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How ambidextrous entrepreneurial leaders react to the artificial intelligence boom

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ABSTRACT

Artificial intelligence (AI) now plays a central role in enhancing business competitiveness by transforming systems, frameworks, and managerial strategies. This study employs a systematic literature review (SLR) approach, utilizing the 'Consensus AI' search platform to explore the characteristics and roles of ambidextrous entrepreneurial leaders in the AI era. Consensus AI is an AI-powered search engine that automates the processes of reviews, literature searches, screening, and data extraction. It also utilizes 'research question searches' within SLRs to avoid the challenges of ambiguity and irrelevant information associated with 'keyword searches,' delivering more directly relevant results and finding featured snippets that answer specific questions. A research gap exists concerning how ambidextrous leadership adapts to the AI boom, highlighting leadership dynamics in the digital age. The findings emphasize the critical role of ambidextrous entrepreneurial leadership (AEL) in guiding organizations through the AI boom, enabling them to leverage AI for innovation, agility, and competitiveness. Organizations that effectively implement AEL by integrating AI technologies can position themselves for long-term success. Key insights show the importance of AEL approaches, and future research may explore challenges that arise for ambidextrous entrepreneurial leaders in the era of AI, such as ethical considerations and organizational culture.

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1. INTRODUCTION

Artificial intelligence (AI) has developed in a sustainable manner and has had a big impact in the 21st century [1]. In organizations, AI could generate business value with deeper understanding of its adoption, value-creating mechanisms, key enablers, and inhibitors [2]. The development of AI systems that model entrepreneurial activity through uncertain environments is promising as it forms new ways of future research on the entrepreneurial decision-making process [3]. When combined with the positive impact of AI on entrepreneurship, opportunities, decision-making, performance, and education among other things, the process of entrepreneurship is growing [4].

AI technologies are progressively emerging as pivotal catalysts of innovation and competitive advantage, with scholarly investigations concentrating on their influence in reshaping decision-making processes, enhancing operational efficiency, and refining strategic management within organizations [5], [6]. Current academic discourse underscores the potential of AI to enhance both exploratory and exploitative

organizational mechanisms [7]. However, there exists a paucity of studies that specifically assess its effects on leadership strategies, especially in the context of ambidextrous entrepreneurial leadership (AEL). This identified gap underscores a significant imperative to investigate the nexus between AI and leadership, a correlation that remains inadequately explored within extant scholarly literature.

The effect of entrepreneurial leadership (EL) on decision-making processes is major, as it combines rational, intuitive, and strategic methods. This combination allows leaders to effectively maneuver uncertainty and complexity, thus ensuring organizational growth and innovation [8]–[10]. Successfully exercising this leadership approach demands deep knowledge of individual characteristics, cognitive biases, and the dynamic relations between the leader and their team [11], [12].

Ambidextrous is the ability to use both hands equally, and in a broader context, especially in business and management, it is the ability of an organization to manage simultaneously exploratory activities related to innovation and the discovery of new opportunities with exploitative activities centered on incremental optimization and efficiency. This dual competency allows organizations to maneuver through an emerging environment with sustained operational efficiency [13], [14]. In the same vein, EL concerns managing an organization by simultaneous search for new opportunities and exploitation of current opportunities [15]. The latter kind of leadership opens and exploits opportunities through the use of knowledge, cognitive skills, strategic decisions, and dynamic capabilities to integrate exploration and exploitation in the innovation process and organizational growth [16]–[18]. This approach integrates exploration and exploitation to drive innovation and organizational growth [19].

Despite comprehensive investigations into the overarching impacts of AI on business operations and innovation, there exists a significant gap in the scholarly discourse that specifically examines the mechanisms through which AEL integrate AI into both exploratory and exploitative endeavors. While a considerable portion of the existing literature has concentrated on the role of AI in augmenting entrepreneurial decision-making [5], there remains a gap of research addressing how leaders effectively reconcile AI-driven innovation with the optimization of operational processes [20]. The current body of literature predominantly underscores the ambidextrous qualities of leadership in promoting both innovation and operational efficiency, yet frequently neglects the integration of AI technologies within these dual strategic frameworks. This investigation seeks to remedy this deficiency by exploring the attributes and functions of AEL within the context of the AI boom, thereby offering a novel perspective point on the evolution of leadership strategies in response to the exigencies of digital transformation.

