European Journal of Innovation Management

437

Digitally transforming the organization through knowledge management: a socio-technical system (STS) perspective

Asha Thomas
Department of Operations Research and Business Intelligence, Wrocław University of Science and Technology, Wrocław, Poland

Received 5 February 2024
Revised 29 April 2024
27 June 2024
Accepted 28 June 2024

Abstract

Purpose – In today's rapidly evolving business landscape, innovation is the cornerstone for every organization. Knowledge management (KM) is crucial for developing sustainable competitive advantage by fostering innovation. This study aims to identify the key drivers of KM in the context of digital transformation through qualitative research.

Design/methodology/approach – This study employs a qualitative approach based on in-depth interviews with senior KM officers, including chief knowledge officers and directors who spearhead KM in their respective organizations. This research identifies four key dimensions, shedding new light on the drivers of KM in the context of digital transformation.

Findings – This study's findings reveal that the integration of important drivers from the lens of social-technical system (STS) theory is categorized into the four dimensions of KM, namely, motivation, technology, people interaction and organizational drivers. These factors jointly impact and design the effectiveness of KM in the digital age.

Originality/value – This study makes a unique contribution to the field of digital transformation. It presents a conceptual framework from the lens of the STS theory that encompasses four critical dimensions of KM: motivation, technology, people interaction and organizational dimensions, each with sub-codes. This framework can be utilized by practitioners and scholars alike.

Keywords Knowledge management, Digital transformation, Drivers, Social-technical system theory (STS), Innovation

Paper type Research paper

1. Introduction

Digital transformation (DT) has become a critical factor driving organizational development and competitiveness in the modern business environment with its dynamic and fast-transforming structure (Schönherr *et al.*, 2023; Corvello *et al.*, 2022; Kraus *et al.*, 2021; Appio *et al.*, 2021). At the center of this transformation is the speedy progression of digital technologies like the Internet of Things (IoT), cloud computing, artificial intelligence/machine learning (AI/ML), augmented reality (AR) and big data analytics (Zaki, 2019). These technologies have redescribed the way businesses function and how they relate with their employees, customers and manage their internal processes. The start of the COVID-19 pandemic in 2019 was a significant catalyst for the current rapid

I would like to thank all the experts for their valuable insights during the interview. This would not have been possible without their contributions.

European Journal of Innovation Management
Vol. 27 No. 9, 2024
pp. 437-460
Emerald Publishing Limited
1460-1060
DOI 10.1108/EJIM-02-2024-0114

digital evolution (Kutnjak, 2021). The pandemic and the social distancing measures imposed as a result of it pushed every division in all organizations to rethink and restructure their operational models (Sharma *et al.*, 2021). The global shift to remote work and online collaboration brought about a drastic change in the traditional approach to work (Thomas, 2023). This transformation was a temporary response to a global crisis but also had long-term effects on the structure of business, accelerating the adoption of digital technologies to an unparalleled degree. It is here that knowledge management (KM) plays a critical role (De Bem Machado *et al.*, 2022). KM, the process of creating, sharing, employing and managing the knowledge and information of an organization, is crucial in a digitally transformed structure (De Bem Machado *et al.*, 2022; Thomas and Gupta, 2022a; Idrees *et al.*, 2023). Effective KM practices help organizations leverage their collective knowledge and expertise, changing them into actionable insights and informed decisions (Wu and Wang, 2023). In Digital Transformation, KM helps organizations accept change more quickly by augmenting the flow of information. It allows businesses to stay agile, adapt to new market demands and be aggressive in a continuously growing digital environment (Marchegiani, 2021). As organizations navigate the complexities of digital transformation, they face many challenges, including data overload, the requirement for quick decision-making and the need to innovate and enhance continuously (Korherr *et al.*, 2022). Research has recently focused on digital transformation (Schönherr *et al.*, 2023; Kraus *et al.*, 2021; Appio *et al.*, 2021), expressly but not limited to Human Resource Management (Zhang and Chen, 2023; Nicolás-Agustín *et al.*, 2022), strategy management (Rêgo *et al.*, 2021), education (Zain, 2021), KM (Mizintseva and Gerbina, 2018; Di Vaio *et al.*, 2021; Marchegiani, 2021; Yang *et al.*, 2023), Industry 4.0 (Akbari *et al.*, 2023; Sony and Naik, 2020; Lyytinen *et al.*, 2009) and entrepreneurship (Corvello *et al.*, 2022). However, there remains a gap in the literature on the critical dimensions or drivers of KM, particularly in digital transformation. To address this gap, the qualitative research conducted in this study draws on interviews with top KM officials. The objective is to understand the primary critical drivers of KM examined through the lens of socio-technical systems (STS) theory. Thus, the research question *(RQ)* addresses the drivers of KM in the context of digital transformation.

In recent times, the swift growth of digitalization, AI and ML has significantly altered the way people engage with technology in work processes. Therefore, the idea of sociotechnical systems has become extremely significant (Pasmore *et al.*, 2019). The socio-technical systems approach is critical for understanding organizations from a KM perspective. STS holds that the social and technical elements of an organization are mutually reinforcing. As such, the success of a KM program will depend on how well the technological and the human side of the organization are integrated. By consciously adopting an STS approach, organizations can design KM systems that support not only the technical aspect of knowledge (collecting, managing and disseminating data and information) but also its human aspect (collaboration, the sharing and use of knowledge). A digital knowledge system that embodies STS principles will ensure that knowledge flows more easily within the organization and that organizational knowledge is applied more readily (Walker *et al.*, 2008). The primary contribution of this research is to identify critical drivers from both social and technical perspectives and indicate how they could be applied to foster organizational success. This study presented a conceptual framework which may be used by both practitioners and scholars alike.

The paper's reminder is as follows: Section 2 of this article emphasizes the study's theoretical underpinnings. Section 3 discusses the research methods, while Section 4 covers data analysis. Section 5 offers complete interview results and the related discussions are presented in Section 6. Lastly, Section 7 summarizes the conclusions and discusses the implications.

2. Theoretical underpinning

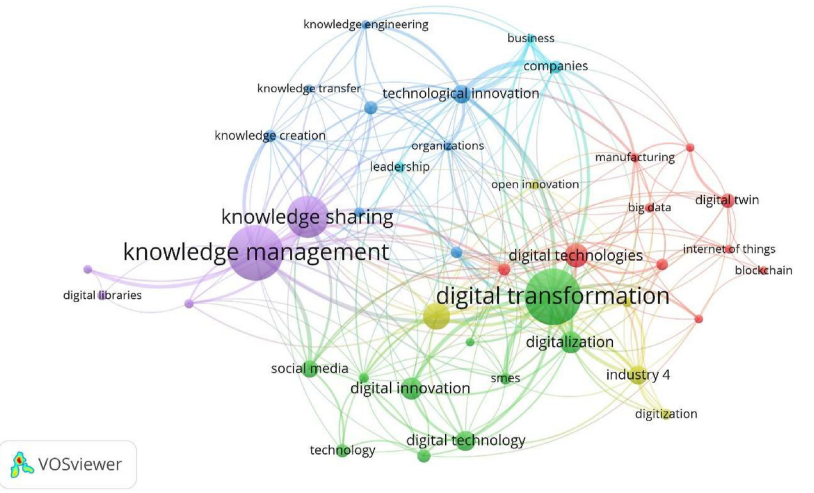
Digital transformation focuses on "directing an organization to adopt more to change itself, which includes adopting processes that allow it to investigate, experiment, and strategically employ new technology on an ongoing basis. Digital transformation is not just about integrating new technology into an organization's processes" (Herbert, 2017). This focuses on the possibility that was outside the scope of integrating new technologies into organizational processes. This possibility is significant in the present research. Also, complementing this notion, the interplay of socio-technical systems theory in digital transformation is also emphasized in the review work of Bockshecker *et al.* (2018). This current study has integrated STS theory, offering a theoretical underpinning for comprehending and conceptualizing KM drivers in digital transformation.

"Socio-technical systems" first entered the theoretical lexicon when in Trist and Bamforth's (1951) seminal study of the work carried in the coal mines of England. It has since been applied to a range of industrial fields, with manufacturing getting the lion's share of attention (Sony and Naik, 2020). STS draws on concepts from general systems theory, particularly the idea of an "open system." Broadly speaking, STS is concerned with the interconnection between the social elements (the people/individuals, their interactions, relationships, incentives, organizations, performance measurement and the structure in which they operate) of an organization and its technical elements (the technology, invention, knowledge, processes, methods and equipment that powers their operations) (Trist, 1981a, b; Appelbaum, 1997; Brown and Harvey, 2006; Pasmore *et al.*, 2019; Münch *et al.*, 2022). More specifically, the theory holds that these two elements, namely social and technical, are mutually reinforcing and that optimizing the performance of one will require the optimization of the other (Trist, 1981a, b; Li *et al.*, 2020). STS further posits that attempting to enhance only the social aspects or only the technical aspects of an organization can often hinder the effectiveness of the organization. For an organization to flourish, it requires a balance of linear processes with predictable outcomes (often generated through technological means) and non-linear processes with unpredictable outcomes (more associated with complex social interactions and human creativity). The goal, then, is to design organizational systems in which the human and technical elements are both nurtured, resulting in greater adaptability without sacrificing predictability and stability (Walker *et al.*, 2008).

