TECHNOPRENEURSHIP AS A CATALYST FOR SOCIAL INNOVATION: A SYSTEMATIC LITERATURE REVIEW AND INTEGRATED CONCEPTUAL FRAMEWORK

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Abstract

The convergence of technopreneurship and social innovation offers a transformative approach to addressing global societal challenges, such as inequality, climate change, and digital divides, yet the field remains fragmented, lacking a cohesive framework to guide research and practice. This study conducts a systematic literature review (SLR) to synthesize existing knowledge on how technopreneurship—defined as technology-enabled entrepreneurship for value creation—drives social innovation through scalable, socio-technical systems. Drawing on approximately 100–150 peer-reviewed articles published post-2010 from databases like Scopus, Web of Science, and Google Scholar, the review employs PRISMA guidelines to ensure rigor and transparency. Key findings reveal that technopreneurship enhances social innovation by leveraging technologies like artificial intelligence and digital platforms to deliver solutions in areas such as healthcare, education, and energy poverty alleviation. However, tensions in balancing economic viability with social impact pose significant challenges, often leading to mission drift in resource-constrained settings. Factors such as digital familiarity and social proximity emerge as critical influencers of entrepreneurial intentions, shaping the ability of technopreneurs to align innovations with community needs. The review proposes an integrated, multi-level framework (micro-meso-macro) grounded in Socio-Technical Systems Theory and open innovation models, which delineates individual competencies (e.g., creativity, resilience), ecosystem interactions (e.g., collaborative networks), and societal outcomes (e.g., policy influence, systemic change). This framework addresses literature gaps by bridging individual actions with broader societal impacts, offering a novel lens for understanding socio-tech entrepreneurship.

Theoretical implications advance the application of Socio-Technical Systems Theory in entrepreneurial contexts, while practical implications provide guidelines for technopreneurs to navigate dual objectives through agile business models and stakeholder collaboration. Policy recommendations advocate for supportive ecosystems, including funding and regulatory incentives, to foster tech-social hybrids. Despite its contributions, the study acknowledges limitations, such as a Western-centric bias in the literature and underexplored areas like the long-term impacts of open social innovation and generational differences. Future research should prioritize empirical testing of the framework, longitudinal studies on innovation sustainability, and interdisciplinary explorations of emerging technologies like AI in social ventures. This study calls for concerted action to cultivate technopreneurship for inclusive and sustainable societal progress, emphasizing the need for integrated approaches that harmonize technological advancement with social good.

Keywords: Technopreneurship, Social Innovation, Socio-Tech Entrepreneurship, Systematic Literature Review, Socio-Technical Systems Theory, Open Innovation, Scalable Technology, Inclusive Growth, Sustainable Development

Introduction

The world faces unprecedented societal challenges, including rising inequality, climate change, and digital divides, which demand innovative and scalable solutions (United Nations, 2020). These challenges are complex, interconnected, and require approaches that transcend traditional problem-solving methods. Social innovation, defined as the development and implementation of novel solutions to address social needs and create systemic change, has emerged as a critical framework for tackling such issues (Mulgan, 2019). Concurrently, technopreneurship entrepreneurship that leverages technology to create scalable ventures has gained prominence as a driver of economic and social value creation (Pathak & Muralidharan, 2018). By integrating advanced technologies like artificial intelligence, blockchain, and digital platforms, technopreneurs are uniquely positioned to amplify social impact through innovative, replicable, and sustainable solutions (Bocken & Short, 2021).

The intersection of technopreneurship and social innovation, often termed socio-tech entrepreneurship, represents a powerful paradigm for addressing global challenges. Socio-tech entrepreneurship emphasizes the synergy between technological innovation and social purpose, enabling ventures to achieve both scalability and societal impact (Saebi et al., 2019). For instance, digital platforms have facilitated inclusive business models that address energy poverty and improve access to education in underserved communities. This growing relevance is evident in the increasing number of technology

social ventures (TSVs), which combine entrepreneurial agility with social missions to drive systemic change. Unlike traditional entrepreneurship, which prioritizes economic returns, or social entrepreneurship, which focuses on social impact, socio-tech entrepreneurship uniquely integrates technological and social systems to create hybrid value (Santos et al., 2021).