Hence, this study aims to explore AEL in the AI boom age for organizations. To date, no previous research study has focused on the relationship between AI and AEL. Therefore, in continuation of this dearth of literature about this relationship, the present paper conducts a systematic literature review (SLR) on studies investigating AEL characteristics and roles and their response to the AI boom. The following research questions lead the paper study:

- What characteristics do ambidextrous entrepreneurial leaders possess that empower them to succeed in the era of AI?
- What roles are carried out by ambidextrous entrepreneurial leaders in leveraging AI in the era of AI?

The results of the research are anticipated to provide valuable insights on the abilities and proficiencies necessary for proficient leadership within the advancing digital environment, furnishing practical recommendations for programs aimed at enhancing leadership capabilities and making strategic decisions in organizations driven by AI.

2. LITERATURE REVIEW

2.1. Overview of artificial intelligence and ambidextrous entrepreneurial leadership

Alternative investment is an integral part of technologies that significantly enhance effectiveness, accuracy, and creativity in business decision-making. These enhancements lead directly to improved organizational success. Additionally, AI drives transformative changes in organizational business practices [21].

AI has gone through rapid evolution from its initial development stage. It has now become a flexible and adaptive method for achieving objectives and tasks far beyond its original scope, emerging as a polished, workable entity within business [22]. AI creates value by exploring its implications, potential applications, and methodologies, thereby enabling a clearer understanding of evolving business landscapes and trends [23].

The potential relationship between AI and leadership underscores the necessity to reassess the skill set essential for future leaders [24]. In organizational contexts, AI is poised to reshape leadership roles. However, successful decision-making requires a seamless integration of AI functionalities and emotional intelligence to maintain a competitive advantage [25]. Leadership in the era of AI is of utmost importance as it serves to motivate and empower individuals, and establishes strategic objectives for organizational change [7], [26]–[28]. It balances AI-driven decisions with ethical considerations and fosters an intrapreneurial organizational culture. These leadership qualities ensure that AI enhances human potential and drives organizational success.

Apart from entrepreneurial aspects, ambidexterity involves balancing exploration and exploitation, which is essential in the current AI era. Ambidextrous leaders are instrumental in promoting innovation and strategic expansion through careful management of exploration and exploitation activities, nurturing cognitive ambidexterity, and ensuring ethical integration of AI [7], [29]–[31]. Their adaptability and strategic incorporation of AI technologies are crucial for organizational success.

The ambidextrous leadership is a combination of the opening and closing behaviors [32]–[34]. This type of leadership not only encourages innovative behavior in employees but also develops psychological ownership, and in this process plays the mediator role [35]. Moreover, this leadership balances and manages exploration and exploitation activities in an organization [36]. Exploration focuses on ambidextrous leadership toward seeking new knowledge, innovation, and experimentation. It is centered on the identification of new opportunities as well as the development of new products, services, or processes [37]. Factors that can be related to exploration are enabling a climate that would promote innovative thinking and risk-taking, the ability to continuously learn, and adaptability [38]. On the other hand, exploitation refers to the optimization and enhancement of existing resources, processes, and capabilities for better efficiency, productivity, and incremental innovation [39], [40]. The key features of exploitation include efficiency initiatives, quality enhancement measures, continuous betterment of available methods, and full maximization of available resources and capacities in operation [41], [42].

On the other hand, EL can broadly be defined as characterized by dynamism [43], [44] and innovation [45]. This leadership style integrates principles of entrepreneurship into practice. It emphasizes highly effective strategies for leading and guiding individuals and teams toward success [46].

2.2. Theoretical perspective

The upper echelons theory [47] proffers comprehensive model of how AEL could, through the effective exercise of AI, exploit its benefits. This theory suggests that organizational outcomes, including strategic decisions and performance metrics, are partly impacted by top executive attributes [48]. The ambidextrous entrepreneurial leader's decisions and actions, in the context of AI, regarding the exploitation-exploration balance become crucial in guiding organizations through the intricacies associated with integrating AI.

