

Techniques and technologies for managing COVID-19 related Knowledge: A Systematic Review

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Abstract: Managing COVID-19 pandemic outbreak requires rapid responses, adapting to change, and developing a set of ongoing, systematic, and interrelated processes to improve the planning, treatment and controlling the pandemic. Knowledge management (KM) is considered one of the instruments that helps organizations and supports managers in making effective use of key resources and in identifying actionable problem-solving knowledge and practice. Thus, it is vital to conduct appropriate KM activities to facilitate effective decision-making efforts. Advanced technologies have made significant contribution to improving the KM processes and provided several tools and mechanisms to enable and facilitate knowledge capturing, sharing, and transfer. With this in mind, the aim of this paper is to explore the techniques and technologies used for managing COVID-19 related knowledge. The findings are in the main, based a systematic review of literature. The findings report on the importance of KM techniques and technologies for managing COVID-19 related knowledge. The study concluded that KM techniques and technologies played vital role during COVID-19 in facilitating distance working/ learning, combating “infodemic”, promoting knowledge share and transfer, facilitating collective /innovation, and in facilitating remote mentoring and training. Social media platforms (e.g., Twitter, Facebook, WhatsApp, etc.), Zoom, MS Teams, Virtual Meeting, Video Conferencing, as well as Email and knowledge maps are among the most used knowledge management techniques and technologies used to manage COVID-19 related knowledge. The paper concludes that to gain competitive advantage, it is necessary for organisations to recognise and use a blend of information and communication technology (ICT) and non-ICT-based KM techniques and technologies. KM techniques and technologies roles are not mutually exclusive, and organisations may adopt any combination of them to tackle their particular issues or support particular motives. Therefore, it is recommended to deploy and combine the simple, low cost, and easy to use with minimum training needs KM techniques and technologies.

Keywords: COVID-19, Knowledge management, knowledge creation, knowledge sharing, techniques, technologies, tools

1. Introduction

The COVID-19 pandemic is the biggest challenge humanity has faced since the Second World War (Al-Omouh et al., 2020; Ahmad Qadri et al., 2021). COVID-19 pandemic has affected all the human activities and has evoked an era of agility (Anwar et al., 2022). Managing a pandemic is a complex task. However, pandemics’ devastating effects can be actively shaped and mitigated by managers, through right and timely decisions (Ammirato et al., 2021). Ahmad Qadri et al., (2021) noted that as the Coronavirus has necessitated organizations to learn rapidly and to develop new ways of functioning. According to Tovstiga and Tovstiga (2021), COVID-19 has produced a perfect knowledge storm. Ammirato et al., (2021) noted that decisions are critical to manage the spread of the pandemic, and the effectiveness of these decisions depends upon the capacity to create, share, collect, transfer, and elaborate knowledge, that is by an effective and efficient process of knowledge management (KM) in pandemics. Therefore, the pandemic poses a unique challenge to knowledge research and practice (Tovstiga and Tovstiga, 2021). Al-Omouh et al., (2020) noted that the Resource-Based View (RBV) theory affirms that firms need to use their physical, human, and organizational assets, both tangible and intangible, to maintain their competitiveness. Within the view of the RBV, knowledge, as an intangible asset is one of the most important sources of proactiveness. Almatrooshi et al., (2021) highlighted the importance of knowledge as a critical factor of succeeding with the process of minimizing the damages caused by diseases such as COVID-19, EBOLA or SARS. The authors noted that this is where knowledge-based organizations benefit from KM techniques and technologies. The authors noted that an organization with a good KM infrastructure will have the advantages as it was noticeable that they were more flexible and faced less issues with the sudden changes that happened with the pandemic of COVID-19 (Almatrooshi et al., 2021). According to Casalegno et al., (2021),