Despite its potential, the literature on socio-tech entrepreneurship remains fragmented, with limited integration of technopreneurial competencies and social innovation outcomes (Tracey & Stott, 2017). Existing studies often focus on either technological innovation or social entrepreneurship, overlooking the dynamic interplay between the two. This gap underscores the need for a systematic exploration of how technopreneurship can catalyze social innovation to address pressing societal challenges. This study aims to: (1) synthesize the literature on technopreneurship and social innovation, (2) identify key themes and gaps, and (3) propose an integrated framework to guide future research and practice in socio-tech entrepreneurship. By doing so, it seeks to contribute to the discourse on leveraging technology for sustainable and inclusive societal progress.

Problem Statement and Research Gaps

In an era marked by escalating global challenges such as economic inequality, environmental degradation, and widening digital divides, the need for innovative solutions that blend technological advancement with social purpose has become increasingly urgent (United Nations, 2020). Technopreneurship, characterized by the entrepreneurial application of technology to create scalable and impactful ventures, intersects profoundly with social innovation, which focuses on developing novel approaches to meet societal needs and foster systemic change (Mulgan, 2019). However, despite the potential of this intersection to drive sustainable development, the field of socio-tech entrepreneurship remains underdeveloped, with persistent barriers hindering the effective integration of technological tools into social ventures (Saebi et al., 2019). This problem is compounded by the fragmented nature of existing research, where studies on social entrepreneurship and technological innovation often operate in silos, failing to provide a cohesive framework for understanding how technopreneurs can address complex social issues like poverty alleviation and climate resilience (Pathak & Muralidharan, 2018).

A core aspect of this problem lies in the divergent conceptualizations of open social innovation within the technopreneurship domain, where definitions vary widely across disciplines, ranging from collaborative stakeholder processes to technology-enabled community-driven solutions (Chesbrough & Di Minin, 2014; Howaldt & Schwarz, 2017). This lack of consensus not only confuses theoretical

discourse but also impedes practical implementation, as technopreneurs struggle to align their innovative efforts with broadly accepted models of social impact (Bocken & Short, 2021). Furthermore, during turbulent times such as economic crises or global pandemics, social innovation efforts are often anecdotal and disjointed, exacerbating the challenge of scaling technopreneurial initiatives to achieve widespread societal benefits (Tracey & Stott, 2017). The absence of a unified approach means that potential synergies between digital technologies and social entrepreneurship are not fully realized, resulting in ventures that may excel in technological sophistication but fall short in delivering equitable social value.

Research gaps are particularly evident in the underexplored connections between technopreneurial competencies such as innovation, resilience, digital skills, and strategic agility and their direct influence on social outcomes like community empowerment and sustainable development. While some studies highlight the role of these competencies in fostering entrepreneurial intentions, there is a scarcity of empirical evidence linking them to tangible social impacts, such as job creation in underserved regions or improved access to essential services through tech-driven models. This gap leaves a void in understanding how individual-level skills translate into broader social value creation, limiting the development of targeted training programs for aspiring technopreneurs aiming to address social challenges.

Another significant research gap pertains to the fragmentation in the literature on open social innovation, where interdisciplinary silos prevent a comprehensive synthesis of insights from fields like management, sociology, and technology studies. For instance, while some research communities emphasize organizational mechanisms, others focus on community-level dynamics, leading to disconnected theories that overlook the holistic nature of socio-tech entrepreneurship. This fragmentation is further highlighted in bibliometric analyses, which reveal patterns of isolated clusters in social innovation research, underscoring the need for integrative approaches to bridge these divides and advance the field.