Moreover, upper echelons theory underscores that the experiences, values, and personalities of the top executives are extremely important because they provide a frame for their interpretations and decisions [48]. AEL will have a distinctive confluence of cognitive flexibility, propensity for risk-taking, and strategic vision in the organization that facilitates harnessing technological change in favor of AI within the firm [49]. They are more capable of making strategic decisions balancing short-term operational efficiency with long-term innovation [47]. This dual emphasis is in line with upper echelons theory, which argues strategic behavior as an influence of leader background and cognitive foundation, focusing on using AI for competitive advantage [48].

3. METHODOLOGY

3.1. AI-driven systematic search of “research questions”

AI has been well recognized for its development and tremendous accomplishments since 2013 [50]. The application of AI has increased massively following 2013, which caused higher research interest in the area. The role of AI in organizational contexts has found greater prominence after 2013 [51]. Therefore, this study performs a SLR on the characteristics and role of the AEL approach applied during 2015-2024.

A standard SLR usually conducts a full review of the literature and reviews through reference databases such as PubMed, Scopus, and Web of Science (WoS) [52], [53]. The review procedure is conducted with the support of the preferred reporting items for systematic reviews and meta-analysis (PRISMA) guidelines [54]. This approach conducts a detailed search strategy formulated and conducted using specific keywords [55], which could lead to ambiguity if the keywords are too general, potentially pulling in a wide range of irrelevant information [56]. Additionally, keywords may not always address the research questions. However, the major issue with searching based on questions is that it has the ability to pull up more relevant search results or at least reveal some featured snippets in response to the questions being asked. Nowadays, AI tools can extend their usage to SLRs with specified questions, going beyond the traditional usage of keywords, which makes the retrieval more relevant and enhances paper selection for review.

In this regard, the Consensus tool is used for conducting the SLR. The search platform is the use of Consensus AI tools, which are rooted in machine learning and crafted to do searches, screening, and data extraction in the context of systematic reviews [57]. This tool, by using a research question query, gives an accurate and related result, hence reducing vagueness and reducing irrelevant information. This thus increases the effectiveness of this review process. Olson and Salem [58] created the Consensus AI tool, which was officially launched in the year 2022. The AI-powered search engine is purposely built to enhance the effectiveness of the search process by automating activities entailed in literature searching, screening, and

data extraction. Its main purpose is to respond rapidly with evidence by utilizing sophisticated machine-learning methodologies. Over time, the Consensus AI technology has been developing and growing while bringing in improvements that involve the Consensus 2.0 functionalities, such as Consensus Copilot and Consensus Meter, that further enrich its capabilities for better user interaction [59]. Consensus search for information from well-recognized and trusted databases like Scopus and WoS to ascertain the credibility and authenticity of the preferred articles. Consensus employs search algorithms that allow researchers to enhance efficiency by rapidly access a wide range of academic papers and pinpoint relevant studies on particular topics, authors, or publication periods [60] based on research questions instead of keywords. This is confirmed when the study cross-checked databases like WoS and Scopus and discovered that Consensus supports a variety of peer-reviewed articles indexed in databases such as WoS and Scopus, offering researchers comprehensive and reliable information. However, its application in SLR has not been sufficiently studied, leading to this research exploring the method of SLR using the Consensus database.

Conducting an SLR with the assistance of Consensus involves a few basic steps aimed at guaranteeing a thorough and methodical examination of existing literature, alongside the incorporation of consensus-building techniques. Figure 1 shows the steps conducted in this SLR using Consensus. The flowchart depicted in Figure 1 delineates the systematic process employed for the identification of pertinent peer-reviewed scholarly articles pertaining to the subject of AEL. This procedure commences with the articulation of the research questions and the formulation of sub-questions for each distinct area of investigation.

This SLR was developed through research questions (RQs) defined as follows:

– What characteristics do ambidextrous entrepreneurial leaders possess that empower them to succeed in the era of AI?
– What roles are carried out by ambidextrous entrepreneurial leaders in leveraging AI in the era of AI?

