ISSN: 2247-6172
Review of Applied Socio- Economic Research
(Volume 26, Issue 2/ 2023), pp. 94 - 108
URL: http://www.reaser.eu
e-mail: editors@reaser.eu

Exploring the Impact of Managerial Capabilities on the Innovation Potential of Artificial Intelligence and Organizational Capabilities: A Literature Review

Ayat Sami Odeibat [1+]

[1] University of Debrecen, Faculty of Economics and Business, Hungary

Abstract. *Cognitive business functions based on artificial intelligence (AI) have been utilized by businesses to enhance competitive advantage, performance, profitability, and economic growth. Given AI's innovation in organizational capability and managerial concerns, there is a limitation in the existing literature about managerial matters that clarify the indirect and direct effects of AI and the adopted technology and its impacts on the organization and the environment. As a necessary consequence, this article explores the impact of managerial capability on AI and organizational capability. This article addresses the subsequent research queries: What impact do the technical capabilities of AI have on managerial capabilities? Will managerial support affect managerial capability? What is the impact of the complexities of AI on managerial capabilities? To what extent does managerial capability have an impact on the compatibility of AI? In order to achieve the research objectives, a set of previous literature was reviewed and analyzed. As shown in the discussion section, by investigating the organizational capability and innovation attributes of AI, the findings of this research clarify the relationship between managerial capabilities and AI adoption.*

Keywords: Artificial Intelligence, Diffusion of Innovation Theory, Managerial capability, Organizational capability

JEL Codes: O3, O33, M11, L2

1. Introduction

Organizations are confronted with new challenges in today's dynamic business environment, such as severe competition, technological development, the COVID crisis, globalization, and economic downturn, which force senior management to make value for shareholders (Ping, *et al.*, 2018; Thomas, 2014; Aier, *et al.*, 2022). Businesses have recognized organizational innovation and technological adoption not simply as an anticipated factor for growth (Hurley & Hult, 1998; Hsueh, *et al.*, 2010; Schueffel, *et al.*, 2019), but increasingly as an essential element for survival in today's fast-paced economic environment (Novakova, 2020; Cefis & Marsili, 2005; Kryeziu, *et al.*, 2022). Organizational performance has been highlighted as a key criterion for evaluating the outcomes of an organization's operations including uncommon resources and distinctive capabilities in responding to market opportunities and recognizing threats (Ping, *et al.*, 2018; Thomas, 2014).

Technology innovation adoptions enhance the firm's productivity, ranging from new product development (Peres, *et al.*, 2010) to business processes (Papinniemi, 1999), to services (Djellal, *et al.*, 2013), and organizational processes (Lin & Chen, 2007; Schueffel, *et al.*, 2019). Also, the potential advantages of AI in

[+] **Corresponding author**: *E-mail address*: ayat.odeibat@mailbox.unideb.hu , *ORCID ID*: https://orcid.org/0009-0008-8163-9266

ISSN: 2247-6172
Review of Applied Socio- Economic Research
(Volume 26, Issue 2/ 2023), pp. 94 - 108
URL: http://www.reaser.eu
e-mail: editors@reaser.eu

Business-to-Business marketing, including its ability to provide valuable insights into customer behaviors, identify crucial market trends, and enhance operational efficiency (Mikalef, et al., 2023). It offers the opportunity to resolve complications, boost performance, create a competitive advantage and add value (Schueffel, *et al.*, 2019; Bughin & Hazan, 2019; Davenport, *et al.*, 2020) and increase profits, eliminate humans bias and errors, increase efficiency, and therefore enhance economic growth (Bughin & Hazan, 2019; Davenport, *et al.*, 2020). Further, regardless of location, age group, or educational level, the COVID crisis has turn into a worldwide accelerator for the information society's growth which started several decades earlier. Practically every part of people's professional and personal lives was changed into a virtual world, and people and organizations all over the world faced a significant challenge and significant change. Humanity was driven into global separation, and digital technology has turned into a way to keep all corporate activities running (Florek-Paszkowska, *et al.*, 2021). According to Kohnke (2016), technology transforms the way employees work and speeds the rate at which businesses evolve. Several businesses and individuals may be more willing to accept reality's rapid and abrupt transformation, as well as its widespread virtualization. Therefore, their economic efficiency was swiftly recovered to pre-pandemic levels. The reason for the COVID pandemic's unfavourable impact was not only a lack of technological and structural readiness to operate the organization remotely but also the lack of managerial staff with the proper mindset to achieve modification in the ambiguous, volatile, uncertain, and complex world as well as the strict organizational culture (Aier, *et al.*, 2022; Florek-Paszkowska, *et al.*, 2021; Mkhitaryan, 2022; Cukier, *et al.*, 2021). Therefore, firms with strong leadership culture built on empathy, clear and effective communication as well as a trust created by expert leaders could succeed in these volatile conditions (Florek-Paszkowska, *et al.*, 2021). Despite the fact that Artificial Intelligence technology has advanced rapidly, not all companies have begun to implement it due to a variety of challenges, including a company culture that does not yet recognize the need for AI, a lack of data and skilled employees, a lack of ability to use the technology, difficulties in hiring qualified workers, and difficulties reorganizing their systems and processes (Glikson & Woolley, 2020; Lichtenthaler, 2018). As a result, rapid adoption of AI could have negative consequences, ultimately harming the organization. Previous AI research has primarily focused on applications and technologies (Walczak, 2016; Qi, Wu, *et al.*, 2007). Nevertheless, managerial considerations regarding AI are often disregarded, particularly the aspects that influence AI's effective adoption. There is limited information in light of the Innovation attribute of AI in organizational capability and managerial concerns which demonstrate the direct and the indirect effects of AI features and the effects of the indicated technology, organization, and environment. As a direct reaction to the global crisis, it is becoming essential to deliver unique and as a direct response to the global crisis, it is more important than ever to provide unique and multidisciplinary studies that willpower the managers and enterprises to be sufficiently prepared in difficult times. As a result, this article dissects the impact of managerial abilities on AI innovation and the capabilities of the organization. What is the current state of research on the relationship between managerial capabilities and Artificial Intelligence (AI) compatibility? How has the complexity of AI impacted managerial capabilities, and what are the key factors influencing the adoption and integration of AI in management? This review article aims to deliver a comprehensive overview of the present literature on the topic and identify gaps in knowledge that future research should address.

