CURRENT TECHNOLOGICAL ADVANCEMENT PRACTICES IN ORGANISATIONAL STUDIES

Mona Abd Elghany, College of Management & Technology Arab Academy for Science & Technology Alexandria
Nermin Khalifa, College of Management & Technology Arab Academy for Science & Technology Alexandria

ABSTRACT

The article examines and assesses the vital issues, current trends, and future path of Modern Technological Advancement Practices in organizational studies, and provides an analytical explanation, critical perspective, and comprehensive conclusion. IT is often regarded as a critical enabler of technical and economic development. Managers use new technology to alter the organisation, the work nature, relationships with businesses' partners, or other aspect of the firm. In commercial companies, governments, and research, information technology (IT) acts a critical role in maximizing efficiency and productivity. The infrastructure of any organisation, which includes computers, network and telecommunication technologies, data, and essential software applications, determines the value of IT. Information Technology (IT) is currently a force of modern technological development and globalisation, allowing for more effective and efficient information management. All management actions that decide the objectives, policy application, and duties, as well as their practice in an organisation in terms of planning, assigning resources, organising, and assuring outcomes for processes improvement, fall under the category of technology management. The following are the key IT Management issues: technology use to design effective and efficient organisations; an information technology development plan for the organisation; IT consideration as a part of the corporate strategy; benefiting of interorganizational systems; making decisions on new IT applications; business processes reengineering; changing the organization; and the management of the IT infrastructure in a time of technological change. For technological advancement, knowledge and skills are both a necessitated and sufficient requirement. In this ever-changing business, developing countries need sufficiently competent IT personnel to design, implement, and manage information technology. As a result, a scarcity of qualified and internationally recognised IT experts is impeding IT adoption and development. IT Management denotes the IT-related management operations in organisations, whereas Management Information Systems denote information management methodologies associated to the support or automation of human decision making.

Keywords: Information Technology, Information Management, ICT Information and Communications Technology, Technological Advancement, Organisation.

INTRODUCTION

The review article investigates the vital issues, current trends, and future path of Modern Technological Advancement Practices in organizational studies. The emergence of computers

and communication technology, as well as their continuous developments, has changed the way businesses operate. Information technology is at the heart of global socioeconomic change, serving as a strategic resource and the foundation for all economic activities (Kabanda, 2014). Developing countries confront numerous hurdles in catching up with global technological advancement practices and as a result, they will reside in the end tail of this technological advancement. In general, African countries are primarily technology end users, and they are even more behind in terms of ICT innovation (Kabanda, 2014).

A microelectronics-based combination of video, telecommunications, and computing is used to acquire, process, store, and disseminate voice, visual, textual, and numerical information. IT encompasses all sorts of computer hardware, certain electrical (video and audio) hardware, all types of computer software, telecommunications hardware and software, and other automation techniques. The *"Information and Communications Technology"* (ICT) term is widely used and often refers to the merging of the information and telecommunications technology sectors with the media technology sector using common digital technology. ICT comprehends all sorts of communications and services and broadcasting systems (mobile, satellite, wireless, wireline), computer hardware, software, services, and networks, as well as content creation and multimedia system management (Sallai, 2012). Accordingly, any application, communication equipment, or service linked to cellular technology, computing, networking, radio, television, and satellite systems, counting videoconferencing and distant learning, is considered ICT.

ICT has a huge influence on cost reduction and improving business process management quality. Berisha-Shaqiri (2015) argued that information and communication technology (ICT) has become increasingly important in business efficiency and success, assisting business processes in the coming areas: Information technology impacts positively the costs saving of management, as its application enhances the management quality; besides the growth of revenue, ICT eases communication between managers within the enterprise and consequently saving time.