researchers in the management and communication literature have argued that inefficiencies in communication and knowledge sharing, especially in emergency and crisis situations, can cause and intensify the knowledge gap among audiences, which can then lead to misbehaviours. Moreover, Al-Omouh et al., (2020) noted that great efforts are being made to research COVID-19 and the effect of the pandemic on business from different perspectives (e.g., human resources perspective, innovation, entrepreneurship, and consumer behaviour change). Although the evident importance of KM to face pandemics, the KM of pandemics is not a unitary and coherent topic within the scientific landscape of KM (Ammirato et al., 2021). Moreover, the current literature shows limited evidence of the role of KM techniques and technologies used to achieve effective KM procedures during the COVID-19 pandemic. There is no work which explores the synergy of the three aspects i.e., COVID-19 pandemic, KM, and techniques and technologies. Therefore, the aim of this paper is to explore the usage of KM techniques and technologies in managing COVID-19 related knowledge.

2. Theoretical background

2.1 Knowledge management

According to Canzano and Grimaldi (2012), in the last years, KM has become one of the most considerable topics both in literature and in practice. Similarly, Sytnik and Kravchenko (2021) noted that during the last decades, the global economy has been facing a transformation from the era based on natural resources to the era of knowledge, in which knowledge has become a strategic asset and a dominant enabler of organizational development, performance, and competitiveness. According to the knowledge-based view (KBV) of the firm, knowledge is seen as the most strategically important intangible asset of organizations and a critical source of competitive advantage (Davenport and Prusak, 1998; Nonaka and Takeuchi, 1995; Sytnik and Kravchenko 2021). In a globalizing and competitive industry, companies need to manage knowledge efficiently in order to succeed. They need to develop precise plans and to provide managerial guidelines, in order to make the available knowledge proper of the organization. KM practices have been shown to improve organizational performance, organizational innovation, and open innovation (Bhatt, 2001; Acharya et al., 2022). According to Sytnik and Kravchenko (2021), nowadays, KM is generally recognized as a profound factor of economic development, innovations, competitiveness, long-term organizational survival, and sustainability. Črešnar et al., (2019) noted that KM as a concept has a wide range of definitions across the range of different functions where it is applied. Acharya et al., (2022) noted that KM, a concept referring to the creation, sharing, and storage of knowledge, focuses on individuals acquiring new knowledge, a team collaborating for innovation, and organizations learning for better performance. Črešnar et al., (2019) argued that KM activities, which include generating, gathering, disseminating, applying, and storing knowledge, are critical for organization's success in innovation. Sytnik and Kravchenko (2021) noted that the vital necessity to manage organizational knowledge in a more effective manner has been giving an impetus for rapid development of KM concepts, models, and tools. Moreover, Črešnar et al., (2019) noted that nowadays, dynamic business environment is increasingly dependent and based more on high technology, which brings with it a high demand for knowledge and innovation. With rapid digitalization and constant globalization, companies and even entire economies are becoming increasingly knowledge based (OmotayoČrešnar et al., 2019). Furthermore, Bhatt (2001) noted that researchers and academics have taken different perspectives on KM, ranging from technological solutions to the communities of practices, and the use of the best practices. For example, information technology (IT) is believed to provide an edge in harvesting knowledge from piles of data repositories, consisting of point of sales, customer credit cards, promotional sales, and seasonal discount data (Bhatt, 2001). However, Bhatt (2001) contend that knowledge resides in human minds and, therefore, employee training and motivation are the key factors to KM. Therefore, technologies and social systems are equally important in KM.

2.2 Techniques and technologies for effective KM implementation

Renukappa et al., (2017) noted that tools are usually required to facilitate KM. The authors argued that, just as it can prove difficult to arrive at a single definition of KM, firm definitions of KM tools can also prove elusive owing to the lack of consensus regarding what constitutes a KM tool. Canzano and Grimaldi (2012) stated that technology plays a fundamental role at every step of the KM system and it is one of the main features characterizing KM. However, KM is not simply a matter of Information and communication technology (ICT) tools. Technology constitutes only a single aspect of the whole set of KM initiatives (Canzano and Grimaldi, 2012). Črešnar et al., (2019) noted the generally accepted differentiation between two main strategic focuses in KM. First strategies (ICT strategies) are explicit oriented and can also be referred as codified strategy or system strategy. Second strategies (personalization/ human strategies) are tacit oriented and focused on interpersonal relationships. With these strategies, knowledge is managed with techniques focusing on people and their

