

The role of information technology in activating knowledge Management in contemporary organizations

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Abstract:

This research article emphasises the significance of present information technology in substantially contributing to the development of knowledge management in modern institutions. As a result of the key responsibilities that information technology plays in the process of managing and disseminating knowledge inside an organization, the study concluded that the relationship between knowledge management and information technology is extremely important; their financial and material resources no longer measure the strength of contemporary organizations, but by their knowledge, which contributes to building a solid human capital.

key words: Technology, Electronic Management, Knowledge, Digital Organizations.

Introduction: In numerous academic domains, including administration, sociology, data management, institutional theory, governance, and human resource management, there has been a significant focus on research and studies pertaining to knowledge management. The significance of knowledge management has been increasingly acknowledged by researchers and various institutions globally.

The integrative relationship between information technologies and knowledge management in the contemporary landscape has become indispensable. The significant development of information technology has allowed for numerous structural and functional changes in various institutions, whether in the public or private sector. (IT) has also brought about many changes in the mechanisms for accessing, disseminating, and using knowledge. On the other hand, knowledge has become a strategic resource in current developments, driving innovation and enhancing decision-making, and thus contributing to organizational success.

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Information technologies are considered essential requirements for the effective execution of knowledge management efforts in all institutions, regardless of their activities and objectives, as they play a prominent role in activating various processes. However, the impact of information technologies (ITs) on knowledge management (KM) is not clear or uniform, as (IT) depends on multitude factors including the nature and caliber of information technology systems, their accessibility, organizational culture and structure, user skills and competencies, and the external environment and context.

Therefore, through our research paper, we seek to answer the following question:

To what extent do information technologies play a role in activating knowledge management within an organization?

Study Objectives:

- To delve deeply into the profound effects that (Its) have on (KM) processes.
- To investigate the challenges and opportunities that arises from the integration of ITs and (KM) procedures.

To analyze the research problem, the **inductive approach** was adopted by collecting data on the extent of the impact of information technology on the activation of knowledge management in organizations. In addition, a **descriptive analytical approach** was used to study the impact of information technology on knowledge management processes.

THE FIRST TOPIC: The concept of information technologies and knowledge management

Undoubtedly, ours is the Information Age, defined by the intensive use of information technologies. These (Its) are fundamental tools for effective knowledge management within organizations. They play a crucial role in the ongoing success of an organization's knowledge cycle, from knowledge generation and storage to its distribution and utilization .

Furthermore, some ITs directly address knowledge management functions with dedicated systems known as knowledge management systems.

FIRST REQUIREMENT: Definition of Information Technology

There are many definitions of the concept of information technology, as researchers have different perspectives on this concept. Here are some of them:

Information technology:"...is the technology related to the storage, retrieval, circulation, and dissemination of information electronically through the integration of hardware..."¹ According to this definition, information technology can be said to be a set of ordered and sequential operations that include storage, retrieval, and circulation in an integrated electronic manner.

Information technology is also defined as: "... The technology that centers on the utilization of information in the execution of work tasks, encompassing various components such as equipment, software, networks, databases, and other related elements..."² This means that information technology relies primarily on the information available through electronic programs, networks, and various databases.

Information technology is also defined as: "...the innovative, modern, and sophisticated methods and methods of processing organizational information and knowledge from computers and a wide-area information network to obtain information, store it, and perhaps develop, update, and reuse (IT) in the organization in order to achieve goals quickly and with high performance in a developed world dominated by fierce competition..."³ This means that information technology is one of the latest products of the human mind, at least at this stage, as (IT) is concerned with processing data and storing (IT) for later reference in a purely electronic way.

According to Patterson, the notion of information technology encompasses the utilization of contemporary technological systems for the purpose of efficiently and precisely processing, transmitting, storing, and retrieving information. The data communication technology, telecommunications technology, computer technology, and ready-made programs are considered to be the most significant systems in this context. "⁴ (IT) is clear from this definition that information technology is related to the application of modern technological systems in processing data and information through all its stages.

In general, we can say that information technology is the culmination of continuous information developments aimed at facilitating transactions between different stakeholders in all organizations, and processing the available data at their level with greater efficiency and effectiveness. These technologies also facilitate communication between individuals, saving time and effort for their various activities. These technologies can be continuously developed according to the requirements of the surrounding environmental changes.