The evolution of the internet has had a significant impact on modern information systems. The internet changed the way people communicate, store, and access information around the world. 'Faster computers and less expensive storage are useful in and of themselves. However, the reason behind the enormous impact of these technologies on practically every part of life is that they are all linked together, allowing information to be transferred and retrieved easily from anywhere (World Bank Report, 2016). This growth has brought with it a slew of positive and negative consequences. Since the invention of the World Wide Web (WWW) in 1989, the rate of technological advancement has accelerated dramatically. Technology developers have been able to cut their development time due to the ease with which they can share and access information around the globe. The internet brought with it inclusion, allowing African countries to connect digitally with the rest of the globe. 'Inclusion for the individual typically entails the growth of a market by those on the other side of the transaction, such as a business or a government that now services a larger number of people' (World Bank Report, 2016).

IT ADOPTION METHODOLOGY

Technology management requires a better theoretical foundation. Technology is a big and growing element of each manager's everyday experience, according to Dolinšek, & Štrukelj (2012), where managers generate technology, utilise technology, purchase technology, and sell technology. On the contrary, it is commonly observed that senior management decision makers

lack the necessary expertise and aptitude to make technology-related judgements and projections; without this skill, their options for incorporating technology into corporate strategy are severely constrained. Except in the case of unique undertakings outside the major lines of production, technology is only mentioned in passing in strategic plans. Technology and innovation strategic management is a new topic with many diverse fields in emerging countries. Khalil (2012) stated that any technology comprises of four codetermining, interdependent, and similarly significant components, as cited in Dolinšek, & Štrukelj (2012).

Hardware refers to the logical layout and physical structure of the machinery or the equipment that will be used to complete the tasks. Software denotes the understanding of how to use the hardware to complete the essential tasks. Brainware considers the justifications for employing technology in a specific way. And the Know-how defines a person's abilities and technological achievements.

Individuals and businesses may now communicate more quickly and easily thanks to computers. Ideas circulate swiftly and cheaply across geographic borders. Companies save money and time while the implementation of their strategies since more and more transactions, such as sales and purchases, are conducted over the phone or online, and managers are supported in their decision-making processes more rapidly. In most organisations, distributed information processing is employed for intra-company and inter-company communication. Almost every industry in the world has benefited from technological advancements. It's been employed in the medical field to save countless lives and improve people's quality of life and lifespan (Stallings, 2005). Machines now perform a large portion of the work in the agricultural and industrial sectors, resulting in higher outputs. Better working surroundings, less human effort, and increased efficiencies have all been made possible by technological advancements. Organizations are capable to store more information in fewer locations and retrieve it at faster speeds because to technological advancements. Technology has enhanced access to knowledge and increased research activities in the educational field. The four sorts of information, including data, image, speech, and video technology, are major determinants of an organisation's competitiveness (Gudanowska, 2017).

For technical growth, knowledge and skills are both essential and adequate. Machines, devices, and industrial processes would be nothing more than a collection of unknown, ineffective, arbitrary, and coincidental processes and materials if they were not accompanied by knowledge and skills. To use machinery, technologies, and production processes logically and successfully, knowledge and skills are required.

Technology management brings together engineering, scientific, and management disciplines to plan, develop, and deploy technical capabilities that help a company form and achieve its strategic and operational goals. Technology management is overseeing the processes that enable the production, acquisition, and use of technology. The use/handling of technology (including technical management) is organised, coordinated, and led by technology management.

In an organization's knowledge and skills Management of technology entails these basic activities: planning of technology use, identification, selection, technology acquisition, preparation and introduction of technology use, implementation, installation, control of technology use, and maintaining technology use (Dolinšek, & Štrukelj, 2012).

Developing countries, on the other hand, frequently lack the necessary resources for technological advancement. With each new breakthrough, employees must be trained and retrained. Technological advancements, according to Schiller (2003), reduce the labour force while augmenting productivity. Information systems could alter the decision-making hierarchy,

along with the Behavioural Theory, lowering the requirement for clerical staff and middle management to distribute information (Kabanda, 2019). The following technological advancement practices should be considered in modern organizational studies: production economies of scope are just as significant as economies of scale, and automation of production should be properly alleviated depending on product volumes and lifetimes.

