Journal of Informatics Education and Research
ISSN: 1526-4726
Vol 3 Issue 2 (2023)
DOI: https://doi.org/10.52783/jier.v3i2.210

Role of Information Technology in Effective Knowledge Management in 21st Century Organisations: An Empirical Study

Dr. Y. Saritha Kumari, MFM, MBA, Dr. Nasa Dhanraj, Dr. Manish Kumar Sharma, Mr. Jitin Kumar

Assistant Professor
Department of Humanities
JNTUA college of Engineering, Kalikiri
Assistant Professor,
School of Commerce,
Presidency University,
Itgalpura, Rajanukunte, Yelahanka, Bengaluru, India, pincode: 560064
drnasa2018@gmail.com
Assistant Professor -III
Faculty of Hospitality and Tourism
Amity University Noida
Assistant Professor
Parul Institute of Business Administration, Parul University, Vadodara, Gujarat.
kjitin1005@gmail.com

Abstract

In the context of the 21st-century dynamic business environment, characterised by constant innovation and technological advancements, effective knowledge management has emerged as a critical driver of organisational success. Given the ongoing evolution of technology, organisations must effectively navigate the intersection of knowledge management and technology to maintain their competitive edge. Knowledge management, as a strategic resource that encompasses human, structural, and technological elements, holds significant importance for contemporary organisations. By seamlessly integrating knowledge into robust technological systems, organisations enhance their capabilities and adaptability. This empirical study aims to explore the multifaceted relationship between Information Technology (IT) and Knowledge Management, shedding light on how modern organisations utilise technology to support the acquisition, dissemination, and utilisation of knowledge assets. As the digital age continues to progress, understanding how IT influences and enhances knowledge management practices becomes increasingly vital for organisations striving to remain competitive, foster innovation, and thrive in today's information-driven world. A sample of 233 respondents was collected from people working in different organizations. Four factors that determine the Role of Information Technology in Effective Knowledge Management in 21st Century Organisations are Collaboration and Communication, Easy Search and Retrievals, Knowledge Capture & Storage, and E-learning and Training.

Keywords: Knowledge Management, Information Technology, Competitive advantage, Innovation

Introduction

In the contemporary business world, knowledge management (KM) is undeniably a critical imperative. With the relentless march of innovation and technology-driven transformations, organisations find themselves in a dynamic landscape where the effective handling of knowledge is paramount to their success. The symbiotic relationship between knowledge management and technology integration has become increasingly evident. Technology, as a powerful enabler, has the potential to significantly enhance KM practices, leading to reduced workloads, time savings, and a distinct competitive edge, especially in an era where creative thinking and technological innovation are vital for survival in fiercely competitive markets (Mer et al., 2023). At the same time, it's important to note that a lack of technological proficiency in KM can serve as a hindrance to an organisation's growth, emphasising the need for a comprehensive understanding of this relationship. Effective knowledge management is not merely an option but a necessity for organisations striving to attain and sustain competitive advantages. In today's business

Journal of Informatics Education and Research
ISSN: 1526-4726
Vol 3 Issue 2 (2023)
DOI: https://doi.org/10.52783/jier.v3i2.210
environment characterised by intense competition, customer-centricity, global operations, and mobile workforces, knowledge management stands as a linchpin for organisational success. The integration of knowledge, coupled with robust information systems, plays a pivotal role in nurturing organisational competencies (Rahimli, 2012).

The synthesis of knowledge management and digital innovation, particularly within knowledge management systems (KMS), holds transformative potential for businesses. This convergence not only ushers in new business models but also elevates governance standards. It involves the strategic utilisation of technologies like the Internet of Things (IoT) and Big Data, which empower companies to enhance competitiveness and uncover valuable knowledge links across different organisational domains. Furthermore, this synergy optimises technologies, bolsters knowledge-sharing strategies, and supports managerial decision-making processes. Digital innovation, through open platforms fostering the free exchange of information and knowledge, contributes to the development of sustainable business models (Di Vaio et al., 2021). Thus, organisations are urged to embrace innovative knowledge initiatives and sustainable practices driven by digital innovation to excel in the ever-evolving business landscape. In this landscape, the ability to harness and apply knowledge effectively is paramount for success.

