A Systematic Literature Review of Knowledge Sharing Based on ICT During COVID-19 Era

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Abstract—**The outbreak of the COVID-19 pandemic has resulted in various studies to find out various solutions, from economic, cultural, social and political perspectives. Changes in lifestyle to survive in the pandemic era have led, scientific communities attempt to seek information and knowledge. This study aims to investigate related to knowledge sharing by utilizing ICT during the Covid-19 pandemic by utilizing a systematic literature review. The search for scientific literature was carried out by using Publish or Perish and PRISMA2000 through the keywords 'knowledge sharing', 'ICT' and 'COVID-19' and found 32 journal articles during the period of 2020 until the first half of 2022. The study found that there has been an increasing trend in research on knowledge sharing based on ICT during the period in question. ICT is very helpful for the community in sharing knowledge and the more people can take advantage of ICT, the faster people will acquire knowledge.**

Keywords—*Knowledge sharing, systematic literature review, ICT, and COVID-19*

I. INTRODUCTION

Knowledge is an important element for the survival of institution or organization. For this reason, an innovative, creative knowledge management that is sustainable is needed for the survival of the institution [1]. In this regard, Nanoka points out that the knowledge contained in a dynamic organization involves two things, namely tacit knowledge and explicit knowledge [2]. In its development, the need for information and knowledge tends to be stored frequently in the individual's brain or mind and this needs to be transformed so that the thought will be implemented when sharing knowledge and most vital one [3]. This knowledge sharing need, according to Wang & Noe, will provide solutions to certain problems that may occur and then generate new ideas in the form of product and create new policies [4].

Explicit knowledge can not only be accessed via offline but also be disseminated through ICT in the pandemic period. Ibnu Majah [et.al] in their research stated that ICT is very vital in the pandemic era, where it will minimize physical interaction among fellow human beings while social distancing protocol is promoted in order to protect the transmission of the COVID-19 disease. On the other hand, the government needs accurate and precise information related to public health conditions [5]. This is emphasized by the statement of Asdzadeh [et.al] that the application of technology can assist emergency management in terms of

prevention/mitigation, preparedness, response and recovery phases of crisis [6].

In addition, the confusion of the community in conveying their knowledge sharing occurs in the field of education or social organization. Sharing knowledge according to Zheng (2017) states that knowledge sharing is different from knowledge transfer and knowledge exchange. In addition, knowledge sharing is not communication, but is related to communication. Knowledge sharing is assumed to be at least a relationship between two parties, one party has knowledge, and the other party acquires knowledge [7]

In this context, Assidiqi and Woro state that an educator will be successful in conveying the learning material seen from the device that will be used [8]. The Covid-19 pandemic has changed people's culture in digital knowledge sharing by utilizing digital platform [9]. The use of technology presented by these experts makes it clear that ICT is very instrumental in the pandemic era in providing knowledge sharing for the community in terms of data and information.

Based on this, the problem in this study is the extent to which knowledge sharing based on ICT is being implemented during the COVID-19 pandemic. This can be seen from the lack of knowledge sharing during the pandemic and the large number of webinars from various institutions that use ICT in Indonesia and also the other country. The novelty in this study is identified simply related too knowledge sharing by applying the systematic literature review method. The systematic literature reviewer is a type of literature review that collects and critically analyzes multiple research studies or papers through a systematic process [8] One of the systematic reviewers of the literature during the COVID-19 period related to information, including Rahmawati and Tamara, researching the spread of hoaxes in various media [9]. Similar research conducted by Sulaiman [et.al] from Nigeria stated that Nigerian youths spread hoax news about COVID-19 through social media such as Facebook, Twitter, WhatsApp and Instagram [10] .

II. RESEARCH METHODS

The method for this research is Systematic Literature Review (SLR). SLR is a method that provides an overview of current knowledge on a topic including substantive findings, theoretical and methodological contributions to a particular topic [11]. One of the goals of the SLR method is to reduce bias and decide the research protocol in the review

[12]. The systematic review process is transparently documented through electronic databases, various journal articles, results of conference proceedings, research published on URLs, any sources related to the research [13]. Documentation of the literature in this study began in 2020-2022. If review is not carried out based on standard and protocol, this tendency can produce a bias and false information about the development of a particular topic. Winchester and Salji refer to it as "cherry picking" [14].