Therefore, social and technological concerns must be considered while deploying new technologies or making changes (Münch *et al.*, 2022). In KM, this socio-technical perspective is mostly prominent (Lee and Choi, 2003).). Lee and Choi's (2003) study identified organizational culture, structure and people as social enablers in STS theory while considering information technology as a technical enabler for KM, processes and organizational performance. Handzic (2011) in her study documented that social and technical initiatives influence the development of organizational knowledge. Thus, it is vital to recognize significant drivers from the lens of both social and technical systems to comprehend how to foster KM in digital transformation. Figure 1 showcases the overview of literature based on the extraction from the Web of Science and analyzed in VOS viewer (Thomas and Gupta, 2022b).

3. Research method

The author aimed to develop a complete comprehension of KM drivers in the context of digital transformation. This research employed a qualitative methodology to understand this topic in line with research on the drivers of KM. The collection and analysis of data point out a gap in the current literature relating to important drivers that foster KM in the digital age. The data was gathered through interviews with the knowledge officers. These knowledge officers were selected by purposive sampling. Potential participants were recognized by perusing their LinkedIn profiles, and later, they were approached through social media messages or email.



Source(s): Created by author

Figure 1.
Mapping knowledge management and digital transformation literature

The interviews were conducted via Zoom calls, email and phone discussions. This research used the grounded theory of thematic analysis to examine the data. In order to construct theory inductively through the use of qualitative data, I adhered to the Gioia technique, which is a well-established and verified methodological approach (Gioia *et al.*, 2013). Further, the interview was guided by the saturation principle outlined by Guest *et al.* (2006). As per this principle, new data tend to be repetitive after a certain number of interviews and do not add considerably to the subject interpretation. The author did the interviews until the data saturation point was attained. With the purposive sampling method, the sample size was decided, as provided by Lune and Berg (2017). This method covers choosing people who are expected to offer insights pertinent to the research questions. The respondents included chief knowledge officers, directors, or KM officers and had more than 15+ years of experience in their roles. Nine of the 26 individuals recognized via purposive sampling consented to contribute to the research. After five interviews, data saturation was attained, and by the ninth interview, major themes were recognized (Guest *et al.*, 2006). The data saturation principle, essential to grounded theory as summarized by Morse (2004), was an analytical aspect in determining the interview participant number for the research. This notion confirms that additional interviews are only performed to provide new insights. In this study, the use of the data saturation principle denoted that many interviews were conducted, and it was obvious that the subsequent interviews were not producing any incremental or new information relating to KM drivers. It echoed insights already offered by the early participants. It was confirmed by this approach that the study was absolute yet effective, evading redundant duplication while taking a complete viewpoint on the subject. The interview results were categorized as per the research objective. Codes were developed by the author by employing NVIVO12, and the data were processed via descriptive and thematic analysis methods (Thomas and Gupta, 2022b). Appendix provides a brief overview of the respondents, which is kept anonymous.

4. Data analysis

The duration of the interviews varied from approximately forty minutes to one hour. These interviews were recorded with the respondents' permission and then transcribed with the help of software like Microsoft 365 and Transkriptor software to facilitate the thematic

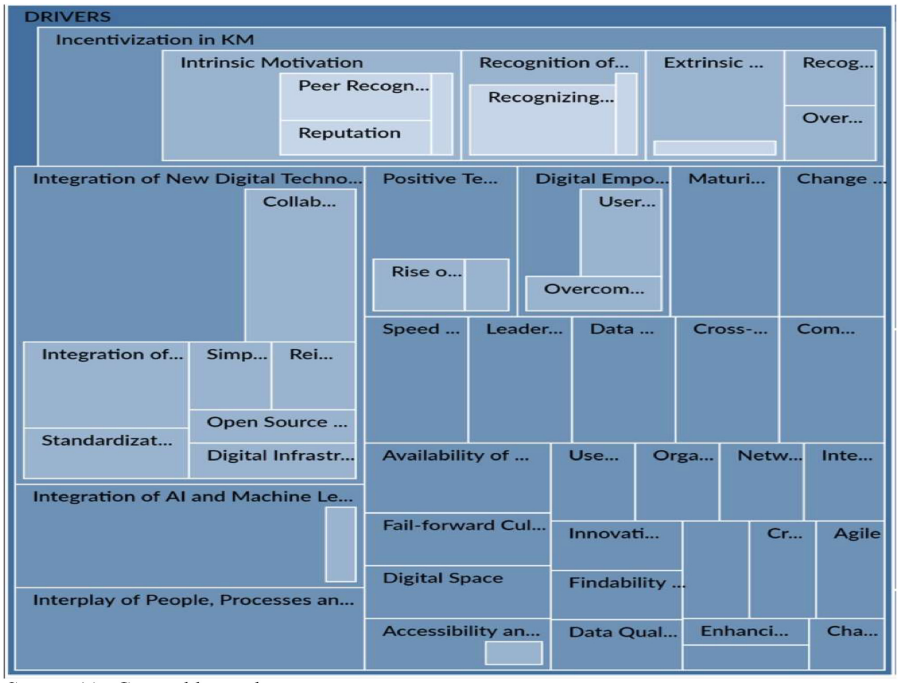
content analysis. The collected interview data from all nine respondents was accumulated to form a systematically analyzed and coded corpus using NVivo12 software. NVivo software is widely acknowledged in qualitative research and provides a robust platform for efficiently and effectively organizing and interpreting qualitative data (Thomas and Gupta, 2022b). The first-order codes were created with the help of NVivo 12 through open coding (see Figure 2). The author then reduced the list to 22 sub-codes by studying the emergent codes with Strauss and Corbin's (1998) axial coding method. In the second phase, the author looked for higher-order concepts to articulate the emerging sub-codes better. The author identified four important drivers. In the final step, once the author had a set of code and dimensions following the "theoretical saturation" approach (Glaser and Strauss, 1967), the present study aggregated the second order into aggregate dimensions from the lens of STS theory (Gioia *et al.*, 2013) and the same was reviewed by five experts in this field.

5. Findings

Thematic analysis was employed as the foundation to enhance our understanding of the main drivers that facilitate KM in the digital age. Figure 3 shows the resulting framework and the four key drivers. The author has branded these key enablers into four important drivers of KM, namely "Motivation Drivers," "Technological Drivers," "People Interaction Drivers" and "Organizational Drivers."

5.1 Motivational drivers

The first dimension is a motivational driver, which is an important part of social systems. In the framework of socio-technical systems theory, incentives play a critical role as



Source(s): Created by author

Figure 2.
NVivo hierarchy chart of codes

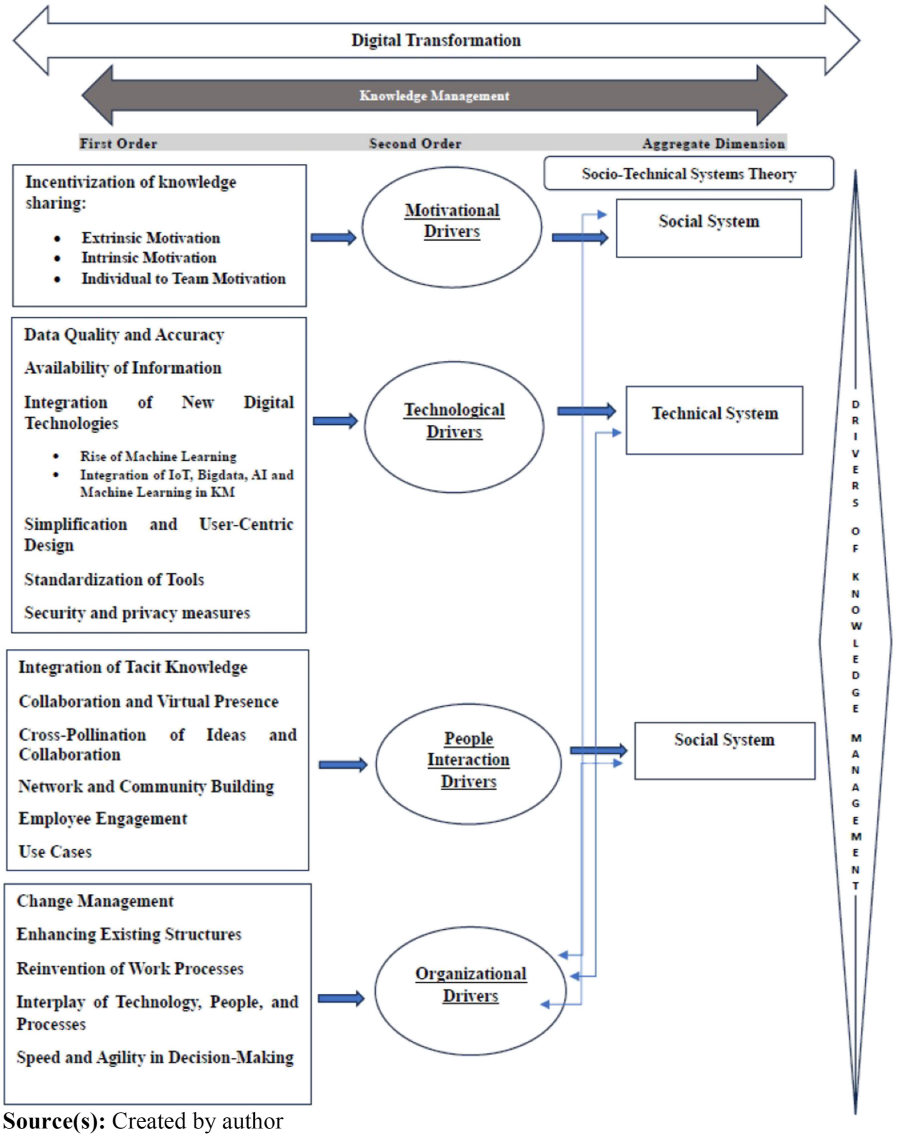


Figure 3.
Conceptual framework: drivers of knowledge management in the context of digital transformation

Source(s): Created by author

motivational drivers within the social dimension (Münch *et al.*, 2022). They are essential for aligning individual efforts and organizational objectives, facilitating effective collaboration and enhancing performance across the system (Thomas and Gupta, 2022a). Further, incentivization in KM is an important driver in digital transformation (Law *et al.*, 2017; Zhao *et al.*, 2016). This study finding clearly indicates that motivation, specifically.

