

Building Resilient Start-up Ecosystems in the Digital Era: A Narrative Review

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ABSTRACT: This narrative review explores the critical factors influencing the growth and resilience of technology-driven start-ups in the digital era. Literature was systematically collected from Scopus, Web of Science, and Google Scholar, covering peer-reviewed studies from 2010 to 2025. Thematic analysis and bibliometric mapping were employed to synthesize findings across diverse contexts. Results show that funding access, supportive regulation, and strong networks remain fundamental pillars for entrepreneurial success. Entrepreneurship education that integrates digital competencies and experiential learning strengthens entrepreneurial capacity, while digital technologies such as artificial intelligence, the Internet of Things, and blockchain underpin disruptive business models that enhance competitiveness. However, persistent barriers exist, including gender inequality in access to resources and technostress among founders, underscoring the need for inclusivity and well-being support. Comparative analysis reveals that advanced economies benefit from robust infrastructure and funding mechanisms, while developing regions, despite resource constraints, demonstrate adaptive localized innovations. The review highlights the importance of coordinated policy, education, and practice in creating equitable and resilient ecosystems. Strengthening financial access, regulatory clarity, digital infrastructure, gender inclusivity, and well-being initiatives emerges as a strategic priority for fostering sustainable technology-driven entrepreneurship.

Keywords: Technology-Driven Entrepreneurship, Start-Up Ecosystems, Digital Entrepreneurship, Innovation Success Factors, Gender Inclusivity, Entrepreneurial Well-Being.



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INTRODUCTION

Technology-driven entrepreneurship has increasingly become a focal point of global economic discourse, acting as a catalyst for innovation, value creation, and sustainable development. By leveraging advanced technologies such as artificial intelligence (AI), the Internet of Things (IoT), and blockchain, entrepreneurs have been able to disrupt traditional business models and generate

transformative change across industries (Munusamy et al., 2025). This paradigm shift not only enhances competitiveness but also fosters inclusive growth by enabling access to markets and resources previously unavailable. The rapid diffusion of digital technologies into entrepreneurial ecosystems illustrates a broader global trend toward the integration of technology into core business strategies, a movement that has reshaped how start-ups are established, financed, and scaled (Hadizadeh et al., 2024). Furthermore, the rise of technopreneurship reflects a broader societal shift, wherein entrepreneurial activities are increasingly framed as solutions to pressing challenges such as sustainability, efficiency, and social inclusion (Elia et al., 2021).

Within the Southeast Asian context, Malaysia exemplifies this transformation through its technopreneurial revolution, propelled by national initiatives like the Malaysia Digital Economy Blueprint. This initiative has facilitated the rise of companies such as Grab and Carsome, whose innovative business models have disrupted traditional sectors like mobility and commerce, while simultaneously generating employment and contributing to digital economic growth (Munusamy et al., 2025). Similar transformations have been observed globally, with digital platforms enabling collaborative business models and enhancing economic sustainability by fostering new forms of entrepreneurship in dynamic markets (Hadizadeh et al., 2024). These developments underscore the critical role of policy frameworks and national strategies in cultivating technology-driven ecosystems that empower entrepreneurs to scale effectively.

The significance of start-up ecosystems as engines of economic growth has been widely documented. Empirical evidence suggests that vibrant ecosystems not only foster innovation but also enhance the resilience of national economies in the face of global disruptions (Kavoura, 2021). In Vietnam and Taiwan, for instance, high rates of entrepreneurial activity underscore the importance of government support in advancing innovation. Local initiatives that emphasize cost-effective resources and domestic market needs have been particularly effective in nurturing competitive advantages for technology-driven ventures. At the same time, the integration of entrepreneurial education with digital competencies has proven to be critical in equipping individuals with the necessary skills to thrive in rapidly evolving markets (Rahmi et al., 2025). This suggests that the interplay between supportive ecosystems, government policies, and entrepreneurial capacity building is central to the growth of sustainable technology-driven ventures.

