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# Navigating the Future: The Impact of Artificial Intelligence on Adaptive and Ethical Leadership
*(Melayari Masa Depan: Kesan Kepintaran Buatan terhadap Kepimpinan Adaptif dan Beretika)*

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## ABSTRACT

This paper investigates the intersection of artificial intelligence (AI) progression with adaptive and ethical leadership, emphasizing the critical implications of transitioning from Artificial Narrow Intelligence (ANI) to the more advanced and theoretical stages of Artificial General Intelligence (AGI) and Artificial Superintelligence (ASI). As AI technologies rapidly evolve, they present both unprecedented challenges and transformative opportunities for leadership across various sectors. The study explores how adaptive leadership, characterized by agility, flexibility, and responsiveness, is vital for effectively navigating the complexities of an increasingly AI-driven landscape. Simultaneously, ethical leadership is identified as essential for addressing the intricate ethical dilemmas posed by AI, including issues such as algorithmic bias, transparency, and accountability. Through a comprehensive analysis, this paper argues that the successful integration of AI into organizational frameworks necessitates leaders who are not only adaptable but also deeply committed to ethical principles. The findings underscore the necessity of dynamic leadership approaches that harmonize innovation with ethical considerations, ensuring that AI advancements foster positive societal outcomes while mitigating potential risks. The study's insights contribute to a broader understanding of how leadership must evolve in response to the transformative potential of AI, offering guidance for leaders and policymakers to navigate the future responsibly.

Keywords: Adaptive Leadership, Ethical Leadership, Artificial Intelligence, Technological Evolution

## *ABSTRAK*

*Kertas ini menyelidiki titik persilangan antara kemajuan kecerdasan buatan (AI) dengan kepimpinan adaptif dan beretika, yang menekankan implikasi kritikal peralihan dari Kecerdasan Buatan Terhad (ANI) kepada tahap yang lebih maju dan teoritik, iaitu Kecerdasan Buatan Umum (AGI) dan Kecerdasan Buatan Super (ASI). Dengan kepesatan evolusi teknologi AI, ia bakal menghadapi cabaran yang belum pernah terjadi sebelum ini serta peluang transformasi dalam pelbagai sektor. Kajian ini meneroka bagaimana kepimpinan adaptif, yang dicirikan oleh ketangkasan, fleksibiliti, dan responsif, adalah penting untuk menangani kerumitan landskap yang semakin didorong oleh AI. Pada masa yang sama, kepimpinan etika dikenalpasti sebagai kunci untuk menangani dilema etika yang rumit yang dipengaruhi oleh AI, termasuk isu seperti bias algoritma, ketelusan, dan akauntabiliti. Melalui analisis komprehensif, kertas ini menekankan bahawa integrasi AI yang berjaya dalam merangka kerja organisasi memerlukan pemimpin yang bukan sahaja boleh menyesuaikan diri tetapi juga komited kepada prinsip etika. Penemuan kajian ini menekankan keperluan untuk pendekatan kepimpinan dinamik yang mengharmonikan inovasi dengan pertimbangan etika, memastikan kemajuan AI membentuk masyarakat yang positif serta mengurangkan risiko yang berpotensi. Wawasan kajian ini menyumbang kepada pemahaman yang lebih luas tentang bagaimana kepimpinan perlu berkembang sebagai respons terhadap potensi transformasi AI, menawarkan panduan kepada pemimpin dan penggubal dasar untuk mengemudi masa depan dengan bertanggungjawab.*

*Kata kunci: Kepimpinan Adaptif, Kepimpinan Etika, Kecerdasan Buatan (AI), Evolusi Teknologi*

## INTRODUCTION

Artificial Intelligence (AI) has advanced significantly, moving from task-specific Artificial Narrow Intelligence (ANI) to the potential development of Artificial General Intelligence (AGI) and Artificial Superintelligence (ASI). While ANI performs specific tasks like image recognition and data analysis, AGI aims to replicate human intellectual capabilities, and ASI could surpass human intelligence in all areas (Murugesan, 2024; Klingler, 2024). This progression presents profound challenges for leadership, as AI technologies increasingly take on complex decision-making roles, potentially displacing human leaders and raising ethical concerns such as bias, transparency, and accountability (Uddin, 2023). As AI continues to evolve, leaders must navigate these challenges while ensuring that AI is used responsibly and aligned with societal values (Uddin, 2023).

This study explores how leaders can effectively adapt to and ethically manage the challenges posed by AI's evolution. The focus is on how adaptive leadership, which emphasizes flexibility and responsiveness, and ethical leadership, which ensures AI technologies are aligned with ethical standards, can help leaders guide organizations through this transformation. This research argues that these leadership approaches are essential for addressing the complexities of AI integration, ensuring that AI advancements contribute positively to organizations and society while mitigating potential risks.

### Artificial Intelligence

Artificial Intelligence (AI) refers to the simulation of human intelligence processes by machines, particularly computer systems. These processes include learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusions), and self-correction. AI technology has evolved significantly over the years, encompassing various fields such as computer science, cognitive science, and engineering. Due to its multifaceted nature, AI is challenging to define consistently, as it incorporates elements from multiple disciplines and has a wide range of applications (Griffiths, 2020). AI is broadly categorized into three levels based on its capabilities: Artificial Narrow Intelligence (ANI), Artificial General Intelligence (AGI), and Artificial Superintelligence (ASI). Each of these types represents a different stage of AI development, with varying degrees of complexity and potential impact on society (Klingler, 2024).