2. Research Elaboration

2.1. Research methodology

This research employed a narrative literature review approach to achieve its objectives. Relevant articles, reports, and books were reviewed, using a range of scholarly databases, including EBSCO Discovery Service (UDiscover), Web of Science, Scopus, Google Scholar, ProQuest, Elsevier, and ScienceDirect, covering the

ISSN: 2247-6172
Review of Applied Socio- Economic Research
(Volume 26, Issue 2/ 2023), pp. 94 - 108
URL: http://www.reaser.eu
e-mail: editors@reaser.eu

period from 1973 to 2023. The search encompassed various fields, exploring keywords, titles, abstracts, and full-text articles to comprehensively survey the literature regarding the relationship between managerial capabilities and AI adoption. Special emphasis was placed on investigating the organizational and innovation capabilities of AI. The selection of articles and reports was guided by their relevance and significance to the research topic.

2.2. Literature review

The sections below will review the previous literature regarding the theoretical background for managerial capabilities' impact on the innovation attribute of AI adoption organizational capability by Information Technology (IT) adoption as a reference date for AI adoption.

Artificial Intelligence evolution

From the initial days of computer science, scientists were able to observe a computer's ability to play chess as a test of the machine's intelligence. Thus, in 1948, Alan Turing presented "Intelligent Machinery," and in 1950, "Computing Machinery and Intelligence," each of that could serve as inspiration for future AI research (Turing, 2009). Artificial Intelligence was once only a theory in science fiction films, but it is now a reality. Self-driving cars, personal assistants, chatbots, navigation systems, and other technologies are examples (Makridakis, 2017). Artificial intelligence arose in the twentieth century, along with the rise of computing technology (Odeibat, 2021; Meek, *et al.*, 2016). Further, the development of AI has been fuelled by the growth of algorithms and the use of big data. Many AI applications become available throughout the blooming period. AI has already found its way into several sectors of society (Chen, 2019). AI was described as computer procedures used to develop a complicated machine with human intelligence-like traits (Stuart & Peter, 1995). The definition of AI has changed throughout time. Because there is no universally standard definition. According to Luger (1993), AI is a discipline of computer science that addresses the automation of intelligent behaviour. AI encompasses the method that gives machines intelligent complexity. Kasemsap (2017) indicates AI assists machines in discovering the optimum solution for complicated issues in a human-like manner. AI offers advantages over natural intelligence, according to Pannu (2015), since it is more consistent, is less expensive, lasts longer, is easier to copy and disseminate, and can execute and record specific activities quicker and better than people. He further claims that AI is neither a branch of computer science nor a branch of psychology since it confirms observation, reasoning, computation, and response.

From a managerial standpoint, Ferràs-Hernández (2018) described AI interacting with the surrounding environment through data collection from other computer systems or natural language and then recognizing practices, diagnosing this data after those creating responses, and finally estimating and evaluating the outcome to improve decision-making techniques to achieve specific goals, resulting in the emergence of a new generation of technologies. (Glikson & Woolley, 2020). Many companies in numerous industries throughout the world have implemented AI applications. Advanced robots, autonomous vehicles, particular areas of medical diagnostics, and intelligent computers are examples of AI applications that range from simple to complicated (Schmidhuber, 2007; Xu, *et al.*, 2018). AI currently has a wide range of capabilities, including the ability to write complicated algorithms, forecast options, communicate with humans in actual time, provide answers and mine trillions of information (Perifanis, & Kitsios, 2023). Deep learning, machine learning and natural language processing are examples of AI technologies that add advanced data analysis abilities to current applications along with a comprehensive variety of sectors, making planning, management, and operation much easier (Kasemsap, 2017; Chen, 2019).

ISSN: 2247-6172
Review of Applied Socio- Economic Research
(Volume 26, Issue 2/ 2023), pp. 94 - 108
URL: http://www.reaser.eu
e-mail: editors@reaser.eu

Artificial intelligence and managerial capability

The technological increase of AI is transforming the planet. Several countries and organizations have established strategic plans to take advantage of AI's prospects (CAICT & Gartner,2018; Chen, 2019). The applications of AI can be utilized in a diversity of industries including business, finance, healthcare, and automobiles (CAICT & Gartner, 2018). Much research is currently being conducted on the corporate shift to AI industries and the implementation of intelligent technology to enhance productivity, competitiveness, efficiency, supply chain processes, and control over operations (Rymarczyk, 2020; Gastaldi, *et al.*, 2022). Companies' management is attempting to integrate Industry 4.0 and reorganize organizational resources, as well as the adoption of intelligent technologies. As a result, managerial capabilities are essential for satisfactory performance and are at the heart of strategic transformation and business regeneration. Managerial capability is defined as a manager's power to impact, motivate, encourage, and empower workers to influence the company's success and effectiveness (House, *et al.*, 2002). It covers innovation, decision-making, building a strong work environment and culture, boosting creativity, and efficiently fulfilling plans and goals. In the context of information technology, project coordination, as well as education and training, are examples of managerial capability. One of the most critical intangible resources for Information Technology (IT) adoption is Managerial capability (Garrison, *et al.*, 2015). The greatest barrier to IT adoption, according to Emmelhainz (1988), is organizational resistance to change. Good managerial capabilities indicators include clear strategic plans and aims, effective and seamless inner cooperation and communication, as well as effective training and education throughout the company (Wixom & Watson, 2001). AI offers a completely modern method of understanding the huge data cloud. As a result, AI adoption is predicated on a comprehensive strategic plan and strategic vision. The absence of a strategic plan and clear vision may stymie IT advancements (Armstrong & Sambamurthy, 1999; Angeles, *et al.*, 2001). Developing AI applications necessitates major transformations in corporate operations. Organizations must have an outstanding leadership team, strong inner teamwork, coordination, and professional training and education to make AI adoption easier. Organizational inhibitors have been reported to impede IT adoption, including a lack of a dedicated team (Grover, *et al.*, 1995), a deficiency of communication among corporate members (Nakayama, 2003; Grover, *et al.*, 1995), and insufficient training (Angeles, *et al.*, 2001; Chen, 2019; Parker & Swatman, 1995). Companies with powerful managerial capabilities can overcome these obstacles and quickly adopt AI technologies. (Dubey, *et al.*, 2021).

