Artificial Intelligence and Leadership Agility: Concepts and their Application

Thomas Katua Ngui

Chandaria School of Business, United States International University- Africa

DOI: https://dx.doi.org/10.47772/IJRISS.2025.914MG0036

Received: 05 February 2025; Accepted: 12 February 2025; Published: 24 March 2025

ABSTRACT

The digital transformation taking place globally has necessitated the adoption of artificial intelligence in all sectors of the economy. This adoption of artificial intelligence has also been used by leaders in all industries to help them improve on their performance. The use of AI is witnessed mainly in the performance of the hard aspects of leadership hence leaving the leaders with only the soft aspects of leadership to deal with. Adoption of AI in leadership has contributed to improved agility hence giving the organizations a competitive edge over the organizations that have not yet adopted AI. Agility is when people have the capabilities and understanding to respond quickly to disruption, capitalize on new opportunities and address threats (Adamopoulos, 2021). Despite the adoption of AI having its own challenges the benefits of AI by far out-weigh the challenges encountered while using AI.

INTRODUCTION

Organizations globally exist in an external environment that is very dynamic and mostly fueled by factors that are beyond their control. The external environmental factors currently making headlines include but not limited to political-legal factors, economic factors, socio cultural factors, technological factors and international environmental factors. These uncertain environments mean that there are no guarantees that your strategies will work and yield the results you desire (Virani, 2019) because the predictions used to develop the strategies may never be realized. The COVID 19 pandemic is credited as a factor that pushed many organizations to unleash their potential in terms of organizational and leadership agility. This was mainly achieved through a very quick change and adoption of technology. While the pandemic created opportunities to accelerate the development and use of technology, it also created a more volatile and uncertain business environment that forced organizations to become more agile and resilient to survive (Kumar, P. & Kumar, S.R., 2022). Denning (2018) in an Article titled *Why Agile is Eating the World* wrote that "Firms have to be nimble, adaptable, [and] able to adjust on the fly to meet the shifting whims of a marketplace driven by the customer." It is firms that are truly agile that are eating the world. In other words, agile mindsets are required across the entire organization to succeed in modern business. This truly pushes the responsibility of ensuring organizational agility to the leaders and especially the leaders at the strategic level of the business.

Leaders in organizations today must therefore be more informed about the changes taking place in the environmental factors in order to effectively respond to them and sustain their competitive advantage. The business environment has become very dynamic and unpredictable making it necessary for the leaders of this century and beyond to be very flexible. With the accelerating development and confluence of technology, data, and human behavior, humankind is increasingly challenged by complex problems that involve multiple disciplines, unclear requirements, coupled parameters, and changing environments (Song, Gyory, Zhang, Zurita, Stump, Martin, Miller, Balon, Yukish, McComb & Cagan, 2022). Today's leaders must possess agility to maneuver through the challenges possed by the dynamic business environment and capitalize on the opportunities presented by the digital age. During the process of leadership, the leader acts with a certain

leadership behavior in order to influence the led employees (followers) (Peifer, Jeske & Hille, 2022). Therefore the leaders today are highly challenged to embrace continuous learning in order to gain the skills required to manage the employees from different generations. Learning organization has become a necessity in the modern business world (Tominc, Oreški, and Rožman, 2023).

VUCA (Volatility, Uncertainty, Complexity, Ambiguity)

Over the last three decades there has been an un precedent growth and advancement in technology globally. This advances in technology remains as the greatest contributor to the dynamic nature of the organizational environment. The term VUCA was coined by the US Army War College to describe the dynamic nature of our world today. This term stands for Volatility, Uncertainty, Complexity and Ambiguity (Horney et al, 2010). The complete meaning of these words making VUCA is presented below:

- Volatility--The nature, speed, volume, magnitude and dynamics of change;
- Uncertainty--The lack of predictability of issues and events;
- Complexity--The confounding of issues and the chaos that surround any organization; and
- Ambiguity--The haziness of reality and the mixed meanings of conditions.

According to the Tristan Blog (2024) the VUCA world demands leaders to pivot swiftly due to several influential factors: technological progression, globalization challenges, fluid trends and economic fluctuations. According to Horney, O'Shea and Pasmore (2010) the 21st century is bringing a frenzy of innovation driven by the continuing digital revolution and expanding global markets.

The leaders therefore need to gain speed, fitness, flexibility and agility to maneuver through this VUCA environment. Young (2013) defined organization agility as an organization's ability to move quickly in response to unforeseen changes and its capability to use foresight in order to seize opportunities. Agility in leadership is the ability to move quickly and easily to effect change (Oluwaniyi, 2024). It describes the ability to prepare for unforeseen challenges that may suffice in a business environment (Oluwaniyi, 2024). For the organizational managers to be truly agile and ready to deal with the unpredictable nature of work they must master flexibility, adaptability and responsiveness (Meyer & Meijers, 2017). Worley and Lawler (2010) argued that agility is particularly needed as environments become more complex, uncertain, and unstable. Agility is therefore an organization's ability to dynamically respond to internal and external factors that are complex, turbulent, and uncertain, and which demand change (Young, 2013). According to Adamopoulos (2021) agility is everywhere today and extends into a myriad of functions - marketing, sales, finance, human resources, etc. as leaders have learned how to apply agile practices effectively across larger teams.