Literature Review

In the 21st century, organisations globally grapple with converting data into valuable knowledge, as intangible assets gain prominence. Effective knowledge management (KM) is pivotal for competitiveness, with varied practices between Asia and the West. Case studies stress resource allocation, especially for IT systems and knowledge repositories as a crucial factor for sustenance. Multinational corporations benefit from substantial resources for consistent KM investment, while SMEs can excel with clear strategies and user involvement. Customised KM initiatives are crucial, influenced by culture and personal factors. Larger firms use division-level initiatives, while smaller ones adopt top-down approaches. KM's evolution, shaped by cultural shifts and events like the 1997 Asian crisis, remains vital in the knowledge-based economy (Hasan & Zhou, 2015).

IT solutions are essential for the success of KM implementations, helping in the categorization and collaboration of explicit knowledge while keeping costs manageable. Organisations recognize the value of utilising IT to manage their internal knowledge resources, even though standardised approaches for KM implementation are lacking. To effectively achieve KM objectives, organisations are advised to adapt existing structures and methods to suit their needs. It's important to note that while IT is a vital enabler for KM initiatives, KM also involves significant social and cultural aspects. In the end, IT contributes significantly to an organisation's dynamic capabilities, enhancing its overall competitiveness and success (Chugh et al., 2013).

While KM approaches vary, optimising knowledge flow is central. Information Technology (IT) plays a key role by aiding document management, data storage, and idea sharing, enhancing KM's efficiency. In a knowledge-driven economy, sectors like telecom and finance thrive on knowledge generation. The IT industry, an early adopter, is a major player. The knowledge economy blurs boundaries, relies on global tech-enabled collaboration, and values knowledge-based products. Organisations embrace KM via IT to excel in this dynamic landscape (Singh, 2022).

Digital knowledge utilisation is vital for ensuring uninterrupted business operations during times of uncertainty. This underscores the importance of knowledge management for business continuity in crises. There is a shift from traditional knowledge management efficiency to the critical aspect of business resilience and information processing capabilities play a key role in integrating dispersed knowledge and supporting firms during uncertain periods, ultimately enhancing business performance(Gupta et al., 2022).

The alignment of knowledge management strategy (KMS) with information technology (IT) strategy holds significant importance for organisations aiming to gain a competitive edge. This alignment positively impacts various aspects of competitive performance, including information strategic alignment, the benefits of IT utilisation, business process performance, and overall firm performance. It highlights the pivotal role of KMS and its synergy with IT in enhancing business processes and decision-making, ultimately contributing to increased

productivity and organisational success. This underscores the broader significance of IT applications in diverse company contexts, emphasising the need for effective integration of KMS and IT strategies to leverage capabilities and resources for improved performance and competitiveness (Yoshikuni & Albertin, 2020).

According to a study conducted by Suhardi et al. (2018), information Technology (IT) plays a vital role in improving knowledge management within Small and Medium Enterprises (SMEs) in Batam City, Indonesia. The presence of IT knowledge, efficient IT operations, and robust IT infrastructure has a positive and significant influence on knowledge management practices among these SMEs. This highlights the critical role of acquiring and developing knowledge in the context of knowledge management implementation. Advanced search tools are also commonly utilised for IT-related knowledge management processes, indicating the centrality of IT tools and platforms in facilitating effective knowledge management. The preference for the non-technological method of Peer Assist suggests that while IT is crucial, it complements rather than replaces traditional knowledge-sharing mechanisms.

In the construction industry, knowledge management (KM) is crucial for a competitive edge, but faces challenges due to project-based work and temporary collaborations. Information technology (IT) is vital in overcoming these obstacles. While traditional tools like telephones are still used for knowledge sharing, IT offers potential by storing knowledge in databases, facilitating communication via email and Groupware. Yet, IT's full potential is untapped, with many organisations recognizing the need for greater implementation and staff training. The construction sector is gradually embracing advanced IT solutions like the Internet and intranets for knowledge transfer, but resistance to change and project transience remain obstacles. To harness IT's capabilities, companies must align its usage with their needs and provide staff training (Egbu & Botterill, 2002).

