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EMERGING TREND OF AMBIDEXTROUS AI-DRIVEN TECH VENTURES

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ABSTRACT

Artificial Intelligence (AI) as a potent catalyst revolutionized legacy business models and led to surge in AI-driven tech ventures. However, there is a gap in understanding of the foundational factors for their emergence, opportunities and challenges they face, and the future trends likely to shape their growth. This paper aims to bridge that gap by employing multiple theoretical underpinnings including Technology Acceptance Model, Diffusion of Innovations Theory, Ambidexterity Innovation, and the Resource-based View to investigate AI integration within these ventures. Using Systematic Literature Review (SLR) approach, 41 studies from WOS and SCOPUS databases covering the period 2020-23 were analyzed and identified four key drivers including technological advancements, market demand, investment and innovation promotion. We conceptualize 'Ambidextrous AI-driven Tech Ventures' as businesses that integrate AI technologies to simultaneously explore new market opportunities and exploit existing resources. However, these ventures face several challenges including skill demands, ethical dilemmas, cyber security risks, and regulatory hurdles. Findings emphasize the need for strategic stakeholder support and targeted investment in developing these ventures' dual capabilities required for sustainable growth. This study offers actionable insights for entrepreneurs, investors, policymakers, and academics stress the urgency of ongoing research and education to navigate and capitalize on sustainable development within AI-driven businesses effectively.
Keywords: *Ambidexterity, Artificial Intelligence, Tech Ventures, Digital Innovation, Strategic Entrepreneurship, Exploration, Exploitation*

1. INTRODUCTION

The rapid evolution of emerging technologies, notably artificial intelligence (AI), has catalyzed significant transformations and can play a crucial role in revolutionizing the way entrepreneurs innovate and create value. For instance, studies such as [1][2][3] have demonstrated AI's disruptive potential in reshaping business models and driving innovation [4][5][6]. Despite the growing recognition of AI's potential in entrepreneurial activity and existing research highlighting its benefits [7][8] a significant gap remains in comprehensively exploring this intersection from theoretical and practical perspectives [9][10][6]. In recent years, AI has emerged as a potent catalyst [11], revolutionizing legacy business models [12], and led to surge in AI-driven tech ventures [13][14][15]. These ventures differ significantly from legacy business models and present distinctive characteristics, driven by unique motivations, confronting novel challenges and showing potential for transformative impact across industries [9][16][17]. However, there remains limited understanding of the foundational factors for their emergence, opportunities and challenges they face, and the future trends likely to shape their growth.

This gap underscores the urgency and importance of conducting a study that bridges existing knowledge with practical insights to address the complexities of AI-driven technology ventures. These ventures represent a critical segment at the intersection of technological innovation and entrepreneurship where balancing market exploration with resource exploitation is key to long-term growth of these ventures. Therefore, the core concern of this research is to provide comprehensive understanding of the factors driving emergence of AI-driven tech ventures, opportunities and

challenges they are facing, and future trends that shape their growth and impact.

This concern between existing knowledge and practical application can be driven by established theories, which provide insights into how entrepreneurs adopt and adapt AI technologies, comprehend market dynamics, manage resources effectively, and capitalize on emerging opportunities. Accordingly, this study adopts a multifaceted approach grounded in established theories such as the Technology Acceptance Model (TAM), Diffusion Innovation Theory (DIT), Ambidexterity Innovation concept, and Resource-based View Model (RBV). These theoretical underpinnings serve as lenses through which AI's impact on entrepreneurship with reference to AI-tech ventures can be explored, leading to the formulation of pertinent research questions:

RQ 1: What are the key reasons for the emergence of AI-driven tech ventures, and how do they differ from legacy business ventures?

RQ 2: What potential opportunities and challenges do AI-driven tech ventures encounter?

RQ 3: What are the future trends and prospects for AI-driven tech ventures?

Guided by these theoretical underpinnings, this study conducts a systematic literature review to assess prior works at the AI-entrepreneurship intersection. Through the lens of ambidexterity innovation concept, the study addresses inquiries concerning the opportunities and challenges faced by AI-driven tech ventures, leading to the conceptualization of 'ambidextrous AI-tech-driven ventures.' This review provides a comprehensive understanding of existing research and informs the development of a conceptual framework that defines key drivers for emergence, challenges, and opportunities integral to AI-driven tech ventures. Furthermore, it sets the stage for identifying future research avenues and strategic directions in this evolving domain.

This study contributes significantly to comprehensive understanding of AI-driven tech ventures and offers practical implications based on insights from systematic literature review findings addressing this knowledge gap which is important for academics, entrepreneurs, policy makers, practitioners and investors to support strategic innovation and sustainable development within AI-driven businesses.

2. LITERATURE REVIEW

2.1. AI-Driven Technology Ventures in Entrepreneurial Research

AI integration into entrepreneurial processes facilitates the development of disruptive products [18], services, and business models [19], fostering innovation [20] across various sectors including healthcare, retail, and manufacturing. This integration encourages entrepreneurs and AI venture managers to leverage these technologies to drive innovation, efficiency, and growth [21]. AI ventures utilize AI in their products, services, or business processes to enhance performance [6], efficiency, or customer experience [22]. According to Steve et. al. (2023), technology and entrepreneurship, innovation with market disruption, operational efficiency, and competitive advantage, lead to the emergence of AI-driven tech ventures. These ventures reshape legacy business industry and drive economic growth [23].

As per [12], AI-driven tech ventures as an emerging trend in entrepreneurship research refer to start-up companies that leverage AI technology as a core component of their business models. These ventures utilize AI to create new value propositions, make use of data to generate value, and incorporate AI technology into their general business reasoning [24] including the adoption of the AI factory approach [21] for rapid growth and scaling. Further elaborates that AI-powered ventures tend to adopt the AI factory approach, which is characterized by two virtuous cycles that drive the scale and scope of the start-ups, small and medium enterprises and large companies etc. This approach involves collecting more data to train the model, improving algorithms for better customer experience, and generating useful business insights for identifying new opportunities and expanding into new markets [25].

Riya and Lista (2023) make a similar point in their study that AI-driven tech ventures adopt the AI factory approach, optimizing scale, scope, and learning through the management of AI processes [24]. A broadly related finding previously made by [26], AI start-ups and venture business models share overlaps with common IT-related business models but also have distinctive aspects. These overlaps include AlaaS stack like software-as-a-service (SaaS), platform-as-a-service (PaaS) [15][16], data

monetization [29][3], and consulting and services [30]. These include new value propositions through AI capabilities, different roles of data for value creation, and the impact of AI technology on the overall business logic [31][32]. One notable trend is the explosion of AI-as-a-Service (AIaaS) models, enabling AI-driven technology startups to access the AIaaS Stack with AI software services through the cloud service layer (SaaS), AI developer services through the cloud service layer (PaaS) and AI infrastructure services corresponding cloud service layer (LaaS) [15] (as shown in Figure 1).