In the context of Industry 4.0, the adoption of sustainable practices and advanced technologies has emerged as a decisive factor for competitive advantage. The implementation of environmentally responsible innovation strategies aligns with the global imperative of sustainable development, thereby enabling entrepreneurs to address ecological concerns while maintaining profitability (Kulova et al., 2024). A resilient entrepreneurial ecosystem—comprising diverse values, actors, and resources—has been identified as essential for ensuring long-term innovation and growth in the digital era (Elia et al., 2021). Moreover, innovations in industrial design, particularly those facilitated by AI, provide entrepreneurs with advanced tools for decision-making by predicting market trends and consumer preferences. These predictive capabilities enhance competitiveness by enabling firms to align product development with consumer demands (Ling, 2025).

Beyond these strategic advantages, global trends indicate that technology-driven entrepreneurship has a broader capacity to enhance economic competitiveness through infrastructure development, innovation facilitation, and ecosystem strengthening. Universities and industry partnerships play a pivotal role in bridging the gap between academic training and real-world entrepreneurial practice, thereby creating a fertile ground for sustainable technology-based ventures (Zabalawi & Kordahji, 2025). Such collaborations highlight the importance of multi-stakeholder engagement in fostering innovative ecosystems, where academic research, industrial application, and policy support converge to accelerate entrepreneurial success.

Despite these promising developments, technology-driven start-ups face a number of persistent challenges that hinder their growth and scalability. Chief among these are financial constraints, as many early-stage ventures struggle to secure sufficient funding due to the high-risk perception of unproven business models (Munusamy et al., 2025; Ling, 2025). While venture capital, angel investors, and public grants are often cited as vital sources of financing, the intense competition for these limited resources creates significant barriers for nascent firms (Régnier, 2023). Regulatory hurdles also present formidable obstacles, particularly in emerging economies, where complex tax regimes, stringent compliance requirements, and ambiguous intellectual property rights frameworks can impose prohibitive burdens on start-ups (Elia et al., 2021). Such regulatory challenges not only slow down business formation but also constrain innovation and market entry.

Another critical challenge lies in resource access, especially regarding human capital and technological infrastructure. Start-ups often find it difficult to recruit and retain skilled professionals due to competition with larger corporations that offer more attractive compensation packages (Snehvrat & Dutta, 2025). Furthermore, the digital divide remains a significant barrier to technology adoption, particularly in developing economies where internet connectivity and digital literacy are unevenly distributed (Gubbi et al., 2023). These limitations restrict the ability of start-ups to fully leverage technological tools for innovation and growth. Compounding these issues is a widespread knowledge gap in technology integration, which hampers the ability of entrepreneurs to swiftly adapt to changing market demands or effectively harness innovation opportunities (Simba et al., 2024).

While the challenges faced by technology-driven entrepreneurs are well-documented, the literature exhibits notable gaps in identifying and systematizing the critical success factors necessary for overcoming these barriers. Much of the existing scholarship has focused on cataloging obstacles without sufficiently exploring strategic frameworks that can empower entrepreneurs to mitigate risks and scale sustainably (Hadizadeh et al., 2024). For example, there is limited research that directly connects entrepreneurial education to the practical needs of the industry, particularly in equipping entrepreneurs with adaptive skills required in technology-intensive sectors (Rahmi et al., 2025). Moreover, ecosystem support structures such as mentorship programs, incubators, and accelerators designed specifically to address funding and regulatory challenges remain underexplored (Mehta & Mathur, 2022). Addressing these research gaps would not only enrich the theoretical understanding of technology-driven entrepreneurship but also provide actionable insights for policymakers and practitioners.

The primary objective of this narrative review is therefore to examine the ecosystems of technology-driven start-ups and analyze the critical factors that contribute to their success. By synthesizing findings from diverse regional contexts, this study seeks to identify common drivers and contextual variations that shape entrepreneurial outcomes. Specifically, the review aims to assess how ecosystems, education, business models, inclusivity, and well-being interact to influence the sustainability and scalability of technology-driven start-ups. In doing so, this paper contributes to a more nuanced understanding of entrepreneurial success in the digital era and offers evidence-based guidance for both policymakers and practitioners (Kulova et al., 2024; Bae & Choi, 2025).