According to a blog by the Agile Leadership Journey (2023) leadership agility identifies a series of five sequential levels of agility that are predictable, learnable, and align with stages of personal development. These five levels are: expert, achiever, catalyst, co-creator, and synergist. As leaders progress in their leadership agility development, they retain the skills and capacities that they developed at the earlier levels. According to Meyer and Meijers (2017) with so many different situations and different people, all demanding a different approach, to be successful leaders must exhibit leadership agility – have the capacity to flexibly switch between leadership styles, and adaptively master new ones, in rapid response to the specific needs of the people and the situation they want to influence. Leadership agility is directly analogous to organizational agility: it is the ability to take wise and effective action amid complex, rapidly changing conditions (Joiner & Josephs, 2008). Organizational agility (OA) is the ability to adapt and accommodate changes required to respond with the required actions and requires the development of a number of characteristics and practices (Shafiabady, Hadjinicolaou, Din FU, Bhandari, Wu RMX & Vakilian, 2023). The ability to adapt to change and anticipate disruption and use both to your advantage, rather than being sidetracked by either, marks the qualities of an agile leader (Keegan, 2020). Therefore all leaders must endeavor to unleash their full potential in terms of quick and accurate data collection and analysis for quick and accurate decision making and also maintain flexibility in their strategies. The 21st century leader does

not have the luxury of rigidity. To gather the data required and make quick and accurate decisions the leader will need to take advantage of technology especially artificial intelligence.

Some studies have been done on leadership agiliy in various sectors. Wang, Lin and Shao (2022) did a study to examine the impacts of chatbot enabled agility (namely, internal and external chatbot agility) on customer service performance and explored the antecedents from the perspective of information technology use (both routine and innovative use). The results of this study showed that both routine and innovative uses of chatbots were positively related to internal and external agility. The innovative use of chatbots was found to play an important role in creating business agility. Internal and external agility were found to be positively related to customer service performance. According to Shafiabady et al, (2023) improving an organizational agility requires a number of ongoing practices including continuous communication, collaboration, engagement and providing support within organizations.

Artificial Intelligence

Various closely related definitions of artificial intelligence (AI) have been offered by different scholars. Artificial intelligence is referred to as machine intelligence and is the ultimate augmentation of human thinking converted into a technological platform (Olomi & Uranta, 2020). Sadek and Choudhury (2012) defined artificial intelligence is the ability of a computer system or machine technology to think, learn and retain, artificial intelligence is geared towards making machines smart. It is the intelligence that is demonstrated by machines compared to the natural intelligence depicted by humans (Olomi & Uranta, 2020). AI is described as a machine's capability to perform operations that typically require human intellect, such as speech recognition, understanding of natural language, and decision-making (Soori et al., 2023). The concept of AI encompasses a range of technologies, including Machine Learning and Deep Learning (Rožman, Oreški, Crnogaj & Tominc, 2023). Artificial intelligence plays a critical role in digital transformation (Frangos, 2022). AI combines aspects of both engineering and cognitive science (Peifer, Jeske & Hille, 2022). Artificial intelligence (AI), as a technology, allows machines to perform difficult tasks that ordinarily need human intelligence (Xiong, 2022). According to Miailhe and Hodes (2017) in terms of capabilities, artificial intelligence can be categorized as 3 different types from low to high capabilities as follow: Artificial Narrow Intelligence (ANI), Artificial General Intelligence (AGI) and Artificial Super Intelligence (ASI). Unlike previous technology adoption, AI is unique due to the rate of change and breadth of application possibilities (Frangos, 2022). AI advancements in the last decade have paved the way for an innovative and more digitalized society (Shafiabady et al, 2024). The AI is enabled to analyze its own environment and to collect, interpret and process essential data (Peifer, Jeske & Hille, 2022).

As businesses look for ways to transform their organizations in an era of uncertainty and emerging competitive threats, many are turning to artificial intelligence technology (Hurwitz, 2021). The very purpose of AI is to augment, improve, and ultimately replace human intelligence, which is still widely regarded, at least by us humans, as our key competitive advantage (Premuzic, Wade & Jordan, 2018). Artificial intelligence is transforming the world of business – and is particularly impacting leaders and their roles by delivering benefits such as helping with better, faster, and more informed decision-making and automating more routine areas of their jobs hence freeing leaders' time to concentrate on motivating and getting the best out of their people (Tivian Blog, 2023). According to Adamopoulos (2021) people are fearful of how AI and automation will affect their careers and are concerned that machines will displace them or render their skills obsolete. According to Olomi and Uranta (2020) artificial intelligence shows and gives employees a sense of work compatibility that reduces work frustration and the presence of this perceived compatibility creates a platform for reduced frustration, which also is a determinant of flexibility. Today's AI systems work with machine learning methods hence they are cognitive systems (Peifer, Jeske & Hille, 2022). Many people are worried they won't understand how to interact with and leverage technology in the digital age hence some are losing motivation to develop their skills or continue their professional development given how quickly technology is advancing (Adamopoulos, 2021). According to Premuzic et al (2018) it is very likely that AI will supplant many aspects of the "hard" elements of leadership — that is, the parts responsible for the raw

cognitive processing of facts and information while progressing to a future where AI will also lead to a greater emphasis on the "soft" elements of leadership — the personality traits, attitudes, and behaviors that allow individuals to help others achieve a common goal or shared purpose. The hard elements of leadership are repetitive and mechanical, whereas the soft elements are adaptable and human (Xiong, 2022). Therefore, artificial intelligence increases flexibility of leaders which in turn leads to increased agility. AI-assisted human teams achieve better coordination, i.e., communicating and responding to teammates rapidly, while acting more effectively and efficiently, i.e., correctly fulfilling their individual tasks more rapidly (Song et al., 2022). Automation is a powerful tool that can augment human skill rather than replace people entirely, so long as we're willing to view it in this light (Adamopoulos, 2021). The current AI revolution is expected to commoditize and automate the data-driven aspect of leadership, delegating the soft elements of leadership to humans (Premuzic, et al, 2018). Hard leadership talents typically require technical and repetitive abilities, such as data analysis, strategic planning, and design (Xiong, 2022). Therefore by using the AI, the hard aspects of leadership will be performed in a faster and more accurate manner using the technology assisted intelligence while the soft aspects of leadership will be performed by use of human intelligence. According to Xiong (2022) although the application of artificial intelligence is developing quickly, no machine or robot could ever replace the special qualities of people, such as their humility, personalities, and vision and therefore a good leader should pay more attention to soft skills in the future. The interpersonal field of human leadership, which may be adaptable to the changing environment, such as listening skills, team building, humanization, and adaptability, is critical to soft leadership skills (Xiong, 2022).