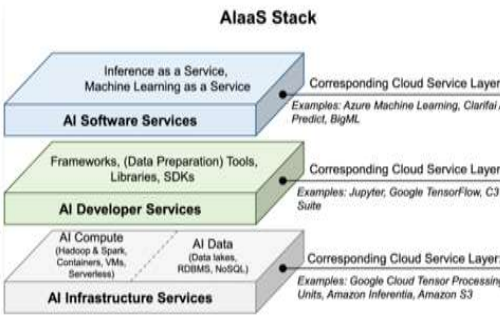

Figure 1: AI as a Service (AIaaS) [15]

The emergence of AI-as-a-Service (AIaaS) models is a significant trend among AI-driven tech ventures, allowing them to access AI software, developer services, and infrastructure via cloud services [27]. Major cloud providers like Amazon, Google, and Microsoft have introduced AI services to democratize access to AI technology for organizations of all sizes. This trend has led to the rise of specialized cloud-based AI services tailored to small and medium-sized enterprises (SMEs) [33] and large enterprises too [34]. Also, platforms like ChatGPT by OpenAI, have emerged as examples of recent AI technologies that support various applications, including customer service and natural language processing [35] further demonstrating the breadth of AI innovation available to ventures. Here, we refer to technology ventures as encompassing not only startups but also SMEs and large enterprises.

These models offer scalability, cost-effectiveness, and flexibility, enabling startups to provide customized AI services and products to customers without extensive infrastructure or expertise. For example, tech ventures can leverage AIaaS platforms such as Google Cloud AI, Microsoft Azure AI, and Amazon Web Services (AWS) AI to access pre-built AI models, APIs, and developer tools for various applications such as natural language processing, computer vision, and machine learning. Also, AIaaS providers like OpenAI offer platforms such as OpenAI API and GPT (Generative Pre-trained Transformer) models like GPT-3, enabling tech ventures to integrate cutting-edge AI capabilities into their products and services with minimal development effort. These examples showcase how tech ventures can utilize AIaaS to offer tailored AI solutions to their customers without the need for significant infrastructure investment or specialized expertise.

Hence, AI ventures' business models align with AIaaS, offering AI-powered solutions and facilitating AI development for customers' satisfaction and new value creation [36] by offering AI-powered products and services to customers [37]. While exploring AIaaS (Artificial Intelligence as a Service), it indicated through previous research [27][37][28][35][34] that it can benefit a diverse range of ventures, including startups, SMEs (Small and Medium Enterprises), and larger enterprises across various industries (as shown in Figure 2).

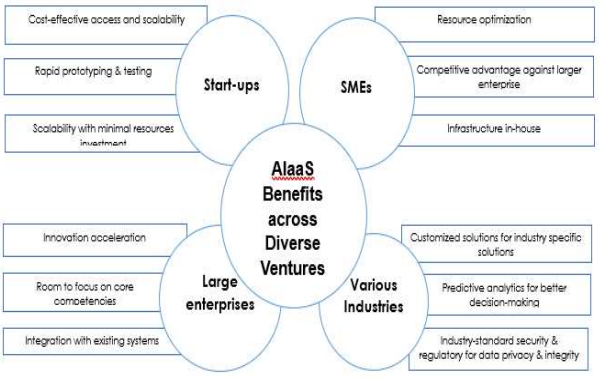

Figure 2: AIaaS Benefits across Tech Ventures in Various Industries (Source: Author's elaboration)

2.2. Theoretical Perspective

Understanding the emerging trend of AI-driven tech ventures requires multifaceted exploration through various theoretical perspectives. Four major perspectives are studied including the Technology Acceptance Model (TAM), the Diffusion innovation theory (DIT), the ambidexterity innovation concept, and the Resource-based View Model (RBV). The

TAM provides a foundational framework for examining how AI tech ventures perceive and adopt new technologies, offering insights into the factors influencing the acceptance and utilization of AI within the venture ecosystem [39]. Complementing the TAM, DIT offers a deeper understanding of how innovations, such as AI technologies, diffuse through markets, explaining the mechanisms driving the adoption and spread of AI-driven tech ventures across diverse industries [40] including start-ups, SMEs, and large enterprises as mentioned above.

Along with DIT, ambidexterity with exploration and exploitation activities within these ventures of these industries is crucial for capitalizing on entrepreneurial opportunities and securing market viability. Ventures must actively respond to environmental shifts to uphold stability and foster accelerated growth [35]. On the other hand, the RBV contributes valuable perspectives on how ventures leverage their unique resources and capabilities, including AI expertise and technological infrastructure, to gain competitive advantages and foster sustainable growth in the increasingly competitive AI-driven entrepreneurship. Further exploration of these theories regarding the emergence of AI-driven startups is discussed below.

Fred Davis (1989) introduced the *'Technology Acceptance Model (TAM)'* and highlighted perceived usefulness and ease of use as crucial factors in determining user acceptance of computer systems [41]. The TAM's emphasis on user perceptions underscores its relevance in enhancing transparency and credibility in new AI methodologies. Widely adopted, the TAM serves as a framework for analyzing factors influencing user acceptance of technology, mediating the relationship between system attributes and adoption [42]. The perception and application of the TAM vary among different stakeholders, including SMEs, startups, and customers. SMEs often use the TAM to evaluate the potential adoption of new technologies within their organizations, focusing on factors like perceived usefulness and ease of use to make informed decisions about resource allocation and IT investments [40].

Whereas AI-driven tech ventures relate to the TAM by leveraging their framework to understand and enhance user acceptance of their AI technologies, products, and services, thus facilitating their growth and success in the market [39]. The acceptance, ease and usefulness of AI technologies are becoming dominant factors in many sectors including medical, finance, retail, manufacturing etc. as stated above. Concerning customers, Herlina, et. al. (2023) mentioned the TAM play a crucial role in assessing the technology's usefulness and ease of use before deciding to adopt it with factors such as perceived benefits, risk, social influence, and trust [43].

Here are some examples of successful AI-driven tech ventures that show how the principles outlined in the TAM have been put into action. By actively adopting and integrating AI technologies into their business models, they have effectively addressed specific industry challenges and facilitated notable advancements in fields such as technology and healthcare, finance, and biopharmaceuticals. For instance, if it is concerned with the technology sector, one notable example is *'DeepMind'* [44], a British AI company acquired by Google in 2014. DeepMind's AI algorithms have made significant advancements in areas such as healthcare, with their AlphaFold algorithm revolutionizing protein folding predictions, which could potentially accelerate drug discovery and medical research. In finance, '*Robinhood',* a commission-free trading platform, utilizes AI algorithms to analyze market data and provide personalized investment recommendations to users [45]. By leveraging AI, Robinhood has democratized access to financial markets, empowering users to make informed investment decisions. These case studies illustrate how AI-driven ventures in technology and finance are driving innovation and enhancing growth experiences. Another example is '*Cortexyme'*, a biopharmaceutical company utilizing AI to develop therapeutics for Alzheimer's disease and other degenerative disorders. Cortexyme leverages AI algorithms to analyze vast datasets and identify potential drug targets, accelerating the drug discovery process. By embracing the usefulness of AI technology, this venture aims to address critical medical challenges and improve patient outcomes [46].

