cited in table1.

No	Electronic databases
1	IEEE
2	Emerald insight
3	Scopus
4	Web of knowledge
5	SpringerLink
6	knovel
7	Science Direct
8	ascelibrary
9	EBSCOhost

Table1. Online databases cited the systematic literature review

In the second step, the researcher tended to apply some screen settings in order to reach the total number of articles. 411 studies were obtained. After excluding the reports and notes, the number became 255 articles. The 255 articles were selected as they were the most relevant and closer to the topic. At the end, the researcher selected 42 articles for reviewing based on their titles and place of publication. The papers selected from Emerald, IEEE, Sage, Springer, Elsevier, ERIC and etc. While many articles from the same field were published in some journals those are not highly ranked.

In the third step, the researcher started to read the chosen articles' titles, abstracts, and introductions to decide their relevance to the topic. All papers were filtered according to their year of publication, and ranking. With this classification, 156 articles were excluded as they were not relevant to the topic. 255 articles were relevant to the topic of knowledge sharing. Then, 42 articles were found as the most suitable papers for analysis.

Figure3 explains the process of choosing the relevant studies. The researcher used the search engine to determine the popular studies with an automated online search. The findings from this search came up with 411 articles considered as applicable to the topic. After reading the papers' abstracts, 255 came as the number of relevant articles, and 42 articles were resulted as the most significant ones. Then, we divided the resulted articles into three main parts, including 199 journals, 45 conferences, and 11 books.
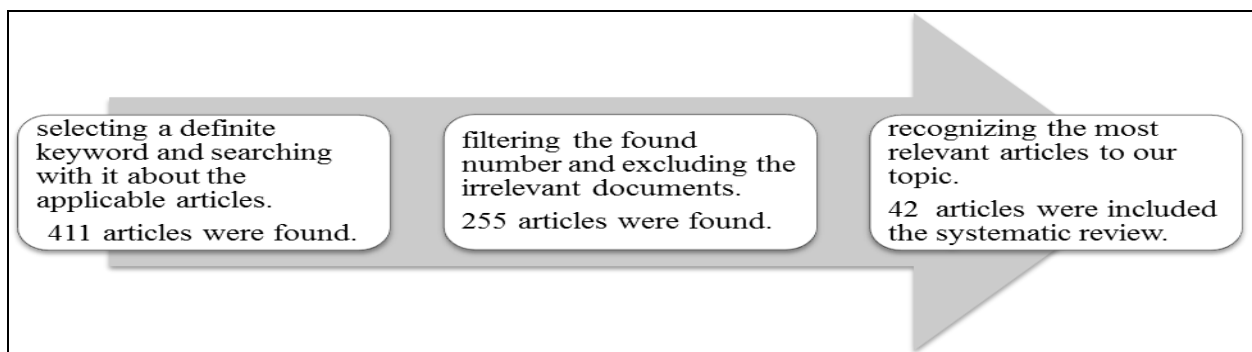

selecting a definite keyword and searching with it about the applicable articles.
411 articles were found.

filtering the found number and excluding the irrelevant documents.
255 articles were found.

recognizing the most relevant articles to our topic.
42 articles were included the systematic review.

Figure3. Articles selection process

3.2 Articles categorization

In this sub-section, the way of categorizing the articles would be explained. The step of classifying the online articles that had been written in the area of knowledge sharing is considered as one of the most important sections of this study. Table 2 includes the number of 411 articles in online webpages; all of them were constructed about the knowledge sharing process. Also, the classification of the articles according to their year of publication is figured out by table 2. The researcher used the search scale as; articles published about knowledge sharing in the period between 2006 to 2016. Moreover, figure 4

introduces the classification of the papers over time depending on the determined categories through some journals such as Wily, Taylor, IEEE, Emerald, ERIC and etc. the publishers are presented by figure 5.

KM stages	Sharing knowledge			
Stage1	411			
Stage2	199 Journals	45 Conferences	9 books	
Stage3	From 2006 to 2009 12 articles	From 2009 to 2011 10 articles	2011 to 2013 11articles	From 2013 to 2016 9 articles

Table2. classification of articles in the area of knowledge sharing

4. Results and Discussion

The use of ICT; information communication technology; is one of the essential improvements of knowledge management in the organizations that help knowledge sharing between individuals (Krauss, 2013). Internet is an intermediate tool between senders and receivers, and considered as one of the most effective contributors in sharing knowledge between people from the same or different organizations (Mearns & Jacobs, 2009). In recent days, the internet has a great impact on gathering people together that helps them to share their experiences and information (Nilmanat, 2009).