Based on these RQs, sub-questions were formulated for searches using the Consensus search engine as follows:

i) RQ 1 sub-questions:
– What are the characteristics of ambidextrous entrepreneurial leaders?
– What are the characteristics of ambidextrous entrepreneurial leaders in this AI age?
– What traits help ambidextrous leaders adapt to AI changes?
– What are the qualities of ambidextrous entrepreneurial leaders?
– What are the qualities of ambidextrous entrepreneurial leaders in this AI age?

ii) RQ 2 sub-questions:
– What are the roles of ambidextrous entrepreneurial leaders?
– What are the roles of ambidextrous entrepreneurial leaders in the age of AI?
– What are the roles of ambidextrous entrepreneurial leaders in the age of AI in organizations?

The search timeframe was filtered from 2015-2024. These sub-questions were adjusted to include keywords such as 'ambidextrous entrepreneurial leaders, 'characteristic,' and 'role' to ensure relevance to the topic and facilitate the search for related journals. Furthermore, each identified journal was cross-checked in the WoS and Scopus databases to confirm its credibility as peer-reviewed information.

The research process included reviewing the 'key takeaway' summary provided by Consensus for each study, which summarized characteristics or roles of AEL, making the process simpler and more efficient compared to the PRISMA ‘keyword search’ method. After searching for the research question and sub-questions, and making adjustments to the keywords for all the questions, this study stopped searching when the same papers repeatedly appeared in the results within the Consensus tool. This study identified a total of seven characteristics of AEL that empower them to succeed in the AI age, and seven roles in leveraging AI.

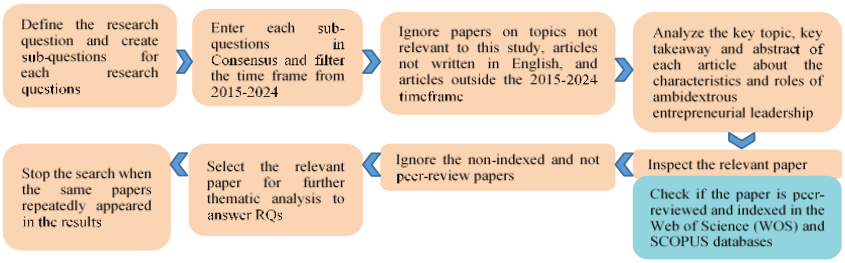

Figure 1. Consensus method flow

Research articles were considered if they fulfilled all of the following inclusive criteria:

– This study uses peer-reviewed journal articles, conference papers, and scholarly books that investigate characteristics and role of ambidextrous entrepreneurial leadership

- Must include the keywords: AI, ambidexterity, entrepreneurial, leadership, consensus, literature searches
- The timeframe of the article from 2015-2024
- Must be written in the English language
- The articles taken from result given by Consensus algorithm
- Must cross-checked in WoS and Scopus databases

Articles were excluded if they met any of the following exclusive criteria: i) the papers discuss other than characteristics and role of ambidextrous entrepreneurial leadership; ii) written in language other than English; iii) papers written not in timeframe of 2015-2024, iv) not indexed and peer-reviewed in WoS and Scopus databases.

4. RESULT AND DISCUSSION

The characteristics and roles of AEL are similar to those of EL. This similarity arises due to the limited existing research specifically addressing AEL. Therefore, this study examines the characteristics and roles identified in EL literature to identify AEL in the context of AI.

4.1. General characteristics of ambidextrous entrepreneurial leadership

Ambidextrous entrepreneurial leaders exhibit several key characteristics that empower them to thrive in the era of AI. The characteristics of EL is more prevalent among founder-leaders than non-founder leaders [61]. This prevalence influences group performance towards recognizing and exploiting entrepreneurial opportunities [61], [62]. Additionally, EL is associated with cultivating innovative behavior among employees with higher levels of creative self-efficacy [45], [62] and a passion for invention [45].