The scope of this review encompasses a comparative analysis of start-up ecosystems across multiple regions, with particular attention to Asia, Africa, and Europe. In Asia, dynamic environments such as China and Singapore illustrate how government policies, cultural dynamism, and skilled human capital converge to accelerate start-up growth, as evidenced by firms like Tencent and Alibaba (Régnier, 2023; Munusamy et al., 2025). In contrast, African contexts highlight the constraints posed by inadequate infrastructure and limited access to capital, which continue to impede entrepreneurial development despite significant potential for innovation (Hadizadeh et al., 2024; Mehta & Mathur, 2022). European ecosystems, meanwhile, benefit from structured funding programs and robust university-industry collaborations, yet are often hampered by regulatory complexity that slows innovation relative to more agile Asian markets (Daim et al., 2022; Jayanna et al., 2024). By incorporating these diverse contexts, the study seeks to generate a global perspective on technology-driven entrepreneurship while acknowledging the localized conditions that shape entrepreneurial success.

In summary, this introduction establishes the significance of technology-driven entrepreneurship as a vital component of global innovation and economic growth. It has outlined the promises and challenges of technology-driven start-ups, highlighted key gaps in the literature, and articulated the objectives and scope of the present review. By focusing on cross-regional comparisons and synthesizing insights across ecosystems, education, business models, inclusivity, and well-being, this paper positions itself to contribute meaningfully to scholarly and policy debates on fostering sustainable and resilient entrepreneurial ecosystems in the digital age.

METHOD

The methodological approach adopted in this narrative review was designed to ensure a comprehensive and rigorous assessment of the literature on technology-driven entrepreneurship and its associated success factors. Given the inherently interdisciplinary nature of the topic, encompassing elements of innovation management, digital transformation, and entrepreneurial ecosystems, a multi-database strategy was employed to capture the breadth and depth of relevant scholarship. Central to this approach was the use of Scopus and Web of Science, two of the most widely recognized scientific databases, known for their extensive coverage of peer-reviewed journals and conference proceedings. Scopus, in particular, offers bibliometric capabilities that facilitated an understanding of citation patterns, thematic clusters, and the evolution of discourse in technology-driven entrepreneurship (Jayanna et al., 2024). Complementary to these core

databases, Google Scholar was utilized as an auxiliary tool to identify additional relevant materials, including grey literature and publications not indexed in Scopus or Web of Science. While Google Scholar lacks the advanced filtering options and quality control mechanisms of the other databases, it nonetheless provided supplementary insights and helped minimize the risk of overlooking pertinent studies.

The selection of search terms was another critical element in the methodology, as keywords determine the scope and relevance of the search results. Four primary keyword clusters were identified based on their prominence in the literature and their alignment with the objectives of this review. The first keyword, “technology-driven entrepreneurship,” was chosen to capture research directly addressing the interplay between technology and entrepreneurial activity, as well as theoretical and empirical studies on technopreneurship (Jayanna et al., 2024). The second keyword, “start-up ecosystems,” was employed to retrieve works analyzing the structures, networks, and institutional frameworks that underpin the success of technology-based start-ups (Bae & Choi, 2025). The third keyword, “innovation success factors,” targeted studies focusing on determinants of entrepreneurial success, including financial, social, technological, and managerial aspects (Yoruk & Jones, 2020). Finally, the term “digital entrepreneurship” was used to locate research on ventures leveraging digital technologies in their business models, reflecting the growing emphasis on e-commerce, platform economies, and digital transformation (Rahmi et al., 2025). These keywords were applied both independently and in combination using Boolean operators such as AND, OR, and NOT to refine searches and broaden coverage across related themes.