interaction rather than on ICT (Črešnar et al., 2019). Renukappa et al., (2017) noted that not all tools are IT based but much emphasis is placed on the electronic tools due to their dynamic capabilities, quick evolution, and organisational impacts. Egbu, et al., (2005) noted that non-IT tools are termed as KM techniques and the IT tools termed as KM technologies. Massingham (2014) noted that the term ‘KM technologies’ refers to information technology-based tools and ‘KM techniques’ refers to non-information technology-based tools. Moreover, Davenport and Prusak (1998) assert that KM tools are more than information technology it is about the people who add value by transforming static data into meaningful information and knowledge by mixing it with their own experience and interpretations. Massingham (2014) suggests that the terms ‘KM tools’ and ‘KM techniques’ are interchangeable and believe that KM techniques are simply the means through which knowledge is managed using tools. Table1 summarises the key differences between KM techniques and technologies.

Table 1: Key differences between KM technologies and techniques

KM Technologies	KM Techniques
<ul style="list-style-type: none"> • Based on explicit knowledge • Involves IT infrastructure and know-how • Can be difficult to set up and maintain • Expensive to set up and maintain 	<ul style="list-style-type: none"> • Grounded on tacit knowledge • People-based • Easy to set up and maintain • Relatively cheap to set up and maintain

Source: (Massingham, 2014).

3. Methodology

The aim of this study is to explore the usage of key KM techniques, and technologies for managing COVID-19 related knowledge. The study follows a systematic literature review (SLR) to achieve this aim, which can be defined as a tool to identify, evaluate, and interpret available and relevant studies regarding a particular research question (Kitchenham, 2004). A research literature review is a: “systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work produced by researchers, scholars and practitioners” (Castaneda et al., 2018). Systematic reviews differ from ordinary literature surveys in being formally planned and methodically executed. They are intended to be independently replicable, and so have a different type of scientific value than ordinary literature surveys.

The critical, or integrative, review approach aims to assess, critique, and synthesise the literature on a research topic in a way that enables new theoretical frameworks and perspectives to emerge. The method used in this study followed that proposed by Tranfield et al., (2003) with three stages: planning the review, conducting the review, reporting, and disseminating the results. Thus, the first stage is planning the review, which involves the core aspects of the systematic review protocol, developing a list of keywords, and criteria for the inclusion of articles, as well as defining the search string to be given in input to the data source. A university’s library search engine, which gives access to various databases including Science Direct, Scopus, TRID, Web of Science, and Wiley Online Library, was used to complete an online search. To this aim, we identified and then, combined a number of keywords, namely ‘COVID-19’, or ‘coronavirus’ or ‘pandemic’ and ‘knowledge management’ or ‘KM’, and ‘tools’, ‘techniques’, and ‘technologies.’ Thus, the resulting search string is [‘COVID-19’ OR ‘coronavirus’ or ‘pandemic’ AND ‘knowledge management’ OR ‘KM’ AND ‘tools’ OR ‘techniques’ AND/ OR ‘technologies’], to search the titles, abstracts and keywords of available articles. In reference to the inclusion criteria, a strict selection criterion for the inclusion of studies was developed in order to provide the best quality evidence. Articles were reviewed according to their relevant subject. In particular, the articles must be published in peer-reviewed journals, which were available online within the time frame between December 2019 and April 2022 (to ensure relevance to COVID-19), written in English and had relevance with respect to the research aim (see Table 2 for the selected articles). These choices are justified by the fact that those inclusion criteria may assure the identification of the most relevant articles related to the topic under investigation (Natalicchio et al., 2017).