In the past decade, companies have embraced IT to tap into their workforce's knowledge, fostering collaboration and information sharing. Yet, this goes beyond technology; it requires community building. Knowledge often demands human interaction and communication. Despite tech advancements, human communities are crucial for the knowledge revolution's full potential. Information systems help disseminate information and connect like-minded individuals, but knowledge involves critical thinking. To truly harness knowledge, we must enhance thinking processes. Many companies now recognize that cross-functional, cross-disciplinary, and cross-geographical communities promote profound thinking, serving as knowledge custodians, nurturing innovation, connecting problem-solvers, and fostering trust for effective collaboration (C Lueg, 2002).

In the context of a study done by Bavarsad et al. (2015) involving banks in Khuzestan Province, the relationship between knowledge management strategies (codification and personalization), technology adoption, and internal performance was evident. These strategies not only directly impact information technology but also indirectly shape internal performance outcomes. Crucially, they serve as catalysts for technology development within organisations. At present these organisations increasingly recognize the pivotal role of knowledge management components in achieving favourable performance results. This understanding empowers organisations to leverage knowledge management for superior performance, optimised processes, and enhanced human resource capabilities. Knowledge management's profound influence on organisations underscores the need for well-defined strategies to unlock its benefits fully.

In a study conducted in Karachi by Saeed et al. (2017), it is found that improving ICT knowledge and usage is vital for professionals and government support, especially from the Ministry of Information Technology and provincial IT departments, plays a key role in promoting IT education and development. While professionals generally have decent ICT knowledge, there's still room to fully utilise these resources for better results. To bridge this gap, it is recommended enhancing staff skills through training and upgrading IT systems. Concerns arise about the effectiveness of local institutions and universities in producing highly skilled IT professionals in specific fields, highlighting the need for quality IT education and training. ICT holds significant importance in the professional arena, and government authorities are crucial in advancing it.

Journal of Informatics Education and Research
ISSN: 1526-4726
Vol 3 Issue 2 (2023)
DOI: https://doi.org/10.52783/jier.v3i2.210

Effective knowledge management encompasses three key elements: human expertise, organisational structures, and technology utilisation. It aims to leverage knowledge resources to achieve organisational objectives by establishing appropriate structures and technological support while emphasising human involvement. This understanding of knowledge management's significance, especially in the context of technology, serves as a valuable asset for enhancing performance, optimising processes, and contributing to overall organisational success (Turulja & Bajgoric, 2018).

Hawajreh & Sharabati (2012) underscores the significant and positive relationship between Information Technology (IT) and Knowledge Management Practices (KMP) in Jordanian Industrial Companies (JICs). This alignment highlights the influential role of IT in shaping and enhancing KMP within these organisations. It is also indicative that both the choice of technology and the development of technical capabilities play vital roles in influencing KMP. Technical capabilities also emerge as the stronger factor, suggesting that JICs prioritise their capacity to acquire and apply IT infrastructure that supports KMP over the specific type of technology they employ.

Objective

To identify the Role of Information Technology in Effective Knowledge Management in 21st Century Organizations.

Methodology

This study considered a sample of 311 people was collected from people working in working different organization. Data was collected through Random sampling method, and scrutinized by "Explanatory Factor Analysis" to get the results.

Findings

The table below shares respondents' general details in which it is found that 59.16% are male and 40.83% are female. Among them, 33.12% are between 26 to 30 years, 29.26% are between 30-34 years, and 37.62% are above 34 years. Regarding Work Experience, less than 5 years are 31.19%, 5 to 10 years are 36.33%, and More than 10 years are 32.48%. Looking at the Firm's size, Small-scale firm are 35.05%, Medium-scale firm are 29.26%, and Large-scale firm are 35.69%.