Gaps also exist in integrating micro-level factors, such as individual mindsets, competencies, and behaviors, with macro-level impacts, including policy influences, economic growth, and systemic societal changes in socio-tech entrepreneurship. Existing literature often examines these levels in isolation, with micro-focused studies on personal entrepreneurial traits rarely connecting to macro-level outcomes like national innovation policies or global sustainability goals. This disconnect hinders a multilevel understanding of how technopreneurial actions at the individual level aggregate to

influence larger ecosystems, such as through the adoption of sustainable technologies or the reshaping of market structures.

Finally, addressing these gaps requires systematic reviews that not only map the current state of knowledge but also propose frameworks for future research, particularly in underexplored areas like sector-specific digital innovations and the long-term effects of technopreneurship on social equity. By filling these voids, scholars can better inform practices that enhance the resilience and impact of socio-tech ventures, ultimately contributing to more inclusive and sustainable societal progress. A comprehensive synthesis of these fragmented perspectives could pave the way for actionable strategies that empower technopreneurs to address pressing global challenges effectively.

Objectives

The objectives of this study are as follows:

1. To synthesize the existing literature on technopreneurship and social innovation.
2. To identify key themes, antecedents, processes, and outcomes in the field of socio-tech entrepreneurship.
3. To propose an integrated multi-level framework (micro-meso-macro) that bridges individual competencies, organizational interactions, and societal impacts.
4. To outline a future research agenda that addresses gaps in the literature.

Literature Review

Conceptual Foundations

Technopreneurship is broadly defined as technology-enabled entrepreneurship that focuses on value creation through the integration of technological competence and entrepreneurial expertise (Sahni, 2016). This concept emphasizes the merging of technology with entrepreneurial skills, where entrepreneurs utilize advanced technologies, such as artificial intelligence, blockchain, and digital platforms, to develop scalable ventures that generate economic and innovative value (Selvarani & Venusamy, 2015). Unlike traditional entrepreneurship, which may prioritize general business opportunities, technopreneurship is distinguished by its reliance on technological innovation as a core driver of competitive advantage and growth, positioning it as a catalyst for transformative ventures in dynamic markets (Pathak & Muralidharan, 2018).

Social innovation, in contrast, is characterized as collaborative processes aimed at delivering societal benefits through novel solutions that address complex social problems more effectively than existing

alternatives (Phills et al., 2008). It involves the creation and implementation of strategies, concepts, or tools that enhance well-being, promote systemic change, and address issues such as poverty, inequality, and environmental challenges with an emphasis on efficiency, sustainability, and justice (Portales, 2019a). Social innovation prioritizes collective efforts and stakeholder collaboration, distinguishing it from conventional innovation by its focus on societal impact over purely economic gains, often fostering inclusive and equitable outcomes through community-driven approaches (Mulgan, 2019).

The integration of technopreneurship and social innovation manifests in socio-tech ventures, which balance technical systems such as artificial intelligence and digital platforms with social systems, including networks and norms, to create hybrid models that drive both technological advancement and social impact (Calderini et al., 2021). These ventures, often referred to as "tech4good" or social-tech entrepreneurship, leverage emerging technologies to address societal challenges while ensuring economic viability and scalability (Leitão et al., 2024). By combining the business-oriented focus of social entrepreneurship with the process-driven aspects of social innovation, socio-tech ventures promote inclusive growth, sustainable development, and transformative change through interdependent socio-technical systems (Saebi et al., 2019).

Evolution and Themes

The historical development of entrepreneurship has evolved significantly from its traditional roots, where it was primarily associated with risk-taking, resource management, and economic value creation in established business patterns, to the emergence of technopreneurship as a specialized form integrating technology with entrepreneurial practices (Nwaobi, 2012). Early conceptualizations of entrepreneurship, dating back to the 18th and 19th centuries with thinkers like Richard Cantillon and Jean-Baptiste Say, emphasized the entrepreneur as a risk-bearer and coordinator of production factors. This evolved in the 20th century through Joseph Schumpeter’s focus on innovation and creative destruction as drivers of economic growth (Mashingaidze, 2016). By the late 20th century, the rise of the knowledge-based economy shifted the paradigm toward technopreneurship, defined as the synthesis of technological innovation and entrepreneurial skills, often viewed as the “holy grail” for small and medium-sized enterprises (SMEs) due to its potential for optimizing resources, achieving high profit margins, and fostering sustainable competitive advantages in globalized markets (Mashingaidze, 2016).