AI standards

The National Institute of Standards and Technology (2019) identifies nine areas of focus for AI standards. These areas are:

- Concepts and terminology
- Data and knowledge
- Human interactions
- Metrics
- Networking
- Performance testing and reporting methodology
- Safety
- Risk management
- Trustworthiness

Trustworthiness standards include guidance and requirements for accuracy, explainability, resiliency, safety, reliability, objectivity, and security.

Characteristics of Artificial Intelligence in Leadership Agility

AI Leadership skills of the future that managers need are heavily oriented towards integrating employees and technology along with long-term decision making and vision (Great Learning Team, 2021). Various scholars and research institutions have done studies and identified the characteristics of AI in leadership agility as well as the characteristics of agile leaders. The study by Shafiabady et al. (2023) found the leading top eight characteristics of organizational agility were; open communications, flexible and adaptable, transparency in decision making, empowered team members, openness to change, committed to agility, continuous learning from experience and self-aware and honest.

The Tristan Blog (2024) identifies the characteristics of agile leaders as visionary adaptability (fostering a clear vision while remaining adaptable in strategy, aligning approaches with evolving circumstances), open-mindedness (welcoming diverse viewpoints, nurturing an innovative and creative culture within their teams), emotional intelligence: (excelling in understanding and managing emotions within the team, fostering trust and resilience), decisiveness: (swift, critical decision-making even in the absence of complete information,

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue XIV February 2025 | Special Issue on Management

with readiness to adjust course) and continuous learning: (commitment to personal and professional development, acknowledging learning as an ongoing journey).

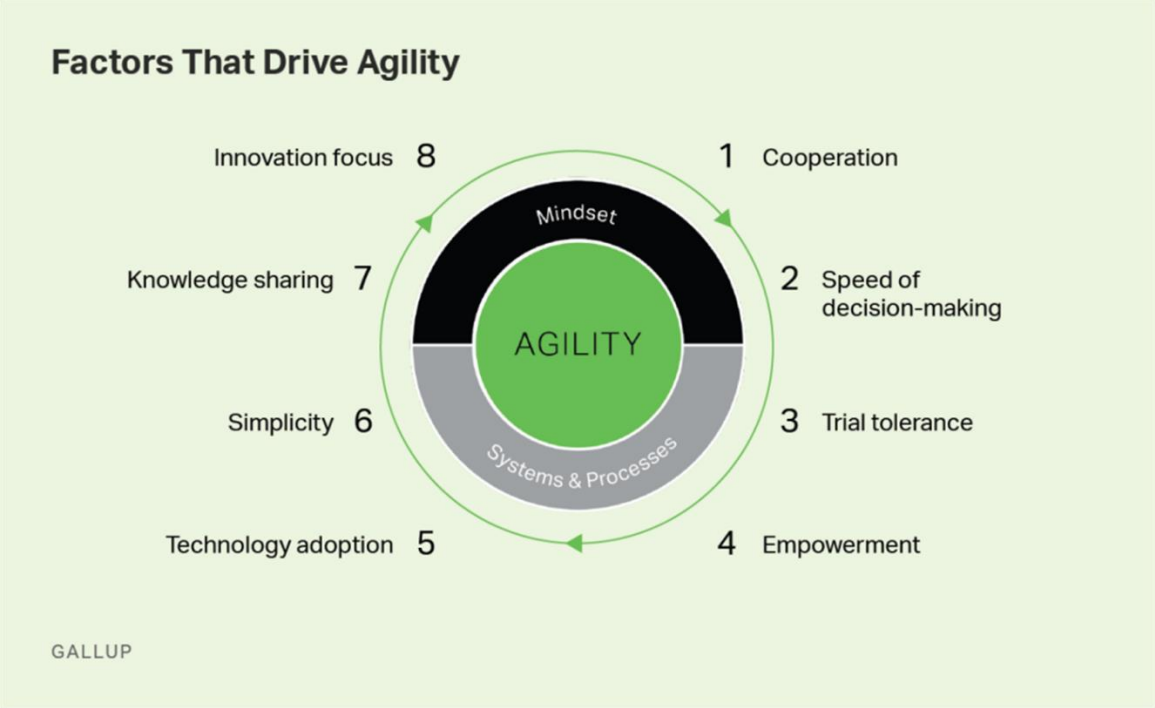
According to Metcalf (2023) there are ten items that leaders will need to do well in the AI powered future. These are:

- Communication
- Growth Mindset
- Adaptiveness
- Emotional Intelligence
- Abundance Mindset
- Domain Expertise
- AI Skills
- Analytical Skills
- Creativity
- Risk Awareness

A blog by the Great Learning Team (2021) identified ten (10) AI leadership skills that are essential for the future. These are:

- Emotional Intelligence
- Agility
- Empathy
- Cultural Intelligence
- Critical and creative thinking
- Ethical judgment
- Humility
- Accountability
- Courage
- Intuition

According to Gallup, the eight factors drive agility are: cooperation, speed of decision making, trial tolerance, empowerment, technology adoption, simplicity, knowledge-sharing, and innovation focus.