General Details

Variables	Respondents	Percentage
Gender		
Male	184	59.16
Female	127	40.83
Total	**311**	**100**
Age (years)		
26 to 30	103	33.12
30 to 34	91	29.26
Above 34	117	37.62

Journal of Informatics Education and Research
ISSN: 1526-4726
Vol 3 Issue 2 (2023)
DOI: https://doi.org/10.52783/jier.v3i2.210

Total	**311**	**100**
Work Experience		
Less than 5 years	97	31.19
5 to 10 years	113	36.33
More than 10 years	101	32.48
Total	**311**	**100**
Firm's size		
Small-scale firm	109	35.05
Medium-scale firm	91	29.26
Large-scale firm	111	35.69
Total	**311**	**100**

"Factor Analysis"

"KMO and Bartlett's Test"

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.856
Bartlett's Test of Sphericity	Approx. Chi-Square	6442.386
	df	153
	Sig.	.000

In table "KMO and Bartlett's Test" above, KMO value found is .856

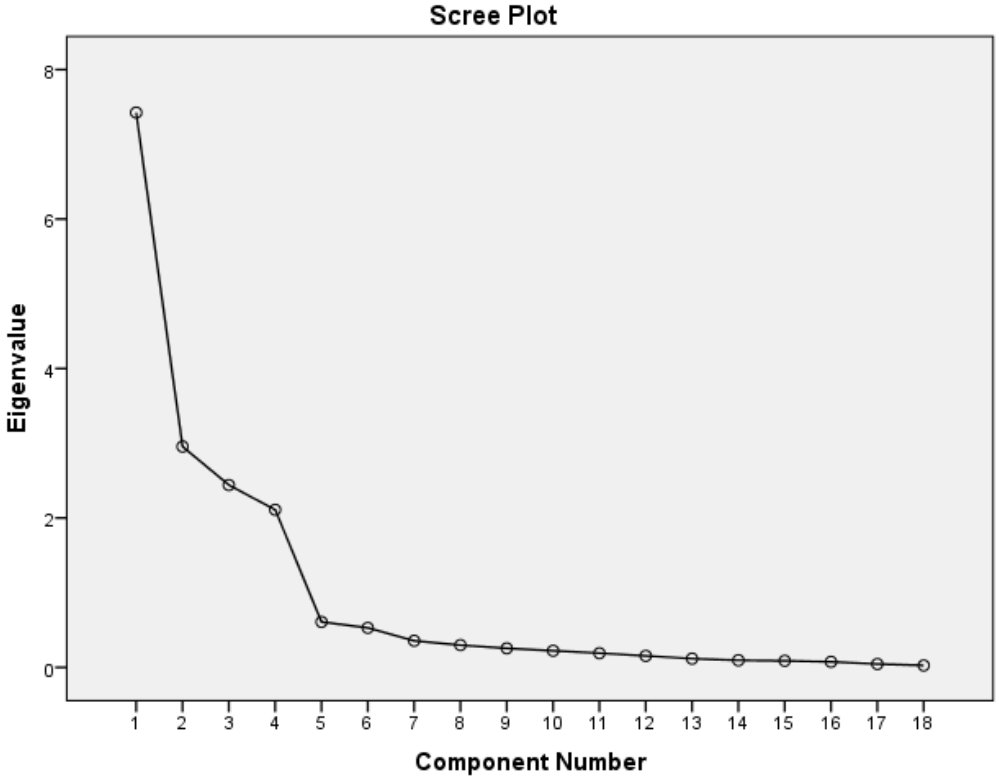
"Total Variance Explained"

"Component"	"Initial Eigenvalues"			"Rotation Sums of Squared Loadings"		
	"Total"	"% Of Variance"	Cumulative %	"Total"	"% Of Variance"	Cumulative %
1	7.425	41.252	41.252	**4.103**	22.796	22.796
2	2.956	16.421	57.673	**3.768**	20.934	43.730
3	2.441	13.561	71.234	**3.598**	19.989	63.719
4	2.110	11.724	82.959	**3.463**	19.240	**82.959**
5	.609	3.383	86.342			
6	.529	2.941	89.283			
7	.356	1.979	91.262			
8	.299	1.658	92.921			
9	.256	1.424	94.345			
10	.224	1.243	95.587			
11	.191	1.060	96.648			
12	.155	.859	97.507			
13	.117	.653	98.160			
14	.095	.530	98.690			