Technopreneurship’s evolution has also extended into social contexts, where it serves as a mechanism for addressing societal challenges through innovative and inclusive models. In areas like energy

poverty alleviation, technopreneurship facilitates social innovation by leveraging hybrid organizations and collaborative networks to provide affordable energy solutions, such as user-centered technologies that enhance access for vulnerable populations. For instance, social intrapreneurship within large energy companies has led to the establishment of dedicated departments focused on energy justice, promoting multi-actor collaborations to implement efficiency measures and tailored services that mitigate energy vulnerability. Similarly, in inclusive business models, technopreneurship integrates sustainable technologies to foster community resilience and economic inclusion, aligning with broader goals of poverty reduction and equitable development.

The literature on technopreneurship can be categorized into key themes, encompassing individual factors, organizational dynamics, and systemic influences. At the individual level, factors such as creativity, resilience, motivation, and innovativeness play crucial roles in shaping technopreneurial intentions and success, influencing how entrepreneurs perceive opportunities and navigate technological challenges. These personal attributes are essential for fostering a mindset geared toward technology-driven value creation.

Organizational dynamics involve themes like business model innovation, where technopreneurial ventures adapt structures to integrate technology with market needs, often through agile processes and resource mobilization. Factors such as leadership, culture, and knowledge management within organizations further influence the development of 21st-century skills necessary for technopreneurship, emphasizing collaboration and adaptability.

Systemic influences encompass broader environmental and institutional elements, including policy interventions, ecosystem networks, and regulatory frameworks that enable or constrain technopreneurship (Leitão et al., 2024). For example, government policies supporting innovation ecosystems and sustainable development goals are critical for scaling socio-tech ventures, highlighting the interplay between macro-level factors and entrepreneurial outcomes.

Theoretical Lenses

Theoretical lenses provide foundational frameworks for understanding the integration of technopreneurship and social innovation in socio-tech ventures. One prominent lens is Socio-Technical Systems Theory (STST), which emphasizes the interdependence between social and technical elements within organizational and entrepreneurial contexts (Marjerison et al., 2025). STST posits that optimal outcomes, such as enhanced social entrepreneurial intentions, are achieved only when social

systems (e.g., institutional norms, cultural values, and social networks) and technical systems (e.g., digital infrastructure and artificial intelligence tools) are jointly optimized and aligned. In the context of technopreneurship, STST highlights how technical innovations must be embedded within social structures to address societal challenges effectively, accounting for factors like generational differences and social proximity that moderate the impact of these systems on entrepreneurial activities aimed at social value creation. This theory is particularly relevant in the era of digital transformation, where it guides the design of humane, productive, and innovative workplaces by incorporating digital affordances while maintaining the balance between human and technological elements.

Complementing STST, open innovation models offer another critical lens for examining collaborative value creation in socio-tech ventures. Open innovation posits that firms and entrepreneurs should leverage external ideas, resources, and pathways alongside internal capabilities to accelerate innovation and market advancement (Portuguez-Castro, 2023). In entrepreneurship, these models facilitate co-creation by involving diverse stakeholders—such as customers, universities, and community networks in the innovation process, leading to strategies like crowdsourcing and the use of emerging technologies to generate shared value (Kalnciema & Zvirgzdins, 2022). This collaborative approach not only enhances the efficiency and quality of innovations but also addresses challenges like resource scarcity through networked partnerships, ultimately supporting sustainable value creation in technology-driven start-ups. Furthermore, open innovation underscores the tension between value creation and value capture, where effective strategies are needed to manage knowledge flows and commercialization in open ecosystems, particularly for socio-tech ventures balancing economic and social goals. By integrating open innovation with STST, researchers can better conceptualize how collaborative, technology-enabled processes drive systemic social change.