Use of AI in Leadership

According to Behrens (2024) today the integration of AI touches every aspect of our lives, from the way we manage our finances to how we communicate with friends. The increasing integration and use of AI have a major impact on the work environment of companies (Peifer, Jeske & Hille, 2022). Its influence spans beyond the realms of product and technology, infiltrating every corner of our professional and personal lives. In an AI age characterized by intense disruption and rapid, ambiguous change, we need to rethink the essence of effective leadership (Premuzic et al, 2018). AI is a potent force that will redefine, not replace, workplace leadership (Xiong, 2022). The contemporary landscape of leadership is swiftly evolving, shaped by the incessant pace of technological advancement and the imperative for adaptability (Tristan, 2024). Successful leaders are those who will constantly find new ways to work, learn and empower their workforces (Adamopoulos, 2021). In addition to the employees, the introduction and use of AI has a significant influence on leaders and leadership (Peifer, Jeske & Hille, 2022). Enlightened corporate leaders recognize the problems of employees and put new progress of leadership theory into practice to create a more successful working environment (Xiong, 2022). According to Virani (2019) in the era of AI leaders will have to shift into roles that require them to think strategically, operate in uncertain environments and learn quickly. AI empowers organizations by analyzing large data sets quickly and accurately, enabling faster decision-making and building agility and resilience therefore giving businesses a competitive advantage and allowing them to adapt to rapidly changing environments (Shafiabady, Hadjinicolaou, Hettikankanamage, MohammadiSavadkoohi, Wu RMX, Vakilian, 2024). AI has dramatically changed the definition of human leadership, and it will become more common in the workplace through automating internal procedures and tasks, improving leaders' outcomes and processes, enhancing human expertise and improve the level of human resource management (Xiong, 2022).

AI creates a need for more leadership capabilities that cannot be tackled by technology or by traditional leadership skills (Upadhyay, 2023). The Tivian Blog (2023) has identified several ways in which artificial intelligence is used by business leaders. This includes, firstly to improve decision-making, secondly it is used in improving performance reviews, thirdly it is used in predictive recruiting and project management and fourthly it is used in more in-depth, personalized leadership training. Besides this according to the Tivian Blog (2023) AI is also used to remove administration as well as to deliver personalized communications. Leaders can bring up the joint effort of human and artificial intelligence and this can be done by deploying AI as a relevant and effective tool (Upadhyay, 2023). By leveraging AI to inform leadership decision-making, companies can improve accuracy, reduce errors, and optimize their operations, leading to better outcomes and increased profitability (Dennison, 2023). Leaders can use their skills, creativity, and personality to make a difference that can be helpful to address the challenges faced by businesses (Upadhyay, 2023). Qualities, such as deep domain expertise, decisiveness, authority, and short-term task focus, are losing their cachet, while others, such as humility, adaptability, vision, and constant engagement, are likely to play a key role in more-agile types of leadership (Premuzic et al, 2018).

Virani (2019) in the Forbes Blog identifies six ways leaders can prepare themselves to lead more effectively in the age of AI and stay agile so that they can adapt to the new environment. This are:

- Build your own learning agility.
- Become a developer of people.
- Make failure an essential part of succeeding.
- Democratize information.
- Develop social skills in your people.
- Step beyond the internal organizational environment.

As AI technology continues to evolve and become more sophisticated, we can expect to see even more significant improvements in accuracy and productivity in the workplace (Dennison, 2023). The advent of machine learning and AI forces leaders to re-evaluate what it takes to lead an AI-driven firm successfully (Frangos, 2022). Deep learning is a separate segment of machine learning (Peifer, Jeske & Hille, 2022).

Deep learning refers to the way to recognize pattern from data by trying to replicate the structure and functionalities of the human brain to hopefully achieve the cognitive capabilities in computers (Al-Walai & Liang, 2021). Machine learning is a subset of AI that empowers machines to learn from data and previous experiences autonomously (Rožman et al, 2023). Machine learning is aimed for data-based pattern recognition by using abstruse statistical techniques enabling computers to improve performance by experience (Al-Walai & Liang, 2021). Computers are efficient in pattern recognition due to its strong capability in utilizing more data and different dimensions of data (Al-Walai & Liang, 2021). Machine learning and data processing capabilities in a business context encompass a wide range of technologies and methods that are used to extract insights, make predictions, and automate decision-making processes based on data thus enabling businesses to leverage their data assets to gain insights, improve operational efficiency, enhance customer experiences, and drive innovation.

Al-Walai and Liang (2021) did a study to explore the impacts of AI application on management and leadership, and also how AI can be used for achieving innovation success in research and development (R&D) department. The study used a single and holistic case study on the organisation. Primary data from multiple interviews and secondary data in the form of publicly available data were collected for the study. The grounded theory approach with nine interviews for a phenomenological study was used for analysis of the data. The results of the study show that AI application in research and development can lead to higher efficiencies in processes, decision making, costs and stimulate innovation, while a shift of leadership elements and organizational structure changes can be expected. Perifanis and Kitsios (2023) did a study on the integration of AI with business and IT strategies in the context of digital transformation. The research found that organizations commonly undergo a digital transition driven by technological developments and regulatory changes and that the integration of AI capabilities with business and IT strategies is crucial for achieving improved business value outcomes and enabling digital transformation alignment. It is imperative to note as argued by Quaquebeke and Gerpott (2023) that technology is moving from a mere tool for human leaders (i.e., the NOW) to an (pro)active advisory/support role for human leaders (i.e., the NEW) to eventually substituting for human leadership (i.e., the NEXT). In the NOW, human leaders are still the main initiators of task relations and change-oriented leadership functions—even if they are enacted via digital channels hence in this case digitalization in leadership refers to digitally mediated communication and the associated challenges of leading a remote or hybrid workforce (Quaquebeke & Gerpott, 2023).

Importance of Agility in Leadership

Businesses worldwide are realizing the potential benefits of emerging technologies such as artificial intelligence (AI), cloud computing, the Internet of Things, and big data (European Commission, 2017 as cited in Tominc et al., 2023). The emergence of AI as a potent force of change will inevitably upend and redefine the agile paradigm (Behrens, 2024). Agility depends on access to relevant data to drive decision making and finding solutions (Virani, 2019). Agile, in its essence, is about navigating change effectively; thus, it must evolve in response to the new realities shaped by AI (Behrens, 2024).