Furthermore, entrepreneurial leaders are perceived as visionary entrepreneurs with the motivation and ethics of a leader, which plays a critical role in venture growth and long-term entrepreneurial success [46]. EL also refers to improved effectiveness outcomes at various levels, with the cultural context being a key moderator, while enterprise type and leadership measures show no significant effects [63]. Moreover, EL positively impacts adaptive innovation in uncertain environments through multiple pathways, such as exploitative learning, exploratory learning, resource bricolage, and boundary-spanning integration [64]. Tables 1 and 2 explain about the characteristics of EL. These characteristics are underscored by various scholars, illustrating the manner in which EL impacts innovation and organizational performance. It is essential for readers to recognize that these characteristics are integral to the mechanisms through which entrepreneurial leaders facilitate innovation, particularly within rapidly evolving contexts. These tables further substantiate the significance of EL in cultivating an innovative organizational culture, a phenomenon that is especially pertinent amid the surge of AI advancements, and these attributes will be explored in greater detail within the context of AEL.

Table 1. Entrepreneurial leadership characteristics

Reference	Characteristics of entrepreneurial leadership
[46]	Perceived as visionary entrepreneurs with the motivation and ethics of a leader
[45], [62]	Cultivate innovative behavior among employees with higher levels of creative self-efficacy
[45]	Fosters employees' innovative behavior through the passion for inventing
[64]	Impacts adaptive innovation in uncertain environments
[65]	Impacts innovation management and its measurement
[63]	Improves effectiveness outcomes at various levels, with cultural context
[61]	More prevalent among founder-leaders than non-founder leaders
[61], [62]	Recognizing and exploiting entrepreneurial opportunities

Table 2. Role of EL

Author	Role of EL
Renko *et al*. [61]	Entrepreneurial leadership is more prevalent among founder-leaders than non-founder leaders, influencing group performance towards recognizing and exploiting entrepreneurial opportunities.
Newman *et al*. [62]	Entrepreneurial leadership, through role modeling and directing employees to entrepreneurial opportunities, significantly enhances the link between creative self-efficacy and innovative behavior.
Bagheri *et al*. [45]	Entrepreneurial leadership of CEOs in high-technology new ventures fosters employees' innovative behavior through the mechanisms of creative self-efficacy and passion for inventing.
Akbari *et al*. [66]	Entrepreneurial leadership positively impacts innovation work behavior in ICT SMEs, with employees' creative self-efficacy and leaders' support for innovation acting as mediators.
Nguyen *et al*. [44]	Entrepreneurial leadership enhances the performance of IT SMEs through the mediating factors of team creativity, dynamic capabilities, and competitive advantages.
Bagheri *et al*. [67]	Entrepreneurial leadership improves employees' innovation work behavior by enhancing their individual and team creativity self-efficacy.
Iqbal *et al*. [68]	Entrepreneurial leadership positively impacts employee innovative behavior in the high-tech services industry, with affective commitment, creative self-efficacy, and psychological safety acting as mediating factors. In high-tech service industries, affective commitment, creative self-efficacy, and psychological safety are mediators that result in innovative behavior.

While previous research has underscored the significance of entrepreneurial leaders in catalyzing innovation and the identification of opportunities, our empirical findings elucidate that AEL exhibit supplementary competencies. These competencies are particularly instrumental in facilitating organizational adaptation to transformations driven by AI. For instance, AEL leaders not only foster an environment conducive to innovative behaviors but also adeptly assimilate AI technologies to enhance both exploratory and exploitative processes, a differentiation that has not been extensively examined in previous scholarly inquiries [19].

4.2. Roles of entrepreneurial leadership

Ambidextrous entrepreneurial leaders play a significant role in leveraging AI in the contemporary business landscape. The success and competitiveness of enterprises are largely dependent on organizational flexibility and innovation [69]. Growing these attributes relies on a central role brought by EL, the one that involves having foresight and strategy that are critical to gaining success in an organization [70], [71].

The indispensable element for promoting innovation is the integration of information technologies, with EL guiding the organization in embracing and leveraging these technologies [44], [72]. EL with a focus on the prioritization of adaptability and forward-thinking [46], [64], [73], assumes a crucial function in nurturing organizational agility [74], which in turn becomes a fundamental constituent for prospering in a competitive market [75]–[77]. This agility is further accomplished through EL's emphasis on competitive intelligence and strategic flexibility [78], [79].

Communication is one of the key attributes in organizational innovation. EL environments offer communication that is both open and effective, which is tremendously important [80]. In general, EL highly influences organizational success and innovation in the present dynamic business environment due to its adoption of flexibility, innovation, IT use, agility, and effectiveness in communication. Table 3 outlines the role of EL in organizational success and innovation.