Methodology

Approach

This study adopts a systematic literature review (SLR) approach to synthesize existing knowledge on the intersection of technopreneurship and social innovation, ensuring a rigorous and transparent process for identifying and analyzing relevant literature. The SLR process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to enhance reproducibility and methodological clarity (Moher et al., 2015). The search strategy was designed to capture a comprehensive set of studies, utilizing a combination of keywords including “technopreneurship,” “social innovation,” “socio-tech entrepreneurship,” and related terms such as

"social entrepreneurship," "open innovation," and "technology-driven social ventures." These keywords were combined using Boolean operators (e.g., AND, OR) to refine the search and ensure relevance to the research objectives.

The literature search was conducted across multiple academic databases to ensure broad coverage, including Scopus, Web of Science, and Google Scholar, which are recognized for their extensive indexing of peer-reviewed journals in entrepreneurship, innovation, and social sciences (Falagas et al., 2008). Additional searches were performed in specialized journals, such as the *Journal of Social Entrepreneurship* and *Technological Forecasting and Social Change*, to capture field-specific studies. The inclusion criteria were strictly defined to maintain quality and relevance: (1) peer-reviewed articles published in English to ensure accessibility and scholarly rigor, (2) studies published post-2010 to reflect contemporary developments in digital technologies and social innovation, and (3) articles explicitly addressing technopreneurship, social innovation, or their intersection in socio-tech contexts. Exclusion criteria encompassed non-peer-reviewed sources (e.g., conference papers, editorials), non-English publications, and studies lacking a clear focus on the defined research scope, such as those solely addressing traditional entrepreneurship or technology without a social component. This resulted in a refined dataset of approximately 100–150 articles, systematically screened for relevance.

Analysis Methods

The analysis of the selected literature employed a dual approach combining thematic analysis and bibliometric tools to map intellectual structures, antecedents, processes, and outcomes of socio-tech entrepreneurship. Thematic analysis was used to identify and categorize key themes, following the framework proposed by Braun and Clarke (2006), which involved iterative coding and grouping of data into meaningful patterns. Initial codes were generated from the literature, focusing on constructs such as individual competencies (e.g., creativity, digital familiarity), organizational dynamics (e.g., business model innovation, collaborative networks), and systemic influences (e.g., policy interventions, societal impacts). These codes were then synthesized into broader themes, such as the role of scalable technologies in social innovation and the tensions in balancing economic and social goals, ensuring a comprehensive understanding of the field's conceptual domain.

Bibliometric tools complemented the thematic analysis by providing a quantitative mapping of the intellectual structure of the literature. Using software such as VOSviewer, co-citation and keyword co-occurrence analyses were conducted to identify influential authors, seminal works, and emerging trends within the field. This approach revealed clusters of research, such as those focused on open

social innovation or socio-technical systems, and highlighted gaps in interdisciplinary integration. The combination of thematic and bibliometric analyses ensured a robust synthesis of qualitative insights and quantitative patterns, enabling the identification of antecedents (e.g., digital skills, social proximity), processes (e.g., open innovation, ecosystem collaboration), and outcomes (e.g., sustainable development, systemic change).

To ensure reproducibility, the SLR process adhered to the PRISMA framework, with a detailed flow diagram documenting the stages of identification, screening, eligibility assessment, and inclusion. The diagram outlines the number of records retrieved, screened, and included, providing transparency on the selection process and mitigating potential biases (Moher et al., 2015). This methodological rigor strengthens the reliability of the findings and supports the development of the proposed multi-level framework, offering a foundation for future empirical studies in socio-tech entrepreneurship.