Innovation attributes of artificial intelligence adoption background

Recently, some research is investigating AI applications in specific fields (e.g., Simou, *et al.*, 2013; Oyelude, 2017; Li, *et al.*, 2017). Other research examines AI's theoretical foundations (Zou, 2015; Murphy, 2018) and its applications (Qiu, 2018; Kouziokas, 2017). Nevertheless, there is limited research on exploring AI adoption at the organizational level particularly (Chen, 2019). The technological context element of AI innovation attributes illustrates the essential aspects of AI adoption. In the extant literature, the effect of innovative traits on the innovation approach has been thoroughly investigated (Kwon & Zmud 1987; Chau & Tam,1997). Although Rogers (1995), identified five innovation qualities in the Diffusion of Innovation theory (DOI), specifically complexity, relative advantage, compatibility, observability, and trialability, just the first three are reliably linked to innovation adoption at the organizational level (Wu, *et al.*, 2007; Tornatzky & Fleischer, 1990). The following table summarizes the innovation qualities in the (DOI) that are most strongly associated with innovation adoption at the organizational level.

ISSN: 2247-6172
Review of Applied Socio- Economic Research
(Volume 26, Issue 2/ 2023), pp. 94 - 108
URL: http://www.reaser.eu
e-mail: editors@reaser.eu

Table 1: The innovation attributes in the Diffusion of Innovation theory (DOI) that are most strongly associated with innovation adoption at the organizational level.

Innovation Attributes	**Authors**	**Related Literature**
Compatibility	Rogers (1995)	Compatibility indicates the innovation's capability to give value and experience while remaining compatible with the requirements of the possible adopters.
	Azadegan & Teich, (2010); Oliveira *et al.,* (2014); Chong and Bauer (2000)	Compatibility is a critical factor in innovation adoption. The compatibility of innovation with requirements and experiences is positively associated with innovation adoption, according to the DOI theory.
	Wu *et al.,* (2007)	High compatibility can lead to more acceptable adoption. To put it another way, the higher the compatibility, the quicker the adoption. To conclude, if AI technology is deemed compatible with present business procedures, the company will need to construct a few changes and adjustments, and workers will be more likely to use it. Otherwise, incompatibilities usually necessitate significant procedure changes, which oftentimes necessitate a lot of education and imply higher adoption resistance. When existing IT infrastructures are compatible with AI technology, it will be cheaper and will require less time and effort to adapt. Consequently, AI will be more widely adopted.
Relative Advantage	Yang *et al.,* (2013)	The relative advantage is the degree to which an innovation is apparent to be superior to the approach it replaces.
	Rogers (2003); Greenhalgh *et al.,* (2004).	The potential value of innovation influences a firm's decision to adopt innovative technology. Consequently, recent technologies that deliver clear and precise advantages in terms of increasing operational and strategic efficiency have more potential to be adopted. In simple terms, the larger the apparent relative advantage of innovative technology, the more quickly it will be adopted.
	Kryeziu *et al.,* (2022); Russell and Norvig (2016)	Organizations are forced to adopt cutting-edge AI technologies to enhance their business operations when confronted with severe market competition in a rapidly changing business environment, as well as the COVID crisis. AI has strong computing capabilities, as well as cross-border integration and deep learning. To conclude AI has the potential to play a significant role in the across-the-board adoption of recent services. The integration of AI technologies and big data will invariably result in competitive advantages and organizational innovation. Workers can gain a full understanding of the benefits that AI can provide if a company educates or trains them on how crucial AI technologies can generate efficiencies and reduce costs.

ISSN: 2247-6172
Review of Applied Socio- Economic Research
(Volume 26, Issue 2/ 2023), pp. 94 - 108
URL: http://www.reaser.eu
e-mail: editors@reaser.eu

		People may accept and engage in the good developments brought by AI once their awareness level has been raised.
Complexity	Yang *et al.*, (2013)	Complexity is the level to which an innovation is recognized as tough to comprehend, realize and use. Also, complexity represents the obstacles to AI adoption.
	Oliveira *et al.*, (2014)	The simpler it is to implement technology into operational processes, the more likely it will be adopted.
	Chen (2019); Huang and Palvia (2001)	AI complicity derives from its lack of technological expertise, absence of maturity, and IT specialists, as well as its high cost and time-consuming. The aspects of AI imply that the most significant barrier to AI adoption is its immaturity. Earlier research has found that the level of IT maturity has a significant effect on firms' strategic decisions when it comes to obtaining and deploying IT. When modern technology is mature, businesses are effectively prepared to implement it. Businesses are more expected to adopt recent technology if they know they can work successfully with vendors.
	Attewell (1992)	Further, another impediment to AI adoption is a scarcity of expertise in AI software and data analysis. Firms delay the internal implementation of complicated technology till they've gained enough technical expertise to implement and operate it successfully. To conclude, many businesses are still unfamiliar with AI and lack a thorough understanding of AI technologies. Considering that AI is yet changing and evolving, determining the return on investment of AI is difficult currently. AI initiatives and pilot tests that are costly and resource-intensive cannot assure the advantages they can obtain.

(Source: Author's own work)

2.3. Organizational capability and its adaptability to business challenges

Organizational capabilities

Organizational capabilities aid in the adoption of an innovation. Perifanis and Kitsios (2023) highlight the necessity for organizations to prioritize both innovative and routine AI deployment. They emphasize that these two crucial aspects of AI ambidexterity synergistically impact the organization's strategic flexibility. Organizational capabilities include includes technical capabilities, the resources of leadership, and managerial capabilities. These capabilities are non-transferable, typically organization-specific, and embedded within a company. The resource-based view (RBV) theory, according to Chen (2019), may be applied to determine organization-specific capabilities that support AI adoption. Companies gain a competitive advantage by incorporating economically valuable, difficult-to-imitate, and non-transferable resources, according to RBV theory (Wernerfelt, 1984; Garrison, *et al.*, 2015). This indicates companies' distinctive and scarce resources may supply them with a competitive advantage in the short term. AI technologies can help businesses enhance their efficiency (Perifanis, & Kitsios, 2023). They can gain an advantage over their competitors in this manner. As a result, organizational-specific capabilities distinguish companies from their competitors.