(1) *Intrinsic and extrinsic:* This study shows that recognition and reward are important factors in determining actions and attitudes and are connected to KM also in the

digital era. These recognitions and rewards accelerate active participation and reinforce the knowledge-sharing culture, which plays a significant role in digital transformation.

> Use incentives and rewards to encourage people to do things . . . . . .If the organization is willing to reward us for doing something, it must be important. – RI

The finding shows that a lack of proper incentives can lead towards inaction, with organizations returning to "business as usual" and weakening to leverage the complete KM tools and methods ability. Literature has talked about motivation in terms of extrinsic and intrinsic motivation based on self-determination theory (Thomas and Gupta, 2022a), which provides the significance of intrinsic motivation and extrinsic motivation in knowledge sharing (KS).

> Extrinsic is more of a short term . . . . .. But when you go to an intrinsic behavior or intrinsic behavioral change that is more of a habit related – R4

Furthermore, the finding shows that while extrinsic rewards, such as bonuses or perks, can offer instant improvement and motivation, they are not endurance for long-term engagement. On the contrary, nurturing intrinsic motivation – habits, respect and setting examples – offers more lasting behavioral change.

(1) *Team motivation*

> We moved from an individualistic approach to recognition to a team approach because you know when you talk about individualistic – R4.

Further, the reference to team-based rewards reveals a rising tendency in KM incentivization. Outside individual recognition, organizations gradually emphasize team achievements, identifying that collaborative efforts often generate more significant results in KM. Incentives such as team offsites or points redeemable via team efforts underline the worth of collective knowledge sharing. This movement from individualistic identification to team-based rewards supports the collaborative nature of KM in the digital transformation era.

5.2 Technological drivers

Technological drivers make up the second dimension. It can be seen as a concept deriving from complexity research (Sony and Naik, 2020; Lyytinen and Newman, 2008). In a more practical sense, these drivers consist of the equipment, machinery and infrastructure that receive inputs and transform them into outputs. This category includes all the physical components that enable operations, including computer systems and IT infrastructure. It also includes the software that runs on those physical components and the processes that support the organization's KM practices and encourage innovation. Advanced technologies are a critical component of this category of drivers, as they provide an organization with enhanced capabilities and greater efficiency. However, these technologies must be carefully implemented to ensure that they are well-integrated with the social dimensions of the organization.

5.2.1 Data quality and accuracy. Data quality and accuracy are vital factors of effective KM practices, particularly in the age where data-driven decision-making is paramount.

> I would say the data quality and accuracy . . . decision-making processes and facilitates, effective knowledge sharing across the board – R2.

This study found that KM has a significant role in confirming the precision and reliability of data and information and vice versa (Korherr *et al.*, 2022). In a digital environment where

massive data is produced and administered, KM's potential to ensure that this data is captured accurately is up-to-date and trustworthy is significant. This accuracy is about keeping the data reliable and confirming its significance and use in formal and informal decision-making processes. High-quality data is a criterion for effective knowledge sharing through an organization, as it creates the basis on which knowledge is built, shared and utilized (Thomas and Chopra, 2020).

> Access to real-time project data enabled data-driven decision-making, which improved project outcomes. – R9

The "real-time project data" feature appends another aspect to this argument. In the fast-paced, digitally-driven business, the availability of up-to-date data allows for more agile and informed decision-making (Intezari and Gressel, 2017; Davenport *et al.*, 2013). This nearness confirms that decisions are grounded on the present and accurate information accessible, guiding towards improved outcomes in projects and other business activities. It also augments a more lively and receptive method to administering and accepting transformation, which is significant in the context of digital transformation. Also, the focus on data-driven decision-making in organizations emphasizes the change from instinct-based to proof-based decision-making (Korherr *et al.*, 2022). In the digital era, the capability to collect, examine and take action on precise data rapidly is a main competitive benefit. With this, organizations can make more planned, strategic, knowledgeable and effective choices, leading to improved business results.

5.2.2 Availability of information. The Availability of Information/findability of information is an important driver of KM in the digital age. This is significant for steering through the overflow of data characteristic of this age.

> Availability of knowledge . . . But in the digital era, you know there is a burst of data and information . . .. So findability is definitely one of the top factors. – R4

The volume of data and information available highlights the critical role of KM in ensuring that the right information is accessible at the right time. This "availability of knowledge" is crucial; it's having vast amounts of data and also about being capable of tracing and using important information effectively (Risko *et al.*, 2016). The victory of KM practices, thus, axes the capability to clean, classify and offer data in a controllable and valuable decision-making manner (Nicolas, 2004). In a digital, managing world, this excess of information is a significant determinant of efficient KM.

> Effective knowledge management practices directly contributed to successful outcomes by ensuring that critical information was accessible and utilized by the project team . . . leading to innovative solutions and a successful digital transformation. – R9

Further, the experts focused on effective KM practices that cover forming central repositories and knowledge-sharing mechanisms openly aiding in the triumph of such projects. Confirming that significant information is promptly accessible and utilized by the team, these practices augment updated decision-making and project administration. The amalgamation of centralized data resources and collaborative tools allows for a more integrated and efficient approach to KM, where knowledge is accessible and also available and applicable.

5.2.3 Integration of new digital technologies. The integration of new digital technologies is a significant driver in the evolution and effectiveness of KM systems (Deng *et al.*, 2023), chiefly in digital transformation. This integration presents a multifaceted enhancement to KM practices, from data processing to user experience optimization.

> Innovation and digital technologies are often interchangeably used and indeed are considered to be mutually inclusive. – R8.

> First, obviously, technology integration and tools. Digital technologies allow for quick and efficient capturing and structuring . . . it could be easily accessible. – R2

The opening role of technology integration in KM. The spirit of this insight is in identifying the significance of embedding advanced digital tools and technologies in KM systems (Nazim and Mukherjee, 2016; Jain *et al.*, 2022; Deng *et al.*, 2023). This integration involves adopting new technologies and strategically incorporating them into the KM processes. It covers influencing these tools to streamline data capture, augment information accessibility and facilitate effective knowledge sharing. By incorporating front-line technologies, organizations can change their KM systems to more dynamic, efficient and user-friendly resources.

The transformative impact of digital technologies on KM in the digital era, where data is generated in bulk, the capability of KM systems to efficiently handle, structure and store this data is significant. Digital technologies allow the raw data to change into various formats like text, audio, video and facilitate its storage in centralized, cloud-based systems. This versatility in data handling and storage enhances the accessibility and usability of knowledge, thus making it more acceptable to diverse user needs and contexts.

> In the maintenance process of knowledge management, we do have certain tools that help you pick up the. List those documents that are up for renewal or review and how it picks.. . . The 80–20 principle. 20% of documents have been used 80% of the time, so it picks up only the 20% . . . really helps knowledge management practices to up the game in terms of being resourceful to the teams using it. – R5

This study's results also emphasize how digital technologies augment the maintenance and efficiency of KM systems. By using intelligent algorithms and principles such as the 80–20 rule (Serradell-Lopez *et al.*, 2023), KM systems can select and emphasize the most critical and regularly employed documents. This selective approach confirms that sources are effectively used and that main information continues to be at the forefront of organizational knowledge processes.

> Integration becomes important almost from the beginning. . . . . .You want to avoid any kind of need to re-enter things more than once. – R1

The findings also focus on the importance of unified integration in KM systems. Effective integration is the main to generate a unified and accessible KM skill. Instead it, KM systems risk becoming fragmented, forcing appliers to steer through manifold stages and re-enter data, which can delay the efficiency and usability of the KM process.

> Talking about the IT industry, innovation and digital technologies are often interchangeably used and indeed are considered to be mutually inclusive.

Also, there is an interdependent association between digital technologies and innovation in KM, especially in the IT industry (Thomas, 2023). The continuous integration of new technologies is essential to fostering innovation and maintaining effective KM practices. In the fast-expanding IT world, where technological advancements are constant, the capability to integrate and leverage these progressions is significant for the evolution and effectiveness of KM systems. Further, there is amazing progress in deep learning that enhances algorithms' abilities to function in tasks traditionally associated with human cognition, like image and voice recognition and complex analytical processing. With rich data and maximized computing power, this progress has been directed towards a more significant artificial intelligence (AI) tool role (Canhoto and Clear, 2020). A methodology is presented by Lei and Wang (2020) that leverage artificial intelligence for corporate knowledge allocation and administration. This method demonstrates an important move towards employing advanced AI technologies in KM systems.

> You can automate knowledge processes where you know that automation of repetitive knowledge processes through . . . a lot of time for employees to focus on the creative part – R2

Furthermore, the incorporation of AI also highlights the knowledge transfer process and augments the capability to administer massive corporate data efficiently, thus improving organizational intelligence and decision-making processes. The role of decision support systems (DSS) has improved with AI, particularly in how data warehousing, supported by artificial intelligence, transforms how organizations tackle data. This permits more efficient procedures in validating, organizing and sharing knowledge through the organizations, thus authorizing workers with apt and significant knowledge (Nemati *et al.*, 2002).