Table 3. The characteristics and role of ambidextrous EL

Characteristics	Roles	Outcome
– Innovative and visionary thinking [46]	– Recognize and capitalize emerging opportunities [61]. – Real case example: Tesla Motors' strategic acknowledgment and exploitation of the emerging opportunity in the electric vehicle sector embody fundamental principles. The company's foresight, innovation, and implementation have not only solidified its position as a market leader but also hastened the worldwide shift towards sustainable energy and transportation [61].	Organizational agility [74]
– Strategic flexibility to balance exploration and exploitation [61]	– Optimize existing resource [64]. – Real case example: Toyota's Just-In-Time production system strategically leverages available resources to attain notable competitive benefits. Through the minimization of waste, enhancement of operational efficiency, and elevation of product quality, Toyota successfully maximized its constrained resources and revolutionized the international automotive sector [81].	Organizational innovation [80]
– Effective communication [80]	– Integrate AI into organizational operation [82]. – Real case example: IBM's Watson utilizes the capabilities of AI to conduct data analysis, facilitate decision-making, and customize treatment plans. Through this utilization, IBM has reshaped healthcare practices and demonstrated the capacity of AI to transform various industries [83].	New value creation [84]
– Passion for inventing [45] – Inspire cultivate innovative behaviour [45], [62]	– Mitigate risks [85]. – Real case example: Airbnb's approach to addressing regulatory obstacles showcases the effectiveness of entrepreneurial leadership in managing risks. Through proactive engagement with regulators, adjustment of the business framework, cultivation of community support, guaranteeing transparency, and allocation of resources towards legal and lobbying endeavours, Airbnb's leadership successfully navigated through intricate regulatory environments, thus safeguarding the company's growth and sustainability [86].	Maintain competitive advantage [84]
– Creative self-efficacy [45], [62]	– Stakeholder collaboration around AI initiatives [87]. – Real case example: Google's AI for Social Good initiative collaborates with non-profit organizations, academic institutions, governmental bodies, and communities. Google leverages the combined knowledge and assets of these stakeholders to develop influential AI solutions. This particular analysis provides evidence that engaging stakeholders in AI projects is essential for attaining significant and enduring results [88].	Adoptive innovation [89]
– Competitive intelligence [78]	– Drive exploratory and exploitative learning [64]. – Real case example: Amazon, known for its dedication to both exploratory and exploitative learning, has played a crucial role in its achievements. The capacity to introduce new ideas while enhancing current processes is key to sustaining growth and upholding a competitive advantage [19].	

Table 3 provides a comprehensive examination of the attributes and functions of AEL and elucidates their influence on organizational performance. The table elucidates the manner in which AEL incorporates AI into operational frameworks, promotes collaborative engagement among stakeholders, and adeptly navigates the balance between exploration and exploitation, thereby facilitating both innovation and risk management. It underscores the pivotal role that AEL leaders assume in the governance of risks, the enhancement of organizational agility, and the promotion of sustainable success within industries influenced by AI.

In contrast to earlier research that primarily examined the contributions of entrepreneurial leaders in promoting innovation through traditional means [45], our results underscore the distinctive ability of AEL to leverage AI. Specifically, AEL utilizes AI for both strategic foresight and operational agility. This ability positions AEL exceptionally well to adeptly navigate the intricacies of the AI-centric business landscape, a subject that has garnered insufficient scholarly attention in preceding studies.

4.3. The role and characteristics of ambidextrous entrepreneurial leadership in navigating the AI boom

Findings related to AEL suggest the importance of such leadership characteristics in coping with the AI boom. AEL shares several characteristics with traditional EL, which include fostering innovation, promoting visionary behavior, and enhancing organizational effectiveness [45], [46]. AEL possesses a number of resemblances to conventional EL, including the encouragement of innovation and visionary behavior and improvements in organizational performance. These qualities are particularly important during the AI boom, where innovation and visionary thinking are vital for effectively leveraging AI technologies and driving organizational success. By embodying these characteristics, ambidextrous entrepreneurial leaders can navigate the complexities of the AI landscape, capitalize on emerging opportunities, and mitigate potential risks [29], [85].