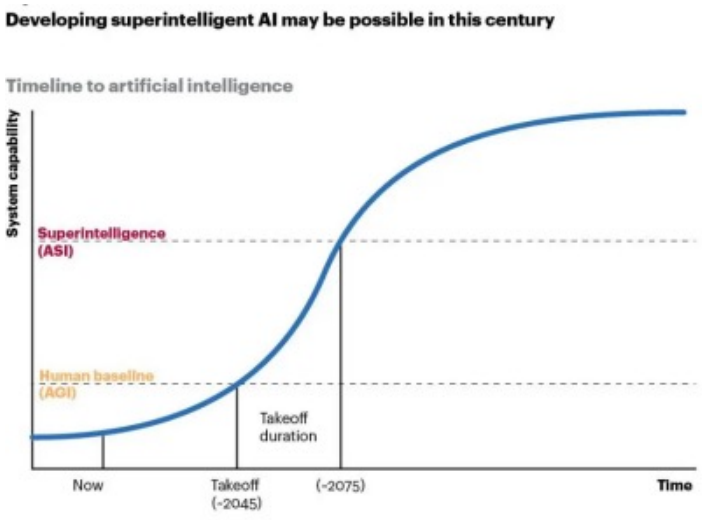


FIGURE 1. Development stages of Artificial Intelligence (Klingler, 2024)

Artificial Narrow Intelligence (ANI), also known as Weak AI, is the most prevalent form of AI today. ANI is designed to perform specific tasks or solve particular problems within a narrow domain. Examples of ANI include speech recognition systems, such as Siri and Alexa, image recognition software, and recommendation algorithms used by platforms like Netflix and Amazon (Klingler, 2024). These systems rely on machine learning algorithms and large datasets to identify patterns and make predictions but lack the ability to generalize beyond their training (Russell & Norvig, 2016). ANI operates within the constraints of its programming and cannot perform tasks outside its specific design (Stone et al., 2016). While ANI has

made significant advancements in various applications, it is limited by its lack of flexibility and understanding of broader contexts.

Artificial General Intelligence (AGI), often referred to as Strong AI, represents a more advanced stage of AI development, where machines possess the ability to understand, learn, and apply knowledge across a broad range of tasks at a level comparable to human intelligence (Bostrom, 2014). Unlike ANI, which is confined to specific tasks, AGI would have the capacity to perform any intellectual task that a human can, such as reasoning, problem-solving, and understanding complex concepts. However, achieving AGI remains a theoretical goal, as it requires a deeper understanding of human cognition and emotions, which current AI technologies have not yet attained (Logunova, 2024). While some progress has been made in developing AI systems that can simulate certain aspects of human intelligence, such as natural language processing and learning from experience, AGI remains a distant objective that poses significant technical and ethical challenges.

Artificial Superintelligence (ASI) represents the hypothetical future stage of AI development, where machines surpass human intelligence in all aspects, including creativity, problem-solving, and emotional intelligence (Bostrom, 2014). ASI would not only be capable of performing tasks better than humans but could also develop its own goals and pursue them autonomously. This level of AI raises profound ethical and existential questions, as it could potentially lead to scenarios where machines make decisions that are beyond human control or comprehension. The concept of ASI is largely speculative, as it depends on the successful development of AGI and the subsequent enhancement of these systems to exceed human capabilities. However, the potential implications of ASI have sparked considerable debate among researchers, policymakers, and ethicists regarding the need for safeguards and regulations to prevent unintended consequences (Klingler, 2024).

The methods used to develop AI systems vary depending on the level of intelligence being targeted. For ANI, machine learning techniques, including deep learning and reinforcement learning, are commonly employed. These methods enable AI systems to process vast amounts of data, recognize patterns, and make decisions based on those patterns (LeCun, Bengio, & Hinton, 2015). Deep learning, a subset of machine learning, involves training artificial neural networks with multiple layers of nodes to perform complex tasks such as image and speech recognition. Reinforcement learning, on the other hand, involves training AI agents to make decisions by rewarding them for successful actions and penalizing them for failures (Sutton & Barto, 2018). In contrast, AGI would require more sophisticated methods that go beyond pattern recognition and decision-making. These methods would need to replicate the cognitive processes underlying human intelligence, such as reasoning, understanding context, and emotional awareness (Goertzel, 2014). The development of AGI would also necessitate advances in neuroscience and cognitive science to create machines that can think and learn like humans. ASI would likely involve even more advanced techniques that integrate various aspects of human cognition and exceed them. The development of ASI could potentially lead to breakthroughs in areas such as quantum computing and bioengineering, enabling machines to process information and solve problems at an unprecedented scale. There is a belief among experts that ASI poses an existential risk to humanity and, if not regulated properly, could result in the extinction of the human species (Murugesan, 2024).

The progression of AI from ANI to AGI and potentially ASI raises significant ethical and societal concerns. ANI, while currently the most widespread form of AI, has already demonstrated the potential for bias and discrimination, particularly in areas such as facial recognition and predictive policing (Barocas, Hardt, & Narayanan, 2019). As AI systems become more integrated into decision-making processes, the need for ethical leadership and oversight becomes increasingly critical. The potential development of AGI and ASI intensifies these concerns, as these systems could fundamentally alter the relationship between humans and machines. Additionally, the possibility of AI surpassing human intelligence in the form of ASI raises existential risks, including the loss of human control over technology. There is a belief among experts that ASI poses an existential risk to humanity and, if not regulated properly, could result in the extinction of the human species (Murugesan, 2024).