Firstly: Characteristics of Information Technology:

Information technology, in general, has an invasive nature, meaning that (IT) penetrates societies whether desired or not and whether (IT) is welcomed or unwelcome, by offering new goods or creating a need for new goods or services. Technology assists individuals in society in carrying out their daily tasks, both simple and complex. Recently, information technology has pervaded all activities of any society, whether political, civil, military, or commercial. In general, technology has distinguished itself with a set of characteristics:⁵

- **Time Reduction:** The technological revolution has made all places adjacent;

- **Space Reduction:** Storage refers to the capacity to store a substantial volume of information, which can be readily and conveniently accessed;

- **Sharing Intellectual Tasks with Machines:** The results of the dialogue between the researcher and the artificial intelligence system contribute in order to foster the advancement of knowledge and enhance the training opportunities available to users, (IT) is imperative to prioritize inclusivity and control.

- **Formation of Communication Networks:** A set of equipment based on technology is unified, which increases the flow of information between users, industrialists, and machine producers, and allows for the exchange of information with other activities;

- **Interactivity:** The user of this technology has the ability to simultaneously act as both a recipient and a sender, making (IT) suitable for the user. This allows participants to switch roles, facilitating interaction between activities;

- **Asynchrony:** (IT) refers to the ability to receive the message at any time that is convenient for the user, without the need for participants to use the system simultaneously;

- **Decentralization:** This characteristic allows for the independence of (IT), as the internet, for example, continues to operate under all circumstances, and no entity can disrupt the internet at the global level;

- **Ubiquity and Proliferation:** Information technology has a global dimension that has turned the world into a small village and brought distant distances closer;

- **Integration and Convergence:** Among all mass media and communication and information technologies.

The unique combination of flexibility and ease of use has propelled information technology to the forefront of societal needs. (IT) facilitates a wide

range of transactions across all fields, with electronic machines taking over many of the time-consuming tasks that once burdened human resources. In some cases, (IT) even tackles tasks previously beyond human capabilities.

Secondly: Benefits of Information Technology:

Various societies, especially the advanced ones, are engaged in an unlimited race to use information technology due to the benefits (IT) achieves, which can be summarized as follows:⁶

- Simplifying procedures within institutions, which positively reflects on the level of services provided to citizens, including reducing the time to execute various administrative transactions.

- Facilitating communication between different departments of the institution as well as with other institutions.

- Accuracy and objectivity in accomplishing various operations within the institution.

- Significantly reducing paper usage, which positively affects the institution's work.

- Reducing paper usage also addresses a problem most institutions face in the process of preservation and documentation, leading to no need for storage spaces, which can then be used for other purposes.

Overall, information technology achieves numerous benefits, particularly in the field of speeding up transactions and reducing many of the daily errors contained in paper transactions. (IT) also contributes to reducing the amount of routine imposed by bureaucracy, although this is contingent on the optimal use of these technologies.

SECOND REQUIREMENT: The Concept of Knowledge Management (KM)

Firstly: Definition of KM:

The concept of Knowledge Management has evolved in various directions and meanings, according to the diversity of sciences and their variety, the differences among organizations, and the nature of organizational and individual needs for information and knowledge. Additionally, due to the varying orientations and interests of researchers, and amidst different approaches to thinking and diverse viewpoints, (IT) is difficult to provide a unified definition for this concept.

Therefore, the most important definitions presented for knowledge management have been addressed, especially those that serve this research:⁷

Knowledge management can be defined as: "...systematic processes, or a set of practices used by institutions in identifying, recording, storing, creating, timing, representing, and distributing knowledge for purposes of use, awareness, and learning throughout all parts of the institution. Knowledge management programs are usually linked to the institution's goals and are intended to achieve specific results such as shared secrets, improved performance, competitive advantage, or reaching higher levels of innovation...".⁸ According to this definition, knowledge management is defined through its systematic and recognized processes of recording, storing, creating, etc., within the framework of achieving specific organizational objectives.

(KM) is also defined as: "...the organized, conscious effort directed by an institution to acquire all types of knowledge related to the activity of that institution, and to collect, classify, organize, store, and make (IT) ready for circulation and sharing among the members of the institution, its departments, and units, thereby enhancing the efficiency of decision-making and organizational performance...".⁹ Thus, knowledge management, as previously mentioned, is a deliberate and conscious process of gathering various knowledge related to the organization, in order to benefit from (IT) to improve organizational performance.

Others view knowledge management as: "...a concept focused on the efforts to organize access to available information sources through networks, which makes (IT) a focal point of interest for information scientists in our present time...".¹⁰ According to this definition, knowledge management is synonymous with the term information.