The second stage involved carrying out the review of relevant articles and selection procedure. The initial search resulted in a total of 829 records. These records were then screened and reduced to 342 by applying the inclusion criteria - i.e., subject area, English language and available online. The articles were then ‘eye-balled’ to ensure they were consistent with the keyword search, the abstracts assessed against the research aim, and duplicates removed. The total number of articles was reduced to 57. The full text of the selected articles was read to determine the relevance with respect to the aim of the study and the results were reduced down to 24 articles. Finally, these 24 articles were reviewed, categorised and analysed (see Table 2). Finally, reporting and dissemination are considered in the third phase. This stage involved critically documenting and presenting the results from the selected articles analysis.

Table 2: techniques and technologies for managing COVID-19 related knowledge LR findings

Reference	Title	Source title	Focus	Methodology	Country	Discussion
Al-Omouh et al., (2020)	Impact of social capital and collaborative knowledge creation on e-business proactiveness and organizational agility in responding to the COVID-19 crisis.	Journal of Innovation & Knowledge	Collaborative knowledge	Online survey	Jordan	Explores the role of social capital in response to COVID-19 crisis.
Buheji and Buhaid (2020)	Capturing accumulated knowledge and learning of COVID-19 pandemic from Front-Line nurse.	HR Management Research	Accumulated knowledge	LR	Bahrain	Investigates nurses accumulated COVID-19 knowledge and how to deal with it.
Dal Mas et al., (2020)	Knowledge translation in oncology. A case study.	Electronic Journal of KM	Knowledge translation (KT)	Case study	UK	Claims that an effective KT enhances knowledge transfer, share, creation and innovation.
Xie et al., (2020)	The information impact of network media, the psychological reaction to the COVID-19 pandemic, and online knowledge acquisition: Evidence from Chinese college students.	Journal of Innovation & Knowledge	Network media information	Survey	China	Investigates impact of COVID-19 network media information on online knowledge acquisition of college students.
Ahmad Qadri et al., (2021)	How to improve organizational performance during Coronavirus: A serial mediation analysis of organizational learning culture with knowledge creation.	KPM	Organisational learning	Questionnaire	Malaysia	Explores how knowledge creation and organizational culture can facilitate organizational performance during COVID-19.
Ayoub et al., (2021)	Combat COVID-19 infodemic using explainable natural language processing models.	Information Processing & Management	Infodemic	Natural language processing model	USA	Detecting and combating infodemic/ misinformation
Bharadwaj et al., (2021)	A review on the role of machine learning in enabling IoT based healthcare applications.	IEEE Access	ML	LR	India	Reviews various state of the art applications of ML algorithms currently being integrated with H-IoT.
Bratianu & Bejinaru (2021)	COVID-19 induced emergent knowledge strategies.	KPM	Emergent KS	LR	Romania	Compares characteristics of emergent knowledge strategies (KS) and deliberate KS.
Casalegno et al., (2021)	COVID-19 in Italy and issues in the communication of politics: bridging the knowledge-behaviour gap.	KM Research & Practice	Communication/ KBGs	Longitudinal methodological approach	Italy	Discusses the role of the institutional communication of politics during emergencies.
Ammirato et al., (2021)	Knowledge management in pandemics. A critical literature review.	KM Research & Practice	KM in pandemics	LR	Italy	Aims to point out the state-of-the-art of management literature on KM of pandemics.
Edghiem et al., (2021)	Covid-19 transition, could Twitter support UK Universities?	KM Research & Practice	Social media platforms	Conceptual FW	UK	Explores the use Twitter to share Covid-19 related knowledge.
Saide and Sheng (2021)	Knowledge exploration–exploitation and information technology: crisis management of teaching–learning scenario in the COVID-19 outbreak.	Technology Analysis & Strategic Management	Knowledge exploration & exploitation	SLR	Taiwan	Provides a holistic view of knowledge transfer and ICT scenario in education during COVID-19.
Singh et al., (2021)	Knowledge sharing in times of a pandemic: An intergenerational learning approach.	KPM	Knowledge sharing	LR/ PRISMA	India	Argues that intergenerational learning is a useful intervention to address the challenge of