5.2.4 Simplification and user-centric design. Nazim and Mukherjee (2016) examined the categorization of various tools required in KM, focusing on the important acts of systems like document management, workflow management and data creation and storage. These tools significantly enhance more effective re-engineering and knowledge-generation processes in organizations. Khalifa and Liu (2003) focused on the significance of these tools in aiding organizations to select and implement the appropriate KM performances efficiently. The key to unlocking these tools' maximum possibilities is their efficient integration. Nazim and Mukherjee (2016) further show that integrating various KM tools, like document management systems, information management systems, search and indexing systems, expert systems and communication and collaboration systems is important. This incorporation eases and rationalizes the processes of knowledge generation, sharing and utilization, transforming the manner in which the organizations tackle and influence their valuable knowledge.

> Integration becomes important almost from the beginning. – R9.

The findings emphasize the need to consider how diverse systems will connect and work jointly from the beginning of their application. The integration method should be pro-active instead of reactive, forming a basis for the technology systems' initial design and deployment. Thus, integration is not just an addition but an important factor in the original design and deployment of technology systems. Further, the finding of this study shows the drawbacks of disconnected systems, where the absence of incorporation leads to inefficiencies and redundancies. Such a disorderly technological environment ruins time and resources and maximizes the mistakes, as appliers must steer through and input data through numerous distinct forums. To deal with these challenges, the interviewee proposes a perfect circumstance where "*To the user, it all appears to be one system, even if it may be more than one." -R1*.

This method shows the significance of a unified user occurrence. Organizations can maximize productivity and reduce the cognitive pressure on their workers by incorporating numerous systems in a manner that they form a single united forum for the end-user. This incorporation allows users to concentrate on their work without being distracted by steering through numerous boundaries or re-entering data. Moreover, the interviewee proposes practical answers to achieve this level of integration, stating the application of *"APIs, application programming interfaces or with RSS feeds or any other mechanism that allows these things to be plugged together."* This suggestion recognizes the technical factors of incorporation, proposing that influencing the present day's programming boundaries and data syndication methods can aid in the swift interconnection of numerous systems and tools. Such technical answers are significant for creating a combined digital environment that promotes effective KM. Thus, incorporating advanced digital technologies in KM means accepting modern tools. It also talks about purposefully shaping these tools to work in harmony, generating a unified, accessible system that rationalizes procedures and improves the complete organization's efficiency. The interview insights offer worthy ideas to improve

this integration, focusing on user knowledge and technical solutions for attaching disparate systems.

5.2.5 Standardization of tools. A new insight emphasizes on the significance of simplicity and uniformity in tool usage in organizations.

> If you have more than one way to do something that just confuses people . . . do that. Instead, say we'll adopt one tool across the entire organization, and so the way that we have practised that. – R1.

The finding of this study displays a state where diverse divisions created their own digital tools for KM-related tasks. The strategic response was not to oppose these growths but to integrate them into a single, unified system. By adopting one tool for each drive in the whole organization, users' difficulty and possible chaos were considerably lessened. This method influenced each tool's power and offered a unified and user-friendly KM experience. Both visions underline the importance of strategic integration and simplification in using new technologies for KM. The aim is to develop an ecosystem where new tools are effortlessly included in the organizational fabric, thus augmenting the efficiency and effectiveness of KM practices. This plan evades repetition of attempts and lessens misperception, nurturing an efficient and united KM surrounding.

5.2.6 Security and privacy measures. In the digital era, Security and Privacy Measures are crucial drivers in the efficient administration of KM systems (Di Chiacchio *et al.*, 2023). As emphasized by experts, "the application of robust security and privacy protocols is significant for developing trust among users", which is necessary for the positive adoption and utilization of KM practices.

> In the digital area, the significance of security and privacy measures is supreme – R9

The application of strong security measures to defend sensitive information and confirm data privacy is significant. The findings show that this is not simply a technical requirement but an opening feature for developing trust among users. When users are self-assured that their knowledge contributions and the subtle knowledge they tackle are safe and their privacy is respected, they will likely be keenly involved in knowledge sharing and storage. This trust is significant for the seamless integration of KM systems into the enterprises' workflows.

5.3 People interaction drivers

People interaction drivers make up the third dimension and are part of the social system. The emphasis here is on the important role of human factors within organizational systems, including behavior, interactions and norms (both social and cultural) that influence attitudes toward technology, how readily they are adopted, and in what way they are utilized. As such, these human factors play a significant role in the integration of new technologies, as they determine the readiness of individuals to accept and use new technologies, make the technology part of their workflow and employ them to streamline communication and the management and use of data. While not strictly technological themselves, these drivers are nevertheless essential to fostering technological innovation within organizations, as well as improving the overall performance of the system.

5.3.1 Integration of tacit knowledge. In digital transformation structures, integrating tacit knowledge into KM systems is an important driver, improving organizational knowledge, depth and application (Thomas and Gupta, 2022b). As emphasized in numerous expert insights, this incorporation speaks about the challenges of converting tacit, often unrecorded, knowledge into accessible, actionable information via digital technologies.

> And when you say tacit knowledge, you know, I mean it can be integrated with your systems, with the right approvals and, you know, licenses. it can be a silent bot . . . . . .whatever they have learned. – R4

The result of this study, based on an expert view, examines a tool intended to capture tacit knowledge, displaying how it can incorporate with existing systems to change crucial business information from emails into particular beneficial documents. This tool is important in its capability to silently and efficiently change day-to-day messages into worthy knowledge assets, speaking about the shared problem of restricted time for knowledge conversion.

> It's important to embrace the concept of generative AI . . .. Extract the knowledge that has that is emerging during the conversations or that's emerging from the recordings, and it can also look at, you know, different recordings for that matter, and see and give you a list of options to – R4.

(1) The Role of Generative AI in Converting Knowledge

Generative AI is important in KM (Hu *et al.*, 2023). Another important finding of this study focuses on *generative AI's* role in converting tacit to explicit knowledge. Because of the fast-moving character of current work environments, where employees change from one project to another with less time for image or documentation, generative AI is important. It culls out the emerging knowledge from conversations and recordings, offering a streamlined, time-efficient way to take worthy insights.

(2) The Role of Gamification in Sharing Tacit Knowledge

> Promote the appropriate use of gamification. – R1, R5

Gamification refers to using design elements similar to those found in games, particularly (though not exclusively) video games. Gamified systems and processes make use of our natural tendency to become engaged and engrossed in games, as well as our penchant for creativity during play, to encourage better and more frequent use of the system. By making processes more appealing and enjoyable, gamification can also be used to promote desirable behaviors within organizations. Game elements like point scores provide feedback and gratification to individuals engaged with the system. Badges can be used to provide a visual representation of an individual's performance or marks their achievement of a milestone. They can also motivate individuals to improve their performance in order to attain more of these tokens. Leaderboards display performance- or achievement-based rankings, introducing an element of friendly competition, which can motivate engagement for the sake of rising in the ranks, essentially adding an extrinsic motivator on top of the intrinsic motivation of doing the task that is being measured. Further, this study shows that gamification tactics can be a highly successful approach to fostering and improving knowledge sharing inside organizations. By including game-like aspects and prizes, gamification can serve as a comprehensive collection of tools that encourage individuals to become more active participants in information distribution. This method not only enhances employee engagement, but it also fosters a collaborative and continuous learning culture (Friedrich *et al.*, 2020).

Furthermore, the findings of this study indicate that social design elements that encourage individuals to interact, recommend and react to each other's contributions will improve the sharing of tacit knowledge. These behaviors can be further encouraged by the implementation of gamified principles to motivate participation and engagement. These elements, whether gamified or not, create a communal atmosphere that fosters the sharing of knowledge and expertise, resulting in a greater contributions to the organization's collective knowledge.

Also, the significance of maintaining institutional knowledge and expertise is focused on. Digital technologies are important in clarifying that the employees' knowledge prevails in the organization even if they are out. This conservation is important for upholding an intense organizational memory and know-how repository.

Lastly, an expert states that modern KM is about influencing pertinent tacit knowledge during requirements (Thomas, 2023). This viewpoint emphasizes the dynamic interplay between the employees' tacit knowledge and the explicit knowledge recognized in the organization. In the digital era, KM is between these two forms of knowledge, regularly growing and accepting fast-paced business changes.

5.3.2 Collaboration and virtual presence.

> Digital technologies have improved collaboration and knowledge sharing, enabling remote teams to work together seamlessly. – R9

Collaboration and Virtual Presence have originated in digital transformation as important KM enablers or drivers. This growth is emphasized by the insights of numerous experts who focus on the transformative impact of technology in nurturing collaboration and enabling virtual work environments.

> I think technology, the new technology, offers a chance to partner between knowledge professionals and information professionals . . . guess our biggest digital transformation was as really a response to COVID. So I think, and I think new technologies, they and their availability . . . pushed the boundaries of collaboration and virtual working. – R6

The outbreak of COVID-19 played an important role in the digital transformation, forcing the limits of collaboration and virtual working (Obembe and Obembe, 2021). This movement emphasizes how technology, especially in reply to outside encounters such as a worldwide pandemic, presents an occasion for knowledge and information professionals to join more effectively. Integrating new technologies has augmented this collaboration and increased the area of what's achievable in effective workspaces. Also, this significance of aided knowledge sharing and collaboration is likely to play a massive part in the future. The highlight isn't on the action of sharing knowledge and generating systems and environments that keenly augment this allocation, creating a unified part of the system. Also, the employment of digital platforms and tools to augment real-time collaboration and sharing between employees, irrespective of their position, is emphasized. These stages confirm cross-team collaboration, collective problem-solving and virtual brainstorming sessions, effectively accelerating these procedures and creating them more effectively. Also, the enhancement in collaboration and knowledge sharing via digital technologies, particularly in allowing remote teams to work jointly flawlessly, is underlined. This progression is important in making productivity and innovation, particularly when physical presence is not achievable.