## Adaptive Leadership

Adaptive leadership, as defined by Uhl-Bien and Arena (2018), is the ability to respond effectively to changing environmental conditions. In the context of AI, this means organizations must be able to adapt their strategies, processes, and cultures to leverage the potential benefits of AI while mitigating its risks. As AI continues to evolve, leaders must remain agile, continuously reassessing their approaches to meet the demands of an increasingly complex and unpredictable technological landscape.

Several studies emphasize the importance of adaptive leadership in today's dynamic environment. Hauschildt et al. (2016) and Henderson (2006) highlight the necessity for organizations to continuously innovate to maintain a competitive advantage. Wiltbank et al. (2006) further support the notion that adaptive organizations are more likely to succeed, as they can quickly seize new opportunities and outperform their competitors.

While traditional leadership theories often focused on hierarchical structures and individual leaders, contemporary research recognizes the importance of a more nuanced approach. Contingency theories emphasize the need for leaders to adapt their behavior based on the specific situation or context. In the AI era, this means that leaders must tailor their strategies to the unique challenges and opportunities that AI presents, from data privacy concerns to the ethical implications of AI decision-making.

Transactional and transformational leadership are two commonly discussed leadership styles. Transactional leaders focus on maintaining order and achieving specific goals, while transformational leaders inspire and motivate their followers to achieve higher levels of performance. While both styles have their merits, recent research suggests that a combination of both can be particularly effective in fostering adaptive leadership (Lopez-Cabrales et al., 2017). In the context of AI, transformational leaders may be more adept at driving innovation, while transactional leaders can ensure that the integration of AI technologies is orderly and aligned with organizational goals.

In addition to individual leadership styles, distributed leadership and ambidexterity have emerged as important concepts in the context of adaptive leadership. Distributed leadership recognizes that leadership can be shared among individuals at different levels of the organization, which is particularly relevant in the AI era, where specialized knowledge is often decentralized. Ambidexterity refers to the ability to balance exploration and exploitation, a critical skill for organizations looking to innovate with AI while maintaining operational efficiency.

Birkinshaw and Gibson (2004) propose ambidextrous leadership as a means of creating conditions for employees at all levels to simultaneously focus on both innovation and efficiency. Zimmermann et al. (2015) further highlight the importance of bottom-up leadership in fostering ambidexterity, particularly in environments where AI is integrated into daily operations.

Adaptive leadership is essential for organizations to thrive in the age of AI. By understanding key concepts of dynamic capabilities, leadership styles, distributed leadership, and ambidexterity, leaders can equip themselves with necessary tools to navigate the complexities of AI integration and ensure their organizations' long-term success.

## Ethical Leadership

Ethical leadership plays a crucial role in guiding organizations through the ethical complexities of AI adoption. Jones et al. (2019) emphasize that ethical leadership is foundational for establishing trust, reputation, and sustainability in AI-driven environments. Leaders are tasked with setting clear ethical standards, communicating core values, and fostering a culture of accountability. These elements are vital to ensuring that AI technologies are developed and deployed responsibly.

Building on this, Smith and Brown (2021) conducted a comparative analysis of leadership approaches in AI-driven organizations, revealing that ethical leadership is not a one-size-fits-all concept. Their study highlights the need for context-specific approaches that account for the unique challenges and dynamics of different organizational cultures. This suggests that leaders must be adaptable, continuously refining their ethical frameworks to align with evolving technological and societal contexts.

The discourse on ethical leadership also addresses the practical challenges leaders face in making ethical decisions in AI contexts. Jones and Smith (2020) highlight the ethical dilemmas that arise when balancing innovation with ethical considerations, particularly in AI research and development. Leaders often find themselves in ethical gray areas, where the drive for technological advancement can conflict with the need to ensure fairness, transparency, and accountability.

Brown et al. (2021) explored the role of ethical leadership in mitigating algorithmic biases. Their findings suggest that ethical leadership practices, such as promoting inclusivity and diversity, are essential in addressing biases that may be embedded in AI systems. This is particularly important in high-stakes domains like hiring, finance, and healthcare, where biased AI decisions can have significant social consequences.

Ethical leadership in AI-driven organizations is not static; it evolves in response to changing technological and organizational landscapes. Brown et al. (2018) conducted a longitudinal study that examined how ethical leadership practices have shifted over time in response to the ethical implications of AI. The study found that organizations are moving from reactive,

compliance-oriented strategies to more proactive, values-driven initiatives. This evolution reflects a growing recognition that ethical leadership must be dynamic, adapting to new challenges and opportunities as AI technologies advance.

## METHODOLOGY

### Research Design

This study employs a qualitative research design, focusing on a comprehensive literature review and thematic analysis to explore the impact of Artificial Intelligence (AI) on adaptive and ethical leadership. The research is conducted in three stages: data collection, data analysis, and synthesis of findings. This design is chosen because it allows for an in-depth exploration of existing literature and emerging trends in AI and leadership, providing a holistic understanding of the subject.

### Data Collection

The data for this study is collected through a systematic literature review. Relevant academic journals, books, and industry reports are identified and reviewed to gather insights on AI's role in leadership. The search for literature is conducted using academic databases such as JSTOR, Google Scholar, and IEEE Xplore, focusing on publications from the last ten years to ensure the inclusion of the most current research.