A. Research Questions

Research questions for this research includes: 1. What is the development of Knowledge Sharing research based on ICT each year during COVID-19 era?; 2. What is the trend of authors on KS research based on ICT during COVID-19 era?; 3. What is Co-authorship network of KS research based on ICT during COVID-19 era; 4. How is KS research based on ICT during COVID-19 era classified?; and 5. What is the general tendency of KS research based on ICT during COVID-19 era?
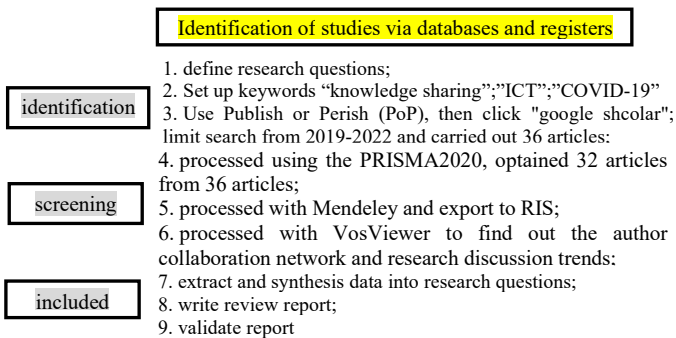
B. SLR Method Planning

Figure. 1. SLR Method with PRISMA2020 diagram

III. RESULT AND DISCUSSIONS

A. Developments of KS research based on ICT during COVID-19 era per year

KS is the most important processes in the KM life cycle. KS is a process of exchanging thoughts, experiences, expertise, and solutions that are agreed upon by the giver and the recipient [15]. Knowledge become the important organizational asset. Managing knowledge is the key for managing organizations [16]. Five important steps that must be considered to managing knowledge (KM) is acquiring, gathering, storing, reusing, retrieving, sharing, and perfecting knowledge [17]. Generally knowledge can be shared through face-to-face communication in a real-time environment which consumes time and effort.

In the pandemic COVID-19 era, knowledge is shared electronically in various soft-copy formats such as documents, images, videos, and sound recordings. This electronic sharing process is carried out through online applications, such as Web 2.0 technologies that disseminate knowledge in a virtual environment. During the recent COVID-19 pandemic, it was imperative to adopt these Web 2.0 applications to communicate and collaborate between academics and students in universities around the world [18].

Research related to this study has been seen by several researchers who have targeted the relationship between the impact of technology on knowledge sharing

that has changed the way due to the COVID-19 pandemic. This relationship tends to be investigated and we can see in the following diagram:
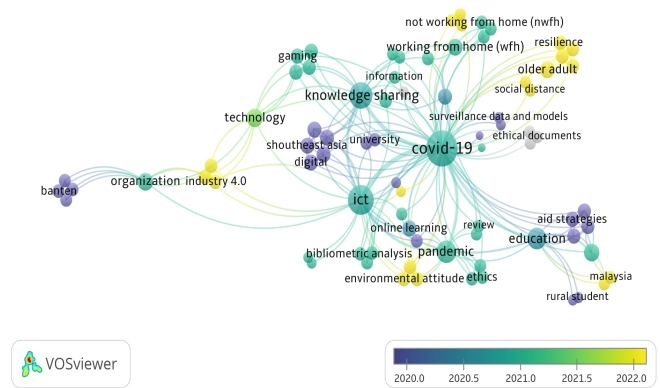

Figure. 2. Trends of KS research based on ICT during COVID-19 era per year

Based on figure 2, it can be seen that trends of KS research based on ICT during the Covid-19 pandemic discussed topics on organizations, industry 4.0, social distance, work from home, education, pandemic, etc. The research trends by year show that the most researched in the first semester of 2020 is about ethics, documents, etc. Then in 2020 the second semester of research trends more research on industry 4.0, environmental attitude, resilience, social distance until mid-2021. Knowledge sharing, ICT, and COVID-19 are hotly discussed and researched by researchers from 2020 to mid-2021 .

Table 1. The development of KS research based on ICT during COVID-19 era per year

Years	Total articles
2020	9 articles
2021	13 articles
2022	10 articles
Total	**32 articles**

Table 1 indicates that there has been significant development of KS research based on ICT during the Covid-19 pandemic from 2020 until the first half of 2022. From the total of 32 articles on KS based on regarding the trend of KS research based on ICT during Covid-19, there were only 9 articles throughout 2020 and 13 articles throughout 2021. But the number has increased until 10 articles in 2020 despite only half a year in 2022.