ISSN: 2247-6172
Review of Applied Socio- Economic Research
(Volume 26, Issue 2/ 2023), pp. 94 - 108
URL: http://www.reaser.eu
e-mail: editors@reaser.eu

Managerial support

Leaders' commitment is essential in any key company transformation since it directs service integration and resource allocation (Co, *et al.*, 1998). Researchers believe that managerial support is a key element in information system integration and technology adoption (Thong, 1999; Müller & Jugdev, 2012; Sanders & Courtney, 1985; Chong, *et al.*, 2009; Nah, *et al.*, 2001). For instance, according to Thong (1999), the characteristics of senior managers in companies influence their information technology (IT) adoption. As stated by Hage and Dewar (1973), leaders at higher levels with the authority to allocate organizational resources affect innovation adoption. Managerial support must be coherent and ongoing during the implementation of the project, or the project will fail (Elbanna,2013). The explanation is that leaders, particularly those in top management can assign qualified employees to manage a project and devote significant financial and other resources to it (Willis & Sullivan, 1984). A lack of managerial support, on the other hand, may have a negative impact on the project (Wixom & Watson, 2001; Pajany, 2021). Rapid innovations in arising technologies are reimagining the managerial roles of leaders. Using remote intelligence (RI) and AI technologies facilitates organizational outsourcing. Therefore, leaders in all positions must know how to lead, motivate, plan, and control virtual, organized, and cross-cultural teams. As well as deal with "global upheavals" in organizations like unemployment, job displacement, and inequality (Song Ng, 2021; Florek-Paszkowska, *et al.*, 2021). Numerous researchers associated the impact of technological disruptions with change management and an industry-wide digitalization movement, which created new digital challenges and opportunities for established companies (Giones, *et al.*, 2018; Song Ng, 2021). AI technologies have the potential to impact entire organizations. Such modifications might have a substantial effect on businesses. Highlight the managers' roles toward IT adoption, AI applications require managerial support and must integrate with companies' strategic objectives. When managers fully understand AI technologies and the work that the entire company is involved in AI, they can regulate how to use AI. Furthermore, once leaders identify and understand AI applications as the main priorities, they are more diligent and able to assign resources for their utilization (Nah, *et al.*, 2001). To maintain the most effective relationship with their partners and vendors, managers must also have a tangible and clear understanding of AI.

Technical capability

The term "technical capability" is defined as the physical assets required to implement innovations, like data, networking, and computer hardware (Aboelmaged, 2014). In the meantime, it demonstrates a company's collective resources for building a scalable and flexible base for enterprise applications (Wang, *et al.*, 2016). Intangible assets, for example, collaboration strategies, IT development, application processes, and technical knowledge that can effectively incorporate the latest technologies are all examples of technical capability (Garrison, *et al.*, 2015). Thus, it is a significant element influencing technology adoption (Garrison, *et al.*, 2015; Wu, *et al.*, 2007). Potent technical capability decreases integration complexities and enables the information technology team to distribute artificial intelligence systems quickly and effectively. AI applications can be successfully adopted once a company is able to achieve technological objectives and effectively integrate artificial intelligence (AI) technologies within its current facilities. The more adept a company is at integrating AI emerging technologies across its existing IT framework, the more quickly it can cut costs and effectively distribute assets to achieve profitable adoption. if a company uses freely available software or collaborators to create an internal artificial intelligence platform or tools, it needs to comprehend the expertise, resources, and technologies required to realize AI's full potential.

ISSN: 2247-6172
Review of Applied Socio- Economic Research
(Volume 26, Issue 2/ 2023), pp. 94 - 108
URL: http://www.reaser.eu
e-mail: editors@reaser.eu

3. Discussions

In the last few decades, many difficult events have occurred. A few of them seem to be turbulent, such as the 2008 financial crisis or the most recent one driven by the COVID-19 crisis (Rueda Cantuche, 2021; Pena-Boquete & Dios-Murcia, 2021). In the short and long term, the organization must respond to volatility, uncertainty, complexity, and obscurity. Handling crises and changes in a company throughout difficult circumstances necessitates quick reaction, flexibility, adaptation, and reorganization of the organization's talents, resources, and competencies (Florek-Paszkowska, *et al.*, 2021). Therefore, businesses should be ready for potentially disruptive future events. Organizational management operates in a continuously changing environment. A competent leadership group can boost organizational efficiency, develop effective marketing strategies, and promote resource sharing. Companies with managerial capability can predict emerging technologies and effectively employ them to align business operations with their goals (Garrison, *et al.*, 2015). The applications for AI are currently expanding at a rapid pace. Several businesses began to enter this domain. Businesses are able to easily implement and utilize emerging artificial intelligence (AI) tools, yet it is more difficult to adapt current company culture and procedures to AI. The organizational managerial capability is required for successful adoption. Since AI's innovation attributes in a company are ideal, they appear in workers' perceptions, which may be turned through managerial capability. AI application difficulty can also be reduced if leaders recognize the possibility of artificial intelligence (AI) technologies to boost the expert abilities and professional value of workers, thereafter, modify hiring and recruit equivalent specialists, focus on training, effectively distribute resources, and establish the environment to AI adoption (Florek-Paszkowska, *et al.*, 2021; Chen, 2019; Ping, Chinn, Yin & Muthuveloo, 2018). Therefore, AI will be better aligned with the organization's culture and existing processes and systems. A high level of managerial capability raises perceptions of the effectiveness and benefits of AI technology (compatibility and relative advantage) while decreasing perceptions of risk associated with technology (complexity). Consequently, the company may quickly adopt AI, gain a competitive advantage, and improve its performance (Müller & Jugdev, 2012; Chen, 2019; Ping, *et al.*, 2018).