The *'Diffusion of Innovation Theory'* by Everett Rogers' (1962) explains how new ideas, products, or technologies permeate and gain acceptance within societies [47]. This is widely applicable across fields like marketing, technology, and social sciences. The theory defines a predictable adoption pattern comprising five stages, i.e., awareness, interest, evaluation, trial, and adoption.

Applied to entrepreneurial research, particularly in the context of AI-driven technology startups, this model serves as a guiding framework for understanding how innovative AI solutions are adopted and diffused across various markets [48]. This understanding is essential for the successful integration and widespread adoption of innovative AI solutions across industries. For example, the DIT provides a framework for understanding the sequential stages through which the AI-driven technology solution is accepted and integrated into the healthcare industry. By recognizing and addressing the factors influencing each stage of adoption, tech ventures can effectively navigate the diffusion process and accelerate the widespread adoption of their innovative AI solution. '*Casetext'* is one of the examples that effectively applied DIT in their business model, targeting early adopters within the legal community. Their AI-powered legal research platform, CARA, leverages advanced algorithms for efficient research. CARA's success demonstrates the effectiveness of innovative diffusion strategies. Additionally, CARA's AI analyzes legal documents, offering case suggestions and generating initial motion drafts, enhancing its utility for legal professionals [49].

The *'ambidextrous innovation'* introduced by Charles and Michael (1996) as a concept that companies can balance the exploration of new opportunities with the exploitation of existing capabilities [50]. It further emphasizes the importance of balancing exploration (seeking new opportunities, and innovation) and exploitation (leveraging existing capabilities, and efficiency) simultaneously to achieve long-term success and competitiveness [51][52]. In the context of AI-driven tech ventures, the concept of ambidexterity innovation can be applied to guide strategic decision-making and organizational processes [53]. For instance, ventures may need to balance efforts between exploring new AI technologies and applications (such as developing novel AI algorithms or exploring new AI-driven products) with exploiting existing AI capabilities (such as optimizing existing AI solutions for commercialization or scaling up production). This approach creates 'opportunities for ventures to innovate and adapt to changing market demands while effectively leveraging their existing resources and expertise to drive growth and competitiveness. Ultimately, this theory assists in identifying the opportunities for AI-driven tech ventures.

The 'Resource-based view (RBV) model' was first introduced by Edith Penrose in 1959 [39][40] and regarding entrepreneurship recently explored by Shakar (2021) [56] with a comprehensive framework for assessing how a firm's tangible and intangible assets contribute to establishing and sustaining competitive advantage. RBV conceptualizes firms as collections of resources that differentiate them and confer competitive advantage. For example, *Honda,* the world's leading engine manufacturer, exemplifies the RBV strategy by leveraging its expertise in petrol-based engine manufacturing to diversify its product portfolio. This proficiency has allowed Honda to expand into various product verticals, including bicycles, scooters, marine engines, generators, lawn and garden equipment, and automobiles under the Honda and Acura brands. This expansion showcases the effective utilization of its distinctive engine-building capabilities [57]. Despite the acknowledged utility of the RBV, there remains a gap in understanding how entrepreneurial ventures effectively manage their resources to attain competitive superiority, as highlighted by [56].

The application of these four underpinnings, including TAM, DIT, ambidexterity innovation concept, and RBV model offers a comprehensive background for addressing the research questions raised earlier on AI-driven tech ventures. The TAM supports understanding the emergence of AI-driven tech ventures and differentiation from legacy businesses. The application of the AIT in addressing the research questions regarding the opportunities and challenges encountered by AI-driven tech ventures. Lastly, the RBV model informs future trends and prospects in dynamic entrepreneurial research. Although the previous literature highlights AI integration in various industries while adopting models like AIaaS and these theoretical underpinnings mentioned, however, it still lacks with the emergence factors of AI-driven tech ventures, distinct opportunities and challenges they have, and prospects to shape their growth. Thus, this lacking indicates further need to explore distinct characteristics and complexities related to these ventures navigate to AI adoption and business model innovation.

3. METHODOLOGY

In this study, the systematic literature review is conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses

(PRISMA) guidelines [58]. These guidelines are selected to facilitate a comprehensive exploration, allowing the source of conclusions and the identification of research gaps. The review includes the following steps:

3.1. Process Of Topic Selection and Relevant Studies

To initiate this step, a search was conducted using the two databases i.e., Web of Science (WOS) and SCOPUS, using keywords such as "artificial AND intelligence", "technology AND ventures", "artificial intelligence (entrepreneurship), and "AI startups". Additionally, some other keywords included "emergence (ai AND tech AND ventures)", "digital entrepreneurship" and "opportunities and challenges (AI tech ventures)" searched within "entrepreneurship ".

According to previous research [8][36][8], AI holds promise for revolutionizing entrepreneurship research, bridging the gap between theory and practice, however, scholarly exploration of AI in tech ventures is still limited which offers significant research potential. Thus, this study exclusively focuses on developing systematic research with the novelty of AI-driven tech ventures while reviewing the literature published from 2020-2023. A search in both WOS and Scopus databases for the keywords 'AI' and 'tech ventures' within 'entrepreneurship' related research results in the first paper showed on the database was published in the year 2023 [7]. That shows that AI-driven tech ventures represent a new trend in entrepreneurship, and the existing body of knowledge is still at its infancy development.

The process for selecting articles is illustrated in Figure 3 of the PRISM diagram below.