In addition to the choice of databases and keywords, this study implemented clear inclusion and exclusion criteria to ensure consistency and rigor in the selection of relevant articles. The inclusion criteria encompassed peer-reviewed journal articles, book chapters, and high-quality conference proceedings published in English between 2010 and 2025. This time frame was selected to capture the most recent developments in technology-driven entrepreneurship while allowing for the identification of foundational works that have shaped the discourse. Studies were included if they examined the role of technology in entrepreneurship, analyzed success factors for start-ups, or provided cross-regional comparisons of entrepreneurial ecosystems. Both conceptual and empirical studies were considered, provided they offered substantive insights into the topic. Conversely, the exclusion criteria eliminated publications not subject to peer review, such as opinion pieces, editorials, and commentaries. Studies that focused exclusively on general entrepreneurship without explicit reference to technology were also excluded, as were articles written in languages other than English, to ensure analytical consistency. Furthermore, duplicate records identified across multiple databases were removed during the screening process.

The types of research designs incorporated into this review reflected the interdisciplinary scope of the field. Quantitative studies, including randomized controlled trials, cohort studies, and cross-sectional analyses, were considered particularly valuable for their empirical rigor and generalizability. These studies often provided measurable evidence on the impact of technology adoption, funding access, or regulatory environments on entrepreneurial outcomes. Qualitative research, such as case studies and grounded theory approaches, was equally significant, offering in-depth insights into the lived experiences of entrepreneurs and the contextual dynamics of start-up ecosystems (Daim et al., 2022). Mixed-methods research was also included, as it allowed for the

triangulation of findings across methodological paradigms, thereby enhancing the validity of conclusions. Collectively, this methodological inclusivity ensured that the review encompassed a diverse range of perspectives and evidence, from large-scale statistical analyses to detailed examinations of individual entrepreneurial journeys.

The process of literature selection involved multiple stages to ensure rigor and transparency. Initially, database searches using the identified keywords produced a large corpus of articles. Titles and abstracts were then screened to determine relevance, with particular attention to whether the studies addressed technology-driven aspects of entrepreneurship. Articles that passed this initial screening were subjected to full-text review, during which the inclusion and exclusion criteria were systematically applied. In cases of uncertainty, discussions were held among the reviewing team to reach consensus on whether a study should be included. This collaborative approach reduced the risk of individual bias and enhanced the reliability of the review. Following full-text screening, the final pool of articles was evaluated for methodological quality, with emphasis placed on clarity of research design, robustness of data analysis, and transparency of reporting. Studies with insufficient methodological rigor were excluded to maintain the integrity of the evidence base.

The evaluation process also included thematic coding to categorize studies into key areas of focus, such as ecosystem structures, innovation drivers, digital transformation, and inclusivity. This coding process facilitated the identification of patterns and themes across diverse research contexts, enabling the synthesis of findings into a coherent narrative. The thematic analysis was complemented by bibliometric mapping using Scopus tools, which allowed for the visualization of citation networks and research clusters, further enhancing the review's capacity to highlight influential works and emerging trends (Hadizadeh et al., 2024). The combination of qualitative synthesis and bibliometric analysis provided a robust methodological foundation for this review, enabling both depth and breadth in understanding technology-driven entrepreneurship.

Ultimately, the methodological approach employed in this review ensured a comprehensive, systematic, and balanced synthesis of the literature. By integrating multiple databases, carefully chosen keywords, rigorous inclusion and exclusion criteria, and diverse research designs, the study was able to capture a holistic view of the field. The layered process of screening, evaluation, and thematic synthesis further reinforced the reliability of the findings, while the use of bibliometric tools provided additional insights into the evolution and structure of scholarly discourse. This methodological framework not only supports the validity of the current review but also offers a replicable model for future studies examining interdisciplinary topics at the intersection of technology, innovation, and entrepreneurship.