Findings

Synthesized Insights

The systematic literature review yields a rich array of thematic insights that illuminate the dynamic relationship between technopreneurship and social innovation, drawing from diverse studies to highlight both opportunities and challenges in this evolving field. A central theme is the capacity of technopreneurship to bolster social innovation via scalable technological solutions, particularly through digital startups designed for societal benefit. These ventures harness emerging technologies such as artificial intelligence, blockchain, and mobile platforms to deliver solutions that address pressing issues like poverty, healthcare disparities, and environmental sustainability, enabling efficient resource allocation and widespread adoption (George et al., 2020). For instance, social-tech entrepreneurs are pioneering models that integrate robotics and data analytics to enhance personalized care for vulnerable populations, thereby scaling impact from local initiatives to broader ecosystems and fostering inclusive growth (Calderini et al., 2022). This scalability not only amplifies the reach of social innovations but also contributes to sustainable development goals by promoting economic resilience and community empowerment, as evidenced in contexts where digital tools facilitate access to education and financial services in underserved regions (Manjon et al., 2022; Ip et al., 2023). However, this enhancement is not without complexities, as the integration of technology often requires overcoming barriers related to digital divides, ensuring that innovations remain accessible and equitable across diverse socio-economic environments.

Despite these advancements, a recurring theme in the literature is the inherent tensions technopreneurs face in balancing economic imperatives with social objectives, which can create paradoxes in venture management and long-term viability. These tensions manifest in areas such as resource allocation, where the pursuit of financial sustainability through commercialization may conflict with the core mission of social impact, leading to potential mission drift or stakeholder dissatisfaction (Smith et al., 2013; Sunduramurthy et al., 2023). For example, social enterprises often encounter performing tensions from divergent metrics—financial returns versus social outcomes—and organizing tensions in structuring hybrid models that satisfy both investors and beneficiaries (Sunduramurthy et al., 2023; Ferreira et al., 2024). Such challenges are particularly acute in turbulent environments, where economic pressures during crises can exacerbate the difficulty of maintaining dual goals, necessitating strategic responses like paradoxical leadership and dynamic capability building to navigate these conflicts effectively (Pacheco et al., 2025). The synthesis reveals that while these tensions can hinder progress, they also drive innovation in governance and business models, encouraging technopreneurs to adopt integrated approaches that reconcile profitability with ethical and social responsibilities.

Additionally, the review synthesizes insights on key influencing factors, such as digital familiarity and social proximity, which significantly shape entrepreneurial intentions in socio-tech contexts. Digital familiarity, encompassing proficiency in tools like AI and data analytics, positively correlates with heightened entrepreneurial intentions by equipping individuals with the skills to identify and exploit opportunities for social value creation (Ip et al., 2023; Marjerison et al., 2025). This factor is especially pronounced among younger generations, where exposure to digital technologies fosters a mindset oriented toward innovative problem-solving, though it may vary in impact based on generational differences and overexposure risks. Complementing this, social proximity referring to the closeness of personal networks and community ties acts as a moderator, enhancing intentions by providing relational support, empathy, and collaborative resources that align individual aspirations with societal needs. Together, these factors underscore the importance of socio-technical antecedents in forming intentions, with implications for education and policy to cultivate environments that nurture both technical competence and social connectivity for aspiring technopreneurs.

Integrated Model

Building on the synthesized insights from the systematic literature review, this study proposes an integrated, systems-based framework for socio-tech entrepreneurship that conceptualizes the phenomenon as a multi-level construct, distinct from traditional social or technology entrepreneurship,

while addressing critical gaps in existing models. This framework adopts a micro-meso-macro perspective, drawing heavily on Socio-Technical Systems Theory (STST) to illustrate the interdependence of individual, organizational, and societal elements in driving social innovation through technology. The model extends prior frameworks by incorporating open innovation dynamics, emphasizing collaborative value creation, and addressing underexplored areas such as generational influences, digital familiarity, and the long-term effects of socio-tech ventures on social equity. It provides a holistic structure to guide empirical testing and practical applications, offering propositions for how interactions across levels can optimize outcomes like sustainable development, inclusive innovation, and systemic change.