5.3.3 Cross-pollination of ideas and collaboration. During digital changes in the KM landscape, dynamic alliances', strategic significance highlights the movement towards more collaborative and integrated approaches (Martinez-Noya and Narula, 2018). This collaborative imperative results from the requirement to incessantly revolutionize and remain driven, make these collaborations vital for organizations. Such collaborations aid the knowledge and technologies swap and augmentation, which results in investigating novel applications and joint reinforcement of capabilities. More dominant to this collaborative framework are the cross-pollination and cross-fertilization notions. These include the interdisciplinary amalgamation of different knowledge and technologies, introducing new challenges that augment innovation and functionality (Bogers and Horst, 2014).

> The second is in terms of cross-pollination of ideas, so collaboration is one of the key things again that came drives, and when you're looking at your readiness for the digital era, you're also looking at thinking differently – R3

The idea of technology convergence, associated with cross-fertilization (Páez-Avilés *et al.*, 2018a, b), includes amalgamating different domains of knowledge and technology. In

contrast to convergence, cross-pollination and cross-fertilization focus on the diversity worth in guiding radical changes and innovations.

These are very significant for organizations determined to familiarize and flourish in the digital era. By accepting cross-pollination and cross-fertilization, organizations can nurture a culture of collaborative intelligence and innovation, where shared knowledge results into more multidisciplinary and new explanations. This is important to stay on top of increasing developing digital landscape, where the integration and application of different knowledge streams are important to opening novel challenges and trails for development.

> Teams could collaborate more efficiently, reducing the time and effort required to complete projects. – R9

The "Cross-Pollination of Ideas and Collaboration" is important in organizations and teams external networks and the internal structure. This notion is to a multi-network search system, exceeds the KM outdated limits by indorsing the switch of knowledge and notions that are outside person's instant network, covering interconnected networks and areas. Such cross-pollination safeguards the information that are augmented by different viewpoints, thereby generating a productive space for innovative ideas and approaches (Santoro *et al.*, 2006).

5.3.4 Network and community building. Network and Community Building arise as a central driver for KM. The findings of the study show that the creation of networks and communities are important in augmenting a more connected, collaborative and knowledge-rich organizational environment.

> The importance of creating spaces where employees can connect, collaborate, co-create, and share knowledge. – R2

In the digital age, where physical contacts are supplemented or replaced by virtual connections, the capability to form networks and communities digitally develops progressively significantly. These digital communities act as platforms for employees to engage with one another, share expertise and collectively solve issues, thus nurturing a culture of continuous learning and knowledge exchange. The influence of these communities extends outside knowledge sharing; they also add to a sense of belonging among employees. In a digitally transformed workplace, keeping connection and community is significant for employee engagement and motivation. By nurturing these communities, an environment can be created where knowledge is shared and develops organically through collaborative efforts. Also, such networks and communities are active in collective knowledge development. They augment the combining of different perspectives and experiences, leading to richer, more comprehensive insights and solutions. In this way, community building in KM transcends mere information and knowledge exchange; it becomes a process of collaborative knowledge creation.

5.3.5 Employee engagement. Employee Engagement is increasingly recognized as a key driver of effective KM. The results of this study illuminate how KM can cultivate a culture of knowledge sharing, collaboration and continuous learning, which are integral to enhancing employee engagement within organizations.

> I would say it's a culture shift that deals with employee engagement. I think KM has the potential to foster sort of a culture that promotes knowledge sharing . . . drives engagement. – R2.

This approach goes beyond the mere acquisition of knowledge; it actively involves employees in both the generation and application of knowledge, aligning their contributions with the organization's broader objectives.

Training and development play a vital role in this context. By equipping employees with knowledge about KM tools, practices and emerging technologies, organizations not only broaden the scope of employee engagement but also empower them to participate in and

contribute to the enterprise's goals actively. This empowerment is crucial in fostering a sense of ownership and involvement among employees, making them feel valued and integral to the organizational fabric. Furthermore, the advent of digital platforms and technologies like virtual and augmented reality in training and development underscores the transformative impact of digitalization on employee engagement. These technologies offer immersive and interactive learning experiences, significantly enhancing knowledge retention and practical application. This integration of advanced digital tool to KM practices not only drives employee engagement but also prepares them for the challenges and opportunities of a digitally the evolving workplace, thereby reinforcing the symbiotic relationship between employee engagement, KM and digital transformation.

5.3.6 Use cases. In digital transformation, the utilization of compelling use cases appears to be an important driver in the adoption and effectiveness of KM systems. The findings of this study show how realistic illustrations of KM tools in action can considerably augment user engagement and understanding.

The social networking service introduction as a KM tool highlights the need to present users with practical use cases. Just directing the people to employ a new tool is often insufficient to inspire its acceptance. Displaying users how to employ the tool in real-world scenarios and discussing the advantages of these makes the application more significant and efficient. This method shows the significance of providing tangible, relatable examples that display a KM tool's realistic worth and potential impact, thus nurturing wider user engagement and utilization.

> So reuse became very important. As part of this journey of guidance, we created a repository of use cases, too, right? A use case in telecom could be repurposed for a use case in manufacturing. – R3

Further, the result focuses on the significance of reuse in KM, essentially via creating a repository of use cases. KM practices can be more adaptable and practical by organizing use cases from numerous divisions, like telecom and manufacturing, and showing adaptability across different notions. This cross-sector application of knowledge augments the use of KM systems and it also inspires innovation and creative problem-solving.

5.4 Organizational drivers

Organizational drivers are the fourth and final dimension. While it has some connection to technology systems, it can be understood primarily as an aspect of social systems (Li *et al.*, 2020). These drivers are primarily concerned with processes that guide individual and group behavior, as well as designing the structures in which they operate.

5.4.1 Change management. Change management is an important feature of contemporary organizational strategy and a crucial driver of KM, mainly in digital transformation. As businesses move through the fast-changing background of technological advancements and changing market aspects, the effective KM role is more pronounced in competitiveness and promoting creation. This changing environment positions change management at the strategic forefront, confirming the digital transitions win and the effective implementation of KM initiatives. In the digital era, organizations face technological changes and a transformation in how knowledge is created, shared and utilized. Integrating digital tools and platforms in day-to-day business procedures has transformed how knowledge is administered. But with this change, there is a set of confrontations associated with recognizing and adjusting the organization's people (Mertins *et al.*, 2003; Errida and Lotfi, 2021). It is here that the change management becomes important.

> Modern knowledge management is agile care. It's also change management, specifically transformational change management. Studying transformational change management, particularly the . . . ability to adapt, reinvent, and pivot. Therefore, modern knowledge management must be agile. It needs to be brave enough to fail fast, learn quickly, and continuously reinvent itself. – R5

Change management in KM and digital transformation means cleverly handling the "people side" of change. It covers a practical way to manage changes that aim to minimize resistance to new systems and processes. The aim is to promote an organizational culture that is open to transformation and also adaptive and agile in new work manners. This transformed management is significant in digital transformations, which often demand an important change in employees' attitudes, work processes and organizational structure. One of the main aims of change management is to confirm that employees at every level comprehend and are in line with the organization's new course. This covers clear communication about the transformation, its significance, and how it will help the individual and the organization. It is important to enunciate the concept behind the digital transformation and augmented KM practices' role in attaining this concept.

5.4.2 Reinvention of work processes.

> A new technology always offers an opportunity to reinvent work and to reinvent the way in which knowledge flows as a result of that, because it creates an opportunity just to evaluate, you know, is this the is it provides new technologies . . . of existing work processes, which can happen in a hurry, then I think it opens the door. – R6

"*Reinvention of Work Processes*" emphasizes technological evolution in the KM landscape. It focuses on the part of new technologies in proposing unparallel challenges to reconsider and change traditional work processes. This transformative possibility is about incremental changes and revisualizing how work is done, directing enhanced efficiency and effectiveness in KM flow. "*Opportunity to reinvent work*" is the most important factor to this code. It proposes that the presentation of new technologies upgrades the present systems and also gives an opportunity to reconsider and reshape how numerous tasks and processes are conducted in an organization. This reinvention is more than shallow changes, examining the center of work processes to recognize sectors where technology can be impactful like, automating routine works with AI and ML algorithms can relax humans for more complicated, original works that gives more worth. Also, "new technologies have some process understanding" shows that latest technologies have an essential knowledge of organizational processes. This indicates that these technologies are not mere tools used in the prevailing workflows but are shaped with an inborn understanding of how work procedures function, and one can enhance these. Technologies like data analytics, cloud computing, and collaborative platforms are accompaniments to the workflow and are catalysts to redescribe the workflow itself. This code, thus, emphasizes the symbiotic association between new technologies and work processes. It talks about influencing technology for improvements in the already existing tools and to present novel working methods. This outcome in more rationalized KM practices, nurturing a surrounding where knowledge is administered and keenly and logically improved by technological innovation.

5.4.3 Enhancing existing structures.

> Integrated digital office infrastructure that was created from the previous paper-based workflows. – R2

In the digital transformation era, enhancing the existing structure is a main KM driver. The study findings show that integrating a digital office infrastructure, growing from traditional paper-based systems, illustrates this notion. This change from paper to digital is a technological upgrade. It characterizes a planned enhancement of the organizational structure to aid more effective knowledge capture, sharing and utilization. By digitizing existing structures, the speed, accessibility and collaborative potential of digital platforms can be leveraged by organizations, significantly elevating their KM processes.