RESULT AND DISCUSSION

Ecosystem of Technology Start-ups

The literature indicates that the success of technology-driven start-ups is strongly influenced by three interrelated factors: funding, regulation, and social networks. Funding is critical in providing the initial capital required for product development and operational scaling. Studies demonstrate

that access to venture capital and strategic investors significantly increases the likelihood of start-up survival and growth, particularly in the early stages of development (Nizhenkovska et al., 2020; Rahmi et al., 2025). Supportive regulatory environments also contribute substantially to entrepreneurial success. Policies that streamline business registration processes, reduce compliance costs, and encourage innovation foster a more conducive ecosystem for start-up development (Jayanna et al., 2024). Equally important are social networks, which provide entrepreneurs with access to mentorship, partnerships, and collaborative opportunities. Such networks enable the sharing of resources and tacit knowledge, thereby strengthening the foundations of entrepreneurial ventures (Bae & Choi, 2025; Hadizadeh et al., 2024).

Comparative studies highlight significant differences between start-up ecosystems in developed and developing countries. In advanced economies such as the United States and Germany, robust infrastructure supports entrepreneurial activity through abundant funding opportunities, well-integrated industrial networks, and innovation-friendly regulatory frameworks. Conversely, start-ups in developing countries often face regulatory volatility, limited access to capital, and inadequate infrastructure, all of which impede growth (Mehta & Mathur, 2022; Ahamat et al., 2021). Nonetheless, resource constraints have fostered localized innovation, with many start-ups in India and Africa focusing on solutions tailored to community needs, thereby demonstrating resilience and adaptability (Ling, 2025). These findings suggest that while structural differences persist, context-specific approaches enable start-ups in diverse regions to thrive.

Education and Capacity Building

Entrepreneurship education integrated with technological competencies has proven effective in enhancing students' entrepreneurial skills and intentions. Evidence suggests that programs embedding digital literacy alongside experiential learning foster greater confidence among students in launching new ventures (Rahmi et al., 2025; Bae & Choi, 2025). Experiential pedagogical methods, such as project-based learning, allow students to translate theoretical knowledge into practical capabilities, bridging the gap between academic training and market realities (Jayanna et al., 2024; Hadizadeh et al., 2024). Such methods also enhance adaptability, risk-taking, and opportunity recognition—skills critical for navigating volatile digital markets.

Innovative teaching models have emerged as particularly effective in cultivating an entrepreneurial mindset. Project-based learning has been highlighted as a model that simulates real-world challenges, preparing students for the unpredictability of technology-driven business environments (Rahmi et al., 2025). Similarly, curricula incorporating technical skills and industry collaboration are instrumental in shaping entrepreneurial competencies. Katz et al. emphasize that simulations and case studies enhance problem-solving capacity and foster active engagement, while internships strengthen practical understanding of market dynamics (Bedaduri & Mamilla, 2024). Collectively, these models underline the importance of aligning educational programs with industry demands to ensure students are adequately prepared for entrepreneurial careers in the digital economy.

Innovation and Business Models

Technological advancements such as AI, IoT, and blockchain are central to the creation of new business models in start-ups. AI enhances operational efficiency and customer engagement by

enabling data-driven personalization and predictive analytics, while IoT facilitates real-time data collection for agile decision-making (Snehvrat & Dutta, 2025; Munusamy et al., 2025; Yoruk & Jones, 2020). Blockchain technology contributes to trust-building and transparency across value chains, providing competitive advantages in industries reliant on secure transactions and decentralized systems.

The success of disruptive business models compared to traditional approaches lies in their agility, continuous innovation, and ability to integrate new technologies quickly. Disruptive start-ups typically exploit underserved market segments, offering novel solutions that challenge incumbent firms. Their adaptability enables them to respond swiftly to shifting consumer demands, thereby capturing market share with greater efficiency (Régner, 2023; Elia et al., 2021). Research underscores that the distinguishing feature of disruptive models is not merely the adoption of advanced technologies, but the capacity to embed these technologies into coherent value propositions that resonate with consumers (Nnaemeka-Okeke et al., 2019; Kulova et al., 2024). This capacity for technological alignment with customer needs positions disruptive start-ups as pivotal actors in transforming industries.