B. Trends of authors on KS research based on ICT during COVID-19 era

With regard to the trend of authors writing KS research based on ICT during COVID-19, as shown in table 2, most authors who write a lot about knowledge sharing based on ICT during COVID-19. The data shows that Andalib Kondori, Motahari Nezhad, and Shekofteh wrote 2 articles and other authors generally wrote 1 article

Table 2. Table of Trends of Author on Knowledge Sharing Based on ICT during COVID-19 Era

Selected	Author	Documents	Total Link Strength
√	andalib-kondori, m.	2	4
√	motahari-nezhad, h.	2	4
√	shekofteh, m.	2	4
√	arbeid, esther	1	6
√	arbeid, esther	1	6
√	clarke, paul	1	6
√	cruz, czarielle dela	1	6
√	dopamu, boluwatife comfort	1	6
√	khan, sanjana	1	6
√	murat yilmaz	1	6
√	nolan, afric	1	6
√	roy, lisa	1	6
√	solan, david	1	6
√	soomro, mahjabeen	1	6
√	white, rachel	1	6
√	wolman, lauren	1	6
√	zwicker, sarah	1	6
√	chen, y	1	4
√	foong, ps	1	4
√	Gao.i	1	4

C. Co-authorship network analysis of KS research based on ICT during COVID-19 era

Co-authorship is a association in which two or more researchers jointly for report the results of their research on several topics. Therefore, the co-authorship network can be seen as a social network that includes researchers reflecting the collaboration between them. Researchers are represented by nodes in the co-authorship network [15].

In the table 3, we can see that there are several names that have a total link strength of 6 indirect connection with it's authors.

Table 3. Table of Total Link Strength for Co-Authorship Network Analysis

Seleted	Author	Documents	Total link strength
√	arbeid, esther	1	6
√	atack, lynda	1	6
√	clarke, paul	1	6
√	cruz, czarielle dela	1	6
√	dopamu, boluwatife comfort	1	6
√	khan, sanjana	1	6
√	murat, yilmaz	1	6
√	nolan, aifric	1	6

√	roy, lisa	1	6
√	solan, david	1	6
√	soomro, mahjabeen	1	6
√	white, rachel	1	6
√	wolman, lauren	1	6
√	zwicker, sarah	1	6
√	andalib-kondori, m.	2	4
√	chen, y	1	4
√	foong, p s	1	4
√	gao, j	1	4
√	hajiri, moch, isra	1	4
√	jiang, w	1	4

In Figure 3 there is a mapping related to the data in table 3. The mapping shows that there is an indirect relationship between each author for KS research based on ICT during COVID-19.

Figure. 3. Mapping of Co-authorship Network Analysis on Knowledge Sharing Research based on ICT During COVID-19 era.

Furthermore, in figure 4 about Co-authorship network overlay visualization of Knowledge Sharing research based on ICT during the COVID-19 era. The co-authorship network takes place in 2022.0 formed by 6 authors, Esther Arbeid, Lynda Atack, Paul Clarke, Graziella Dela Cruz, Boluwatife Comfort Dopamu, and Sanjaya Khan.
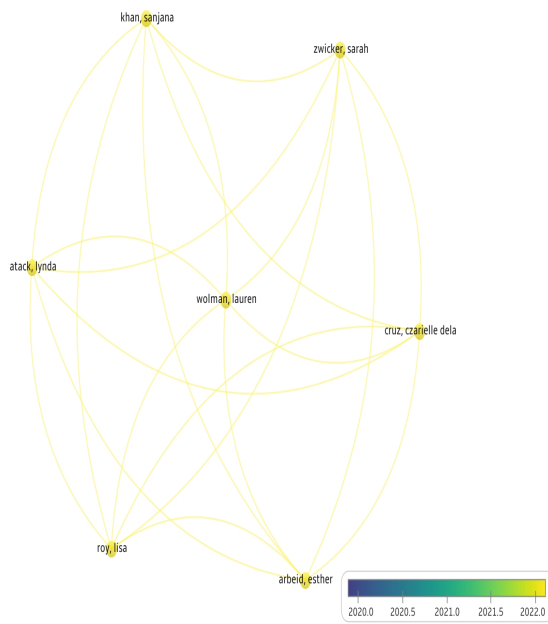
Figure. 4. Co-authorship network overlay visualization of Knowledge Sharing research based on ICT during COVID-19 era

D. Cluster of KS research based on ICT during COVID-19 era

The research cluster related to the total links for selected keywords shows that there are 13 selected researches is COVID-19, ICT, knowledge sharing, pandemic, education, leadership, online learning, social media, technology, working from home (WFH), higher education, older adult, and organization as listed sequentially in table 4.