(KM) is a comprehensive procedure that encompasses the acquisition, exchange, renewal, and organization of data, materials, and knowledge within an organizational setting. Its primary objective is to enhance productivity and efficiency, minimize expenses, and enhance overall performance. Knowledge management encompasses a range of processes within institutions, including the identification, creation, sharing, transfer, acquisition, and utilization of knowledge. Additionally, (IT) empowers institutions to strategically accomplish their overarching goals.¹¹

In general, despite the variety of definitions surrounding the concept of knowledge management, (IT) ultimately crystallizes and is classified as an administrative school that is added to the ranks of schools witnessed by administrative literature, through its intellectual developments. This conclusively

indicates that management is moving towards establishing scientific bases to advance organizations to keep pace with the evolutionary movement known in the competitive market.

Secondly: Knowledge management processes:

It is observed that the processes of knowledge management vary in number from one organization to another and from one researcher's perspective to another; however, they agree on six essential processes for knowledge management, which are as follows:

1- Knowledge Identification: The process of knowledge identification is important in any knowledge program. Based on this identification, policies and programs for other operations are established because one of the outcomes of the identification process is knowing the type of knowledge available. By comparing (IT) with what is required, the gap can be determined.¹²

2- Knowledge Acquisition: This refers to obtaining (IT) from various sources, using benchmarking methods, attending conferences and workshops, journals and publications, electronic mailing, and individual learning.¹³

3- Generating Knowledge: The term 'generating knowledge' refers to several other designations, including innovation, acquisition, purchase, and discovery. All of these imply the attainment of knowledge but through different methods.¹⁴ Generating knowledge is a continuous process as long as organizations exist, in the context of keeping up with knowledge developments in an immediate and innovative manner, in order to maintain a competitive edge.

4- Keeping Knowledge: The storage process is considered one of the most important operations necessary to preserve knowledge gains from being lost, within the framework of forming a cumulative knowledge inventory for the organization. The availability of knowledge at the right time, with concise reports written in the working language, all lead to reducing the effort of searching for it.¹⁵ This is what the storage process achieves by making knowledge available when needed.

5- Transfer and Distribution of Knowledge: The facilitation and dissemination of knowledge necessitate the presence of efficient mechanisms that enable this process. These mechanisms can manifest in formal forms, such as reports, work guides, training sessions, scheduled official meetings, and experiential learning, or in informal forms, such as meetings, seminars, and unregulated discussion groups.¹⁶

6- Application of Knowledge: Making knowledge more useful for doing the work of the institution is what (IT) means to "apply" it. The last step in the (KM) process is this one.

THE SECOND TOPIC: The Impact of Information Technology on the Implementation of Knowledge Management in the Organization

The role of information technology in implementing knowledge management is a crucial and meaningful topic of debate. Information technology is extensively utilized in institutions, making (IT) a natural medium for the dissemination of knowledge. This assertion is underscored by a research conducted by the American Productivity & Quality Center, which demonstrates that organizations that initiate the adoption of knowledge management practices depend on the establishment of a suitable information technology infrastructure. Conversely, prominent theories in knowledge management have highlighted and cautioned against a tendency that compels management to prioritize substantial investments in information technology while neglecting investments in human capital. Knowledge management strategies reliant on information technology may inadvertently encapsulate and immobilize knowledge, thereby disregarding the significance of tacit knowledge. Nevertheless, this phenomenon primarily stems from the lack of clarity or comprehension surrounding information technologies. These technologies encompass not only the establishment of direct interpersonal connections through various applications like email, chat rooms, video conferences, and collaborative software, but also the storage of information in databases and other repositories. Databases can be effectively employed as valuable resources from a knowledge management standpoint to enhance the dissemination of diverse practices and safeguard the intellectual assets of institutions. In the context of knowledge management projects, (IT) is imperative to acknowledge the significance of investments in information technology.¹⁷

(IT) is considered one of the most crucial elements in the implementation of knowledge management, as (IT) helps to efficiently and effectively accomplish various organizational activities. This can be applied to the efforts of implementing knowledge management within an organization, whether in the formation, acquisition, dissemination, or retention of knowledge. (IT) is concerned with coordinating with various human resources in many applications, such as document processing, decision support systems, and expert systems. Since technological advancements impose a new type of knowledge resource, this

requires further research to maximize the benefits from this resource on one hand, and how to manage (IT) on the other.¹⁸ The concepts of information technology can support making the knowledge stored in the human brain or in documents available to all employees of an institution. Moreover, the complete understanding, creation, organization, storage, transfer, and exchange of knowledge in the process of (KM) depend on the assistance provided by information technology.¹⁹