The influence of AI touches leadership and agility (along with everything else) – affecting team roles, structures and dynamics, process guidelines and facilitation, technical practices, data security and ethics, and the very essence of agile frameworks (Behrens, 2024). This broad-reaching impact underscores the demand and necessity for agile practitioners and leaders to adapt to the evolving needs prompted by AI (Behrens, 2024). Artificial intelligence technologies can rapidly provide new insights into events, shorten development cycles, enable quality control by machines, and enhance overall quality of life (Gupta, 2022). As the environment shifts, the company must adapt correspondingly to ensure efficient and successful operations (Stoddard, Gillis & Cohn, 2019). Companies that know how to use artificial intelligence tools are more innovative and competitive (Tominc et al, 2023).

Failure to prioritize agility and responsiveness can result in increased costs, missed opportunities, competition and reputational damage, and ultimately, loss of customers, revenue, profitability, and market share (Shafiabady, Hadjinicolaou, Hettikankanamage, MohammadiSavadkoohi, Wu RMX & Vakilian,

2024). This is because according to Oluwaniyi (2024) agility helps leaders pivot strategies and operations to address any situation that may arise hence agile leaders have more ability to handle unexpected crises that may affect the business. High strategic agility in organizations is associated with stronger employee commitment and motivation, both of which stimulate creativity and the exchange of ideas for developing new products and services in the workplace (Franco & Landini, 2022). Agility is the ability of the organization to renew itself and stay flexible without sacrificing efficiency (Junni, Sarala, Tarba & Weber, 2015). Agility enables individuals to make quick decisions to minimize the impact of change on their organization and stakeholders (Oluwaniyi, 2024). According to Shafiabady et al., (2023) the benefits of agility include the acceleration of organizational learning to meet the pace of rapid environmental change through flexibility in assembling resources, knowledge, processes and capabilities. Flexibility is required for changes which are familiar and often lead to a temporary change in the level of activity of the organization (Olomi & Uranta, 2020). Agility also enables organizations to sustain their competitive advantage by increasing responsiveness when making business decisions. Currently AI is enhancing agility by changing the way that leaders make decisions hence leaders use AI to simplify and enhance the decision-making process by reducing the cognitive processing of facts and information (Xiong, 2022). In recruitment AI helps to tackle issues such as unconscious bias that have previously affected decision making and proved slow to eradicate and also AI can use data analytics during hiring decisions to ensure there is balance and diversity, also ensuring a level playing field for candidates regardless of gender, age, ethnic origin and location (De Fonseca, 2010). AI can help identify individual employee strengths and development areas more precisely (Triangility, 2024).

Agility enables businesses to respond rapidly to customer needs, improve operational efficiency, and gain a competitive edge. AI offers opportunities for automation, data-driven decision-making, personalized customer experiences, and predictive analytics (Rožman, Oreški, Crnogaj and Tominc, 2023). Agility depends on access to relevant data to drive decision making and finding solutions (Virani, 2019). AI can provide significant tools to help businesses take advantage of their data and knowledge (Hurwitz, 2021). The findings of the study by Rožman et al, (2023) confirm that AI plays a crucial role in providing accurate data and information, facilitating quick and informed decision-making and ultimately leading to successful outcomes where products or services meet customer expectations. AI systems are able to process huge amounts of data in real time, identifying patterns and trends that often remain hidden to human eyes hence enable more informed and data-driven decision-making hence leaders are better informed and can respond more quickly to changing market conditions (Triangility, 2024).

AI has serious potential, but leaders need to manage expectations, understand implications, and develop AI solutions tailed to their agency mission and needs (Keegan, 2020). AI has the capacity to augment human decision-making, bringing to the boardroom more complex problem-solving and impartial data analysis than would otherwise be possible, while continuing to value human creativity and innovation (De Fonseca, 2010). AI can take also over tasks so that managers can concentrate more on strategic planning, innovative idea development and, above all, on the individual support of their employees (Triangility (2024). Hurwitz, (2021) proposes three key imperatives that can help an organization to make good use of AI strategy that can help support the organizations business goals. These include firstly know the business problems you're targeting with AI. Secondly create hybrid teams of business and technical professionals and lastly focus on augmented intelligence.

Alshamsi, Hussain and Ali (2024) did an in-depth analysis of the interaction between Artificial Intelligence (AI), organizational agility, and performance within the UAE's public energy sector. The study adopted a cross-sectional survey design, with data collected from 245 managers across various public energy companies in the UAE. From the analysis of the collected data the study's findings revealed a significant direct impact of AI on organizational performance, which is further enhanced by the presence of organizational agility. The data also indicated that AI's integration within Customer Relationship Management and Cost-efficient IS Operations positively affects performance. Additionally, organizational agility through its components of responsiveness and competency serves as a significant intermediary, amplifying the influence of AI on performance.

Benefits of AI in Leadership

Organizations that successfully leverage AI can gain a competitive edge in an unstable and confusing market (Dennison, 2023). As the scope and applicability of AI aggrandize, traditional leadership needs to evolve and meet the challenges and harness the opportunities this elusive technology presents (Frangos, 2022). AI can forever change how the world works, revolutionizing the way we perceive, think, reason, learn, and make decisions (Keegan, 2020). AI in business involves the use of intelligent computer software with humans to increase productivity, improve customer experience, heighten revenue and efficiency, and encourage business growth and transformation (Upadhyay, 2023). Additionally, AI has the potential to help address many of our country's pervasive problems and advance our safety, health, and well-being (Keegan, 2020). Some leaders mistakenly believe that automation is solely about cutting costs (i.e., human workers) when its real value comes from freeing people to discover higher value uses for their time (Adamopoulos, 2021).