Technological Advancement Practices in organizational studies are slanted towards investigating and comprehending information technology as a corporate resource, which influences the organisation's operational and strategic capabilities in developing and designing products and services for maximum corporate competitiveness, productivity, profitability, and customer satisfaction (Catalin & Alina, 2010). IT Management refers to IT-related management operations in enterprises, whereas Management Information Systems refer to information management methodologies associated to the support or automation of human decision making. Information Technology Management is primarily reliant on the alignment of technology and business strategy, as well as taking into account the value that technology creates. Technology plays a critical part in strengthening an organization's total value chain, in which value is created through a network of linkages between internal and external environments. Both the project manager and the IT manager are responsible for coordinating people's efforts in order to meet organisational goals. The mission of Project Manager is critical due to the time constraints of projects. What each IT manager should be informed about project management is that there are best practices that, when implemented throughout an organisation, may dramatically improve project success. As a result, using Project Management to successfully manage alteration in the IT environment will be more consistent and easier.

DISCUSSION

Information Technology (IT) is currently a driving force behind modern technological development and globalisation, making information management more efficient and effective (Ejiaku, 2014). IT is widely acknowledged as a critical enabler of economic and technical development. Business operations, education, technology, and economic growth all benefit from information technology. However, if employed to fulfil local and national needs, this technology could assist to alleviate poverty in developing economies. In commercial companies, governments, and research, Information Technology (IT) plays a critical role in increasing production and efficiency. The infrastructure, which includes computers, data, network and telecommunication technologies, and essential software applications, determines the value of IT in every organisation. In this ever-changing business, developing countries need adequate competent IT personnel who can design, implement, install, configure, and manage information technology (Ejiaku, 2014). As a result, a scarcity of competent and internationally recognised IT experts is stifling IT adoption and development. Poor infrastructure, ineffective government policies, and insufficient qualification and training, are contributing elements in producing obstacles in Information Technology transfer and adoption in Africa. All of these challenges and issues must be considered by IT management, particularly in developing economies. Managers use new technology to modify things, whether it's the organisation, the nature of work, ties with other businesses, or something else entirely (Lucas, 2009).

Concerning planning, assigning resources, coordinating, and assuring outcomes that enhance processes, technology management encompasses all management activities that decide the application of objectives, policy, and duties, as well as their implementation in an

organisation (Laudon & Traver, 2008). Gudanowska (2017) agrees, stating that technology management should take into account the available resources, current technology, the market's future, as well as the social and economic surroundings. There are important ideas that can be utilised to analyse the impact of technology in an organisation or country, according to Kabanda (2019). The first is the Microeconomic Model, which considers technology as a production component similar to labour and capital. The Cobb-Douglas production function is used to illustrate the link between labour and capital inputs to produce output, which can be considerably boosted if technology is included as a new input (Walsh, 2017).

A CEO recognises the significance and value of information technology in running a 21st-century business. Lucas (2009) claims that technological advancement practices: Provide novel organisational structures and approaches to construct organisations; Create new relationships between customers and suppliers who are connected online; Offers a possibility for electronic commerce that decreases purchase cycle times, boosts supplier exposure to clients, and improves buyer convenience; Electronic data interchange enables great efficiencies in the manufacturing and service industries, allowing for just-in-time production; In the airline and securities industries, for example, it alters the basis of competition and industry structure; Make methods available for coordinating activities and building a knowledge base of organisational intelligence using groupware; Allows the company to capture its employees' expertise and make it available to everyone in the company; Contributes to knowledge workers' productivity and flexibility; Provides alternatives to face-to-face communication and oversight for the management; Delivers chances for emerging countries to compete with industrialised nations.