The benefits of technology on knowledge management in organizations can be summarized as follows:²⁰

- Increased control over knowledge: Technological developments have made (IT) easier, cheaper, and more accessible to control existing knowledge.
- Creation of a favorable environment for knowledge generation: Technology has helped to create an environment that is conducive to human resource interaction and the generation of new knowledge.
- Technology has facilitated the standardization, simplification, and acceleration of all knowledge management processes, encompassing generation, analysis, storage, sharing, transfer, application, and retrieval.
- Facilitation of collaboration: Technology has provided communication tools that have made (IT) easier to create shared workshops, which are needed by interacting groups in different geographical areas.

Therefore, starting from the significant role that information technology plays in supporting knowledge management programs, some have defined knowledge management from a purely technological perspective, by stating that (KM) is: "...the use of technology to access information wherever (IT) may be...".²¹ Consequently, one of the most significant challenges that organizations face in the information society is the ability to explore new ways of performing tasks (using technological media) and to devise solutions based on the knowledge of modern technological means used, and to be able to design a suitable environment, in order to deliver information as quickly and cost-effectively as possible in a manner that enables the management of operations, their control, and the measurement and evaluation of learners' performance.²²

Given the responsibility of education in developing human resources and enhancing their capabilities through the use of information technology, there has become an urgent need to activate knowledge management. This involves abandoning the usual traditional methods of its management and innovating new, effective methods that are compatible with the data and variables of the era, enabling humans to work competently within the knowledge economy. This may

require some redesign to keep pace with the transition from information management to knowledge management.²³

Information technology has facilitated organizations' use of knowledge management solutions by providing suitable tools for executing these processes. The necessity of (KM) initiatives based on information technology has led to a strong reason for further exploration, viewing these initiatives as powerful assistive tools that restructure organizations. This may also cast a shadow on the general economy for managing and renewing its system.²⁴ Perhaps one of the most important outcomes of these initiatives is the shift towards what is known as the digital organization.

The most effective approach to utilizing information technology in knowledge management involves combining two essential elements: firstly, recognizing the limitations of information technology and recognizing that any use of information technology will not yield significant results without a broader cultural shift towards the importance of knowledge; secondly, incorporating information technology specifically designed for knowledge management processes.²⁵

THE THIRD TOPIC: Knowledge Management Systems: From Database Systems to Knowledge Base Technology Systems

Knowledge management and information management are closely linked, as information management feeds the development of knowledge management. Dealing with objects represents information management, while dealing with people represents knowledge management. Information management is concerned with diagrams, documents, computer-aided design, and electronic spreadsheets, meaning (IT) deals exclusively with clear presentation. In contrast, knowledge management involves acquiring in-depth opinions, concepts, and experiences that are systematically compiled in preparation for exchange. There is also a view that information management, knowledge management, as well as document and record management, are all interconnected operations that fall within a single domain called knowledge management systems.²⁶

Currently, knowledge management systems are widely recognized as a crucial element within the information technology sector. They provide significant support in decision-making and in other applied fields of information and knowledge systems within an organization. Consequently, researchers in the field of information systems do not classify these systems as part of administrative information systems; rather, they consider them foundational systems, commonly referred to as 'knowledge base systems.' This is because they do more than just

compile, categorize, analyze, and present data; they also add a new element, which is the process of extraction and providing expertise. They perform tasks typically within the human domain, such as giving advice and performing certain kinetic tasks (robots, etc.). Therefore, they are considered a more sophisticated alternative to databases,²⁷ whether in the process of generating, acquiring, disseminating, or retaining knowledge, using various technological applications in the field of computers and software, which are particularly highlighted through decision support systems that operate their applications on:²⁸

- Solving problems and finding alternatives for the decision-maker.
- Handling critical situations and overcoming crises with ease.
- Generating more information, knowledge, and expertise.