5.4.4 Interplay of technology, people and processes. In the digital transformation era, the well-balanced integration of technology, people and knowledge processes appears as an important KM driver.

> People is a core, and technology is just a driver. You cannot make it a core – R1
>
> Data analytics and artificial intelligence have enhanced the ability to extract valuable insights from vast amounts of data, facilitating informed decision-making. – R9
>
> Digital technologies are incredibly effective and efficient tools, but they're still "tools." It's always going to be the human element, that is, recognizing and utilizing the digital tools available in gathering and disseminating knowledge. – R7

This interaction is significant in making a KM system that is technologically advanced but at the same time also rooted in human expertise and well-structured processes. An expert insight emphasizes the ability of new technologies to augment the current knowledge structures, proposing that "it's taking an existing structure and amplifying it and adding some value to that." This method shows how technology performs as a promoter, inspiring human-driven social structure in organizations like communities of practice (Qamar *et al.*, 2021). It underlines the notion that technology should not be covered by the current procedures. It should intertwine with them to enhance the meaning of knowledge sharing and learning and also highlight technology's role in KM.

Another expert notes the significance of predictive analytics in knowledge maintenance, mentioning that it can "forecast gaps in the knowledge and identify critical knowledge areas." This active technology employment in KM highlights how digital tools can be influenced to except future knowledge requirements and strategically direct the efforts of organization's KM. But, the centrality of the human element in KM is also emphasized, with the cue that "People is a core and technology is just a driver." With this declaration human expertise and interaction are at the front of KM, seeing technology as a helpful tool that augments and enhances human-centric KM processes. The synergy between technology and human decision-making is displayed by data analytics and AI in extracting valuable insights from large data sets. This cooperation exhibits that while technology can tackle and examine massive amounts of data, human interpretation and application of these insights push effective KM. Revealing the role of digital technologies as tools, an expert states that they are "incredibly effective and efficient . . . but it's always going to be the human element." This viewpoint strengthens the notion that technology is a facilitator in KM, and people play a central role in its application and utilization for knowledge collecting and dissemination. Lastly, this study also noted that KM's future insight is that "AI is not going to take your job. The person who knows how to use AI is going to take your job." This underlines the continuing significance of human expertise in influencing technology in KM, emphasizing the requirement for individuals to apply these tools effectively.

5.4.5 Speed and agility in decision-making. In digital transformation, the notions of speed and agility in decision-making are significant drivers to attain success in an organization. This requirement for speedy and flexible act has filtered into all business sectors and this is furthered by the difficulties presented by the global pandemic.

> I think the digital platforms can speed that entire process up. – R2
>
> So the decisions were taken overnight, so speed was again one of the important things. – R4
>
> Embrace an agile approach, allowing for iterative evaluation and adjustment as the initiative progresses. – R9

The finding shows that the age of digital transformation clarifies that agility is not a choice but a precondition for existence and keenness in today's fast-developing market structure.

KM nurtures this agility. By efficiently administering and influencing knowledge, faster and more informed decisions can be made by organizations that can adapt rapidly to the transforming market circumstances and customer requirements. KM tools and strategies permit the smooth distribution and use of knowledge, claiming that the right knowledge is accessible at the right time to the right individuals. The agile organization flourishes on flexibility (Rafi *et al.*, 2022). This flexibility spreads to KM tools employed to steer through indecision. Agile organizations allocate knowledge by creating and sharing it in its members, offering a base for rapid, open decision-making. The transmission of knowledge in an agile organization means storage and retrieval and also generating an ecosystem where knowledge flows easily and is uninterruptedly revised and improved.

6. Discussion

The results of this research reveal that the design and the effectiveness of KM programs and practices depend on four independent drivers, namely, motivation, technology, people interaction and organizational drivers. The technological dimension of KM, which touches on Big Data, AI, ML, system integration and user-centric design, is critical for organizations in the age of Digital Transformation. The integration of these technologies augments the efficiency of preset, repetitive tasks while also improving tasks that rely on human cognition, thereby transforming KM into dynamic, interactive platforms. Collaboration and virtual presence, enabled by digital tools, are significant for effective remote teamwork and knowledge sharing, particularly since the start of the COVID-19 pandemic. Simplification and standardization across KM systems create accessible interfaces, which in turn nurture employee engagement and the effective use of these systems. The technological dimension of KM shows a turn toward a more familiar, efficient and collaborative KM practices. The motivational driver is also significant, and the emphasis should be on nurturing a feeling of fitting and joint motive, focusing on intrinsic motivation alongside extrinsic rewards. By rejoicing in the team's achievements and encouraging a collaborative environment, KM practices become more than just tasks; rather, they become catalysts for growth and creativity. Prioritizing the value of teamwork over individual achievements creates a more collaborative and engaging workplace, which is far more suitable for the communication-centric and rapidly changing digital age. As the research shows, the "People Interaction Drivers" in KM places an emphasis on integrating tacit knowledge and enhancing collaboration via virtual existence. This nurtures the cross-pollination of ideas necessary for building strong networks and communities. This shows that successful KM pivots involve the creation of environments where knowledge is efficiently communicated and collaboratively established and employed. This highlights the importance of human interactions in KM, where technology is an enabler but not the sole driver. Thus, "Organizational Drivers" are significant. Change management is the center of this, focusing on the requirement for familiarizing with the fast-changing digital environment. Under this concept, the reinvention of work processes and augmenting existing structures are central, which confirms the importance of KM practices to meet organizational changes. The actual amalgamation of technology, people and processes is necessary, with each factor supporting the others. Speed and agility in decision-making, enabled by digital tools, are also very critical for ensuring that KM practices are receptive and informed.

7. Conclusion and implication

In digital transformation, KM covers four dimensions: motivation, technology, people interaction and organizational drivers, each of which includes a number of sub-codes. Through the lens of social and technical systems theory, one can see how these dimensions

are interconnected in ways that are sometimes complex. The fact that a balanced social-technical system can handle and, to some extent, exhibit some non-linear, complex and unpredictable patterns is what makes KM more adaptable to digital changes (essentially, it makes the system/organization more agile). But too much of that non-linear, unpredictability can also reduce the system/organization's productivity and effectiveness. Generally speaking, the social aspect of the system is going to introduce more of that non-linear complexity, while the technological system are going to be linear, regular and predictable. Since what is needed to succeed during digital transformation is a combination of the non-linear, agile approach with the more productive, linear approach, organizations that can balance the two stand a better chance at becoming successful.

Jointly, they make up an organization's complete KM. This interdependence highlights the significant role they play in promoting efficient KM in the digital era, focusing on the requirement for a holistic approach that integrates all of the drivers (both social and technical) identified in this study to enhance KM in the organization.

KM managers need to focus on implementing technology, such as big data, AI and ML, to augment effectiveness and decision-making. These technologies rationalize information processing, changing KM into a proactive system. Managers need to emphasize the automation of routine tasks to free up human resources and make them available for difficult problem-solving. Digital tools for collaboration and virtual presence are vital for fostering unified teamwork and knowledge sharing, particularly in remote work environments. Managers also need to aim for system integration and user-centric design in order to create simplified, instinctive KM processes. Knowledge managers and organizations need to accept a dual approach to incentivization in KM. While intrinsic motivation remains important, it should be supplemented by extrinsic motivators that recognize individual and team achievement. Knowledge managers and organizations also need to efficiently implement the "People Interaction Drivers" in KM. This includes the vigorous incorporation of tacit knowledge, augmented virtual collaboration and nurturing the cross-pollination of ideas. By creating strong networks and communities and highlighting employee engagement, they can create an active and collaborative knowledge-sharing culture. Focusing on these human-centric connections while leveraging technology as an enabler is the approach that will result in a more interconnected KM practice, which will in turn drive organizational growth, nurture innovation and create a culture of continuous learning. Knowledge managers should focus on Change Management as well, in order to ensure members of the organization familiarize themselves with its KM systems and the evolving digital landscape in which they operate. Organizations should augment their existing structures by digitizing workflows, enabling effective knowledge capture and sharing. The well-balanced integration of technology, people and processes is important for organizational success and essential for agile decision-making, which should be standard in today's business world.

According to Trist and his colleagues, technology does not impose a single form of organized labor; rather, organizations have the freedom to experiment with many configurations of their work systems. This method allows for creating workplaces where employees have extensive influence over technical tools, encouraging collaboration that improves operational outcomes and generates social and psychological rewards (Pasmore *et al.*, 2019). Building on this foundation, current research supports these findings by stressing the significance of social factors such as motivation and interpersonal interactions. These social elements, together with organizational and technological drivers, have been identified as significant drivers in the field of KM. They play an important role in improving both organizational performance and creativity. In today's rapidly changing digital landscape, incorporating sociotechnical systems into workplace design is more important than ever.

The limitation of this research is that it did not employ a mixed-methods approach. Therefore, future research could focus on the variables identified in this qualitative study to produce more robust results.

References

Akbari, M., Kok, S.K., Hopkins, J., Frederico, G.F., Nguyen, H. and Alonso, A.D. (2023), "The changing landscape of digital transformation in supply chains: impacts of industry 4.0 in Vietnam", *The International Journal of Logistics Management*, Vol. 35 No. 4, pp. 1040-1072, doi: 10.1108/IJLM-11-2022-0442.

Appelbaum, S.H. (1997), "Socio-technical systems theory: an intervention strategy for organizational development", *Management Decision*, Vol. 35 No. 6, pp. 452-463, doi: 10.1108/00251749710173823.