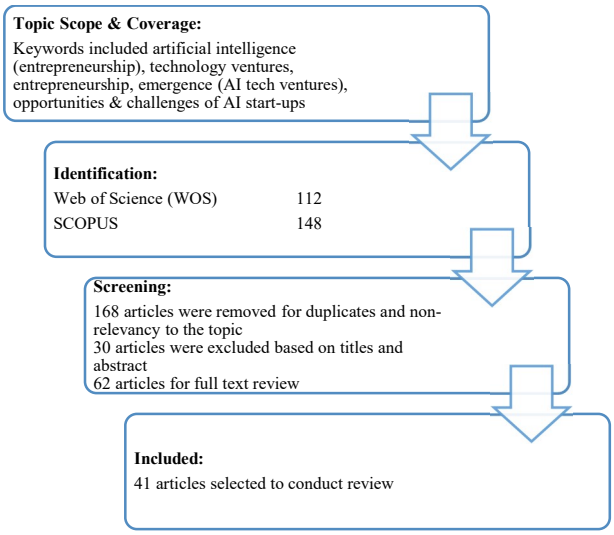

Figure 3: Prism Diagram of Search Strategy

3.2. Screening Of Studies

Initially, 260 papers were identified through the formulated search strings: 148 entries from the Scopus database, and 112 from the Web of Science (WOS) database. All articles included in the initial search discussed various aspects of AI in entrepreneurship. The screening process involved evaluating article titles and abstracts based on relevance and suitability, following established criteria. Articles not aligned with the study's scope were excluded. Full-text articles meeting eligibility criteria were retrieved, considering factors such as topic, authorship, and publication year. Exclusion criteria for this systematic review included studies that were not directly related to AI and entrepreneurship and lacked relevance to research questions. This criterion aimed to ensure a focused review of peer-reviewed academic literature, enhancing review accuracy and credibility by eliminating duplicates from other sources. Following this, duplicate studies and non-relevancy were identified and excluded, resulting in the removal of 168 papers, 30 were again excluded based on titles and abstracts only. The subsequent step involved scrutinizing 62 articles and 21 studies were deemed irrelevant to the research questions. Finally, 41 articles comprising of theoretical papers, quantitative and qualitative empirical papers, and working papers were selected for the review and analysis.

3.3. Synthesis

To initiate this step, three procedures were undertaken, including:

- **Data Extraction:** Information for this study was gathered from the selected literature utilizing a standardized data extraction form. This form encompassed details such as author(s), publication year, research queries, research methodology, sample size, data collection techniques, and primary outcomes.
- **Data Synthesis:** The extracted data from the chosen studies underwent synthesis through thematic analysis, wherein they were organized into themes aligning with the research inquiries and prevalent patterns observed in the literature. These themes summarized significant insights, and key findings, and identified research gaps.
- **Reporting:** While using NVivo 11, the outcomes of the review are communicated with a narrative synthesis, outlining the prominent themes, highlighting insights, and proposing potential areas for future research and practical implementation.

Other researchers [4][5][8] have employed a similar approach to screening, study selection, and findings reporting within the literature, offering diverse perspectives. It's crucial to acknowledge that this review focuses exclusively on the emergence of AI-driven tech ventures along with opportunities and challenges. Nonetheless, efforts have been made to address this limitation through a thorough and transparent search and screening procedure.

4. RESULTS

Considering the research questions, key themes include (1) key reasons for the emergence of AI-driven tech ventures (2) AI-driven technology ventures Vs. legacy businesses (3) potential opportunities for AI-driven tech ventures and (4) challenges for AI-driven tech ventures (5) future trends and prospects were developed to take insights. NVivo 11 was used to analyze the data from selected studies around the key themes.

4.1. Key Reasons for Emergence of AI-Driven Tech Ventures

Ventures and entrepreneurship play crucial roles in fostering innovation. The significance of AI tech ventures lies in their rapid expansion and considerable potential for transformative innovation [59]. The emergence of AI-driven tech ventures has several reasons. According to the review of selected studies, four key reasons are identified including technological advancements [21][23][17][60][61][4][15][18][13], market demand [60][62][3], investment and funding [4][60][10][29][22], and promote innovation [21][12] as shown in Figure 4.

Technological advancements as the first reasons for the emergence shows that the rapid progress in AI technology [17], including machine learning algorithms [60][61] and natural language processing [4], has made it more accessible and feasible for ventures to integrate AI into their products and services. Within this context, the focus on technological progress, particularly in AI, is paramount for understanding its impact on entrepreneurial activities within the framework of Industry 4.0 [21]. Exploring the integration of AI-driven predictive technologies to strengthen digital entrepreneurship emphasizes the key role of technological advancement in shaping entrepreneurial activity. Also, the advancements in machine learning, forced by technological paces, have accelerated the propagation and utilization of artificial intelligence products, reshaping labor dynamics across various sectors [60][13]. Entrepreneurs leverage AI technologies like artificial learning and natural language processing to streamline operations, optimize cost structures, and enhance customer experiences, highlighting the transformative potential of technological advancements in expanding entrepreneurial efficacy and market competitiveness [4][20].

The second reason for the emergence is market demand which identified AI as a growing trend for innovative solutions that leverage to address complex problems and improve. The increasing trend for AI products is influenced by automation, with potential shifts in work demand and skills required, impacting employment [60]. Tech ventures respond to this demand by grabbing the opportunity to develop AI-driven solutions customized to meet market needs. While struggling for their growth and scalability, these tech ventures tend to accept and utilize AI tools and services [39] and to support entrepreneurs in their day-to-day operations and decision-making processes [17][24]. AI enables ventures' managers and entrepreneurs to identify and capitalize on opportunities, improve decision-making, enhance performance, and

facilitate education and research [21]. The integration of AI into the entrepreneurial process can provide entrepreneurs with a digital infrastructure for automated testing and prediction, accelerating the entrepreneurial process and enabling the development of innovative solutions [63].

Thirdly, investment and funding play a role in the emergence and growth of AI-driven tech ventures, particularly in sectors where financial barriers hinder growth. Investors and venture capitalists are increasingly interested in funding AI ventures due to the potential for high returns and disruptive innovation [60][29][10][22]. Access to venture capital funding is imperative for artificial intelligence-driven ventures particularly based on machine learning, facilitating crucial support for research, development, and scalability of their AI-driven products. This aligns with the study [29], which demonstrates a positive correlation between proprietary training data possession and future venture capital funding for AI tech ventures. Other studies [21][64][65] also highlight the promising aspects of these startups, with potential widespread ripple effects across industries worldwide. It emphasizes the significance of proprietary data in product development. This suggests that ventures leveraging such data gain a competitive edge by creating differentiated products with less substitutable inputs, thereby enhancing attractiveness to potential investors.

This invasion of investment capital has emerged with the trend and growth of AI-driven tech ventures. These ventures, operating within various vertical markets such as technology, healthcare, finance, or manufacturing [17], capitalize on AI's transformative potential to revolutionize organizational operations, necessitating adaptability and openness to change [4]. According to the recent exploration of the growth and scalability of AI-driven tech ventures, it is suggested that venture capitalists play a critical role in supporting these by assisting in building AI factories, reducing data risk [64], and supporting financial models [66]. Therefore, there is evidence to show that AI-driven tech ventures in entrepreneurship are representing a new driver of growth and innovation, with the potential to have a significant economic impact.

Fourthly, the emergence of AI-driven tech ventures is associated with the primary goal of promoting innovation. AI enables the development of unique opportunities, products, and services by enhancing decision-making processes and operational efficiency [21]. It also facilitates the introduction of new business models and fosters collaborative efforts among technology ventures through the ecosystem [6][39]. Thus, it contributed to the dynamic development of AI-driven tech ventures [12].