Managers transfer duties and decision-making to lower levels of management, and information systems make data available to those who need it to make decisions (Lucas, 2009). To reduce the usage of paper, technology-enabled businesses use highly automated production and electronic information handling, and they rely heavily on pictures and optical data storage. Managers are faced with decisions about: Using technology to build and structure the company, the formation of electronic linkages in alliances and partnerships, the choice of systems to support various types of workforce, the use of groupware or group-decision support systems, developing a strategy for the World Wide Web, transaction processing systems that are used on a regular basis, personal assistance systems, control and reporting, and production procedures that are fully automated.

Infrastructure design, installation, configuration, training, and maintenance are all required by Information Technology (IT) (Ejiaku, 2014). Because IT is a primary engine of modern technological growth and globalisation, both emerging and established countries must continue to adopt and develop IT to varied degrees. Three important criteria that influence the establishment of a strong IT industry in a developed country are identified by Watson and Meyers (2001). The amount to which governments promote IT, the quality of research and development, and the existence of an education system that generates IT-literate graduates are all factors to consider. Lack of resources to develop IT in poor nations, as well as a high reliance on foreign help, are significant factors that impede progress. In addition, developing countries' ability to support proper IT transfer, implementation, and development is hampered by a lack of basic IT infrastructure and networks.

IT has a significant impact on the following (Lucas, 2009) among organisations, new procedures, workflows, workgroups, the knowledge base, products and services, and communications are all being developed, structure of the organization, the establishment of divisions, geographic scope, and *"virtual"* organisations, as well as new reporting relationships,

increased spans of control, local decision rights, and supervision, creation of new customer-supplier relationships, alliances, and collaborations. In addition to the state of the economy, electronic commerce, disintermediation, new kinds of marketing and advertising, partnerships and alliances, transaction costs, and modalities of governance in customer-supplier relationships can all change the nature of markets. Moreover, education; videoconferencing, e-mail, electronic meetings, groupware, and electronic guest lectures can all be used to improve "on campus" education. E-mail, groupware, and videoconferencing can all help with distance learning, facilitate collaborative efforts across time zones and distances by providing access to enormous amounts of reference information. Last but not the least, development of the country through giving small businesses an international presence and make trade easier and making massive volumes of data available, possibly to the chagrin of certain governments.

According to Lucas (2009), the primary IT Management concerns are: Using technology to build efficient and productive organisations; Creating an information technology strategy for the company, incorporating IT into business strategy, utilising interorganizational systems, and deciding on and building new IT applications; Changing the organisation, business processes reengineering, adopting specific applications, managing IT infrastructure in an era of technological development, and accelerated growth, deciding what and whether or not to outsource, and the amount of investment in IT.

These strategies for managing global IT were followed: focus on interorganizational connections, build an infrastructure and acquire global systems development skills, utilize newly liberalised telecommunications; endeavor for data consistency; and develop criteria for shared vs local systems.

It can be witnessed that a tremendous rise of global organisations as a result of rapid technology advances with these characteristics: treating the entire planet as though it were a single market, more products are sold outside of the home country than within it, customers, personnel, suppliers, and technology are all sourced globally, with no regard for national borders. Technology management is a new field that incorporates a variety of disciplines and can be defined as a continuous process of identification, selection, acquisition, and exploitation. How plans are applied and the role of technology in building sustainable business models has an impact on organisational success. Organizations that are learning to manage technology from both internal and external sources, as well as competing in sophisticated and technical contexts, have reached a vital moment in their knowledge acquisition. Project management, strategic management, new product development, research & development management, entrepreneurship, innovation management, and information management are all aspects of technology education management. These management styles are intertwined and reliant on one another. Processing and storage capacities are increasing at an exponential rate, making knowledge available to more individuals than at any other time in human history. As the full implications of new technologies such as the 3-D printing, artificial intelligence, energy storage, Internet of Things, and quantum computing emerge, the future holds even more possibilities for human growth.