Appio, F.P., Frattini, F., Petruzzelli, A.M. and Neirotti, P. (2021), "Digital transformation and innovation management: a synthesis of existing research and an agenda for future studies", *Journal of Product Innovation Management*, Vol. 38 No. 1, pp. 4-20, doi: 10.1111/jpim.12562.

Bockshecker, A., Hackstein, S. and Baumol, U. (2018), "Systematization of the term digital transformation and its phenomena from a socio-technical perspective – a literature review", Research Paper, available at: https://aisel.aisnet.org/ecis2018_rp/43 (accessed 4 January 2024).

Bogers, M. and Horst, W. (2014), "Collaborative prototyping: cross-fertilization of knowledge in prototype-driven problem solving", *Journal of Product Innovation Management*, Vol. 31 No. 4, pp. 744-764.

Brown, D.R. and Harvey, D. (2006), *Organization Development*, 7th ed., Pearson Education, p. 166.

Canhoto, A.I. and Clear, F. (2020), "Artificial intelligence and machine learning as business tools: a framework for diagnosing value destruction potential", *Business Horizons*, Vol. 63 No. 2, pp. 183-193.

Corvello, V., De Carolis, M., Verteramo, S. and Steiber, A. (2022), "The digital transformation of entrepreneurial work", *International Journal of Entrepreneurial Behavior and Research*, Vol. 28 No. 5, pp. 1167-1183, doi: 10.1108/ijebr-01-2021-0067.

Davenport, T.H., Barth, P. and Bean, R. (2013), "How 'big data' is different", *MIT Sloan Management Review*, Vol. 54 No. 1, pp. 43-46.

De Bem Machado, A., Secinaro, S., Calandra, D. and Lanzalonga, F. (2022), "Knowledge management and digital transformation for Industry 4.0: a structured literature review", *Knowledge Management Research and Practice*, Vol. 20 No. 2, pp. 320-338, doi: 10.1080/14778238.2021.2015261.

Deng, H., Duan, S.X. and Wibowo, S. (2023), "Digital technology driven knowledge sharing for job performance", *Journal of Knowledge Management*, Vol. 27 No. 2, pp. 404-425, doi: 10.1108/jkm-08-2021-0637.

Di Chiacchio, L., Martínez-Caro, E., Cegarra-Navarro, J.G. and Garcia-Perez, A. (2023), "Eco-innovation in the textile industry: the strategic importance of data privacy and environmental knowledge management", *Kybernetes*, Vol. ahead-of-print No. ahead-of-print, doi: 10.1108/K-02-2023-0222.

Di Vaio, A., Palladino, R., Pezzi, A. and Kalisz, D.E. (2021), "The role of digital innovation in knowledge management systems: a systematic literature review", *Journal of Business Research*, Vol. 123, pp. 220-231, doi: 10.1016/j.jbusres.2020.09.042.

Errida, A. and Lotfi, B. (2021), "The determinants of organizational change management success: literature review and case study", *International Journal of Engineering Business Management*, Vol. 13, 18479790211016273, doi: 10.1177/18479790211016273.

Friedrich, J., Becker, M., Kramer, F., Wirth, M. and Schneider, M. (2020), "Incentive design and gamification for knowledge management", *Journal of Business Research*, Vol. 106, pp. 341-352, doi: 10.1016/j.jbusres.2019.02.009.

Gioia, D.A., Corley, K.G. and Hamilton, A.L. (2013), "Seeking qualitative rigor in inductive research: notes on the Gioia methodology", *Organizational Research Methods*, Vol. 16 No. 1, pp. 15-31, doi: 10.1177/1094428112452151.

Glaser, B.G. and Strauss, A.L. (1967), *The Discovery of Grounded Theory: Strategies for Qualitative Research*, Routledge.

Guest, G., Bunce, A. and Johnson, L. (2006), "How many interviews are enough? An experiment with data saturation and variability", *Field Methods*, Vol. 18 No. 1, pp. 59-82, doi: 10.1177/1525822x05279903.

Handzic, M. (2011), "Integrated socio-technical knowledge management model: an empirical evaluation", *Journal of Knowledge Management*, Vol. 15 No. 2, pp. 198-211, doi: 10.1108/13673271111119655.

Herbert, L. (2017), *Digital Transformation: Build Your Organization's Future for the Innovation Age*, Bloomsbury Publishing, London.

Hu, X., Tian, Y., Nagato, K., Nakao, M. and Liu, A. (2023), "Opportunities and challenges of ChatGPT for design knowledge management", *Procedia CIRP*, Vol. 119, pp. 21-28, doi: 10.1016/j.procir.2023.05.001.

Idrees, H., Xu, J., Haider, S.A. and Tehseen, S. (2023), "A systematic review of knowledge management and new product development projects: trends, issues, and challenges", *Journal of Innovation and Knowledge*, Vol. 8 No. 2, 100350, doi: 10.1016/j.jik.2023.100350.

Intezari, A. and Gressel, S. (2017), "Information and reformation in KM systems: big data and strategic decision-making", *Journal of Knowledge Management*, Vol. 21 No. 1, pp. 71-91, doi: 10.1108/JKM-07-2015-0293.

Jain, N., Thomas, A., Gupta, V., Ossorio, M. and Porcheddu, D. (2022), "Stimulating CSR learning collaboration by the mentor universities with digital tools and technologies – an empirical study during the COVID-19 pandemic", *Management Decision*, Vol. 60 No. 10, pp. 2824-2848, doi: 10.1108/MD-12-2021-1679.

Khalifa, M. and Liu, V. (2003), "Determinants of successful knowledge management programs", *Electronic Journal of Knowledge Management*, Vol. 1 No. 2, pp. 101-110.

Korherr, P., Kanbach, D.K., Kraus, S. and Mikalef, P. (2022), "From intuitive to data-driven decision-making in digital transformation: a framework of prevalent managerial archetypes", *Digital Business*, Vol. 2 No. 2, 100045, doi: 10.1016/j.digbus.2022.100045.

Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N. and Roig-Tierno, N. (2021), "Digital transformation: an overview of the current state of the art of research", *Sage Open*, Vol. 11 No. 3, 21582440211047576, doi: 10.1177/21582440211047576.

Kutnjak, A. (2021), "Covid-19 accelerates digital transformation in industries: challenges, issues, barriers and problems in transformation", *IEEE Access*, Vol. 9, pp. 79373-79388, doi: 10.1109/access.2021.3084801.

Law, K.K., Chan, A. and Ozer, M. (2017), "Towards an integrated framework of intrinsic motivators, extrinsic motivators and knowledge sharing", *Journal of Knowledge Management*, Vol. 21 No. 6, pp. 1486-1502, doi: 10.1108/JKM-03-2016-0119.

Lee, H. and Choi, B. (2003), "Knowledge management enablers, processes, and organizational performance: an integrative view and empirical examination", *Journal of Management Information Systems*, Vol. 20 No. 1, pp. 179-228.

Lei, Z. and Wang, L. (2020), "Construction of organisational system of enterprise knowledge management networking module based on artificial intelligence", *Knowledge Management Research and Practice*, pp. 1-13, doi: 10.1080/14778238.2020.1831892.

Li, A.Q., Rich, N., Found, P., Kumar, M. and Brown, S. (2020), "Exploring product–service systems in the digital era: a socio-technical systems perspective", *The TQM Journal*, Vol. 32 No. 4, pp. 897-913, doi: 10.1108/TQM-11-2019-0272.

Lune, H. and Berg, B.L. (2017), *Qualitative Research Methods for the Social Sciences (Ninth)*, Pearson Education.

Lyytinen, K. and Newman, M. (2008), "Explaining information systems change: a punctuated socio-technical change model", *European Journal of Information Systems*, Vol. 17 No. 6, pp. 589-613, doi: 10.1057/ejis.2008.50.

Lyytinen, K., Newman, M. and Al-Muharfi, A.R.A. (2009), "Institutionalizing enterprise resource planning in the Saudi steel industry: a punctuated socio-technical analysis", *Journal of Information Technology*, Vol. 24 No. 4, pp. 286-304, doi: 10.1057/jit.2009.14.

Marchegiani, L. (2021), *Digital Transformation and Knowledge Management*, Routledge, Oxon and New York.

Martinez-Noya, A. and Narula, R. (2018), "What more can we learn from R&D alliances? A review and research agenda", *BRQ Business Research Quarterly*, Vol. 21 No. 3, pp. 195-212.

Mertins, K., Heisig, P. and Vorbeck, J. (Eds) (2003), *Knowledge Management: Concepts and Best Practices*, Springer Science & Business Media.

Mizintseva, M.F. and Gerbina, T.V. (2018), "Knowledge management: a tool for implementing the digital economy", *Scientific and Technical Information Processing*, Vol. 45 No. 1, pp. 40-48, doi: 10.3103/s0147688218010094.

Morse, J.M. (2004), "Constructing qualitatively derived theory: concept construction and concept typologies", *Qualitative Health Research*, Vol. 14 No. 10, pp. 1387-1395, doi: 10.1177/1049732304269676.

Münch, C., Marx, E., Benz, L., Hartmann, E. and Matzner, M. (2022), "Capabilities of digital servitization: evidence from the socio-technical systems theory", *Technological Forecasting and Social Change*, Vol. 176, 121361, doi: 10.1016/j.techfore.2021.121361.

Nazim, M. and Mukherjee, B. (2016), *Knowledge Management in Libraries: Concepts, Tools and Approaches*, Chandos Publishing.

Nemati, H.R., Steiger, D.M., Iyer, L.S. and Herschel, R.T. (2002), "Knowledge warehouse: an architectural integration of knowledge management, decision support, artificial intelligence and data warehousing", *Decision Support Systems*, Vol. 33 No. 2, pp. 143-161.