4.2. AI-Driven Technology Ventures Vs. Legacy Businesses:

AI-driven tech ventures differ from legacy businesses (for example, organizations that have been operating for a considerable period often have traditional business models and practices that may not heavily rely on or integrate advanced digital technologies like AI) regarding growth stages and key characteristics.

The growth stages of AI-driven technology ventures involve (1) *initiation* - based on defining their vision for improving efficiency [60], conducting market research [26], and establishing initial funding [61] (2) *planning* - develop a comprehensive strategy for improved products and services [4] and identify target markets [26] (3) *execution* - involves bringing the AI-driven solution to execution, focusing on product development, testing, and building scalable infrastructure [17][37][3] (4) *expansion* – AI-driven tech ventures scale their operations, enter new markets, and diversify their product offerings while prioritizing customer satisfaction and innovation [8][12][17][19][5][7][26].

Throughout these stages, AI-driven tech ventures remain agile and adaptable, continuously iterating on their strategies to navigate market dynamics and capitalize on emerging opportunities [21]. In contrast, several studies show [37][22][27][28] that legacy business ventures exhibit a slower pace of growth and rely on more established business models and industries, have a broader range of operational focuses and require less specialized skill sets [12]. Thus, it can be said conveniently that AI-driven tech ventures differ from legacy businesses in technological integration [37], and utilize tools to develop AI products through cloud-based platforms and neural networks [60] business expansion to achieve rapid growth [29]. These cycles enable AI ventures to scale their operations and enter new markets more effectively.

In terms of characteristics, AI-driven tech ventures are observed different from legacy businesses while using AI technologies for innovation, have the potential for disruption and scalability, and perform with an interdisciplinary approach and collaboration. Firstly, AI-driven tech ventures across various sectors and industries including healthcare, retail, and manufacturing use AI products in their routine operations [17], optimize procedures, enhance product design, and accelerate innovation [19]. Secondly, AI-driven tech ventures possess a significant potential for disruption and scalability to transform industries like healthcare [68] and power [69] rely heavily on the synergy between digitalization and AI solutions, enabling capabilities such as demand forecasting, system optimization, and fault detection. The scalability due to AI applications, grounded in machine learning algorithms, especially supervised learning, promises to lower costs, expedite decision-making, and foster more systematic, evidence-based decisions across industries [70] making AI-driven tech ventures more efficient as compared to legacy businesses.

Thirdly, the success of AI-driven tech ventures centers on the adaptation of an interdisciplinary approach and collaboration to help entrepreneurs understand user needs, obtain user demand information and expand their audience [71]. Through collaborative ecosystems, AI-driven ventures unlock the full potential of AI, driving efficiency, and innovation by bringing together diverse talents to address complex challenges. Collaboration-driven mechanisms are designed to encourage multiple stakeholders, ventures and start-up managers to cooperate in collecting accurate data for AI diagnosis [62]. This collaborative spirit extends beyond organizational borders, with startups forging partnerships with research institutions, industry leaders, and governmental bodies. Like the example of India Industry-University Collaboration (IUC) [72]. The collaboration between Intel India and PES University's Center for Innovation and Entrepreneurship aimed to inspire a research mindset among undergraduate students and enhance the impact of Industry-University Collaboration (IUC) outcomes. This initiative reflects the intertwining of technology, innovation, and entrepreneurship, garnering significant interest globally from governments, industries, and universities.

These characteristics differentiate AI-driven tech ventures from legacy businesses, showcasing their adaptability and potential for transformative change in various sectors (as shown in Figure 4 below).

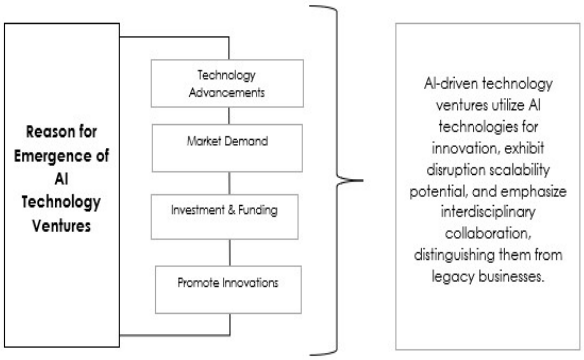

Figure 4: Emergence Dynamics of AI-driven Tech Ventures (Source: Author's elaboration)

4.3. Potential Opportunities for AI-Driven Tech Ventures Through Ambidexterity Lens

The review reveals that in response to the reasons for the emergence of AI-driven tech ventures, specific opportunities have emerged (Figure 5). These ventures present significant opportunities for enhancing efficiency and productivity across various industries. By leveraging AI tools, these ventures target specific domains such as energy, public health, and transportation, offering transformative solutions to address rising costs and challenges [73]. For instance, within the airfreight industry, AI ventures focus on optimizing operations and attracting potential customers, promising productivity enhancements [74].

Similarly, in software engineering, AI systems like Copilot aid programmers by providing code suggestions, thereby improving productivity and code quality [11]. Moreover, AI's impact on firms' productivity has been studied, showing that increased AI penetration can lead to significant increases in total factor productivity, achieved through value-added enhancement, skill-biased enhancement, and technology upgrading effects [34]. These findings suggest that ventures operating within various vertical markets are leveraging AI's transformative potential to revolutionize organizational operations. When viewed through the lens of ambidexterity, these ventures exhibit

characteristics of both exploration and exploitation strategies.

On one side, they are exploring new opportunities and technologies by incorporating AI into their operations, which aligns with the exploration aspect of ambidexterity. This involves venturing into new markets and experimenting with innovative approaches to address industry-specific challenges. On the other side, these ventures are also exploiting existing resources and capabilities within their respective vertical markets to create value. This includes leveraging domain expertise, industry knowledge, and existing networks to implement AI solutions and drive operational improvements effectively.

For example, AI-driven tech ventures offer avenues for market disruption [36] and competitive advantage through their innovative value propositions and capabilities [12]. The continuous learning mechanisms enable these startups to enhance their offerings over time, attracting more customers and building a loyal customer base. With access to proprietary training data, AI ventures can develop differentiated and valuable AI products, potentially attracting increased venture capital funding [29]. Thus, AI-driven tech ventures have the potential to transform markets, challenge incumbents, and gain competitive advantages through their AI capabilities and innovative business models [37][7][13][16].