One of the most important areas of future technological progress is artificial intelligence (AI). Organizations are constantly researching ways to enable robots to accomplish more and more of what humans now do in order to make task execution faster, simpler, and cheaper. This has the effect of lowering long-term operational costs while also eliminating the necessity for some human-powered employment. *"Machines are growing smarter in the sense that they can learn to solve issues on their own. A neural network is one such method that can warn you if*

your credit card has been used fraudulently" (Cummings, 2012). Over time, neural networks create trends or patterns of user behaviour. The neural network raises an alarm when activity outside of the regular pattern is noticed. These technologies are being more widely used in a variety of fields, and they will help humans make faster decisions. As beneficial as these advancements are to MIS, they also have an impact on people's cultures, raise legal issues in some locations, and may generate national security concerns.

Every day, terabytes of data are created around the world, which is referred to as Big Data, and its storage and management is growing increasingly difficult. When it comes to third parties, its analysis and subsequent use have legal ramifications. Lawyers will increasingly be tasked with evaluating what is and is not permissible in terms of privacy. Banks all across the world are establishing compliance divisions to handle issues such as the collecting, storage, and use of stakeholder data, among other things. The Compliance department's role is to make sure that MIS is in place to prevent such clients from accessing foreign banking services, which could result in the institution being fined heavily.

Artificial Intelligence (AI), Blockchain, Internet of Things (IoT), Financial Technology (FinTech), and Quantum Computing, according to Rainer (2012), are the future's rising technologies. The Internet of Things (IoT) is rapidly expanding. Almost any device that has an electrical current flowing through it will have sensors placed in the future. These sensors will be connected to a system over the internet for a variety of purposes; 'the rapid proliferation of sensors on all objects (animate and inanimate) is resulting in a sense-and-respond world' (Rainer, 2012).

Blockchain, or distributed-ledger technology, is gaining traction in a variety of industries, the most well-known of which is cryptocurrency. The traditional regulated financial services system is being disrupted as a result of this. This is a financial currency that is unregulated and has no territorial jurisdiction. The majority of people are still sceptical of crypto currencies, and governments are concerned about how they can't be controlled, making it tough to combat money laundering, terrorism financing, and sanctions violations. This enhances the necessity for businesses to keep a careful eye on how these changes may affect them.

Bits that are either a '0' or a '1' have been the basis of digital computing for decades. Quantum computing makes use of quantum bits (qubits), which can take on any value superposition. It is still in its infancy, but it has the potential to deliver a large improvement in processing speeds as well as the ability to modify computational parameters beyond the two states of '1' and '0.' Other advanced technologies, such as Genetic Algorithms, are benefiting from quantum computing. These two have been combined to create Quantum Genetic Algorithms (QGA), which are far more efficient than traditional genetic algorithms. The QGA has a modest population value, a quick convergence time, a high global optimization capability, and good robustness' (Wang et al., 2013). Quantum computing, once fully worked out, will be a revolutionary development from digital, just as digital was from analogue.

The following technology advancements for 2019 and beyond are identified by Sakovich & Weldon (2018):

1. Cloud Computing - an increasing number of businesses will have cloud computing infrastructure. In fact, the tendency will favour the utilisation of many clouds. More advancements in mobile internet will occur as a result of increased IT spending, affecting cloud computing and stimulating other innovations;
2. Artificial Intelligence (AI) - AI will become more prevalent in a variety of industries, infiltrating more homes and offices and becoming incorporated into transportation, healthcare, finance, and education.

AI will change the labour market, causing certain occupations to vanish while others become more relevant;

3. 5th Generation Wireless (5G) - New generation networks and 5G devices are predicted to deliver 10x faster internet speeds across mobile networks than 4G;

4. Internet of Things (IoT) - This is a network of physical gadgets, automobiles, home appliances, and other electronic equipment. Many more objects are implanted with electronics, software sensors, actuators, and connectivity, allowing them to connect and exchange data;

5. Automation - Technology will be widely used to accomplish tasks without the need for human intervention. Self-driving automobiles and robotic surgery are two examples;

6. Drones — In developed countries, these unmanned air vehicles or autonomous planes are already being utilised for military surveillance and accident monitoring;