Reference	Title	Source title	Focus	Methodology	Country	Discussion
						knowledge sharing in the NWoW.
Tovstiga and Tovstiga (2021)	COVID-19: a knowledge and learning perspective.	KM Research & Practice	'Conscious-competence'	'Conscious-competence' FW	UK	Attempts to make sense of the pandemic from a knowledge perspective.
Tran et al., (2021)	Social media insights during the COVID-19 pandemic: Infodemiology study using big data	JMIR Medical Informatics	Social media	LR	Vietnam	Aims to understand public attention toward the pandemic through social media platforms.
Wang and Wu (2021)	Knowledge management based on information technology in response to COVID-19 crisis	KM Research & Practice	KM in CM	LR	Taiwan	Presents a set of operational guidelines for healthcare organisations by means of effective KM practices
Abdalla et al., (2022a)	An evaluation of critical knowledge areas for managing the COVID-19 pandemic.	JKM	Knowledge mapping	SLR	UK	Knowledge mapping represents a great opportunity to create value, facilitate collaboration, knowledge share and transfer.
Abdalla et al., (2022b)	Managing COVID-19-related knowledge: A smart cities perspective.	KPM	Smart cities & KM	SLR	UK	Suggests that the increased adoption of smart cities strategies supports knowledge capture, acquisition, sharing, and transfer.
Acharya et al., (2022)	Managing information for innovation using knowledge integration capability: The role of boundary spanning objects.	IJ of Information Management	Knowledge Integration	Questionnaire	USA	suggests that relational obstacles could be resolved through a common knowledge.
Al-Omouh et al., (2022)	Networking and knowledge creation: Social capital and collaborative innovation in responding to the COVID-19 crisis.	Journal of Innovation & Knowledge	Social capital	Questionnaire	Jordan	Social capital has played a significant role in responses to the COVID-19 crisis
Anwar et al., (2022)	A Tacit-Knowledge based Requirements Elicitation Model Supporting COVID-19 Context.	IEEE Access	COVID-19 Elicitation model	SLR	Pakistan	Aims at identifying the requirements elicitation techniques and challenges supporting COVID-19 Context.
Dias et al., (2022)	Revisiting Small-and Medium-Sized Enterprises' Innovation and Resilience during COVID-19: The Tourism Sector.	J Open Innovation: Technology, Market, & Complexity	SMEs innovation & resilience	Questionnaires/ interviews	Portugal	Emphasizes innovation and resilience as the starting points to understand how SMEs are influenced by external factors.
Naqshbandi & Jasimuddin (2022)	The linkage between open innovation, absorptive capacity and managerial ties: A cross-country perspective.	Journal of Innovation & Knowledge	Open innovation	Questionnaire	Brunei	Show mediating effect of perceived absorptive capacity in relationship of external managerial ties and open innovation.
Tomé et al., (2022)	Knowledge management and COVID-19: Technology, people and processes.	KPM	Technology, people & processes	LR	Portugal	Analyse impact of Covid-19 in organizations from KM perspective

4. Findings and discussion

4.1 General observations

The first step in the analysis of the selected articles was to classify them by date of publication. Half of the articles are published in 2021 (n=12, 50%), one third of the articles included in this review are published in 2022 (n=8, 33%), and around one sixth of the articles are published in 2020 (n=4, 17%). Leading authors are affiliated with institutions in Europe (n=5), UK (n=5), USA (n=2), and Asia (n=12). Regarding the academic journals, the articles

included in this review are published in various academic journals including: Knowledge and Process Management (n=5), Knowledge Management Research & Practice (n=5), Journal of Innovation & Knowledge (n=4), IEEE Access (n=2), Journal of Knowledge Management (n=1), Journal of Open Innovation: Technology, Market, and Complexity (n=1), International Journal of Information Management (n=1), JMIR Medical Informatics (n=1), Human Resource Management Research (1), Electronic Journal of knowledge management (n=1), Information Processing & Management (n=1), and Technology Analysis & Strategic Management (n=1).