Inclusion and Gender Equality

Female entrepreneurs in technology-driven sectors face disproportionate barriers compared to their male counterparts. These challenges include limited access to financial capital, restricted participation in professional networks, and persistent gender stereotypes that marginalize women's entrepreneurial potential (Bedaduri & Mamilla, 2024; Aggarwal et al., 2024). Structural inequalities in education and training exacerbate these barriers, leaving many women without the technical competencies necessary to compete effectively in technology-intensive markets. Cultural and social biases further restrict women's ability to secure funding or establish influential networks, creating systemic disadvantages.

Inclusive strategies have demonstrated potential in mitigating these challenges. Programs tailored to enhance women's digital and entrepreneurial skills increase their confidence and readiness to engage in technology-driven ventures. For example, initiatives offering mentorship, access to professional networks, and targeted capacity-building workshops provide critical support in overcoming structural barriers (Bedaduri & Mamilla, 2024). Public policy also plays an essential role by addressing discriminatory practices, fostering equal access to resources, and incentivizing female participation in entrepreneurship ecosystems (Régner, 2023; Yoruk & Jones, 2020). Evidence suggests that gender-inclusive ecosystems not only improve equity but also contribute to broader economic dynamism by unlocking underutilized talent.

Mental Health and Well-being

The relationship between intensive technology use and entrepreneurial well-being is a recurring theme in the literature. Founders of technology-driven start-ups often experience technostress, a condition arising from constant exposure to digital tools, high performance expectations, and the pressure to remain perpetually connected (Simba et al., 2024). This stress frequently manifests as burnout, anxiety, and reduced psychological resilience. The high-paced environment of start-up culture, coupled with market volatility, intensifies these pressures, making mental health a critical but often overlooked determinant of entrepreneurial sustainability.

To mitigate these risks, workplace wellness programs and organizational practices promoting work-life balance have been proposed as effective strategies. Interventions such as mindfulness training, psychological counseling, and flexible work arrangements are associated with improved resilience among entrepreneurs. Furthermore, cultivating a workplace culture that prioritizes well-being can reduce the psychological burden of start-up leadership, thereby enhancing overall business performance (Simba et al., 2024). Encouraging digital moderation—such as setting boundaries for device usage—has also been shown to alleviate stress. These findings underscore the importance of integrating well-being considerations into start-up support systems and policy frameworks, ensuring that the human dimension of entrepreneurship is not overshadowed by technological imperatives.

Comparative Global Insights

Cross-regional comparisons reinforce the notion that technology-driven entrepreneurship is shaped by local conditions and systemic structures. In Asia, government-backed initiatives and a strong culture of innovation have enabled countries like China and Singapore to cultivate thriving start-up ecosystems, producing global leaders such as Tencent and Alibaba (Régner, 2023; Munusamy et al., 2025). In contrast, African economies, while rich in entrepreneurial potential, continue to face infrastructural deficits and capital constraints that hinder growth (Hadizadeh et al., 2024; Mehta & Mathur, 2022). Nevertheless, innovations tailored to local contexts—such as mobile banking solutions—highlight the ingenuity of African entrepreneurs in leveraging technology to address pressing societal needs. European ecosystems, supported by strong R&D funding and university-industry collaborations, are more structured but can be constrained by complex regulatory environments that slow innovation compared to more agile Asian markets (Daim et al., 2022; Jayanna et al., 2024). These comparative insights emphasize that while universal success factors exist, regional variations critically shape entrepreneurial pathways.

Synthesis of Findings

The results of this review illustrate the multifaceted nature of technology-driven entrepreneurship. Success is contingent on an interplay of structural, educational, technological, and social factors, each of which exerts distinct influences across regions. Funding, regulation, and networks emerge as foundational elements of thriving ecosystems, while education and innovative pedagogies equip future entrepreneurs with essential skills. Technological adoption drives business model innovation, with disruptive approaches offering pathways to competitive advantage. Inclusivity remains a pressing concern, as gender disparities continue to limit access and opportunities, while mental health challenges underscore the need to address the human cost of entrepreneurship. Comparative insights reveal that although global trends shape the overall trajectory of technology-driven entrepreneurship, regional ecosystems and policies create significant variation in outcomes. Together, these findings provide a nuanced understanding of the dynamics shaping technology-driven start-ups and highlight areas for future research and policy intervention.