Companies' management can be found at different levels generally: starting from first-line managers, middle managers, and top managers. Various managers inside the company prioritize different parts of the work, from strategy to communication to operations. These three levels of management comprise a firm's management team (Floyd & Lane, 2000). Managerial capability can have an impact on managerial support. Therefore, According to Adner and Helfat (2003), Managerial capability refers to these managers' capacity to create and construct resources in order to accomplish organizational objectives. The current organization is a huge and complex approach, and the leadership team frequently does the majority of the management and decision-making jobs. An efficient management team is an indicator of strong managerial capability. Thus, a company's managerial capability is critical. The dominant logic of leaders can be influenced by managerial capability (Kor and Mesko, 2013). As a result, over time, the leader's dominant logic continues to expand and integrate company-level techniques, resources, and procedures, to establish the dominant logic at the organizational level, conceivably affecting how businesses operate (Kor & Mesko, 2013; Laitila, 2018; Wamba-Taguimdje, *et al.*, 2020; Littunen, *et al.*, 2021). A well-managed organization frequently has effective communication systems, cooperation, appropriate processes, and training. Also, sustained competitive advantage. As a result, the more effective the management team and the more powerful the company's managerial capability, the more top management will support them. Work plans and proposals developed by an effective and strong leadership team will be more easily accepted by upper management. Furthermore, the technical capability will be affected by managerial capability.

According to Kettinger, Davis, and Kettinger (2015), an organization's technical capability is a combination of software, hardware, technical skills, shared services, and management approaches.

ISSN: 2247-6172
Review of Applied Socio- Economic Research
(Volume 26, Issue 2/ 2023), pp. 94 - 108
URL: http://www.reaser.eu
e-mail: editors@reaser.eu

Accordingly, Technical capability includes both tangible assets such as networking, software, and hardware, as well as intangible assets such as problem-solving processes and technical knowledge. Physical assets of information technology capability have no major impact on gaining a competitive advantage. This is because of the simple fact that competitors can easily obtain them. When a firm launches a new system or technology, as a result, its competitors will quickly follow, erasing the initial competitive advantage (Chen, 2019; Bharadwaj, 2000). While information technology capability's intangible assets are scarce, non-replicable, unique, and precious resources. These are the skills, attitudes, and knowledge leaders must have in order to create IT-related resources and effectively adopt recent technologies. As a result, IT capability intangible assets can be assumed to be a subset of managerial capability. Managerial capabilities include leadership and coordination skills that can facilitate new technology innovation (Chen, 2019; Bharadwaj, 2000).

Furthermore, strong managerial capability significantly impacts organizational culture and improves the productivity of external and internal communication enhances employee quality, supports the provision of technical solutions for combining AI technologies, and helps companies reach their aims. Thus, a product management team with a strategic vision could develop a dynamic work environment, foster technological innovation, reallocate resources rationally, seek and employ skilled IT managerial and technical talent, and hence improve the organization's overall technical capabilities (Bharadwaj, 2000; Chen, 2019).To conclude, previous literature demonstrates that managerial capability has a positive impact on the compatibility of AI and the relative advantage of AI while having a negative impact on the complexity of AI. Furthermore, organizational capability has a positive relationship with managerial capabilities as managerial support and technical capabilities in both phases.

4. Conclusions

Organizations face new challenges in today's dynamic business environment, such as severe competition, technological development, the COVID crisis, globalization, and economic downturn, which force businesses to create value for shareholders and integrate AI technology to cope. Firms have identified organizational innovation and AI technological adoption not only as a desired factor for growth but increasingly as an essential element for survival in today's volatile economic environment. Despite recognizing the importance of AI innovation and technological adoption, there is limited knowledge regarding the specific managerial concerns that directly and indirectly impact the characteristics of AI and the effects on technology, the organization, and the environment. Moreover, in a company, an outstanding project management team, with proper training, education, suitable inner communication, and collaboration can encourage workers' passion for understanding, enhance their acceptance of AI technologies, and decrease possible threats. Workers' negative emotions and conflicts will be significantly decreased as a result of the complication and complexity of the process caused via AI technologies. Therefore, AI will be more compatible with the organization's culture and existing processes and systems. A high level of managerial capability raises perceptions of the effectiveness and benefits of AI technology (compatibility and relative advantage) while decreasing perceptions of technological threats (complexity). Consequently, a result, the company will be able quickly to embrace AI technologies, gaining a competitive advantage and improving its performance. In conclusion, previous literature that was included in the literature review above demonstrates that managerial capability significantly influences the innovation attribute of AI, particularly through its impact on the compatibility, complexity, and relative advantage of AI. A high level of managerial capability positively affects the compatibility and relative advantage of AI while negatively affecting the complexity of AI. Furthermore, there is a positive relationship between organizational capability and managerial capabilities in both managerial support and technical capabilities phases. By leveraging

ISSN: 2247-6172
Review of Applied Socio- Economic Research
(Volume 26, Issue 2/ 2023), pp. 94 - 108
URL: http://www.reaser.eu
e-mail: editors@reaser.eu

managerial and organizational capabilities, companies can quickly adopt AI technologies, gain a competitive advantage, and improve overall performance.

5. References

[1] Aboelmaged, M. G. (2014). Predicting e-readiness at firm-level: An analysis of technological, organizational and environmental (TOE) effects on e-maintenance readiness in manufacturing firms. *International Journal of Information Management*, *34*(5), 639-651.

[2] Adner, R., & Helfat, C. E. (2003). Corporate effects and dynamic managerial capabilities. *Strategic management journal*, *24*(10), 1011-1025.

[3] Aier, B., Hota, P. K., & Singh, N. (2022). Embracing Covid-19 pandemic: Entrepreneurship within the Indigenous context. *Review of Applied Socio-Economic Research*, *24*(2), 5-17.

[4] Angeles, R., Corritore, C. L., Basu, S. C., & Nath, R. (2001). Success factors for domestic and international electronic data interchange (EDI) implementation for US firms. *International Journal of Information Management*, *21*(5), 329-347.

[5] Armstrong, C. P., & Sambamurthy, V. (1999). Information technology assimilation in firms: The influence of senior leadership and IT infrastructures. *Information systems research*, *10*(4), 304-327.

[6] Attewell, P. (1992). Technology diffusion and organizational learning: The case of business computing. *Organization science*, *3*(1), 1-19.

[7] Azadegan, A., & Teich, J. (2010). Effective benchmarking of innovation adoptions: A theoretical framework for e-procurement technologies. *Benchmarking: An International Journal*.

[8] Bharadwaj, A. S. (2000). A resource-based perspective on information technology capability and firm performance: an empirical investigation. *MIS quarterly*, 169-196.

[9] Bughin, J., & Hazan, E. (2019). Can artificial intelligence help society as much as it helps business?. *The McKinsey Quarterly*.