4.2 Importance of knowledge management during COVID-19 pandemic

Wang and Wu (2021) noted that in times of crisis such as in the time of the COVID-19 pandemic, where rapid responses are required, it is vital to conduct appropriate KM activities to facilitate effective managerial efforts. Sytnik and Kravchenko (2021) noted that KM provides integration of some organizational processes like planning, organizing, motivating, and controlling of employees, designed, and used systematically to ensure effective employment of an organization's knowledge-related assets. Tomé et al., (2022) noted that the distinctive feature of the current crisis is that the COVID-19 crisis is about knowledge and information and can only be understood in the scope of the knowledge economy and the society of information. Ammirato et al., (2021) noted that decisions are critical to manage the spread of the pandemic, and the effectiveness of these decisions depends upon the capacity to create, share, collect, transfer, and elaborate knowledge, that is by an effective and efficient process of KM in pandemics. Additionally, the absence of reliable information on the novel coronavirus has shown the extent to which "we don't know what we don't know" (Tovstiga and Tovstiga, 2021; Bratianu and Bejinaru 2021). Thus, Bratianu and Bejinaru (2021) noted that the COVID-19 crisis proved that we are managing in an uncertain world. KM may contribute significantly to reduce the overall uncertainty by focusing knowledge dynamics on knowledge sharing, organizational learning, increasing network knowledge flow, and an influx of consumers' knowledge (Bratianu and Bejinaru, 2021). Moreover, building specific COVID-19 pandemic inter-regional knowledge could facilitate more effective response strategies in the future, especially when dealing with such aggressive infections (Buheji and Buhaid, 2020; Ammirato et al., 2021).

Additionally, the current literature has extensively investigated how collaborative knowledge creation provides businesses with a basis for proactive actions in a complex and uncertain environment (Al-Omouh et al., 2020; Ammirato et al., 2021; Ahmad Qadri et al., 2021; Sytnik and Kravchenko, 2021; Buheji and Buhaid, 2020). Sytnik and Kravchenko (2021) noted that since collective knowledge exists throughout the employees' interaction process, rather than in their minds or databases, social factors such as communication and collaboration play a vital role in the utilization and coordination of knowledge resources. However, communication is badly affected due to the restrictions in COVID-19 scenario. During COVID-19 pandemic, the interference in concentration of employees has caused serious challenges and brought problems in sharing tacit knowledge (Anwar et al., 2022). Moreover, limited shared knowledge and understanding arise because of the differences in individuals' functional specialization, hindering their efforts to collaborate (Acharya et al., 2022; Naqshbandi and Jasimuddin, 2022). Therefore, Anwar et al., (2022) noted that many organisations deployed a variety of communication channels and collaborative tools to overcome communication challenges. However, lack of proper training on how to efficiently use such tools created significant communication gaps between the analyst and stakeholder. Thus, Singh et al., (2021) noted that to solve the emerging challenges facing effective KM in the current COVID-19 crisis, organizations find creative ways to promote knowledge sharing among their workforces.

4.3 The role of KM techniques, and technologies for managing COVID-19 related knowledge

The findings emphasises the role of digital technology in the COVID-19 pandemic response management (Drew et al., 2020; Abdalla et al., 2022b). Moreover, ICTs provided various tools that facilitate KM procedures during COVID-19 pandemic (Alomari et al., 2021; Abdalla et al., 2022a). ICT based tools and social media platforms (e.g., WhatsApp, Twitter), MS Teams, Video Conferencing, virtual communities, Virtual Meeting, instant messaging, and mobile applications are considered key sources for knowledge capturing and knowledge sharing during COVID-19 pandemic (Alomari et al., 2021). Similarly, Drew et al., (2020) noted that mobile phone applications and web-based tools facilitate self-guided collection of population-level data which can be rapidly redeployed to inform participants of urgent health information. In addition, during and post-COVID-19 pandemic the use of online video conferencing tools, webinars, Zoom, Skype and Microsoft Teams enabled distance-working, facilitated knowledge sharing between employees (Acharya et al., 2022; Tomé et al., 2022).