The Tivian Blog (2023) has identified four benefits of AI for leaders. These benefits include: enabling transformative leadership, supports better leadership development, supporting proactivity and agility and increase team performance and collaboration. AI analyses data in real time and provides recommendations for action hence allows leaders to make better-informed decisions and react faster to changes (Triangility, 2024). By implementing AI solutions, companies can free employees to focus on higher-level tasks requiring more critical thinking and creativity (Dennison, 2023). AI will increase the productivity of leaders by taking over some automated, mechanical, and administrative activities (Xiong, 2022). It can improve agencies' effectiveness, make data more understandable and easier to use, and help citizens navigate government services (Keegan, 2020).

AlNuaimi et al (2022) did a study on how digital transformation organizational agility influences transformation with strategy as a moderator. From the study they found that transformation influences agility positively. Ameen, Tarba, Cheah, Xia and Sharma (2024) did a study to identify new ways in which organizations can use artificial intelligence (AI) more effectively for creativity. The researchers collected research data via a large survey of managers distributed to 600 organizations in China. Analysis of the collected data showed that coupling AI capability with strategic agility can directly support creativity. The findings of the study also showed that coupling AI capability and strategic agility can significantly improve firms' new product creativity and new service development performance when there is a high level of government institutional support.

Olomi and Uranta (2020) did a research to examine the extent to which artificial intelligence predicts organizational agility of head of departments (HODs) of tertiary institutions in Rivers state. Three (3) tertiary institutions were investigated using a cross sectional research design where 45 HODs were sampled using the random sampling technique and then primary data was collected using a structured questionnaire. Both descriptive statistical analysis and inferential analysis were done on the collected data. Descriptive statistics was used for analysis of data while Spearman correlation statistics was used in testing the hypotheses formulated. The findings from the data analysis show that artificial intelligence positively and significantly influences both competence and flexibility. From these findings it was concluded that artificial intelligence can act as a tool in attaining organizational agility. Janićijević (2017) acknowledged that machines or robots with artificial intelligence can perform better than human performance level in some curtain circumstances only. Based on literature, Frangos (2022) presented a new framework to build on current leadership insights and technology adoption theories. The framework connects required leadership capabilities (agility, vision, engagement, ethics, and digital know-how) and organizational domains (knowledge, competence, and culture) to create a tool for executive leaders to drive AI adoption throughout their firms. Leaders who possess an agile and inquisitive mindset can better position the organizations they lead to realize the benefits of artificial intelligence while avoiding potential pitfalls (Keegan, 2020). Artificial intelligence can reduce operational expenses in businesses, and companies can engage customers, systematize business logistics and processes and enhance productivity (Upadhyay, 2023). Dennison (2023) has identified predictive analytics, natural language processing and fraud detection as other benefits of AI-informed leadership. Predictive

analytics is a branch of artificial intelligence that uses data mining, machine learning, and statistical algorithms to analyze current and historical data to make predictions about future events or trends (Dennison, 2023).

Challenges of AI in Leadership

Although artificial intelligence (AI) has advanced far enough to be effective for task-specialized problem solving, it is still challenging for AI alone to solve such complex interdisciplinary problems purely through data analysis and powerful computing capacity (Jarrahi, 2018). Organizations face the two-fold challenge of meeting ever-increasing customer demands and safeguarding their reputations. In this context, using Artificial Intelligence (AI) is becoming increasingly crucial to deal with more significant customer requirements and levels of customer satisfaction required to prevent reputation loss (Shafiabady et al, 2024).

Implementing and adopting successful AI applications in organizations means not only opportunities in business growth, improved customer experience, or increase of efficiencies through automation and optimization, but also poses challenges towards the agility of leadership, the talent and competence skill management, and the organizational design and governance - demanding an AI operating model that considers process, structure, people, and technology (AMLD EPFL, 2020). If we are to steer the technologies between the benefits it can bring and the challenges it can create, our society needs to seriously think about and build a set of standards and policies that guide the development of these technologies (Keegan, 2020). The use of artificial intelligence poses some challenges for the management of leaders, such as data security and ethical and moral issues hence leaders need to change their leadership styles and philosophies with the times to meet these challenges (Xiong, 2022). The Tivian Blog, (2023) has identified three challenges of AI for leaders include managing employee concerns around AI, becoming an AI-driven leader and leaders need to develop and focus on new skills. Artificial intelligence can support, but interpersonal interaction, empathy and emotional intelligence remain essential elements of successful leadership (Triangility, 2024).

CONCLUSIONS

To overcome the weaknesses in using AI among employees and leaders, organizations must invest in training and development programs to help employees adapt to technological changes and AI integration. Leaders should focus on blending AI with human-centered leadership by fostering emotional intelligence, collaboration, and innovation. Companies should implement strong change management strategies to reduce employee resistance and create a culture of adaptability. Ethical considerations in AI deployment must be prioritized, ensuring transparency, data security, and responsible decision-making. Additionally, organizations should adopt flexible strategic planning frameworks that allow them to pivot quickly in response to external changes. A balanced approach to agility and stability should be maintained, ensuring that leaders do not become overly reactive but instead take calculated risks to drive growth. Lastly, leveraging AI for data-driven decision-making should be complemented by human intuition to create a holistic leadership approach

REFERENCES

1. Adamopoulos, A. (2021). Aligning Business Agility with AI Opportunity. *Journal of Business Agility, 38-43*. https://www.emergn.com/wp-content/uploads/2021/12/Emergence-Aligning-Business-Agility-with-AI-Opportunity-Alex-Adamopoulos.pdf
2. Agile Leadership Journey (2023). https://www.agileleadershipjourney.com/leadership-journey/leadership-agility
3. AlNuaimi, B. K., Singh, S. K., Ren, S., Budhwar, P. & Vorobyev, D. (2022) Mastering digital transformation: The nexus between leadership, agility, and digital strategy. *Journal of business research, undefined*. https://doi.org/doi:https://doi.org/10.1016/j.jbusres.2022.03.038