[10] CAICT & Gartner. (2018). 2018 World Artificial Intelligence Industry Development Blue Book. 2018 World Artificial Intelligence Conference. Retrieve from http://www.caict.ac.cn/kxyj/qwfb/bps/201809/P020180918696200669434.pdf.

[11] Cefis, E., & Marsili, O. (2005). A matter of life and death: innovation and firm survival. *Industrial and Corporate change*, *14*(6), 1167-1192.

[12] Chau, P. Y., & Tam, K. Y. (1997). Factors affecting the adoption of open systems: an exploratory study. *MIS quarterly*, 1-24.

[13] Chen, H. (2019). Success factors impacting artificial intelligence adoption: Perspective from the Telecom Industry in China (Doctoral dissertation, Old Dominion University).

[14] Chong, A. Y. L., Lin, B., Ooi, K. B., & Raman, M. (2009). Factors affecting the adoption level of c-commerce: An empirical study. *Journal of Computer Information Systems*, *50*(2), 13-22.

[15] Chong, S., & Bauer, C. (2000). A model of factor influences on Electronic Commerce adoption and diffusion in small-and medium-sized enterprises.

[16] Co, H. C., Eddy Patuwo, B., & Hu, M. Y. (1998). The human factor in advanced manufacturing technology adoption: An empirical analysis. International Journal of Operations & Production Management, 18(1), 87-106.

ISSN: 2247-6172
Review of Applied Socio- Economic Research
(Volume 26, Issue 2/ 2023), pp. 94 - 108
URL: http://www.reaser.eu
e-mail: editors@reaser.eu

[17] Cukier, W., McCallum, K. E., Egbunonu, P., & Bates, K. (2021). The mother of invention: Skills for innovation in the post-pandemic world. Public Policy Forum. Retrieved from https://www.ryerson.ca/diversity/reports/MotherOfInvention_EN.pdf

[18] Davenport, T., Guha, A., Grewal, D., & Bressgott, T. (2020). How artificial intelligence will change the future of marketing. *Journal of the Academy of Marketing Science*, *48*(1), 24-42.

[19] Djellal, F., Gallouj, F., & Miles, I. (2013). Two decades of research on innovation in services: Which place for public services?. *Structural change and economic dynamics*, *27*, 98-117.

[20] Dubey, R., Bryde, D. J., Blome, C., Roubaud, D., & Giannakis, M. (2021). Facilitating artificial intelligence powered supply chain analytics through alliance management during pandemic crises in the B2B context. *Industrial Marketing Management*, *96*, 135-146.

[21] Elbanna, A. (2013). Top management support in multiple-project environments: an in-practice view. *European Journal of Information Systems*, *22*(3), 278-294.

[22] Emmelhainz, M. A. (1988). Strategic issues of EDI implementation. *Journal of Business Logistics*, *9*(2), 55.

[23] Ferràs-Hernández, X. (2018). The future of management in a world of electronic brains. *Journal of Management Inquiry*, *27*(2), 260-263.

[24] Florek-Paszkowska, A., Ujwary-Gil, A., & Godlewska-Dzioboń, B. (2021). Business innovation and critical success factors in the era of digital transformation and turbulent times. *Journal of Entrepreneurship, Management and Innovation*, *17*(4), 7-28. https://doi.org/10.7341/20211741

[25] Floyd, S. W., & Lane, P. J. (2000). Strategizing throughout the organization: Managing role conflict in strategic renewal. *Academy of management review*, *25*(1), 154-177.

[26] Garrison, G., Wakefield, R. L., & Kim, S. (2015). The effects of IT capabilities and delivery model on cloud computing success and firm performance for cloud supported processes and operations. *International journal of information management*, *35*(4), 377-393.

[27] Gastaldi, L., Lessanibahri, S., Tedaldi, G., & Miragliotta, G. (2022). Companies' adoption of Smart Technologies to achieve structural ambidexterity: Ananalysis with SEM. *Technological Forecasting and Social Change*, *174*. https://doi.org/10.1016/j.techfore.2021.121187

[28] Giones, F., Brem, A., & Berger, A. (2019). Strategic decisions in turbulent times: Lessons from the energy industry. *Business Horizons*, *62*(2), 215- 225. https://doi.org/10.1016/j.bushor.2018.11.003

[29] Glikson, E., & Woolley, A. W. (2020). Human trust in artificial intelligence: Review of empirical research. *Academy of Management Annals*, *14*(2), 627-660.

[30] Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., & Kyriakidou, O. (2004). Diffusion of innovations in service organizations: systematic review and recommendations. *The milbank quarterly*, *82*(4), 581-629.

[31] Grover, V., Jeong, S. R., Kettinger, W. J., & Teng, J. T. (1995). The implementation of business process reengineering. *Journal of management information systems*, *12*(1), 109-144.

[32] Hage, J., & Dewar, R. (1973). Elite values versus organizational structure in predicting innovation. *Administrative science quarterly*, 279-290.

[33] House, R., Javidan, M., Hanges, P., & Dorfman, P. (2002). Understanding cultures and implicit leadership theories across the globe: an introduction to project GLOBE. *Journal of world business*, *37*(1), 3-10.

[34] Hsueh, J. T., Lin, N. P., & Li, H. C. (2010). The effects of network embeddedness on service innovation performance. *The Service Industries Journal*, *30*(10), 1723-1736. https://doi.org/10.1080/02642060903100398

ISSN: 2247-6172
Review of Applied Socio- Economic Research
(Volume 26, Issue 2/ 2023), pp. 94 - 108
URL: http://www.reaser.eu
e-mail: editors@reaser.eu

[35] Huang, Z., & Palvia, P. (2001). ERP implementation issues in advanced and developing countries. *Business process management journal*.

[36] Hurley, R. F., & Hult, G. T. M. (1998). Innovation, market orientation, and organizational learning: an integration and empirical examination. *Journal of marketing*, *62*(3), 42-54.

[37] Kasemsap, K. (2017). Artificial intelligence: Current issues and applications. In *Handbook of research on manufacturing process modeling and optimization strategies* (pp. 454-474). IGI Global.

[38] Kettinger, W. J., Li, Y., Davis, J. M., & Kettinger, L. (2015). The roles of psychological climate, information management capabilities, and IT support on knowledge-sharing: an MOA perspective. *European Journal of Information Systems*, *24*(1), 59-75.