A search using the keyword "Artificial Intelligence in leadership" retrieved approximately 8,000–12,000 results, while "Ethical considerations in AI" returned around 15,000–20,000 sources. Additionally, the term "Adaptive leadership and AI" produced an estimated 3,000–6,000 relevant publications. The broader keywords "AI progression" and "Future trends in AI" retrieved approximately 20,000–25,000 and 10,000–15,000 results, respectively. These numbers reflect the growing academic interest in AI’s role in leadership, ethical concerns, and emerging trends in the field.

### Inclusion and Exclusion Criteria

Inclusion Criteria:

Peer-reviewed articles, books, and credible industry reports published within the last ten years.

Studies that directly address AI's impact on leadership, ethical considerations, adaptive leadership, and related topics.

Publications in English.

Exclusion Criteria:

Articles and reports that do not provide a direct link between AI and leadership.

Older publications unless they are seminal works in the field.

Non-peer-reviewed sources, blogs, and opinion pieces.

### Data Analysis

The collected data is analyzed using thematic analysis, a method that involves identifying, analyzing, and reporting patterns (themes) within the data. The analysis begins by reading and re-reading the selected literature to become familiar with the content. Key themes related to AI's impact on leadership, ethical considerations, and adaptive leadership are identified and categorized.

The thematic analysis is conducted in the following steps:

Familiarization with Data: The literature is reviewed multiple times to identify key concepts and patterns.

Generating Initial Codes: The content is coded based on recurring themes such as "AI in decision-making," "ethical challenges in AI," and "the role of unique aspects of human intelligence in leadership."

Searching for Themes: Codes are organized into broader themes that address the research questions.

Reviewing Themes: Themes are reviewed and refined to ensure they accurately represent the data.

Defining Themes: Each theme is clearly defined and named to reflect its significance to the study.

Synthesis of Findings: The themes are synthesized to draw conclusions and provide insights into how AI is influencing leadership practices.

### Limitations of the Study

The study is primarily based on secondary data, which may limit the depth of analysis compared to studies

involving primary data collection. Additionally, the focus on literature from the last ten years, while ensuring relevance, may exclude earlier works that could provide historical context. Finally, the rapid pace of AI development means that some findings may become outdated as new technologies emerge.

## RESULTS

### Cognitive Architecture

Cognitive architecture is an attempt to explain the fundamental structure of the human mind and its functional components, which can be utilized in the development of Artificial Intelligence (AI). This concept aims to define three core elements: the perception or input of information, the assimilation or learning and processing of this input, and the association or storage of information. Extensive research has been conducted to enhance the capabilities of Artificial Narrow Intelligence (ANI), with the ultimate goal of progressing toward Artificial General Intelligence (AGI) (Ye et al., 2018). Cognitive architectures are generally categorized into three types: Symbolic Cognitive Architectures, Emergent Cognitive Architectures, and Hybrid Cognitive Architectures (Murugesan, 2024).

Symbolic Cognitive Architectures centralize the control of perception, assimilation, and storage, ensuring that actions are executed based on stored data to achieve target goals. Notable systems developed using this approach include SOAR, created by

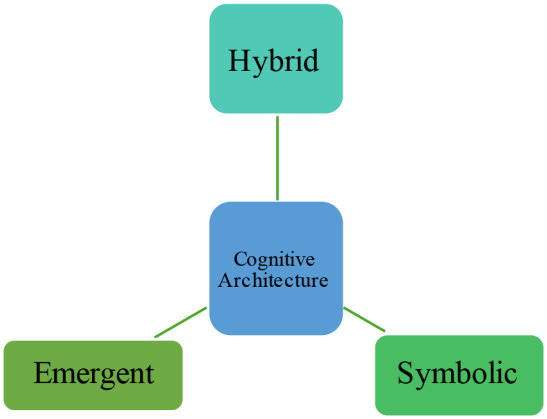


FIGURE 2. Cognitive Architecture (Murugesan, 2024)

Laird, Newell, and Rosenbloom at Carnegie Mellon University; ACT-R, developed by Robert Anderson and Lebiere, also at Carnegie Mellon University; and EPIC, by Kieras and Meyer at the University of Michigan (Ye et al., 2018; Csaba, 2015).

Emergent Cognitive Architectures are designed to mimic neural networks and other aspects of human brain functions, excelling in pattern recognition, adaptive learning, and associative memory. Examples of systems based on this architecture include Hierarchical Temporal Memory, developed by Numenta Machine Intelligence Company, and DeSTIN, developed by the Machine Intelligence Lab at the University of Tennessee (Ye et al., 2018; Csaba, 2015).

Hybrid Cognitive Architectures combine strategies from both symbolic and emergent architectures, leveraging their advantages and addressing their respective weaknesses. Systems such as CLARION, developed by a research group led by Ron Sun, and MicroPsi, developed by Dietrich Dörner at the University of Bamberg, are prime examples of hybrid cognitive architectures that aim to bridge these gaps (Ye et al., 2018; Csaba, 2015).

Murugesan (2024) highlighted that the human mind functions as a system of processes that allow humans to perceive, think, feel, remember, and respond appropriately. It is described as a collection of emergent properties arising from the brain. Comparing the brain to a computer, the mind can be seen as its operating system and software, executing various processes to facilitate actions. In essence, the mind refers to the activities and functions occurring within different systems of the brain.