Innovation and Entrepreneurship Policy

The findings of this review illustrate the strong interconnection between systemic factors and the development of technology-driven entrepreneurship, and these insights can be directly linked to

innovation and entrepreneurship policies at both national and international levels. Evidence underscores the pivotal role of enabling policy environments in shaping the trajectory of start-ups by influencing access to finance, regulatory frameworks, and social networks (Hadizadeh et al., 2024; Kulova et al., 2024). For instance, supportive policies that streamline bureaucratic procedures, reduce compliance costs, and encourage research and development create an environment that allows new ventures to thrive. Internationally, collaboration between countries facilitates the sharing of best practices in ecosystem development, including the design of incubators and accelerators that provide entrepreneurs with practical support, mentoring, and access to resources (Yoruk & Jones, 2020). Such cooperative arrangements contribute to the diffusion of innovation models across borders, ultimately strengthening global entrepreneurial ecosystems.

A key policy implication lies in the alignment of education with innovation strategies. Sustainable entrepreneurship education that integrates technological competencies prepares future entrepreneurs to navigate complex and rapidly changing markets. Policies that bridge education, research, and industrial application reinforce national innovation systems and ensure that talent pipelines are adequately prepared to contribute to entrepreneurial ecosystems (Rahmi et al., 2025). As Daim et al. (2022) emphasize, innovation policy must be coupled with support for education and R&D to stimulate dynamic and inclusive start-up ecosystems. Thus, policy frameworks that are integrative and multi-sectoral not only promote technological innovation but also build resilience within entrepreneurial ecosystems by ensuring long-term sustainability.

Systemic Factors Shaping Barriers to Start-up Growth

The literature consistently highlights regulatory challenges, limited access to finance, and inadequate technological infrastructure as the most significant systemic barriers inhibiting the development of technology-driven start-ups. In many emerging economies, unclear or frequently changing regulations discourage investment and limit entrepreneurial activity, stifling growth before ventures can mature (Hadizadeh et al., 2024; Bae & Choi, 2025). These conditions contrast sharply with ecosystems in advanced economies, where clearer frameworks and predictable policy environments contribute to greater entrepreneurial confidence. The absence of stable and transparent regulations not only constrains firm creation but also undermines innovation capacity, as entrepreneurs expend significant resources navigating compliance rather than investing in innovation.

Access to finance represents another systemic barrier. While venture capital and angel investment are abundant in developed economies, start-ups in developing regions often face restricted access to formal financial channels. This scarcity of capital forces entrepreneurs to rely on informal financing or self-funding, which limits scalability and hinders entry into competitive markets. Research demonstrates that the availability of diverse financing instruments is directly correlated with higher survival rates and more sustainable growth trajectories for start-ups (Rahmi et al., 2025). Addressing financial constraints therefore requires both institutional reforms and targeted policy measures, such as tax incentives, innovation grants, and risk-sharing mechanisms to reduce investor apprehension.

Technological infrastructure and digital literacy represent a third critical challenge. Many start-ups in emerging markets operate in environments with unreliable internet connectivity, limited access

to digital platforms, and insufficient technological training (Mzyece et al., 2021). These deficits create disparities in entrepreneurial opportunity by preventing firms from leveraging technologies such as AI, IoT, and blockchain that are increasingly central to competitive advantage (Snehvrat & Dutta, 2025; Munusamy et al., 2025). Consequently, policies aimed at improving digital infrastructure and promoting digital skills development are essential for fostering equitable participation in technology-driven entrepreneurship. Strengthening these systemic enablers not only mitigates barriers but also enhances ecosystem inclusivity, allowing a broader range of actors to engage in innovative activities (Kulova et al., 2024).