While people can share their knowledge by using two different ways; using computers and electronic devices or face to face communication, online communication is more effective to save efforts and time(Sere et al., 2011). As a result, online communication came as an alternative solution instead of face to face communication(Chiang, Low, Calderbank, & Doyle, 2007). Also replacing the face to face communities with the online communities came as a second result (Ligorio & Van Der Meijden, 2008).

Another factor encouraged this replacement is the task-time achievement, as by using the online communication tools people can minimize the time of any task(Gauthier & Krajicek, 2013). It is undeniable that despite the existence of such huge number of online communities, a small number of them only is effective in encouraging individuals sharing their knowledge (Rau, Gao, & Ding, 2008). Moreover, online network settings contribute in improving people socially, have relationships, interact with each other, teach, learn, and share knowledge by using technology (Gil de Zúñiga, 2012). The high anticipation of the achievement with self-efficacy has its own great role in knowledge sharing through an online community (Suppiah & Singh Sandhu, 2011).

Additionally, the status might affect the approach of knowledge sharing in a certain group and its members that can affect the attitudes as well. In this regard, sharing knowledge would help in providing combined skills such as social networking in order to share useful information with the whole community (Suppiah & Singh Sandhu, 2011). Pi et al (2013) stated that the most important factor that can influence the process of knowledge sharing is culture sharing. On the other hand, a large number of studies n showed that the way of announcing for sharing knowledge in the groups is considered as an effective factor for motivating people sharing their information and experiences (Kuzu & Özilhan, 2014). The following paragraphs would introduce a review of the selected articles until 2017.

The majority of the published papers until 2008 discussed the importance of online knowledge sharing and illustrated that different groups of people cannot only meet online to share their experiences and information, but they can also form some educational organizations. The period between 2006 and 2009, about 12 articles were published. The essential points that discussed in this period, were the effective and sustainable knowledge sharing environments (Hemlin, 2009). Ahern et al. (2007) argued that the major challenge that faced the process of knowledge sharing was the minor number of participants in sharing their information and experiences, but Mark (2009) came up with a solution for that problem by increasing the benefits of sharing their experiences and information to make it attractive for everyone.

Moreover, a group of papers had been constructed between the year of 2009 and 2012, this number of articles revealed the effects of some different factors on the process of knowledge sharing. Some of those factors are such as resources of the knowledge, institutional intrinsic encouragement, international motivations, and social encouragement (Javernick-Will, 2012).

While another group of papers emphasized not only the importance of social media pages on sharing knowledge but also the importance of the process of sharing knowledge between employees to make those papers popular and famous (Schutz, 2014). Another issue had been discussed through few case studies after the year of 2014; this issue is the relation between the process of providing knowledge and

manager's attention allocated to the posted problems by their employees on the online communities (Haas, Criscuolo, & George, 2015). Also, the importance of applying programmatic tools such as JavaScript Object Notation-Linked Data to find the time changes between different periods in the Business field (Shaw, Rabinowitz, Golden, & Kansa, 2016).

Publisher	Year of publication	Number of articles
IEEE	2006	1
	2007	2
	2008	2
	2009	3
	2010	1
	2011	3
	2012	2
	2013	2
	2014	1
	2015	3
	2016	2
Emerald	2006	1
	2007	6
	2008	1
	2009	4
	2010	5
	2012	4
	2014	3
	2015	2
	2016	2
	2017	1
Springer	2006	2
	2007	2
	2008	1
	2009	1
	2010	2
	2011	1
	2012	2
	2013	2
	2014	3
	2015	4
	2016	3
	2017	2
Elsevier	2006	1
	2007	1
	2008	3
	2009	2
	2010	3
	2011	2
	2012	2
	2013	2
	2014	1
	2015	2
ERIC	2011	1
	2012	1
Citeseer	2010	1
	2015	2
Different publishers	2001	1
	2002	2
	2003	5
	2004	2
	2005	2
	2006	6
	2007	4
	2008	10
	2009	13
	2010	15
	2011	18
	2012	18
	2013	15
	2014	23
	2015	10
	2016	12
	2017	10

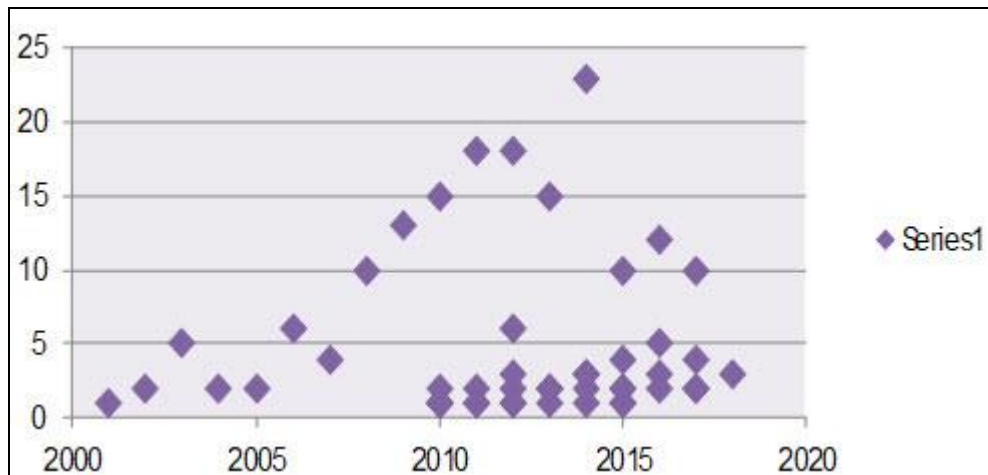**Table3. Articles distribution by numbers, years, and publishers**