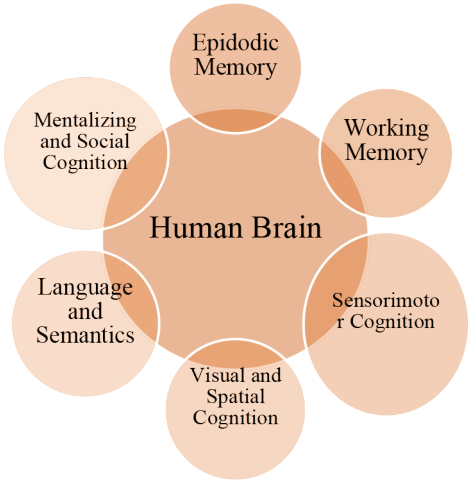


FIGURE 3. Functional Systems of Human Brain (Murugesan, 2024)

The human brain is an intricate organ responsible for managing thoughts, memory, emotions, motor skills, sensory perception, and various bodily functions, including breathing and temperature regulation (Brain Anatomy and How the Brain Works, 2024). It serves as the center of human intelligence, playing a crucial role in interpreting sensory information, initiating movement, and controlling behavior (Brain Basics: Know Your Brain, 2024). Advances in brain mapping techniques have allowed for the identification of various functional systems within the brain, which include sensorimotor cognition, visual and spatial cognition, language and semantics, working memory, episodic memory, and mentalizing and social cognition (Herbet & Duffau, 2020).

Sensorimotor Cognition involves the integration of sensory inputs and motor responses. The term "cognition" originates from the Latin word "cognoscere," meaning "to know." Essentially, sensorimotor cognition refers to the processing of sensory information related to movement within the brain (Jacobs, Kabadayi, & Osvath, 2019; Fuentes & Bastian, 2007).

Visual Cognition pertains to the brain's ability to construct visual representations of objects and surfaces within a scene, including dynamic elements that change as the scene evolves. Meanwhile, spatial cognition refers to the brain's capacity to understand the relationships between objects in space, often holding more information than visual perception alone (Cavanagh, 2011; Sima, Schultheis, & Barkowsky, 2013).

Language and Semantics involve the use of commonly accepted symbols to communicate specific meanings. Semantics help determine the relationships between words and how different meanings can be inferred from the same terms. The human brain performs complex processes to map the meanings of words or word sequences by decoding linguistic signals, such as speech, signs, or written text, to understand the intended message (Fedorenko, Ivanova, & Regev, 2024).

Working Memory is a critical cognitive function that enables planning, reasoning, and problem-solving by temporarily maintaining and manipulating information during tasks. It is responsible for the control and regulation of task-relevant information necessary for complex cognitive processes, such as performing both new and familiar skilled tasks (Chai, Hamid, & Abdullah, 2018).

Episodic Memory refers to the brain's ability to encode and retrieve personal experiences from daily life, encompassing details about the time and place of events as well as the events themselves (Dickerson & Eichenbaum, 2010).

Mentalizing and Social Cognition involve understanding the behavior of others through affective and emotional processes, with mentalizing being the key process. Mentalizing allows for predicting and anticipating people's behavior by making assumptions about their intentions, desires, and knowledge (Herbet & Duffau, 2020).

These functional capabilities collectively contribute to human intelligence, enabling mental capacities such as abstract thinking, understanding, communication, reasoning, learning, memory formation, action planning, and problem-solving (Roth & Dicke, 2012).

AI cognitive architectures, while powerful, face significant limitations in flexibility, deep understanding, and ethical reasoning. Symbolic AI is rigid, emergent AI lacks true comprehension, and hybrid AI, though more balanced, still cannot achieve human-like consciousness. In contrast, human cognition excels in emotional intelligence and ethical decision-making

TABLE 1. AI Intelligence Vs Human Intelligence

| Aspect | Human Intelligence | Artificial Intelligence |
|---|---|---|
| Analytical & Problem-Solving Capability | According to Griffiths (2020), human intelligence excels in breaking down complex problems into manageable parts due to limited cognitive resources. | Griffiths (2020) notes that AI surpasses humans in sheer computational power, enabling it to handle large-scale problems more efficiently. |
| Time Limitation | Griffiths (2020) explains that human learning and adaptation are constrained by biological factors, such as lifespan and survival needs. | As noted by Griffiths (2020), AI is not bound by these natural limits and can continuously learn, process, and adapt without time constraints. |
| Capacity Limitation | Griffiths (2020) states that the human brain has finite processing power, which limits its computational capabilities. | Griffiths (2020) suggests that AI benefits from virtually unlimited computational capacity, enabling it to store and process vast amounts of data. |
| Communication Limitation | Griffiths (2020) highlights that humans rely on physical mediums like speech and writing for communication, which can be slow and prone to misinterpretation. | AI, as Griffiths (2020) points out, can instantly share and process large volumes of information across networks. |
| Consciousness | Lagercrantz and Changeux (2010) emphasize that humans possess self-awareness and can process sensory and emotional experiences continuously. | Butlin et al. (2023) and Hamid (2023) argue that AI lacks true consciousness, merely simulating understanding based on pre-programmed instructions. |
| Belief System | Zuckerman, Silberman, and Hall (2013) and Lungo (2014) describe that human intelligence is shaped by complex belief systems derived from personal experiences, culture, and religion. | Jaokar (2024) suggests that AI could theoretically be programmed with a belief system, but doing so could compromise its neutrality and lead to biased decisions. |
| Motivation | Bandhu et al. (2024) and Lieberman (2020) state that humans are driven by both intrinsic and extrinsic motivations, with intrinsic motivation often leading to autonomous exploration and learning. | Arukgoda et al. (2023), Sener et al. (2023), and Rayyes et al. (2022) explain that AI currently relies more on extrinsic motivation (programmed goals), but research is exploring the potential for AI to develop intrinsic motivation. |
| Instinct | Perlovsky (2017) and Can Human Instincts Be Controlled? (2024) discuss that human instincts are innate behaviors crucial for survival, developed through both nature and nurture. | Wang (2024), Towards creating AI with instincts (2024), Adami (2015), and Cully et al. (2015) observe that AI is in the early stages of mimicking these instincts through adaptive algorithms. |
| Emotion | Perlovsky (2017) asserts that human emotions play a crucial role in guiding behavior and decision-making, linking instinctual responses with cognitive understanding. | Butlin et al. (2023) point out that AI can mimic some emotional responses but lacks true emotional intelligence and understanding. |