<table>
<tr><td rowspan="2">Ambidexterity Perspective on Entrepreneurial Opportunity</td><td>Exploitation</td><td rowspan="2">Leveraging AI tools for transformative solutions

Leveraging AI tools (exploitation) to create transformative solutions (exploration)

e.g. Assisting programmers with code suggestions in software engineering through AI systems like Copilot [59].</td><td rowspan="2">Product Development

Developing differentiated and valuable AI products with access to proprietary training data [17].</td><td>Focusing on Optimization in Specific Industries

Optimizing operations and attracting customers in the airfreight industry for productivity enhancements [58].</td><td>Strategic Utilization for Continuous Improvement

Utilizing domain expertise, industry knowledge, existing networks, and continuous learning to implement AI solutions effectively, enhance offerings, and build customer loyalty [11].</td><td rowspan="2">Ambidextrous AI-driven Tech Ventures

Businesses or organizations in the technology sector that heavily rely on/ or integrate AI technologies in their strategic balance of exploring new opportunities/markets and exploiting existing resources/ capabilities</td></tr>
<tr><td>Exploration</td><td>Domain-specific Targeting

Targeting specific domains such as energy, public health, and transportation with AI solutions [57]</td><td>Market Disruption

Offering avenues for market disruption and competitive advantage through innovative value propositions [23]</td></tr>
<tr><td colspan="6">AI-driven Tech Ventures defined by Ambidexterity's Perspective on Entrepreneurial Opportunities</td></tr>
</table>

Figure 5: Ambidextrous AI-driven Tech Ventures (Source: Author's elaboration)

Figure 5 illustrates the ambidexterity perspective in entrepreneurial opportunity. The ambidexterity approach with the ability to balance the exploration of new opportunities and the exploitation of existing capabilities, defines the opportunities in AI-driven tech ventures. Categorized findings from systematic literature review on opportunities reveal how ventures

leverage AI tools for transformative solutions and develop differentiated products through access to proprietary training data. This perspective encompasses domain-specific targeting, market disruption, and strategic utilization for continuous improvement, exemplified by ventures targeting specific domains with AI solutions and offering innovative value propositions for market disruption. Viewing these findings through the lens of ambidexterity extends to the proposal of a unique concept of 'ambidextrous AI-driven tech ventures' as businesses or organizations in the technology sector that heavily rely on/ or integrate AI technologies in their strategic balance of exploring new opportunities/markets and exploiting existing resources/ capabilities.

To conclude this section, the literature indicated that AI-driven tech ventures exhibit the potential to thrive in the VUCA (volatility, uncertainty, complexity, ambiguity) world these days by embracing an ambidextrous approach, balancing exploration and exploitation strategies as an elaboration shown in Figure 6. By effectively navigating industry complexities and capitalizing on both the pursuit of new opportunities and the utilization of existing resources, these ventures position themselves for accelerated and sustained growth.

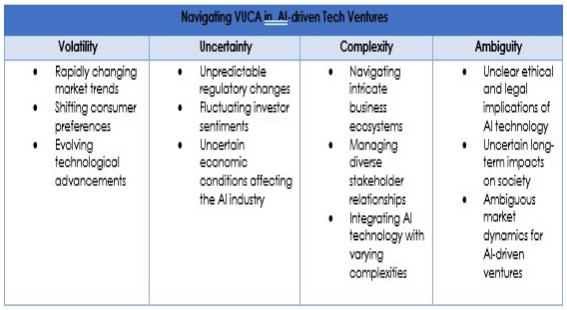

Figure 6: Navigating VUCA in AI-driven Tech Ventures Context (Source: Author's elaboration)

4.4. Challenges For AI-Driven Tech Ventures

AI-driven tech ventures face several challenges related to ethical considerations and biases. One challenge is the potential for algorithms to unintentionally reinforce biases, leading to the provision of biased content and the creation of echo chambers where dissenting information is ignored, like in the case of 'ByteDance' an AI-powered startup [75]. The algorithms used by ByteDance to curate content on its platforms, such as TikTok or Toutiao, may inadvertently prioritize or amplify certain types of content based on user interactions [2]. For example, if the algorithm observes that users engage more with a particular type of content, it may prioritize showing similar content to other users, thus creating an echo chamber effect where dissenting or diverse viewpoints are overlooked in favor of reinforcing existing preferences or biases.

Another challenge is algorithmic bias, where the quality of the input data can lead to flawed decisions or the amplification of gender or race discrimination [13]. Cyber security is also a concern, as AI-powered firms accumulate massive amounts of data that make them targets for data breaches and attacks [36]. Additionally, the control of access to user information by data-rich AI-driven tech ventures and firms raises ethical issues, as seen in cases like unauthorized access to user data by Cambridge Analytica [76]. These challenges highlight the need for AI tech ventures to develop strong in-house data governance processes and engage with various stakeholders, including governments and venture capitalists, to address legal and ethical issues [29].

Additionally, AI-driven tech ventures face challenges related to regulatory hurdles and compliance issues [12]. The impact of AI on society has raised concerns about legal and ethical issues, such as privacy violations and misinformation spread by AI-powered firms as mentioned earlier about the 'ByteDance' [75][2]. These ventures need to navigate issues like algorithmic bias, cyber security threats, and platform control over user information [13]. Access to data is crucial for AI ventures [29], but it also raises data risk and the need for strong data governance processes [36]. Governments play a role in setting regulations for AI-powered firms, and engagement with various levels of government is beneficial to minimize political risk [76]. Additionally, VCs can provide financial resources and expertise in managing political risk for AI tech ventures [25]. In short, AI-driven tech ventures must address regulatory and compliance challenges to ensure the ethical and responsible use of AI technology.

Moreover, AI-driven tech ventures encounter significant challenges in talent acquisition and skill shortages. The demand for skilled professionals in fields such as data science, machine learning, and software engineering far exceeds the available supply, leading to intense competition for top talent.

These ventures rely on the market for human capital expertise, but larger firms already have established cross-disciplinary expertise, including specialized economics and machine learning knowledge needed for AI innovation [76][37]. This creates a shortage of skilled professionals for AI-driven tech ventures. Previous evidence [36] shows that these ventures lack the computational ability and expertise necessary to benefit from complementary innovations, which often rely on the same production inputs as the initial innovations. Usually, the reason for ventures' failure lack of proprietary resources like research and development or specific training data, limiting their ability to develop a competitive advantage [29][59]. These challenges in talent acquisition and skill shortages can hinder the growth and success of AI-driven tech ventures.

4.5. Future Trends and Prospects for AI-driven Tech Ventures

AI-driven tech ventures are expected to have future trends and prospects in various areas. One trend is the increasing focus on ethical and legal issues faced by AI-driven tech ventures, such as algorithmic bias, cyber security, and platform control, which require strong in-house data governance processes and engagement with various stakeholders, including governments and venture capitalists [13]. Additionally, the competitiveness of AI technology-based ventures in the digital era depends on factors like successfully utilizing AI within companies, developing new value propositions through AI capabilities, and different roles of data for value creation [36]. AI-driven tech ventures that have access to proprietary data may have a competitive advantage, as it enables them to create less elastic and more differentiated products, potentially leading to more venture capital (VC) funding [29]. These trends and prospects highlight the importance of agility, ethical considerations, and data strategies for the success of AI-driven tech ventures. To explore the future trends and prospects in AI-driven startups, it is further segregated into two main heads.