Journal of Informatics Education and Research
ISSN: 1526-4726
Vol 3 Issue 2 (2023)
DOI: https://doi.org/10.52783/jier.v3i2.210

15	.089	.495	99.185			
16	.075	.414	99.599			
17	.046	.254	99.853			
18	.026	.147	100.000			

All 4 factors contribute to explain total 82.959% of variance. The variance explained by Collaboration and Communication is 22.796%, Easy Search and Retrievals is 20.934%, Knowledge Capture & Storage is 19.989%, and Knowledge Capture & Storage is 19.240%.



Screeplot

Rotated Component Matrix

S. No.	Statements	Factor Loading	Factor Reliability
	Collaboration and Communication		**.948**
1.	IT Collaborate platforms, video conferencing, instant messaging facilitating easy communication	.910	
2.	Facilitates cross-functional collaboration among learners	.887	
3.	Facilitates exchanging tactic knowledge and information	.855	
4.	Facilities communication through emails and groupware	.834	

Journal of Informatics Education and Research
ISSN: 1526-4726
Vol 3 Issue 2 (2023)
DOI: https://doi.org/10.52783/jier.v3i2.210

5.	Collaborates explicit knowledge with minimal cost	.828	
	Easy Search and Retrievals		**.975**
1.	IT allows quick access to relevant information and knowledge	.944	
2.	Effective search engines reduce time spent on searching information	.939	
3.	Easy access to information helps in making informed decisions	.937	
4.	Many tools provide full text search option for specific word or phrase	.931	
	Knowledge Capture & Storage		**.956**
1.	IT allows store vast amount of knowledge in various formats	.964	
2.	It captures and stores information and knowledge in text, videos, documents, etc.	.933	
3.	Information Technology preserve knowledge and intellectual capital	.901	
4.	Cloud based storage solutions offer secured storage	.848	
	E-learning and Training		**.881**
1.	IT facilitate continuous learning and knowledge acquisition	.844	
2.	Easily disseminate knowledge through online courses and virtual classroom	.844	
3.	E-learning facilities have removed all the barriers of time and place	.822	
4.	It has reduced the cost of printed material and physical facilities	.779	
5.	Combination of traditional training and e-learning give a comprehensive experience	.720	

Factors and associated variables

First factor in study is Collaboration and Communication, the variables included in this factor are, IT Collaborate platforms, video conferencing, instant messaging facilitating easy communication, facilitates cross-functional collaboration among learners, facilitates exchanging tactic knowledge and information, Facilities communication

through emails and groupware, and collaborates explicit knowledge with minimal cost. Second factor in the study is Easy Search and Retrievals it has variables like IT allows quick access to relevant information and knowledge, Effective search engines reduce time spent on searching information, Easy access to information helps in making informed decisions, and Many tools provide full text search option for specific word or phrase. Third factor is Knowledge Capture & Storage, the variables included in this factor are IT allows store vast amount of knowledge in various formats, it captures and stores information and knowledge in text, videos, documents, etc., Information Technology preserve knowledge and intellectual capital, and Cloud based storage solutions offer secured storage. Fourth and last factor is E-learning and Training Reliability Statistics, the variables are IT facilitate continuous learning and knowledge acquisition, easily disseminate knowledge through online courses and virtual classroom, E-learning facilities have removed all the barriers of time and place, It has reduced the cost of printed material and physical facilities, and Combination of traditional training and e-learning give a comprehensive experience.

Reliability Statistics

Cronbach's Alpha	Number of Items
.911	18

Total reliability of 18 items including variables in context of Role of Information Technology in Effective Knowledge Management in 21st Century Organisations is 0.911.