7. Virtual reality (VR)/ Augmented reality (AR)—AR represents a live view of a tangible, real-world environment, either directly or indirectly, while virtual reality (VR) scenario is a computer-generated scenario, which resembles a real-life experience;

8. 3D Printing — This is a method of creating three-dimensional items by joining or solidifying materials under computer control;

9. Biometrics - Future developments will include the extensive dissemination of biometrics or realistic authentication as a form of identification and access control;

10. Blockchain – This is an information storage system that uses cryptography to link and safeguard an increasing number of data called blocks;

11. Quantum Computers - Quantum computers achieve extraordinary levels of speed by utilising quantum mechanical phenomena such as superposition and entanglement.

CONCLUSION

The article evaluated the important concerns, trends, and future path of technological advancement practices, and gave an analytical review on the best trending practices in managing Information Technology in organizational studies. For government involvement in the diffusion and acceptance of information technology breakthroughs by enacting favourable regulations, increasing training initiatives, and leading by example. The private sector can also fully participate in technology development initiatives so that developing countries can reap the same benefits as industrialised countries. The third theory that examines the impact of technology proposes that one corporation can bring new ways of managing transactions and serve as a nexus or connection point for other smaller market players. This will broaden the range of services available, ensuring that technology is maintained.

Information Technology (IT) is currently a driving force behind modern technological growth and globalisation, allowing for more efficient and effective information administration. IT is widely acknowledged as a critical enabler of technical and economic development.

Managers use new technological advancement to amend things, whether it's the organisation, the nature of work, ties with other businesses, or something else entirely. In this ever-changing business, developing countries need adequate competent IT personnel who can design, implement, install, configure, and manage information technology. Consequently, a lack of competent IT experts is stifling IT adoption and development. Managers transfer duties and decision-making to managerial lower levels, and information systems provide data to those who need it to make decisions. To reduce the usage of paper, technology-enabled businesses use highly automated production and electronic information handling, and they rely heavily on pictures and optical data storage.

REFERENCES

Berisha-Shaqiri, A. (2015). Information technology and management. *Academic Journal of Business, Administration, Law and Social Sciences*.

Catalin, P., & Alina, P. (2010). Information technology management. *Journal of Knowledge Management, Economics and Information Technology*.

Cummings, M. (2012). Management information systems for the information age.

Dolinšek, S., & Štrukelj, P. (2012). Technology, wealth and modern management of technology. *Managing Global Transitions: International Research Journal*, *10*(1).

Ejiaku, S.A. (2014). Technology adoption: Issues and challenges in information technology adoption in emerging economies. *Journal of International Technology and Information Management*, *23*(2), 5.

Gudanowska, A.E. (2017). Modern research trends within technology management in the light of selected publications. *Procedia Engineering*, *182*, 247-254.

Kabanda, G. (2019). *Trends in information technology management*. GRIN Verlag.

Kabanda, G.P. (2014). Technology affordances and diffusion for mobile connectivity and applications in Zimbabwe.

Laudon, K.C. (2008). *E-commerce: Business, technology*. Pearson India.

Lucas, H.C. (2009). Information technology for management: A global text, creative commons attribution 3.0 license, Switzerland, 2009.

Rainer, R.K., (2012). Management information systems, moving business forward.

Sakovich, N. (2018). *Top five information technology trends to watch in 2019*. Sam Solutions.

Sallai, G. (2012). Defining infocommunications and related terms. *Acta Polytechnica Hungarica*, *9*(6), 5-15.

Stallings, W. (2005). *Business data communications*. New Jersey: Pearson - Prentice Hall, Upper Saddle River.

Walsh, C.E. (2017). *Monetary theory and policy*. MIT press.

Wang, H., Liu, J., Zhi, J., & Fu, C. (2013). The improvement of quantum genetic algorithm and its application on function optimization. *Mathematical Problems in Engineering*.

World Bank. (2016). World development report.