On the other hand, the World Health Organization announced a massive "infodemic" that made it difficult to find trustworthy and reliable sources of information (WHO, 2020; Ayoub et al., 2021). Ayoub et al., (2021) noted

the widespread and dissemination of false and misleading information about COVID-19 and that it is even promoted by famous public figures, including celebrities and politicians. “Infodemic” can intensify or lengthen outbreaks when people are unsure about what they need to do to protect their health and the health of people around them (WHO, 2020). However, KM techniques and technologies - especially with the growing digitization and the expansion of social media - provided various opportunities in detecting and combating COVID-19 related misinformation. For example, according to Ayoub et al., (2021), it was reported that by April 2020 Facebook removed more than fifty million posts related to COVID-19 since they were classified as misinformation. Other big social media companies, including Google and Twitter, also removed scammers of ads related to face masks, hand sanitizers, and manipulative posts related to COVID-19 (Ayoub et al., 2021). Moreover, Ammirato et al., (2021) highlighted the role of media in the management of pandemic and how it contributes to effective knowledge transfer. Dal Mas et al., (2020) noted the emergence of several knowledge translation and KM tools and techniques. The authors highlighted those technological tools allow to translate and share data and knowledge in a more accessible and standardised way. Moreover, electronic medical records are used to store data and share information both internally and also with external professionals. Xie et al., (2020) highlighted the role of social media in promoting knowledge sharing and acquisition during COVID-19. During the early months of the pandemic, social media platforms (e.g., Facebook) were the main source for public information and engagement instead of official COVID-19 government sites (Xie et al., 2020; Tran et al., 2021).

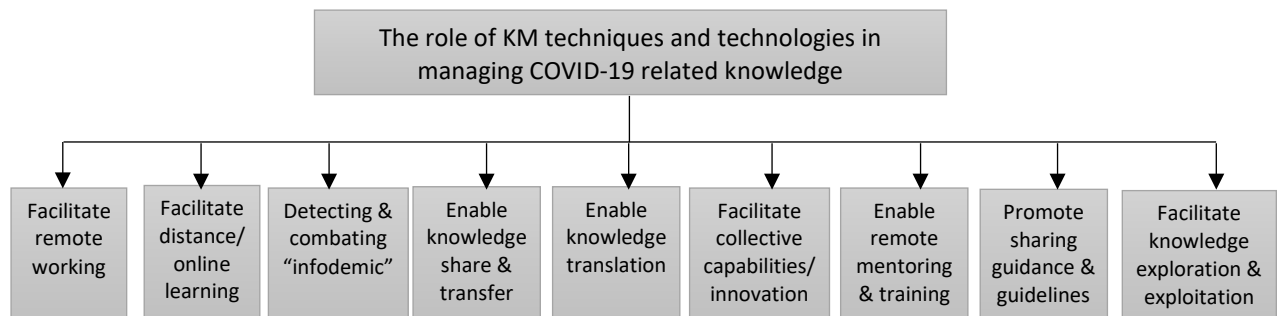


Figure 1: Summary of the findings on the role of KM techniques and technologies in managing knowledge related to COVID-19 pandemic