While prior investigations have recognized these attributes within the broader framework of EL, our empirical study elucidates that adaptive AEL exhibit exceptional proficiency in applying these characteristics within the domain of AI. This proficiency enables organizations to effectively leverage existing resources while simultaneously pursuing novel AI-driven opportunities. Consequently, our findings contribute a novel perspective to the comprehension of EL in the context of a swiftly transforming technological environment.

Other than this, AEL is important in creating organizational agility and innovation, which helps in adjusting the speeded adjustment brought in by the boom of AI [74]. Ambidextrous leaders can handle both exploitation and exploration excellently [62], so they allow the organization to exploit new opportunities and optimize present resources [64]. This agility assists organizations in remaining competitive and dynamic in a market environment driven by AI.

AEL also supports their organizations in the adoption and exploitation of information technologies, including AI. In the AI boom period, effective exploitation of AI technologies is important to enhance competitive advantage and foster innovation [45], [62]. Ambidextrous entrepreneurial leaders, with their forward-thinking mindset and strategic orientation [31], are pivotal in integrating AI technologies into organizational operations and leveraging their potential benefits [82]. They ensure that AI initiatives align with organizational goals and are implemented effectively to drive value creation and maintain a competitive advantage [84].

Moreover, innovation in organizations largely depends on effective communication through EL [80]. In light of the AI boom, there is a need to develop open and effective communication channels both inside and outside of the organization for the realization of collaboration, sharing insights, and getting the stakeholders aligned with AI initiatives [87]. Ambidextrous entrepreneurial leaders create an environment in which communication takes place, enabling collaboration and sharing of knowledge for harnessing AI technologies in the process of innovation and organizational success [89].

In essence, AEL is one of the critical issues evident in organizations' reactions to the AI wave. This leadership approach is particularly significant in fostering innovation, agility, adoption of IT, and communication. Ambidextrous entrepreneurial leaders provide direction on how organizations can harness AI technologies most effectively, chart opportunities and risks, navigate an AI-driven business environment, and lead sustainable growth and success in the digital age.

5. LIMITATIONS

Even with the innovative algorithms that are incorporating advances in search precision, efficiency, and comprehensiveness, the Consensus tool remains quite vulnerable to algorithmic bias. It can never completely capture the intricate details of research. The task is made more difficult by the need for authors to minimize this subjectivity through regular adjustments, reviews, and calibration of the Consensus tool's algorithms, and human oversight. Another limitation is that this paper looked only into peer-reviewed articles published in the English language within the specific timeframe of 2015-2024. Lastly, the generalizability and scope of the study's findings is limited since it was only based on characteristics and role of AEL.

6. CONCLUSION

AI improves the business competitiveness of organizations through improved systems, models restructuring, and offers innovation in management approaches to enhance competitiveness in global markets. This study conducted a SLR to investigate the characteristics of the AEL role and its reaction to the AI boom. This filled in the gap for lack of study between the boom of AI and AEL. The study tried to identify the features possessed by AEL that would empower them to succeed and explore the roles that these leaders could carry out in leveraging AI in the era of AI. An AEL guides organizations through the AI explosion, empowering them to leverage fully AI technologies in organizational innovation, agility, new value creation, continuous competitive advantage, and adopt innovation. By being more creative, strategically agile, and effective in stakeholder partnering, AEL makes a difference in ensuring success in the AI era and beyond. They enable new value creation and competitive intelligence, bringing about innovative behavior within their firms and enabling long-term success and resilience in a radically changing digital environment. The leadership at any level needs to be ambidextrous and entrepreneurial in such a way as to effectively respond to the AI boom by balancing innovation and operational efficiency while navigating through uncertainty and exploiting emerging opportunities. This prepares organizations for agility, ensures continuous learning, and integrates AI into strategic goals while sustaining competitive advantage in a fast-changing environment. Future research could be based on the challenges awaiting these ambidextrous, entrepreneurial leaders in the AI future.

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AUTHOR CONTRIBUTIONS STATEMENT

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C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
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CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

DATA AVAILABILITY

Data availability is not applicable to this paper as no new data were created or analyzed in this study.

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