Potential areas for future growth and innovation for AI-driven tech ventures include the application of financial technology (financial decision-making and blockchain) and the method of data analytics (big data visualization and data analytics platforms) [26]. These ventures leverage the AI factory approach to achieve rapid growth in scale and scope, and they are advised to design a flat organizational structure and cultivate an agile culture to fully take advantage of AI and challenge incumbent companies [65]. Additionally, there is a need for VCs to develop expertise in data risk faced by AI-powered ventures in their portfolio, as data risk is pervasive and reducing it is crucial [13].

Research [14] shows that the specialized nature of AI expertise requires a unique blend of technical skills and domain knowledge, further complicating the recruitment process. Ventures must navigate these talent shortages by adopting innovative strategies such as talent development programs, partnerships with academic institutions, and fostering a culture of continuous learning within the organization to attract and retain skilled professionals [65][77]. The summary of conceptual exploration through a systematic literature review of selected studies is indicated in Table 1.

Table I: Summary of Conceptual Exploration through a Systematic Literature Review

Conceptual Exploration of AI-driven Tech Ventures as an Emerging Trend			
Key Reasons for the Emergence of AI-driven Tech Ventures	**Ambidexterity Opportunities for AI Tech Ventures**	**Challenges for AI Tech Ventures**	**Future Trends & Prospects**
Technological Advancements [21][23][17][60][61][4][15][18][13]	Efficiency and Productivity Enhancement → Utilizing AI Tools for Enhanced Efficiency Across Industries [73].	Ethical considerations and biases (algorithms biases and echo chambers) [75][2].	Establish internal data governance frameworks and collaborate with stakeholders, including governments and venture capitalists, to tackle legal and ethical concerns effectively [29].
		Algorithmic bias and amplification of gender or race discrimination [13].	Need to navigate issues like algorithmic bias, cyber security threats, and platform control over user information [13].
		Access to data raises data risk Cyber security (data breaches and attacks) [36].	Need for strong data governance processes [36].

		Regulatory hurdles and compliance issues to ensure ethical and responsible use of AI technology [12][75].	The role of governments in setting regulations for AI-powered firms, and engagement with various levels of government is beneficial to minimize political risk [76].
Market Demand [60][62][3]	Market disruption and competitive advantage through their innovative value propositions and capabilities and innovative business models [37][7][13][16].	-	-
Investment & funding [4][60][10][29][22]	Venture capitalists (VCs) can provide financial resources and expertise in managing political risk for AI startups [25].	-	-
Promote innovation [21][12]	AI penetration through total factor productivity is achieved through value-added enhancement, skill-biased enhancement, and technology upgrading effects [34].	Talent acquisition, skill shortages and demand for skilled professionals in fields such as data science, machine learning, and software engineering [76][37].	AI expertise requires a unique blend of technical skills and domain knowledge [14].
		Lack the computational ability and expertise necessary to benefit from complementary innovations, which often rely on the same production inputs as the initial innovations [36].	Navigate these talent shortages by adopting innovative strategies such as talent development programs, partnerships with academic institutions, and fostering a culture of continuous learning within the organization to attract and retain skilled professionals [65][77].
		Proprietary resources like research and development or specific training data, limit their ability to develop a competitive advantage [29][59].	

Differentiation - AI-driven Tech Ventures Vs. Legacy Businesses	*Growth Stages:* **1. Initiation** [60][26][61] → vision to improve efficiency, market research and seek funding. **2. Planning** [4][26] to develop strategies for product/ service improvement and identify markets. **3. Execution** [17][37][3] → bringing AI-driven solutions to execution, product development, testing, and building scalable infrastructure. **4. Expansion** [8][12][17][19][5][7][26] scale-up operations, recognition for new markets, product/ services	*Characteristics:* **Innovative Use of AI Technologies** → AI-driven tech ventures use AI technologies in their day-to-day operations for innovation [17], optimize procedures, enhance product design, and accelerate innovation [19]. **Potential for Disruption & Scalability** → The scalability due to AI applications, grounded in machine learning algorithms, especially supervised learning, promises to lower costs, expedite decision-making, and foster more systematic. **interdisciplinary approach & Collaboration** to help entrepreneurs understand user needs, obtain user	*Differentiation:* As compared to AI-driven tech ventures, legacy businesses tend to have slower growth rates, rely on established business models and industries, and require less specialized skill sets [22][12][37][28] Evidence-based decisions across industries [70] make AI-driven tech ventures more efficient as

	diversification, achieving customer satisfaction and further innovation.	demand information and expand their audience [71].	compared to legacy businesses.

5. DISCUSSION

This study sets out a conceptual exploration of key themes including the reasons for the emergence of AI-driven tech ventures, their comparison with legacy businesses, potential opportunities, and challenges with the prospects. This study has found that the emergence of AI-driven tech ventures marks a significant shift in entrepreneurship, driven by a convergence of technological advancements, market demand, investment opportunities, and the pursuit of innovation. Insights into the dynamics of AI-driven technology ventures are gained. Technological advancements stand out as a primary substance for the rise of AI-driven technology ventures. The rapid progress in AI technology, particularly in machine learning algorithms and natural language processing, has lowered barriers to entry, enabling startups to integrate AI into their products and services.

The study revealed a noteworthy finding regarding the key role of ambidexterity in AI-driven tech ventures. Ambidexterity, metaphorically referring to the ability to balance exploration and exploitation activities, allows these ventures to excel in both aspects simultaneously. By strategically leveraging ambidexterity, they can explore new technologies like AI and markets while exploiting existing resources, thus enhancing their innovative capacity and competitive advantage. This finding aligns with the work of Maria (2023) that ambidexterity creates an impact on SMEs and small businesses [52]. Based on this understanding, we define 'ambidextrous AI-driven tech ventures' as businesses or organizations in the technology sector that heavily rely on or integrate AI technologies in their strategic balance of exploring new opportunities/markets and exploiting existing resources/capabilities.

The increasing trend for AI products is driven by automation and the need for innovative solutions to address complex problems. AI-driven tech ventures integrate business reasoning [24] with the adoption of the AI factory approach [21] for rapid growth and scaling to capitalize on market demand. They leverage AI tools and services to streamline operations, optimize costs, and enhance customer experiences. [36]. AI ventures business models, including those offering AI-infused products/services and aiding AI development, are in line with the AIaaS concept, providing AI-driven solutions to clientele. [37]. The integration of AI technologies in AI-driven tech ventures not only enhances operational efficiency but also drives transformative innovation across various sectors, reshaping labor dynamics and market competitiveness.