Underexplored Areas in Current Research

Despite the rapid growth of literature on technology-driven entrepreneurship, several areas remain underexplored. One such area is the social and environmental impact of technology-based entrepreneurship. While research has demonstrated the economic benefits of start-ups, limited attention has been given to how they contribute to sustainability goals or influence social equity (Hadizadeh et al., 2024). Understanding these dimensions is increasingly important in the context of global sustainability agendas, as start-ups are uniquely positioned to innovate in ways that align with environmental and societal needs. Further studies that adopt multidimensional evaluation frameworks could provide insights into how entrepreneurship can simultaneously drive economic growth and sustainable development.

Gender inclusivity is another domain that warrants greater scholarly attention. The literature highlights persistent disparities faced by women in technology-driven entrepreneurship, including unequal access to capital, networks, and technical training (Bedaduri & Mamilla, 2024). However, research on effective interventions to mitigate these disparities remains limited. While some studies identify mentorship programs and capacity-building initiatives as promising strategies, systematic evaluations of their long-term impact are scarce (Aggarwal et al., 2024). Future research could adopt a multidisciplinary lens, integrating insights from economics, sociology, and gender studies to design inclusive frameworks that effectively dismantle barriers for women entrepreneurs. By doing so, research can inform policy interventions that foster more equitable and diverse entrepreneurial ecosystems.

The mental health and well-being of entrepreneurs represents an additional area that has not been sufficiently investigated. The phenomenon of technostress—arising from the intensive use of digital technologies—has been shown to negatively impact the psychological resilience of start-up founders, often leading to burnout and reduced productivity (Simba et al., 2024). Yet, empirical studies on the prevalence, determinants, and mitigation strategies for technostress in entrepreneurial contexts are limited. Considering the human cost associated with entrepreneurship, more research is needed to understand the relationship between technological intensity and founder well-being. Studies that explore organizational practices, support mechanisms, and cultural interventions could yield valuable insights into how entrepreneurs can maintain a sustainable balance between professional demands and personal health.

Taken together, these gaps suggest that while the field of technology-driven entrepreneurship has advanced significantly in understanding structural and economic determinants of success, it remains underdeveloped in exploring broader societal, inclusivity, and well-being dimensions. Addressing these gaps will require interdisciplinary approaches that bring together diverse

methodologies and perspectives, as well as closer collaboration between academia, policymakers, and industry practitioners. This expanded research agenda has the potential to generate more holistic insights that not only advance theoretical understanding but also inform more effective policies and practices in the realm of technology-driven entrepreneurship.

CONCLUSION

The findings of this narrative review highlight the multifaceted nature of technology-driven entrepreneurship, underscoring its significance as a driver of global innovation, economic growth, and social transformation. The analysis demonstrates that the success of technology-driven start-ups is shaped by systemic factors such as funding, regulation, and access to networks, which together form the foundation of resilient entrepreneurial ecosystems. Education emerges as another pivotal determinant, with evidence pointing to the effectiveness of experiential and digitally integrated learning models in cultivating entrepreneurial skills and intentions. The role of digital technologies, particularly artificial intelligence, the Internet of Things, and blockchain, is shown to be central to the development of disruptive business models, enhancing competitiveness and creating new avenues for value creation. Despite these opportunities, persistent challenges remain, especially for female entrepreneurs who face barriers of access, discrimination, and structural inequality, as well as start-up founders who struggle with mental health pressures associated with intensive technology use.

The urgency of addressing these barriers is evident, requiring coordinated interventions at the policy, institutional, and organizational levels. Policies that strengthen access to financing, streamline regulatory frameworks, and enhance digital infrastructure are essential to fostering inclusive and sustainable entrepreneurial growth. At the same time, targeted initiatives that promote gender inclusivity and support entrepreneurial well-being are critical in ensuring that the benefits of technology-driven entrepreneurship are equitably shared. Future research should address underexplored dimensions such as the social and environmental impacts of start-ups, gender inclusivity, and the intersection between digital intensity and entrepreneurial well-being. By integrating systemic reforms with inclusive practices, technology-driven entrepreneurship can evolve into a transformative force that supports sustainable, equitable, and resilient global development.

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