4. Alshamsi, S. A. S. A., Hussain, T. P. R. S., & Ali, S. S. S. (2024). The Role of Artificial Intelligence on the Public Energy Sector Performance in the United Arab Emirates: The Mediation Role of Organizational Agility. *Journal of Law and Sustainable Development*, *12*(1), e2808. https://doi.org/10.55908/sdgs.v12i1.2808
5. Al-Walai, S. & Liang, J. (2021). *Impact of Artificial Intelligence on Management and Leadership in Research & Development A Case Study of Thermo Fisher Scientific*. Department of Industrial Economics at Blekinge Institute of Technology in partial fulfilment of the requirements for the Degree of Master of Science in Industrial Economics and Management.
6. Ameen, N., Tarba, S., Cheah, J.-H., Xia, S. & Sharma, G.D. (2024). Coupling Artificial Intelligence Capability and Strategic Agility for Enhanced Product and Service Creativity. *British Journal of Management.* Vol. 0, 1–19. https://doi.org/10.1111/1467-8551.12797
7. AMLD EPFL (2020). Leadership in the Age of AI: encoding Autonomy, Agility, and Purpose in an AI-driven Organization. https://appliedmldays.org/events/amld-epfl-2020/talks/leadership-in-the-age-of-ai-encoding-autonomy-agility-and-purpose-in-an-ai-driven-organization16:00-16:30, January 27 @ 4BC
8. Behrens, P. (2024). Why Agilists are Heading to AI. Founder and CEO, Agile Leadership Journey. https://www.linkedin.com/pulse/why-agilists-heading-ai-pete-behrens-uczgc/
9. De Fonseca, M. S. (2010). What the rise of AI in leadership means for the future of work. *Thought Leadership*, Jan 10, 2010.
10. Denning, S. (2018). *The Challenge Of Leadership In The Age Of Agile*. HESSELBEIN & COMPANY. First published: 12 April 2018. https://doi.org/10.1002/ltl.20371
11. Dennison, K. (2023). The Impact Of Artificial Intelligence On Leadership: How To Leverage AI To Improve Decision-Making. Forbes. https://www.forbes.com/sites/karadennison/2023/03/14/the-impact-of-artificial-intelligence-on-leadership-how-to-leverage-ai-to-improve-decision-making/?sh=1e05f49933d9
12. Frangos, P. (2022). An Integrative Literature Review on Leadership and Organizational Readiness for AI. *European Conference on the impact of artificial intelligence on and Robotics.* Vol. 4.issue1
13. Franco, C. and Landini, F. (2022). 'Organizational drivers of innovation: the role of workforce agility', *Research Policy*,51, art. 104423.
14. Gao, Z., Cheah, J.-H., Lim, X.-J. & Luo, X. (2024). Enhancing academic performance of business students using generative AI: An interactive-constructive-active-passive (ICAP) self-determination perspective, *The International Journal of Management Education*, 10.1016/j.ijme.2024.100958, 22, 2, (100958), (2024).
15. Great Learning Team (2021). 10 Effective Leadership Skills You Need in the Age of AI. Updated on May 17, 2021. https://www.mygreatlearning.com/blog/effective-leadership-skills-you-need-in-the-age-of-ai/
16. Gupta, S. (2022). Artificial Intelligence, Analytics and Agile: Transforming Project Management in the 21st Century. *Int. J. Recent Technol. Eng.* 2022, 11, 1–8. [Google Scholar] [CrossRef]
17. Horney, N., O'Shea, T. & Pasmore, B. (2010). Leadership agility: a imperative for a VUCA world. *People & Strategy*, vol. 33, no. 4, Dec. 2010, pp. 32+. *Gale Academic OneFile*, link.gale.com/apps/doc/A249309860/AONE?u=anon~ccee0279&sid=googleScholar&xi=512df2a3. Accessed 25 Apr. 2024.
18. Hurwitz, J. (2021). Artificial Intelligence (AI): 3 imperatives to support business agility. The Enterprisers Project- A community helping CIOs and IT leaders solve problems. https://enterprisersproject.com/article/2021/4/artificial-intelligence-ai-3-keys-agility
19. Janićijević, N. (2017). Organizational models as configurations of structure, culture, leadership, control, and change strategy. *Economic Annuals*, 62 (213), 67-91.
20. Jarrahi, M.H. (2018). Artificial intelligence and the future of work: Human-AI symbiosis in organizational decision making. *Business Horizons*, 61 (4) (2018), pp. 577-586
21. Joiner, B. & Josephs, S. (2008). Leadership agility. *Insight (American Society of Ophthalmic Registered Nurses)*. 33. 32-7.