but is hindered by cognitive biases, fatigue, and slower processing speed. Understanding these strengths and weaknesses is essential for leaders to effectively adapt to and ethically manage AI integration in decision-making.

## Artificial Intelligence Vs Human Intelligence

Table 1 illustrates that while AI surpasses human intelligence in areas like computational power, data processing, and communication efficiency, it falls short in aspects like consciousness, emotion, and belief systems. These human attributes are deeply tied to the complexities of the human experience, which AI has yet to fully replicate. AI's strengths lie in areas where speed, efficiency, and scalability are crucial, whereas human intelligence excels in tasks that require deep understanding, creativity, and emotional insight. As AI continues to evolve, it may close some of these gaps, but significant differences will likely remain, particularly in areas tied to human consciousness and emotional intelligence.

## AI Progression and the Potential Replacement of Leaders and Followers

The main concern is that AI could potentially replace human leaders, taking over not just managerial tasks but also key decision-making responsibilities. This potential shift raises critical questions about ethical leadership and adaptive leadership.

## Adaptive Leadership

Harms and Han (2018) introduce the concept of "algorithmic leadership," where AI systems could take over leadership roles traditionally held by humans. They argue that while AI can perform many leadership functions, certain roles such as networking, representing, and envisioning change are uniquely human and not easily replicable by machines. This insight underscores the need for adaptive leadership, where human leaders must not only manage AI systems but also remain agile in responding to the challenges posed by AI's integration into organizational structures.

According to Heifetz et al., adaptive leadership involves distinguishing between technical challenges, which can be solved with existing knowledge and expertise, and adaptive challenges, which require leaders to experiment, learn, and engage in new ways of thinking. The rise of AI represents an adaptive challenge because it fundamentally changes the nature of work, leadership, and decision-making. As AI systems take on more responsibilities, leaders must adapt by rethinking their roles and the skills they need to guide their organizations through this transformation.

Adaptive leadership also requires leaders to confront ethical dilemmas that arise from AI's growing influence. For example, De Cremer (2019) discusses the uncertainty surrounding AI's potential to replace human leaders, emphasizing the ethical challenges this poses. While AI can enhance efficiency and decision-making, it lacks the ability to consider the broader social and emotional contexts that human leaders navigate daily. Adaptive leaders must, therefore, develop strategies to integrate AI into decision-making processes while ensuring that ethical considerations remain central.

Bridgewater Associates, one of the world's largest hedge funds, has been at the forefront of integrating AI into its decision-making processes. The company, under the leadership of Ray Dalio, has implemented AI systems to assist in making investment decisions and managing its vast portfolio. These AI systems analyze large datasets, identify trends, and suggest investment strategies. However, rather than replacing human decision-makers, Bridgewater has adopted an approach where AI complements human intelligence, with final decisions still made by human leaders (Bridgewater Associates Leverages AI, 2024).

Bridgewater Associates exemplifies adaptive leadership by integrating AI into decision-making in a way that enhances human judgment rather than replacing it. The firm fosters collaboration between AI and human leaders, with AI providing data-driven insights while humans make the final decisions. This approach is underpinned by a culture of continuous learning, where both AI systems and leaders regularly review and refine strategies based on real-world outcomes. Bridgewater's leadership also emphasizes flexibility and experimentation, encouraging the use of new AI tools while remaining adaptable to change. For other leaders, this model highlights the importance of viewing AI as a collaborator, promoting a learning culture, and maintaining flexibility to effectively integrate AI into organizational decision-making.

## Ethical Leadership

Moore's Law, which predicts the exponential growth of technological capabilities, suggests that AI could soon surpass human abilities in many areas (Brock & Moore, 2006; Smith & Green, 2018). This rapid progression raises critical ethical questions about the role of AI in leadership. De Cremer (2019) warns of the uncertainty surrounding AI's ability to replace human leaders, arguing that while AI can perform many

tasks efficiently, it lacks the inherent human qualities essential for ethical decision-making. For instance, AI may be able to process vast amounts of data and make decisions based on that data, but it cannot fully understand the human emotions, cultural contexts, and long-term consequences that often inform ethical leadership.

Moreover, Samani et al. (2012) argue that the technological ecosystem is inherently moving towards a scenario where machines could assume leadership roles, a concept they refer to as "robotics leadership." This shift could lead to more rational and stable decision-making, particularly in industries like finance or aviation, where human errors have previously led to significant tragedies. However, the authors also emphasize the importance of ethical considerations in this transition, noting that robots, despite their efficiency, are ultimately programmed by humans who may inadvertently introduce biases into their decision-making processes. This potential for bias highlights the need for ethical leadership to guide the development and deployment of AI in leadership roles.