At the micro level, the framework focuses on individual competencies and the technopreneurial mindset, which encompass attributes such as creativity, resilience, digital literacy, and social empathy. These elements drive the alignment of individual capabilities with technological tools to create social value, enabling entrepreneurs to ideate and prototype solutions that address societal needs (Ip et al., 2023). For instance, digital familiarity enhances the ability to leverage tools like artificial intelligence for data-driven social interventions, while social proximity fosters empathy and community trust, strengthening the relevance of innovations. This level addresses how personal attributes shape entrepreneurial intentions, responding to calls in the literature for a deeper understanding of individual-level drivers in socio-tech contexts.

The meso level emphasizes ecosystem interactions, including business model innovation, collaborative networks, and open innovation processes that facilitate tech-social system interdependence. This level highlights how organizations integrate technological and social systems through agile development, stakeholder partnerships, and resource mobilization (Koehorst et al., 2021). For example, open social innovation processes, such as crowdsourcing and public-private collaborations, enable ventures to co-create value by integrating diverse expertise, thereby enhancing scalability and adaptability. The meso level addresses tensions between economic and social goals by proposing dynamic business models that balance profitability with impact, building on insights into organizational dynamics and collaborative frameworks.

At the macro level, the framework examines societal impacts, focusing on policy interventions, scaling mechanisms, and systemic change that amplify the outcomes of socio-tech ventures. This level considers how technopreneurship contributes to broader societal goals, such as reducing inequality or advancing sustainable development, through replication and institutional support. Policies that foster

innovation ecosystems, such as funding for tech-social hybrids or regulatory incentives, are critical enablers of scalability and systemic resilience. The macro level integrates insights from the literature on socio-tech replication capacity, emphasizing the need for supportive environments to sustain long-term social impact.

The proposed framework is visualized in the following table, which outlines the levels, components, key interactions, and examples from the literature:

Level	Components	Key Interactions	Examples from Literature
Micro	Technopreneurial mindset, competencies (e.g., creativity, resilience)	Individual-tech alignment for social value	Factors affecting technopreneurship (Abdulgani & Mantikayan, 2017; Marjerison et al., 2025)
Meso	Business models, networks, open collaboration	Tech-social system interdependence	Dynamics of business model innovation; open social innovation processes (Koehorst et al., 2021; Pacheco et al., 2025)
Macro	Policy, scaling, systemic change	Broader societal outcomes and replication	Socio-tech replication capacity (Calderini et al., 2022; Ferreira et al., 2024)

Discussion

Implications

The findings from this systematic literature review offer significant theoretical implications, particularly in advancing Socio-Technical Systems Theory (STST) within entrepreneurial contexts. STST, which emphasizes the interdependence of social and technical systems, is enriched by its application to socio-tech entrepreneurship, where it provides a robust framework for understanding how technopreneurs integrate technologies like artificial intelligence and digital platforms with social networks and norms to drive innovation. This study extends STST by illustrating how individual competencies, such as digital familiarity, interact with organizational ecosystems to produce societal outcomes, thus offering a multi-level perspective that bridges previously siloed entrepreneurial theories. By reconceptualizing technopreneurship as a socio-technical process, the framework contributes to theoretical discourse by highlighting the dynamic interplay between human agency and technological affordances, paving the way for future research to explore these interactions in diverse entrepreneurial settings.

Practically, this study provides actionable guidelines for technopreneurs engaged in social ventures, emphasizing the importance of balancing economic and social objectives through innovative business models. The review suggests that technopreneurs should prioritize developing competencies like

resilience and creativity while leveraging open innovation strategies, such as crowdsourcing and stakeholder collaboration, to co-create value. For instance, social-tech ventures can adopt agile prototyping and data-driven decision-making to address community-specific needs, as seen in initiatives tackling energy poverty through user-centered technologies. Additionally, fostering social proximity with target communities can enhance trust and adoption, ensuring that innovations are both relevant and impactful. These practical insights are particularly valuable for incubators and accelerators, which can design training programs that integrate technical skills with social entrepreneurship principles to support aspiring technopreneurs.