22. Junni, P., Sarala, R. M., Tarba, S. Y. & Weber, Y. (2015). 'The role of strategic agility in acquisitions', *British Journal of Management*, 26, pp. 596–616
23. Keegan, M. J. (2020). Agile and Inquisitive—AI Leadership. *IBM Center for The Business of Government*, 6 5-67. Forum: Evolving Use of Artificial Intelligence in Government
24. Kumar P. and Kumar Singh R., "Strategic framework for developing resilience in Agri-Food Supply Chains during COVID 19 pandemic," *International Journal of Logistics Research and Applications*, vol. 25, no. 11, pp. 1401–1424, 2022. [Google Scholar]
25. Metcalf, M. (2023). 10 Characteristics Business Leaders Will Need In The Age Of AI. Leadership, Forbes. Jun 21, 2023,09:15am EDT
26. Meyer, R. & Meijers, R. (2017). Developing Leadership Agility: Different Projects, Different Approaches. *Advances in Project Management. PM World Journal* Vol. VI, Issue XI – November 2017. www.pmworldjournal.net Series
27. Miailhe, N. & Hodes, C., (2017). The Third Age of Artificial Intelligence. *Field actions science reports,* pp. 6-11
28. National Institute of Standards and Technology (2019). U.S. LEADERSHIP IN AI: A Plan for Federal Engagement in Developing Technical Standards and Related Tools. Prepared in response to Executive Order 13859. Submitted on August 9, 2019. https://www.nist.gov/system/files/documents/2019/08/10/ai_standards_fedengagement_plan_9aug2019.pdf
29. Olomi, P, O & Uranta, R. S. (2020). Artificial Intelligence and Organisational Agility of Heads of Department in Tertiary Institutions within Port Harcourt Metropolis, Rivers State, Nigeria. *American International Journal of Business Management (AIJBM).* ISSN- 2379-106X, www.aijbm.com Volume 3, Issue 9 (September 2020), PP 03-08
30. Oluwaniyi, R. (2024). https://www.testgorilla.com/blog/agility-in-leadership/
31. Peifer, Y., Jeske, T., & Hille, S. (2022). Artificial Intelligence and its Impact on Leaders and Leadership. *Procedia Computer Science 200* (2022) 1024–1030. DOI.10.1016/j.procs.2022.01.301
32. 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*. 2023; 14(2):85. https://doi.org/10.3390/info14020085
33. Premuzic, T. C., Wade, M. & Jordan, J. (2018). As AI Makes More Decisions, the Nature of Leadership Will Change. *Havard Business Review.* January 22, 2018
34. Quaquebeke, N. V., & Gerpott, F. H. (2023). The Now, New, and Next of Digital Leadership: How Artificial Intelligence (AI) Will Take Over and Change Leadership as We Know It. *Journal of Leadership & Organizational Studies,* 30(3), 265-275. https://doi.org/10.1177/15480518231181731
35. Rožman, M., Oreški, D., Crnogaj, K., & Tominc, P, (2023). Agility and Artificial Intelligence Adoption: Small vs. Large Enterprises. *NAŠE G O S P O D ARSTVO / O U R E C O N O M Y* 69 (4) 26-37
36. Shafiabady N, Hadjinicolaou N, Din FU, Bhandari B, Wu RMX, & Vakilian J (2023) Using Artificial Intelligence (AI) to predict organizational agility. *PLoS ONE* 18(5): e0283066. https://doi.org/10.1371/journal.pone.0283066
37. Shafiabady, N., Hadjinicolaou, N., Ud DIN, F., Bhandari, B., Wu, R.M.X & Vakilian, A. (2023). Using Artificial Intelligence (AI) to predict organizational agility. *PLoS One*. 2023; 18(5): e0283066. Published online 2023 May 10. doi: 10.1371/journal.pone.0283066
38. Shafiabady N, Hadjinicolaou N, Hettikankanamage N, MohammadiSavadkoohi E, Wu RMX, Vakilian J. 2024. eXplainable Artificial Intelligence (XAI) for improving organisational regility. *PLoS One*. 2024 Apr 24;19(4):e0301429. doi: 10.1371/journal.pone.0301429. PMID: 38656983; PMCID: PMC11042710
39. Song, B., Gyory, J. T., Zhang, G., Zurita, N. F. S., Stump, G., Martin, J., Miller, S., Balon, C., Yukish, M., McComb, C. & Cagan, J., (2022). Decoding the agility of artificial intelligence-assisted human design teams, *Design Studies,* Volume 79, 2022, 101094, ISSN 0142-694X, https://doi.org/10.1016/j.destud.2022.101094.

40. Soori, M., Arezoo, B., & Dastres, R. (2023). Artificial intelligence, machine learning and deep learning in advanced robotics, a review. *Cognitive Robotics,* 3, 54–70 DOI: https://doi.org/10.1016/j.cogr.2023.04.00
41. Stoddard, M. M.; Gillis, B.; Cohn, P. (2019). Agile project management in libraries: Creating collaborative, resilient, responsive organizations. *J. Libr. Adm.* 2019, 59, 492–511. [Google Scholar] [CrossRef]
42. Tivian Blog, (2023). How is AI changing leadership? https://www.tivian.com/us/ai-leadership/
43. Tominc, P.; Oreški, D.; Rožman, M. (2023). Artificial Intelligence and Agility-Based Model for Successful Project Implementation and Company Competitiveness. *Information* 2023, *14*, 337. https://doi.org/10.3390/info14060337
44. Triangility (2024). AI and Leadership: How Artificial Intelligence is changing the leadership role. https://triangility.com/ai-and-leadership-how-artificial-intelligence-is-changing-the-leadership-role/
45. Tristan (2024). AI and Leadership Agility: Adapting to the Rapid Pace of Technological Change. January 25, 2024. https://www.tristanahumada.com/blog/ai-and-leadership-agility-adapting-to-the-rapid-pace-of-technological-change
46. Upadhyay, D. (2023). How Does AI Pose Challenges for Leaders in Organizations? -A Conceptual Study. *J Edu Psyc Res*, 5(3), 720-727.
47. Virani, Y. (2019). Leadership. Six Ways For Leaders To Stay Agile In The Age Of Artificial Intelligence. *Forbes.* Oct 8, 2019,08:15am EDT
48. Wang, X., Lin, X. & Shao, B. (2022). How does artificial intelligence create business agility? Evidence from chatbots, *International Journal of Information Management*, Volume 66, 2022, 102535, ISSN 0268-4012, https://doi.org/10.1016/j.ijinfomgt.2022.102535.
49. Worley, C. G., & Lawler, E. E., III. (2010). Agility and organization design: A diagnostic framework. *Organizational Dynamics,* 39(2), 194.
50. Xiong, W. (2022). AI and Leadership New Changes of Leadership Under the Development of Artificial Intelligence. MMET 2022, ASSEHR 703, pp. 497–503, 2023. https://doi.org/10.2991/978-2-494069-51-0_ 69
51. Young, A.G. (2013) "*Identifying the impact of leadership practices on organizational agility*" (2013). Theses and Dissertations. 386. https://digitalcommons.pepperdine.edu/etd/386