Generally, the benefit of knowledge management from information and communication technology systems requires several components of subsidiary systems. These systems contribute to the creation of innovative organizations by involving individuals with information in the execution process and at various levels of the organization, in terms of information flow from top to bottom and from bottom to top. Additionally, (IT) includes the communication process outside the organizations, which is represented by the relationships with stakeholders.²⁹ Both artificial intelligence systems and expert systems, along with the presence of other systems, are considered one of the most important outputs of information technology in the field of technologically benefiting knowledge management. The following is some clarification about these two systems, which rely entirely on the existence of computers:

Artificial Intelligence: "Artificial intelligence is built on the premise that (IT) is possible to describe and simulate human intelligence in technical systems and devices. Therefore, most definitions focus on the following definition: ‘...it is the study and design of systems or devices that perceive their environment in order to take actions that mimic human behavior...’.³⁰ Artificial intelligence and knowledge-based systems provide important information technologies that help nourish and grow knowledge management. The reason for this is that human intelligence relies heavily on such systems. Artificial intelligence involves search processes to find a solution, bridging the gap between the current situation and the desired state to be achieved, through a series of steps and procedures that lead to the goal.

Expert Systems: Expert systems are: “...a computer program that contains human expertise, distinction, rules of inference, intuition, and other experiences to provide advice and solutions in a specific specialty or field. An expert system can

store and preserve the rare expertise found among a number of experts, which may be difficult to consult at any given moment when needed. In other words, the expert system attempts to imitate or simulate human thinking and problem-solving methods in a specific field...”.³¹ Expert systems match and often contain human expertise. They are composed of a set of main components, primarily based on the use, transformation, and storage of knowledge for use when needed. The most important of these are:³²

Knowledge Base: (IT) is a database that includes knowledge and expertise in a field of human knowledge stored in a logical sequence. (IT) is characterized by flexibility, allowing additions or deletions of parts without affecting the operation of the other components.

Inference Engine: This is the element of the expert system that determines how knowledge will be processed and used, regardless of how (IT) is presented for thinking. (IT) is the system’s code that extracts results and recommendations from the knowledge base, enabling responses to inquiries.

Data Base: The database contains observations, data, and inferred information related to a specific problem, provided by the system user. The expert system may connect with external databases to store observations and information for future comparisons, sometimes referred to as the Knowledge Database (Knowledge Data Base).

Expert systems, through their components, can provide three of the most fundamental elements in the field of knowledge management for organizations in general. These elements are:³³

- The ability to make decisions;
- A knowledge base containing knowledge about a specific subject;

The capacity to differentiate between various forms of knowledge, thereby enabling convenient retrieval.

In addition to artificial intelligence systems and expert systems, there are other subsidiary systems that contribute to providing support and reinforcement for knowledge management operations, which are as follows:

- Office systems;
- Group collaboration systems;
- Knowledge work systems for innovating new knowledge and information.

These systems are considered advanced databases, which serve to continuously and innovatively activate knowledge management processes, with greater effectiveness and efficiency.

Conclusion:

Contemporary organizations that possess the keys to digital technology and virtual leadership are now in a position that qualifies them to reap the benefits of the new digital economy by achieving and ensuring the highest levels of competitive advantage. This has become a characteristic of organizations and business establishments capable of activating modern technology, consolidating its strength, and benefiting from its capacity. The reliance on modern information technologies has become one of the most important pillars for modern organizations, distinguishing them as a prominent feature because their activities are based on informational knowledge. This has created a new administrative reality that opposes traditional management principles and foundations, resulting in a qualitative intellectual shift. As a result, contemporary organizations have been affected, changing their structures, transactions, and performance standards in a way that helps them achieve quality and excellence in service and product delivery. Contemporary organizations have recognized the importance of information and knowledge as a vital strategic resource among the various development sectors, becoming a national wealth no less important than other resources. (IT) has become the main artery relied upon in various decisions and all fields.

(KM) is one of the most prominent modern methods that should utilize information technology as one of the essential requirements for its success at the organizational level. Modern technologies will contribute to developing human capital capabilities through learning, knowledge acquisition, and stimulating creativity and innovation in innovative and unique ways, keeping pace with the continuous change that characterizes today's world. In the context of ongoing efforts to maintain competitive advantage, information technology plays a vital role in enhancing the performance of an organization. This is achieved through its ability to provide information at the right time and elevate the role of information to rationalize decisions. Technology has become crucial in maximising the organizations' Capacity to generate novel insights and foster an internal atmosphere that promotes the exchange of knowledge and organizational expertise. Attention has shifted to seeking abundance in information and knowledge, which increases in value with use, a possibility that the severe use of these technologies can provide. Information technology provides a wide range of sophisticated tools that greatly aid in the implementation of organizational knowledge management

systems. These systems are known for their ability to quickly distribute, transfer, convert, and share knowledge across different levels within an organization.

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