[39] Kohnke, O. (2017). It's not just about technology: The people side of digitization. In *Shaping the digital enterprise* (pp. 69-91). Springer, Cham.

[40] Kor, Y. Y., & Mesko, A. (2013). Dynamic managerial capabilities: Configuration and orchestration of top executives' capabilities and the firm's dominant logic. *Strategic management journal*, *34*(2), 233-244.

[41] Kouziokas, G. N. (2017). The application of artificial intelligence in public administration for forecasting high crime risk transportation areas in urban environment. *Transportation research procedia*, *24*, 467-473.

[42] Kryeziu, L., Bağiş, M., Kurutkan, M. N., Krasniqi, B. A., & Haziri, A. (2022). COVID-19 impact and firm reactions towards crisis: Evidence from a transition economy. https://doi.org/10.7341/20221816

[43] Kwon, T. H., & Zmud, R. W. (1987). Unifying the fragmented models of information systems implementation. In *Critical issues in information systems research* (pp. 227-251).

[44] Laitila, T. (2018). The Role of Managerial Capabilities and Organisational Culture in Corporate Venturing: The Case of a Successful Corporate Spin-off.

[45] Li, R., Zhao, Z., Zhou, X., Ding, G., Chen, Y., Wang, Z., & Zhang, H. (2017). Intelligent 5G: When cellular networks meet artificial intelligence. *IEEE Wireless communications*, *24*(5), 175-183.

[46] Lichtenthaler, U. (2018). Substitute or synthesis: The interplay between human and artificial intelligence. *Research-Technology Management*, 61(5), 12–14.

[47] Lin, C. Y. Y., & Chen, M. Y. C. (2007). Does innovation lead to performance? An empirical study of SMEs in Taiwan. *Management research news*.

[48] Littunen, H., Tohmo, T., & Storhammar, E. (2021). Innovation among SMEs in Finland: The impact of stakeholder engagement and firm-level characteristics. *Journal of Entrepreneurship, Management and Innovation*, *17*(4). https://doi.org/10.7341/20211746

[49] Luger, G. F. (1993). WA Stubblefield. AI: Structures and Strategies for Complex Problem Solving.

[50] Makridakis, S. (2017). The forthcoming Artificial Intelligence (AI) revolution: Its impact on society and firms. *Futures*, *90*, 46-60.

[51] Meek, T., Barham, H., Beltaif, N., Kaadoor, A., & Akhter, T. (2016, September). Managing the ethical and risk implications of rapid advances in artificial intelligence: a literature review. In *2016 Portland International Conference on Management of Engineering and Technology (PICMET)* (pp. 682-693). IEEE.

[52] Mikalef, P., Islam, N., Parida, V., Singh, H., & Altwaijry, N. (2023). Artificial intelligence (AI) competencies for organizational performance: A B2B marketing capabilities perspective. *Journal of Business Research*, *164*, 113998.

[53] Mkhitaryan, A. (2022). Critical evaluation of organizational structure and culture impact on the productivity of MFIs within the example of Agroleasing. *Review of Applied Socio-Economic Research*, *24*(2), 106-120.

ISSN: 2247-6172
Review of Applied Socio- Economic Research
(Volume 26, Issue 2/ 2023), pp. 94 - 108
URL: http://www.reaser.eu
e-mail: editors@reaser.eu

[54] Müller, R., & Jugdev, K. (2012). Critical success factors in projects: Pinto, Slevin, and Prescott–the elucidation of project success. *International journal of managing projects in business.*

[55] Murphy, J. (2018). Artificial intelligence, rationality, and the world wide Web. *IEEE Intelligent Systems*, *33*(1), 98-103.

[56] Nah, F. F. H., Lau, J. L. S., & Kuang, J. (2001). Critical factors for successful implementation of enterprise systems. *Business process management journal*.

[57] Nah, F. F. H., Lau, J. L. S., & Kuang, J. (2001). Critical factors for successful implementation of enterprise systems. *Business process management journal*.

[58] Nakayama, M. (2003). An assessment of EDI use and other channel communications on trading behavior and trading partner knowledge. *Information & Management*, *40*(6), 563-580.

[59] Novakova, L. (2020). The impact of technology development on the future of the labour market in the Slovak Republic. *Technology in Society*, *62*. Https://doi.org/10.1016/j.techsoc.2020.101256.

[60] Odeibat, A. S. (2021). The Effect Of Technology Evolution On The Future Of Jobs. *Network Intelligence Studies*, (17), 57-67.

[61] Oliveira, T., Thomas, M., & Espadanal, M. (2014). Assessing the determinants of cloud computing adoption: An analysis of the manufacturing and services sectors. *Information & Management*, *51*(5), 497-510.

[62] Oyelude, A. A. (2017). What's trending in libraries from the internet cybersphere–artificial intelligence and other emerging technologies. *Library Hi Tech News*.

[63] Pajany, P. (2021). Ai Transformative Influence: Extending the Tram to Management Student's AI's Machine Learning Adoption (Doctoral dissertation, Franklin University).

[64] Pannu, A. (2015). Artificial intelligence and its application in different areas. *Artificial Intelligence*, *4*(10), 79-84.

[65] Papinniemi, J. (1999). Creating a model of process innovation for reengineering of business and manufacturing. *International Journal of Production Economics*, *60*, 95-101.

[66] Parker, C. M., & Swatman, P. M. (1995). Educating tomorrow′ s managers for telecommunications and EDI: a cross-cultural experience. *Information Technology & People*.

[67] Pena-Boquete, Y., & Dios-Murcia, I. (2021). Factors behind the employment loss in Galicia: Great Recession of 2008 vs. the first wave of the COVID-19 pandemic. *Revista Galega De Economía*, *30*(1), 1-18. https://doi.org/10.15304/rge.30.1.7451

[68] Peres, R., Muller, E., & Mahajan, V. (2010). Innovation diffusion and new product growth models: A critical review and research directions. *International journal of research in marketing*, *27*(2), 91-106.

[69] Perifanis, N. A., & Kitsios, F. (2023). Investigating the influence of artificial intelligence on business value in the digital era of strategy: A literature review. *Information*, *14*(2), 85.