Figure 4. Articles distribution by years

Recently, the majority of events assure that sharing news in social media became a fact of growing social, financial, and ethical significance because people can now contribute to news construction and distribution in wide universal practical organizations. Knowledge about issues affecting news sharing in social media is still controlled.

Lee and Ma (2012) constructed a case study to examine the effects of knowledge searching, socializing, entertaining, status searching and past social media allocating experience on news sharing goal. The author designed a survey of 203 students in a huge local university. Findings from structural equation modeling (SEM) analysis showed that participants who were directed by the satisfaction of information seeking, socializing, and status-seeking were more likely to share news in social media platforms. Past experience with social media was also a clear factor of news sharing purpose.

In another case study, Jarrahi (2015) had provided vision into the critical task that social media can do in the process of knowledge sharing (KS) in an initiative through the views of social capital. This study surveys the different methods in which the implementation of social media findings in ordinal alternation of natural relations that support the social links required for KS, both within and across institutions. The empirical basis of this research was a domain study depending on the implementation of social media by knowledge employees from 17 consulting organizations and the results showed the effective role of social media in the process of knowledge sharing.

Knowledge sharing has an essential responsibility in the field of information security, according to its effective impression on individuals' information security consciousness. It is recognized that security consciousness is the most critical element that moderates the issue of information security gaps in institutions. From this point, another group of papers reflected the role of individuals in the process of knowledge sharing and how people could be positive to create a successful process of sharing their knowledge or not. Safa and Von Solms (2016) presented a model to reflect the importance of informal knowledge sharing and how to minimize the risks of losing this information. The results of this case study showed two factors affected the use of their model; institutional motivation as an extrinsic factor and the employees' inner satisfaction which is considered as intrinsic motivation.

5. Conclusion and future directions

The previous section discussed the reviewed articles in the domain of knowledge sharing from different eras. Additionally, this section provides a summarization of the article's steps including the answers of the research questions with a number of future recommendations. The reviewed articles were divided according to their year of publication, purpose and field between a group emphasized the importance of networks in motivating people to share their information and experiences, other group emphasized the important role of institutions themselves in letting their employees sharing their knowledge, another group focused on the social manners of people who used to share their knowledge, and the last group presented different models to tackle the risk of information security. From this systematic review, we realized that knowledge sharing is considered as the most effective step to improve organizations from different fields. All of the reviewed articles assured that knowledge sharing has many advantages such as providing a kind of flexibility between employees, increasing workers' productivity, developing the social manners of employees in different organizations, and saving their time. Few

obstacles are cited through some papers about sharing individuals' knowledge such as some traditions in different places that let people shy to share their knowledge. Lastly, we found that the largest number of papers had been published in the period of 2014 and 2015 and the reason for that might be the technological development. From all of the above, some recommendations for future research came clearer such as to combine all the mentioned factors affecting knowledge sharing in one research study. The best instrument could be used in this type of research is a questionnaire asking people about why they like and do not like to share their information.

Knowledge sharing is an essential perception, especially in the developed countries. As knowledge sharing is pointed by many researchers as an important procedure of knowledge management, there are many issues needed to be studied in the field of knowledge management and its procedures in the future. Both of managing and sharing knowledge are important for any institution to survive in a worldwide competitive environment. The result of the current study has shown that knowledge sharing is essential for all societies, but it faces some obstacles in the shape of specific difficulties that delay the fruitful process of sharing the knowledge.

The process of knowledge sharing, and transfer have been searched mostly in developed regions; also research in the same field can be done in developing regions. Additionally, there are few indications of research related to knowledge sharing and transfer in the educational sectors; hence, these sectors can be studied further. Moreover, studying cultural dimensions should be emphasized in future research with the exploration of the cognitive side as well. Consequently, future studies should strengthen the essential role of social media in educational institutions as an intermediate tool of the process of knowledge sharing. As a result, the process of online knowledge sharing and transfer in different cultural contexts and organizations can be studied. Furthermore, different formal and informal communication instruments at the institutional stage, can be explored as well.

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