Nicolas, R. (2004), "Knowledge management impacts on decision making process", *Journal of Knowledge Management*, Vol. 8 No. 1, pp. 20-31, doi: 10.1108/13673270410523880.

Nicolás-Agustín, Á., Jiménez-Jiménez, D. and Maeso-Fernandez, F. (2022), "The role of human resource practices in the implementation of digital transformation", *International Journal of Manpower*, Vol. 43 No. 2, pp. 395-410, doi: 10.1108/ijm-03-2021-0176.

Obembe, F. and Obembe, D. (2021), "The impact of digital transformation on knowledge management during COVID-19", *European Conference on Knowledge Management*, Academic Conferences International, pp. 992-XXIII.

Páez-Avilés, C., Juanola-Feliu, E. and Samitier, J. (2018a), "Cross-fertilization of key enabling technologies: an empirical study of nanotechnology-related projects based on innovation management strategies", *Journal of Engineering and Technology Management*, Vol. 49, pp. 22-45.

Páez-Avilés, C., Van Rijnsoever, F.J., Juanola-Feliu, E. and Samitier, J. (2018b), "Multi-disciplinarity breeds diversity: the influence of innovation project characteristics on diversity creation in nanotechnology", *The Journal of Technology Transfer*, Vol. 43, pp. 458-481.

Pasmore, W., Winby, S., Mohrman, S.A. and Vanasse, R. (2019), "Reflections: sociotechnical systems design and organization change", *Journal of Change Management*, Vol. 19 No. 2, pp. 67-85, doi: 10.1080/14697017.2018.1553761.

Qamar, Y., Agrawal, R.K., Samad, T.A. and Jabbour, C.J.C. (2021), "When technology meets people: the interplay of artificial intelligence and human resource management", *Journal of Enterprise Information Management*, Vol. 34 No. 5, pp. 1339-1370, doi: 10.1108/jeim-11-2020-0436.

Rafi, N., Ahmed, A., Shafique, I. and Kalyar, M.N. (2022), "Knowledge management capabilities and organizational agility as liaisons of business performance", *South Asian Journal of Business Studies*, Vol. 11 No. 4, pp. 397-417, doi: 10.1108/SAJBS-05-2020-0145.

Rêgo, B.S., Jayantilal, S., Ferreira, J.J. and Carayannis, E.G. (2021), "Digital transformation and strategic management: a systematic review of the literature", *Journal of the Knowledge Economy*, Vol. 13 No. 4, pp. 1-28, doi: 10.1007/s13132-021-00853-3.

Risko, E.F., Ferguson, A.M. and McLean, D. (2016), "On retrieving information from external knowledge stores: feeling-of-findability, feeling-of-knowing and Internet search", *Computers in Human Behavior*, Vol. 65, pp. 534-543, doi: 10.1016/j.chb.2016.08.046.

Santoro, F.M., Borges, M.R. and Rezende, E.A. (2006), "Collaboration and knowledge sharing in network organizations", *Expert Systems with Applications*, Vol. 31 No. 4, pp. 715-727.

Schönherr, S., Eller, R., Kallmuenzer, A. and Peters, M. (2023), "Organisational learning and sustainable tourism: the enabling role of digital transformation", *Journal of Knowledge Management*, Vol. 27 No. 11, pp. 82-100, doi: 10.1108/jkm-06-2022-0434.

Serradell-Lopez, E., Lara-Navarra, P. and Martínez-Martínez, S. (2023), "The Pareto Principle in virtual communities of learning", *Computers in Human Behavior*, Vol. 138, 107444, doi: 10.1016/j.chb.2022.107444.

Sharma, G.D., Thomas, A. and Paul, J. (2021), "Reviving tourism industry post-COVID-19: a resilience-based framework", *Tourism Management Perspectives*, Vol. 37, 100786, doi: 10.1016/j.tmp.2020.100786.

Sony, M. and Naik, S. (2020), "Industry 4.0 integration with socio-technical systems theory: a systematic review and proposed theoretical model", *Technology in Society*, Vol. 61, 101248, doi: 10.1016/j.techsoc.2020.101248.

Strauss, A. and Corbin, J. (1998), *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*, 2nd ed., Sage.

Thomas, A. (2023), "Promoting IT professionals' tacit knowledge sharing through social capital and web 2.0: the moderating role of absorptive capacity", *Kybernetes*, Vol. 52 No. 12, pp. 5849-5874, doi: 10.1108/K-05-2022-0649.

Thomas, A. and Chopra, M. (2020), "On how big data revolutionizes knowledge management", in *Digital Transformation in Business and Society: Theory and Cases*, pp. 39-60.

Thomas, A. and Gupta, V. (2022a), "The role of motivation theories in knowledge sharing: an integrative theoretical reviews and future research agenda", *Kybernetes*, Vol. 51 No. 1, pp. 116-140, doi: 10.1108/K-07-2020-0465.

Thomas, A. and Gupta, V. (2022b), "Tacit knowledge in organizations: bibliometrics and a framework-based systematic review of antecedents, outcomes, theories, methods and future directions", *Journal of Knowledge Management*, Vol. 26 No. 4, pp. 1014-1041, doi: 10.1108/JKM-01-2021-0026.

Trist, E. (1981a), *The Evolution of Socio-Technical Systems: A Conceptual Framework and an Action Research Program*, Ontario Quality of Working Life Centre, Ontario.

Trist, E.L. (1981b), *The Evolution of Socio-Technical Systems*, Ontario Quality of Working Life Centre, Toronto, Vol. 2.

Trist, E.L. and Bamforth, K.W. (1951), "Some social and psychological consequences of the longwall method of coal-getting: an examination of the psychological situation and defences of a work group in relation to the social structure and technological content of the work system", *Human Relations*, Vol. 4 No. 1, pp. 3-38, doi: 10.1177/001872675100400101.

Walker, G.H., Stanton, N.A., Salmon, P.M. and Jenkins, D.P. (2008), "A review of sociotechnical systems theory: a classic concept for new command and control paradigms", *Theoretical Issues in Ergonomics Science*, Vol. 9 No. 6, pp. 479-499, doi: 10.1080/14639220701635470.

Wu, S.Y. and Wang, W.T. (2023), "Knowledge management in data-driven business models during the digital transformation of healthcare organisations", *Knowledge Management Research and Practice*, Vol. 21 No. 5, pp. 983-993, doi: 10.1080/14778238.2023.2226409.

Yang, J., Zhang, X. and Pei, Y. (2023), "Digital transformation of the business models of Chinese sporting goods enterprises in the post-COVID-19 era: a knowledge-management perspective", *Journal of Knowledge Management*, Vol. ahead-of-print No. ahead-of-print, doi: 10.1108/JKM-12-2022-0946.

Zain, S. (2021), "Digital transformation trends in education", in *Future Directions in Digital Information*, Chandos Publishing, pp. 223-234.

Zaki, M. (2019), "Digital transformation: harnessing digital technologies for the next generation of services", *Journal of Services Marketing*, Vol. 33 No. 4, pp. 429-435, doi: 10.1108/jsm-01-2019-0034.

Zhang, J. and Chen, Z. (2023), "Exploring human resource management digital transformation in the digital age", *Journal of the Knowledge Economy*, Vol. 15, pp. 1-17, doi: 10.1007/s13132-023-01214-y.

Zhao, L., Detlor, B. and Connelly, C.E. (2016), "Sharing knowledge in social Q&A sites: the unintended consequences of extrinsic motivation", *Journal of Management Information Systems*, Vol. 33 No. 1, pp. 70-100, doi: 10.1080/07421222.2016.1172459.

Further reading

Bostrom, R.P. and Heinen, J.S. (1977), "MIS problems and failures: a socio-technical perspective, part II: the application of socio-technical theory", *MIS Quarterly*, Vol. 1 No. 4, pp. 11-28, doi: 10.2307/249019.

Cillo, V., Borin, E., Thomas, A., Chaturvedi, A. and Faggioni, F. (2023), "The role of crowdfunding in endorsing responsible open innovation for shared value co-creation: a systematic literature review", *European Journal of Innovation Management*, Vol. 26 No. 7, pp. 278-307, doi: 10.1108/EJIM-03-2022-0131.

Farooq Sahibzada, U., Thomas, A., Sumbal, M.S.U.K. and Malik, M. (2023), "Nexus of knowledge management and organizational performance: a cross-country study of China and Pakistan higher educational institutes", *Kybernetes*, Vol. 52 No. 12, pp. 6348-6378, doi: 10.1108/K-08-2021-0768.

Niepce, W. and Molleman, E. (1998), "Work design issues in lean production from a sociotechnical systems perspective: neo-Taylorism or the next step in sociotechnical design?", *Human Relations*, Vol. 51 No. 3, pp. 259-287, doi: 10.1177/001872679805100304.

Pan, S.L. and Scarbrough, H. (1999), "Knowledge management in practice: an exploratory case study", *Technology Analysis and Strategic Management*, Vol. 11 No. 3, pp. 359-374, doi: 10.1080/095373299107401.

Appendix

Respondent	Status	Country
RI	Former global lead for knowledge management, author and speaker	United States
R2	Chief technical advisor	Ukraine
R3	Chief knowledge officer, speaker	India
R4	Knowledge management architect	Netherlands
R5	People analytics consultant	United Kingdom
R6	Director, author and speaker	United Kingdom
R7	Chief knowledge officer (retired), author and speaker	United States
R8	Manager	Australia
R9	Human capital management consultant	India

Source(s): Created by author

Table A1. Description tab of respondents

Corresponding author
Asha Thomas can be contacted at: mailashaat@gmail.com