This strategic integration reflects the ambidextrous nature of these ventures, as they simultaneously explore new technologies and markets while exploiting existing resources and capabilities. Market demand serves as a catalyst for their growth, prompting them to adopt an AI factory approach and leverage AI tools to streamline operations, optimize costs, and enhance customer experiences, thereby capitalizing on market demand with an ambidextrous mindset. These findings emphasize the importance of understanding and embracing ambidexterity as a fundamental aspect of their entrepreneurial practices, contributing to their adaptability and success in dynamic market environments.

While presenting significant opportunities for efficiency enhancement and market disruption, AI-driven technology ventures also encounter challenges that must be addressed to ensure ethical and responsible use of AI technology and sustainable growth. Collaborative ecosystems, innovative strategies, and stakeholder engagement are essential in navigating the complexities of the AI-driven ventures and unlocking their transformative potential.

Their focus on technological integration, business expansion, and interdisciplinary collaboration sets them apart, enabling rapid scalability and market disruption.

The findings also raised an important question about the need and availability of venture capital investment for research and development of these ventures. The finding shows that investment and funding further drive the growth of AI tech ventures, with venture capitalists recognizing the potential for high returns and disruptive innovation. Access to

funding is vital for research, development, and scalability, providing crucial support for AI-driven products. In contrast to legacy businesses, AI-driven tech ventures exhibit distinct characteristics and growth stages.

Drawing upon theoretical perspectives such as the TAM DIT, RBV, it can distinguish insights into the dynamics of AI-driven tech ventures. Technological advancements, a central theme in the RBV, serve as a primary catalyst for the rise of AI ventures, enabling their integration of AI technologies into products and services, as theorized by the TAM [42]. Market demand, a key aspect in the DIT, enhances the growth of AI-driven tech ventures, as they respond to the increasing need for innovative solutions driven by automation. This increasing need for innovative solutions is also associated with the ambidexterity opportunity with exploration and exploitation. Further, investment and funding supported the concept of TAM and RBV to drive the growth of AI ventures, providing crucial support for research, development, and scalability.

Some recommendations and prospects were identified and developed regarding regulatory frameworks, stakeholder engagement, and developing policy measures to combat ethical and legal issues for successful AI-driven tech ventures. Regulatory frameworks for AI-driven tech ventures, government support and investment strategies, ethical guidelines and responsible AI practices are all important policy implications and recommendations in the context of AI-driven tech ventures. AIaaS providers should receive scrutiny from regulators and policymakers to address legal responsibilities and liabilities [33]. Government support, both in terms of financing and creating a conducive environment, is crucial for enhancing the competitiveness of AI tech-based ventures [2]. Additionally, strong engagement with various levels of government is beneficial to minimize political risk and navigate varying demands placed on data collection, storage, and sharing [13]. Ethical and legal issues faced by AI-driven tech ventures, such as algorithmic bias and cyber security, highlight the need for ethical guidelines and responsible AI practices [36]. These policy measures can help ensure responsible development.

It is expected that ventures leveraging ambidexterity will achieve greater success in navigating the complexities of the AI-driven landscape, capitalizing on both exploratory and exploitative opportunities to drive innovation and growth. This necessitates the adoption of innovative ambidexterity, however, there remains a research gap in the analysis of innovative ambidexterity within technology ventures, indicating the need for further investigation in this area [37][38][70]. Future research should focus on empirically testing this hypothesis by examining the strategic behaviors and performance outcomes of AI ventures employing ambidextrous strategies, as well as identifying the specific mechanisms through which ambidexterity influences ventures' success and sustainability.

5.1. Limitation

The potential exclusion of relevant studies published in non-indexed or non-English language sources, potentially limits the comprehensiveness of the findings. Also, the dynamic nature of the field of AI-driven tech ventures may reduce some of the insights dated or subject to rapid obsolescence, requiring ongoing updates and revisions to maintain relevance.

5.2. Differences from Prior Work

Previous studies have explored AI's impact across industries with different theoretical models and concepts, however, this research addresses the gap by specifically focusing on AI-driven tech ventures as a distinct category. There are certain pros and cons of the study. For example, with reference to pros, this study provides an systematic literature review of AI-driven technology ventures which are relatively underexplored in entrepreneurship literature. It also offers novel insights to conceptualize '**Ambidextrous AI-driven Tech Ventures'** as businesses or organizations in the technology sector that heavily rely on/ or integrate AI technologies in their strategic balance of exploring new opportunities/markets and exploiting existing resources/ capabilities.

With reference to cons, although this study offers valuable insights into AI-driven tech ventures but due to the rapid evolution of AI technology, some findings may become outdated quickly because of the emergence of new models and concepts.

5.3. Conclusion

This study systematically explored the emergence of AI-driven tech ventures, their differentiation from legacy businesses, the opportunities they present, and the challenges they face, along with future trends. The findings emphasize the growing significance of AI-driven ventures across various industries and findings underscore the critical roles of technological advancements, market demand, investment, and innovation promotion in fostering these ventures. A notable contribution of this research is the introduction of the concept of 'Ambidextrous AI-driven Tech Ventures.' This concept summarizes the potential of these ventures to effectively balance exploratory and exploitative strategies, leveraging AI to drive innovation and growth. This finding underscores how ambidexterity enables ventures to remain agile amid rapid technological shifts and addressing the problem of managing risks associated with uncertain market environments and AI technologies. The study provides insights for stakeholders like academics, government institutions working and investing on AI and huge range of investors to invest in technology ventures while highlighting the importance of collaboration in supporting the incubation and scaling of these ventures. Policy incentives targeting innovation, along with investor confidence are crucial to overcoming challenges and barriers to the market to ensure long term sustainability. This is preliminary study to examinine how AI-driven tech ventures can leverage ambidextrous strategies to foster innovation and competitiveness. It also stresses the importance of interdisciplinary academic programs that combine technology management in AI applications and helping future entrepreneurs to develop skills needed to navigate a complex tech-driven economy. This study concludes that venture capitalists can continue to invest in AI-driven ventures not only to drive economic growth and job creation but also address societal challenges validating the need for strategic investment. Detailed examples include how ambidextrous strategies have enabled firms to respond agilely to market changes and disruptions, ultimately contributing to sustainable business practices and competitive advantages in global markets. By integrating theoretical insights with practical applications, this study not only contributes to academic discourse but also offers actionable recommendations for enhancing the competitiveness and innovativeness of AI-driven tech ventures. While the results offer practical implications for organizational strategies and future research should be empirically testing these findings particularly the concept of 'Ambidextrous AI-driven Tech Ventures' across industries and refine how ambidextrous strategies can be operationalized to maximize both economic and societal benefits.

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