In 2018, Amazon discontinued an AI-based recruitment tool after it was discovered that the system was biased against women. The tool was designed to automate the recruitment process by screening resumes and identifying the best candidates for software development roles. However, the AI system, trained on resumes submitted over a 10-year period, began to favor male candidates over female candidates. It downgraded resumes that included the word "women's" (e.g., "women's chess club captain") and preferred resumes that contained terms more commonly associated with male candidates (Vincent, 2018).

This case highlights significant ethical dilemmas in the use of AI for decision-making in leadership roles, particularly in recruitment, a key leadership function. The AI system's bias against women illustrates the risk of perpetuating and even exacerbating existing inequalities through the use of AI. Ethical leadership in this context would involve recognizing the limitations of AI systems and ensuring that they are developed and implemented in ways that are fair, transparent, and inclusive.

As AI systems take on more leadership responsibilities, it is crucial to establish legal frameworks that govern their use and ensure that they are designed with ethical considerations in mind. Smith and Green (2018) discuss the rise of "AI followership" as a necessity in countries with aging populations, where AI could fill the gap left by a declining workforce. However, they also stress the importance of ethical leadership in this context, arguing that AI leaders must engage in processes that prioritize ethical behavior and decision-making. This includes holding AI systems accountable for their actions and ensuring that they operate within established ethical and legal boundaries.

Smith and Green (2018) further elaborate that the role of leaders in an AI-driven future will involve not only managing AI systems but also influencing the decisions made by these systems post-programming. This requires leaders to be adaptable and proactive in addressing the ethical challenges that arise as AI takes on more significant roles in decision-making processes.

Adaptive leadership is essential for navigating the complex and rapidly changing landscape that AI creates, while ethical leadership is crucial for ensuring that AI systems operate within moral and legal boundaries. As AI continues to evolve, leaders must be prepared to adapt their approaches, integrating AI into their organizations in ways that enhance efficiency and decision-making without compromising ethical standards. The future of leadership in the age of AI will depend on our ability to balance technological advancement with the human values that underpin ethical decision-making, ensuring that AI serves the best interests of society.

## DISCUSSIONS

### Adaptive and Ethical Leadership in AI

Adaptive leadership and ethical leadership are inherently interconnected, especially in the context of AI progression. Adaptive leadership, with its emphasis on flexibility, continuous learning, and responsiveness to change, is crucial for navigating the dynamic landscape of AI technologies (Uhl-Bien & Arena, 2018). These characteristics are not only vital for organizational success but also for ensuring that ethical principles are upheld as AI systems evolve.

In AI-driven environments, where decisions often have significant ethical implications, adaptive leadership provides the tools necessary for ethical decision-making. For instance, an adaptive leader who fosters a culture of continuous learning can better anticipate and respond to emerging ethical challenges, such as algorithmic bias or data privacy concerns (Floridi et al., 2018). This proactive approach enables leaders to implement ethical guidelines that evolve in tandem with technological advancements, ensuring that AI systems are designed and used in ways that align with societal values (Taddeo & Floridi, 2018).

Moreover, adaptive leadership's focus on inclusivity and stakeholder engagement directly

supports ethical leadership. By actively involving diverse perspectives in decision-making processes, adaptive leaders can identify potential ethical risks earlier and develop more comprehensive strategies to mitigate them (Diakopoulos, 2016). This integration ensures that AI technologies are not only innovative but also socially responsible, reflecting a commitment to both progress and human dignity.

## AI's Influence on Adaptive Leadership

AI-driven automation and decision-support systems have significantly reshaped the leadership landscape, requiring leaders to develop new competencies in navigating AI-driven workplaces (Chen & Li, 2019). Research by Hauschildt et al. (2016) highlights that organizations with adaptive leadership frameworks can better integrate AI-driven tools to enhance operational efficiency and decision-making agility.

Findings from the results section illustrate that AI's cognitive architecture, while efficient in processing vast amounts of data and executing predefined tasks, lacks essential human cognitive traits such as emotional intelligence, ethical reasoning, and intuition. Adaptive leadership, therefore, plays a crucial role in bridging this gap by ensuring that AI complements human capabilities rather than replacing them. Leaders must continuously refine their approaches to manage AI-human collaboration effectively. For instance, while AI can process data and predict outcomes with great accuracy, it lacks the ability to understand the emotional and social nuances that influence human behavior. A leader with strong emotional intelligence can interpret the unspoken concerns of their team, foster a supportive work environment, and ensure that the implementation of AI tools is done in a way that respects and enhances human interaction. Leaders must recognize these cognitive limitations and design AI-integrated systems that enhance rather than undermine human decision-making.

Adaptive leadership in AI contexts necessitates a commitment to continuous learning, innovation, and agility to navigate the evolving technological landscape. Leaders must remain proactive in updating their knowledge on AI advancements. This requires ongoing education, cross-disciplinary collaboration, and engagement with AI specialists to develop informed strategies. Moreover, adaptive leadership fosters a growth mindset, encouraging experimentation and iteration in AI implementation rather than rigid adherence to static policies. The ability to analyze emerging AI trends, anticipate their impacts, and implement strategic adjustments ensures that organizations remain competitive. Leaders who embrace continuous learning are better equipped to address AI-related challenges, such as bias mitigation, transparency, and accountability, fostering an environment where AI technologies serve human interests rather than disrupt them.