Nevertheless, the findings revealed the role of KM tools in promoting knowledge exploration and exploitation to and, thus, facilitating online learning during COVID-19 pandemic. For example, social media platforms (e.g., Facebook, Twitter, etc.), Zoom, Google meet, MS Teams, YouTube, video conferencing, and email are among the most important KM tools that support knowledge exploration process in the times of crisis such a COVID-19. Whilst electronic document management systems, e-journals, e-books, Moodle, and knowledge portal are amongst the KM tools adopted to support knowledge exploitation (Saide and Sheng, 2021; Ahmad Qadri et al., 2021; Acharya et al., 2022). Furthermore, Al-Omouh et al., (2022) noted that social capital has played a significant role in responses to the COVID-19 crisis. The developments in collaboration environments enabled by the advance of digital technologies have created KM tools fundamental to the development and enhancing social capital, collective intelligence and collaborative capabilities (Al-Omouh et al., 2022; Buheji and Buhaid, 2020). Edghiem et al., (2021) noted that social media platforms such as Twitter facilitate communication in institutions and bridge the space between their boundaries and online communities. Additionally, Singh et al., (2021) noted that excessive formal training interventions may not be effective within the COVID-19 situation when a large segment of the workforce is working remotely. The authors highlighted the role of intergenerational learning programs (IGL) in facilitating training and mentoring especially in a time of uncertainty such as that of the current COVID-19 pandemic. Thus, KM techniques and technologies may be deployed to facilitate IGL programs during COVID-19. Moreover, Abdalla et al., (2022a) highlighted the role of Knowledge maps in promoting KM procedures sharing during COVID-19. Knowledge mapping represents a great opportunity to create value by bringing stakeholders together, facilitating comprehensive collaboration and facilitating broader in-depth knowledge sharing and transfer.

5. Conclusion

Knowledge is a fundamental resource for an organisation. KM is perceived as the deliberate and systematic coordination of employees, technology, processes, and organizational structure so as to add value through knowledge use, reuse and innovation (Tomé et al., 2022). Therefore, organizations need to develop and deploy robust strategies, of strategically oriented tools, techniques, and technologies to successfully manage

knowledge (Tomé et al., 2022). Technology becomes the main knowledge transmission vehicle within the firm, enabling the right integration between KM and the organization. ICT has provided organizations with fast, high quality, and reliable information systems, which enable the re-usage of codified knowledge (Črešnar et al., 2019). ICT helps support knowledge sharing, quality decisions, and internal organizational links (Canzano and Grimaldi, 2012). ICT enabled KM tools are rapidly changing and there are a lot of IT or KM system features to facilitate and maximise knowledge acquisition, share, and transfer in times of crisis such a COVID-19 (Saide and Sheng, 2021). During the times of COVID-19, IT enabled KM tools (e.g., network, technology platform, repositories, and firewall) represented a critical asset that facilitates KM activities and prevents healthcare professionals from being infected by the virus (Wang and Wu, 2021). The findings revealed various KM techniques and technologies deployed during COVID-19 pandemic. Social media platforms (Facebook, Twitter, WhatsApp, etc.), Zoom, Google meet/ classroom, MS Teams, YouTube, video conferencing, Edmodo, Moodle, knowledge maps, and email are among the most important KM tools that support KM process in the times of crisis such a COVID-19. Mentorship programmes, communities of practice, advisory groups, systematised learning, and comprehensive repositories of tools and resources have also been identified as putting knowledge into practice techniques to facilitate the management of COVID-19 pandemic (Ammirato et al., 2021). The findings indicate that during COVID-19 pandemic, KM techniques and technologies played significant role in facilitating remote working, facilitating distance/ online learning, detecting and combating “infodemic” , promoting knowledge share, transfer, and translation, facilitating collective capabilities/ innovation, facilitating remote mentoring and training, promoting sharing guidance and guidelines, and in facilitating and promoting knowledge exploration and exploitation. Organizations should consequently adopt knowledge-oriented ICT infrastructure. However, it is recommended that ICT based tools are adopted and combined with processes and structures. Both conventional and modern KM techniques and technologies could enable effective KM during COVID-19 pandemic. Therefore, to gain competitive advantage, organisations should recognise and use a blend of ICT and non-ICT based KM techniques and technologies. This literature review set out to provide an understanding of the use of KM techniques and technologies to manage knowledge related to COVID-19 pandemic. This research provides a basis for future empirical research on the role and importance of KM techniques and technologies in managing COVID-19 pandemic.

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