Table 4. Table of Total Link Strength for Selected Keyword

Selected	Keyword	Occurrences	Total Link Strength
√	covid-19	27	38
√	ict	14	26
√	knowledge sharing	9	17
√	pandemic	5	10
√	education	5	9
√	leadership	2	6
√	online learning	2	5
√	social media	2	4
√	technology	2	4
√	working from home (wfh)	2	4
√	higher education	2	3
√	older adult	2	2
√	organization	2	2

Based on table 5, the total Link Strength for Keyword can be seen that COVID-19 has 27 occurrences with 94 total link strength. Then ICT has 14 occurrences with 49 total link strength. Meanwhile, knowledge sharing has 9 occurrences with 33 total link strength.

Table 5. Table of total Link Strength for Keyword.

Seleted	Keyword	Occurrences	Total link strength
√	covid-19	27	94
√	ict	14	49
√	knowledge sharing	9	33
√	pandemic	5	19
√	education	5	17
√	technology	2	12
√	organization	2	10
√	higher education	2	9
√	older adult	2	8
√	working from home (wfh)	2	8
√	digital	1	7
√	leadership	2	7
√	onlline learning	2	7
√	southeast asia	1	7
√	singapore	1	7
√	thailand	1	7
√	vietnam	1	7
√	aid strategies	1	6
√	Gaming	1	6
√	hrd	1	6

The mapping from table 5 can be seen in figure 5 covering 80 keywords, 8 clusters, 235 links, and 271 total link strength. The first cluster is dominated by COVID-19, ICT, online learning, review, bibliometric analysis, pandemic, environmental attitude, ethnicity, ethics and surveillance data and many more.
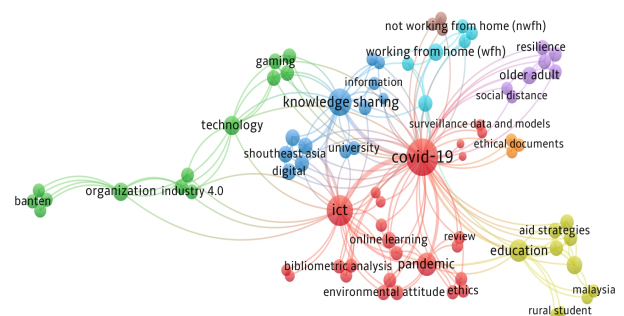

Figure. 5. Cluster of Knowledge Sharing research based on ICT during COVID-19 era

E. The tendency of KS research based on ICT during COVID-19 era

The tendency of KS research based on ICT during COVID-19 can be seen from figure 6. It shows that knowledge sharing has 22 links with 33 total link strengths and 9 occurrents and 3 Clusters.
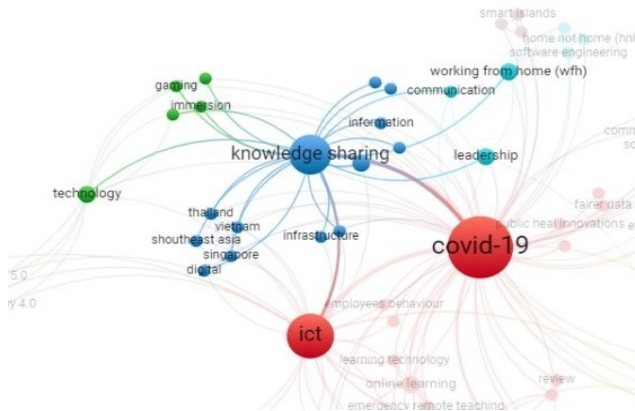
Figure 6. The tendency of KS research based on ICT during covid-19 era

Figure 6 shows data regarding the tendency of KS research based on ICT during the COVID-19 era. The figure shows that the scope of research in question covers various disciplines across sciences, social sciences, and the humanities, such as technology, information, communication, leadership, education and management like, working from home and others.

The research that has been described shows that in general KM improves the overall performance of many organizations to increase their competitive advantage[19]. Massa and Testa [20] define KM as an aggregation of technologies, people, and processes that work together to create knowledge that improves organizational performance. In principle, knowledge sharing techniques and activities are applied to maximize organizational profits [21]. However, the COVID-19 pandemic demands an urgent need to change face-to-face communication to online communication techniques.

CONCLUSION

The findings in this study conclude that there has been increasing development of KS research based on ICT during the Covid-19 pandemic in terms of the quantity of research and scope of topics from collaborative authors networks. This has shown that ICT is very helpful for the community in sharing knowledge in COVID-19 era, the more people can take advantage of ICT, the faster people will acquire knowledge. Researches on knowledge sharing based on ICT during the COVID-19 era will continue to develop and become interesting research themes for many authors.

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