[70] Ping, T. A., Chinn, C. V., Yin, L. Y., & Muthuveloo, R. (2018). The Impact of Information Technology Capability, Business Intelligence Use and Collaboration Capability on Organizational Performance among Public Listed Companies in Malaysia. *Global Business & Management Research*, *10*(1).

[71] Qi, J., Wu, F., Li, L., & Shu, H. (2007). Artificial intelligence applications in the telecommunications industry. *Expert Systems*, *24*(4), 271-291.

[72] Qiu, C. (2018). Application of artificial intelligence technology in GIS. *Journal of advanced oxidation technologies*, *21*(2).

[73] Rogers, E. M. (1995). Diffusion of Innovations: modifications of a model for telecommunications. In *Die diffusion von innovationen in der telekommunikation* (pp. 25-38). Springer, Berlin, Heidelberg.

ISSN: 2247-6172
Review of Applied Socio- Economic Research
(Volume 26, Issue 2/ 2023), pp. 94 - 108
URL: http://www.reaser.eu
e-mail: editors@reaser.eu

[74] Rogers, E. M. (2003). The diffusion of innovation 5th edition.

[75] Rueda Cantuche, J. M. (2021). The economy of the European Union in times of COVID-19. *Revista Galega De Economía*, *30*(1), 1-17. https://doi. org/10.15304/rge.30.1.7663

[76] Russell, S. J., & Norvig, P. (2016). *Artificial intelligence: a modern approach*. Malaysia; Pearson Education Limited.

[77] Rymarczyk, J. (2020). Technologies, opportunities and challenges of the industrial revolution 4.0: Theoretical considerations. *Entrepreneurial Business and Economics Review*, *8*(1), 185-198. https://doi.org/10.15678/EBER.2020.080110

[78] Sanders, G. L., & Courtney, J. F. (1985). A field study of organizational factors influencing DSS success. *MIS quarterly*, 77-93.

[79] Schmidhuber, J. (2007). 2006: Celebrating 75 years of AI-history and outlook: the next 25 years. In *50 Years of Artificial Intelligence* (pp. 29-41). Springer, Berlin, Heidelberg.

[80] Schueffel, P., Baldegger, R., Buenzli, D., & Caon, M. (2019). The antecedents and outcomes of AI adoption in SMEs. In *Proceedings of 2019 International Council for Small Business World Congress* (No. CONFERENCE). 18-21 June 2019.

[81] Schueffel, P., Baldegger, R., Buenzli, D., & Caon, M. (2019). The antecedents and outcomes of AI adoption in SMEs. In *Proceedings of 2019 International Council for Small Business World Congress* (No. CONFERENCE). 18-21 June 2019.

[82] Simou, P., Tiligadis, K., & Alexiou, A. (2013, September). Exploring artificial intelligence utilizing BioArt. In *IFIP International Conference on Artificial Intelligence Applications and Innovations* (pp. 687-692). Springer, Berlin, Heidelberg.

[83] Song Ng, H. (2021). Are managers still necessary in the era of the fourth industrial revolution (I4.0)? In *Future of Work, Work-Family Satisfaction, and Employee Well-Being in the Fourth Industrial Revolution* (pp. 81-98). Pennsylvania: IGI Global: International Academic Publisher. https://doi.org/10.4018/978-1-7998-3347-5.ch006

[84] Stuart J. R. & Peter, N. (1995). AI A Modern Approach, by Prentice-Hall, Inc. A Simon & Schuster Company Englewood Cliffs, New Jersey.

[85] Thomas, E. F. (2014). Platform-based product design and environmental turbulence: The mediating role of strategic flexibility. *European Journal of Innovation Management*. Vol. 17 No. 1, pp. 107-124. https://doi.org/10.1108/EJIM-06-2013-0055

[86] Thong, J. Y. (1999). An integrated model of information systems adoption in small businesses. *Journal of management information systems*, *15*(4), 187-214.

[87] Tornatzky, L. G., Fleischer, M., & Chakrabarti, A. K. (1990). *Processes of technological innovation*. Lexington books.

[88] Turing, A.M. (2009), "Computing machinery and intelligence", in Parsing the Turing Test, Springer, Heidelberg, pp. 23-65.

[89] Walczak, S. (2016). Artificial neural networks and other AI applications for business management decision support. *International Journal of Sociotechnology and Knowledge Development (IJSKD)*, *8*(4), 1-20.

[90] Wamba-Taguimdje, S. L., Wamba, S. F., Kamdjoug, J. R. K., & Wanko, C. E. T. (2020). Influence of artificial intelligence (AI) on firm performance: the business value of AI-based transformation projects. *Business Process Management Journal*. DOI 10.1108/BPMJ-10-2019-0411

[91] Wang, P., Chaudhry, S., & Li, L. (2016). Introduction: advances in IoT research and applications. *Internet Research*.

ISSN: 2247-6172
Review of Applied Socio- Economic Research
(Volume 26, Issue 2/ 2023), pp. 94 - 108
URL: http://www.reaser.eu
e-mail: editors@reaser.eu

[92] Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic management journal*, *5*(2), 171-180.

[93] Willis, R. G., & Sullivan, K. H. (1984). CIMS IN PERSPECTIVE-COSTS, BENEFITS, TIMING, PAYBACK PERIODS ARE OUTLINED. 2. *Industrial Engineering*, *16*(2), 28.

[94] Wixom, B. H., & Watson, H. J. (2001). An empirical investigation of the factors affecting data warehousing success. *MIS quarterly*, 17-41.

[95] Wu, J. H., Wang, S. C., & Lin, L. M. (2007). Mobile computing acceptance factors in the healthcare industry: A structural equation model. *International journal of medical informatics*, *76*(1), 66-77.

[96] Xu, L. D., Xu, E. L., & Li, L. (2018). Industry 4.0: state of the art and future trends. *International journal of production research*, *56*(8), 2941-2962.

[97] Yang, Z., Kankanhalli, A., Ng, B. Y., & Lim, J. T. Y. (2013). Analyzing the enabling factors for the organizational decision to adopt healthcare information systems. *Decision Support Systems*, *55*(3), 764-776.

[98] Zou, X. (2015). Innovation and scientific breakthroughs in artificial intelligence methods. *Management, Information and Educational Engineering*, 929-932.

Manuscript received: 09.06.2023

Manuscript received in revised form: 14.08.2023

Manuscript accepted: 24.08.2023