Conclusion

The seamless integration of knowledge into robust technological systems not only enhances organisational capabilities but also enhances adaptability to changing business environments. Businesses, particularly in the industrial sector, need to carefully consider both their IT investments and their efforts to develop technical capabilities when devising strategies for effective knowledge management. In an era where knowledge is a key competitive asset, this study provides valuable guidance for organisations seeking to optimise their KM through IT integration and capability-building. As we progress further into the digital age, the understanding of how IT influences and supports knowledge management practices becomes increasingly essential for organisations striving to maintain their competitiveness, stimulate innovation, and succeed in today's information-driven world. These insights have broader implications for various sectors and provide a foundation for ongoing research in the dynamic intersection of knowledge management and technology as organisations continue to seek strategies for sustained success. Four factors that determine the Role of Information Technology in Effective Knowledge Management in 21st Century Organisations are Collaboration and Communication, Easy Search and Retrievals, Knowledge Capture & Storage, and E-learning and Training.

References

[1] Bavarsad, B., Derikvandi, F. N., Mansouri, Z., & Hozhabri, A. A. (2015). A Study of the Relationship between Knowledge Management, Information Technology and Internal Performance. *9th International Conference on E-Commerce with Focus on E-Business*, 1–8.

[2] C Lueg. (2002). Knowledge Management and Information Technology: Relationship and Perspectives. *The European Online Magazine for the IT Professional*, 4–7.

[3] Chugh, M., Chugh, N., Punia, D. K., & Agarwal, A. (2013). The Role of Information Technology in Knowledge Management. *Conference on Advances in Communication and Control Systems 2013*, 688–693.

[4] Di Vaio, A., Palladino, R., Pezzi, A., & Kalisz, D. E. (2021). The role of digital innovation in knowledge management systems: A systematic literature review. *Journal of Business Research*, *123*(1), 220–231.

[5] Egbu, C. O., & Botterill, K. (2002). Information Technologies for Knowledge Management: Their Usage and Effectiveness. *ITcon*, *7*, 125–137.

[6] Gupta, S., Tuunanen, T., Kar, A. K., & Modgil, S. (2022). Managing digital knowledge for ensuring business efficiency and continuity. *Journal of Knowledge Management*, *27*(2), 245–263.

[7] Hasan, M., & Zhou, S. N. (2015). Knowledge Management in Global Organisations. *International Business Research*, *8*(6), 165–173.

[8] Hawajreh, K. M., & Sharabati, A.-A. A. (2012). The Impact of Information Technology on Knowledge Management Practices. *International Journal of Business, Humanities and Technology*, *2*(7).

[9] Mer, A., Saini, Dr. A. K., & Ghai, S. (2023). Impact of Technology on Effectiveness of Knowledge Management: An Empirical Study. *European Economic Letters*, *13*(1), 281–285.

[10] Rahimli, A. (2012). Knowledge Management and Competitive Advantage. *Information and Knowledge Management*, *2*(7), 37–43.

[11] Saeed, S., Ahmed, M. O., & Malik, U. (2017). Role of Information Communication Technology (ICT) In 21st Century. *Journal of Business Studies* , *13*(2), 124–147.

[12] Singh, Dr. S. (2022). The Role of Information Technology in Knowledge Management. *Journal of Positive School Psychology* , *6*(4), 1200–1204.

[13] Suhardi, Banjarnahor, H., Adam, S., & Kurniawan, A. (2018). The Role of Information Technology In Knowledge Management in Small Medium Enterprise. *Journal of Theoretical and Applied Information Technology*, *96*(24), 8265–8278.

[14] Turulja, L., & Bajgoric, N. (2018). Information technology, knowledge management and human resource management. *VINE Journal of Information and Knowledge Management Systems*, *48*(2), 255–276.

[15] Yoshikuni, A. C., & Albertin, A. L. (2020). Leveraging Firm Performance Through Information Technology Strategic Alignment and Knowledge Management Strategy: An Empirical Study of It-Business Value. *International Journal of Research -GRANTHAALAYAH*, *8*(10), 304–318.