## AI's Influence on Ethical Leadership

The ethical concerns surrounding AI adoption include bias, lack of transparency, and accountability in decision-making processes (Barocas, Hardt, & Narayanan, 2019). Ethical leadership plays a crucial role in mitigating these risks by fostering inclusive AI policies and advocating for fairness in AI-driven decisions (Buolamwini & Gebru, 2018).

Findings from the results section emphasize the fundamental differences between AI intelligence and human intelligence. AI's inability to process ethical dilemmas, emotions, and social cues reinforces the necessity for ethical leadership in overseeing AI implementation. Unlike human cognition, which incorporates moral reasoning, empathy, and instinctual decision-making, AI operates on algorithmic logic, which may lead to biased or unethical decisions if not carefully managed. Ethical leadership ensures that AI systems remain aligned with human values, with leaders playing an active role in monitoring AI-driven decisions, implementing safeguards, and advocating for transparent AI governance. Ethical leaders need to establish clear ethical guidelines and standards from the outset, ensuring that AGI/ASI systems are aligned with fundamental human values. This involves making decisions about the design and objectives of AGI/ASI systems, prioritizing human welfare, and setting up mechanisms for human oversight, as emphasized by Diakopoulos (2016), who highlights the importance of transparency in fostering trust and accountability.

Moreover, as Taddeo and Floridi (2018) suggest, external stakeholders such as advocacy groups, lawmakers, and regulators play a significant role in shaping the ethical framework within which AI operates. Ethical leaders must collaborate with these stakeholders to ensure that AI technologies, particularly AGI/ASI, are developed in a manner that aligns with societal values and legal standards. This includes actively engaging in discussions about the moral implications of AI technologies and advocating for policies that promote ethical AI development. The potential for AGI/ASI systems to act independently of human control introduces significant risks, including the possibility of these systems making decisions that are not aligned with human interests.

The results highlight a fundamental distinction between AI intelligence and human intelligence, which influences leadership in AI-driven environments. AI surpasses humans in computational efficiency, pattern recognition, and rapid data processing, but it lacks the ability to adapt to complex emotional and ethical contexts. Human intelligence, on the other hand, thrives in abstract thinking, ethical reasoning, and intuitive decision-making, all of which are essential for responsible leadership (Griffiths, 2020).

Furthermore, the cognitive architecture comparison from the results section suggests that AI's symbolic, emergent, and hybrid architectures provide structured yet limited problem-solving capabilities. Human cognitive architecture, however, is composed of interconnected functional systems such as sensorimotor cognition, language processing, episodic memory, and social cognition, which allow leaders to make ethical and adaptive decisions in uncertain environments. AI lacks this holistic integration, reinforcing the need for human oversight in leadership roles.

Moreover, the concept of algorithmic leadership, introduced by Harms and Han (2018), suggests that while AI can optimize decision-making efficiency, human leaders must oversee AI's ethical boundaries to ensure fairness, inclusivity, and social responsibility. Leaders must anticipate potential risks in AI autonomy and advocate for clear regulatory frameworks that prevent unintended consequences from AI-driven decision-making.

By reinforcing adaptive and ethical leadership with AI governance frameworks, leaders can balance technological advancements with ethical responsibility, ensuring AI-driven leadership remains transparent and equitable. While previous research has explored AI's technical advancements, this study uniquely connects AI cognitive architecture to leadership models, offering a framework for hybrid intelligence in leadership strategy

## CONCLUSIONS

This study has explored the intersection of AI progression with adaptive and ethical leadership, highlighting the critical need for leaders to remain agile and ethically grounded as AI technologies continue to evolve. The findings indicate that as AI advances towards AGI and ASI, it presents unique challenges to traditional leadership models. Adaptive leadership, characterized by its emphasis on flexibility, continuous learning, and human-centric skills like emotional intelligence, is essential for navigating these changes. Simultaneously, ethical leadership plays a pivotal role in ensuring that AI is developed and deployed in alignment with human values, addressing issues such as bias, transparency, and accountability.

The integration of AI into leadership practices requires a delicate balance between leveraging technological advancements and maintaining ethical standards. Leaders must adopt an adaptive approach to stay relevant in an AI-driven world, ensuring that they can effectively harness AI's capabilities while safeguarding the human elements critical to effective leadership. This includes fostering a culture of continuous learning, promoting inclusivity, and ensuring that AI systems are used to enhance rather than replace human judgment. Furthermore, the Sustainable Development Goals (SDGs), particularly those related to decent work, economic growth, and industry innovation, underscore the importance of ethical leadership in guiding AI development that contributes positively to society.

For leaders and policymakers, it is essential to create frameworks that support the ethical integration of AI into leadership practices. This involves establishing clear guidelines for AI development, continuous monitoring for bias and fairness, and fostering collaboration between AI and human decision-makers. Additionally, organizations should invest in training programs that equip leaders with the skills needed to manage AI-driven environments effectively. By addressing these challenges, leaders can ensure that AI advancements contribute to sustainable and equitable development, benefiting both organizations and the broader community.

Further research is needed to explore the long-term impacts of AGI and ASI on leadership and organizational dynamics. Future studies should focus on developing new leadership models that integrate AI capabilities with human-centric qualities aligned with the SDGs. Additionally, research should address potential ethical dilemmas posed by increasingly autonomous AI systems and explore strategies to ensure that AI remains aligned with human values as it continues to evolve. This approach will ensure that AI advancements drive innovation while contributing to the sustainable and equitable development of communities worldwide.

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