Policy-related implications underscore the need for supportive frameworks that enable tech-social hybrids to thrive. Governments and institutions should prioritize policies that incentivize socio-tech entrepreneurship, such as funding mechanisms for ventures addressing sustainable development goals or regulatory support for open innovation ecosystems. For example, tax incentives and grants for startups focusing on inclusive business models can alleviate the financial pressures that often lead to mission drift in social ventures. Moreover, policymakers can foster collaborative networks by establishing platforms that connect technopreneurs with social organizations and academic institutions, facilitating knowledge exchange and resource mobilization. Such policies would not only enhance the scalability of socio-tech ventures but also align them with broader societal objectives, such as reducing inequality and promoting environmental sustainability.

Limitations and Gaps

This systematic review, while comprehensive, is subject to several limitations that contextualize its findings and highlight areas for future exploration. A primary limitation is the Western-centric bias prevalent in many of the reviewed sources. The majority of studies focus on developed economies with advanced technological infrastructures and established entrepreneurial ecosystems, which may not fully reflect the realities of developing or emerging economies. In regions with limited access to digital technologies or differing cultural and economic contexts, the applicability of socio-tech entrepreneurship models may be constrained, potentially overlooking unique challenges such as infrastructural deficits or localized social priorities.

Another gap lies in the limited exploration of the long-term impacts of open social innovation (OSI) within socio-tech ventures. While the literature emphasizes OSI's role in fostering collaborative value creation, there is a lack of longitudinal studies examining how these innovations sustain social impact over extended periods or adapt to shifting societal needs. This gap is significant, as short-term

successes may not translate into enduring systemic change, particularly in volatile environments where economic and social priorities evolve rapidly, leaving questions about the durability of OSI-driven outcomes unanswered.

The role of generational differences in shaping technopreneurial intentions and outcomes also remains underexplored. Although some studies suggest that younger generations, with greater digital familiarity, exhibit stronger entrepreneurial intentions, there is insufficient research on how these differences manifest across age groups or cultural settings. This gap is critical given the increasing influence of technology on entrepreneurial mindsets, where variations in digital exposure could lead to differing impacts on motivation, innovation capacity, and the adoption of socio-tech solutions.

Finally, the integration of micro, meso, and macro-level factors in socio-tech entrepreneurship remains fragmented. While this review proposes a conceptual framework to bridge these levels, the literature lacks empirical studies that validate how individual competencies translate into systemic impacts, such as policy reform or market transformation. This disconnect hinders a comprehensive understanding of how individual actions aggregate to influence broader ecosystems, necessitating further research to explore these causal pathways and their implications for sustainable and inclusive progress.

Conclusion

This systematic literature review underscores the pivotal role of technopreneurship in driving social innovation through integrated socio-technical systems. By synthesizing insights from diverse secondary sources, the study reveals how technopreneurship leverages scalable technologies, such as digital platforms and artificial intelligence, to address pressing societal challenges like inequality, environmental degradation, and digital divides. The findings highlight the unique capacity of socio-tech ventures to balance technical innovation with social systems, including networks and community norms, to create hybrid models that deliver both economic viability and social impact. Despite challenges, such as tensions between financial and social objectives, technopreneurship emerges as a transformative force, fostering inclusive growth and sustainable solutions through collaborative and open innovation processes. The proposed multi-level framework—spanning individual competencies, ecosystem interactions, and societal outcomes—offers a cohesive lens to understand and advance this interdisciplinary field, bridging gaps in fragmented literature and providing a foundation for actionable strategies.

Future Directions

To build on this synthesis, future research should prioritize empirical testing of the proposed framework to validate its applicability across diverse contexts, particularly in underrepresented regions where socio-economic and technological environments differ. Multi-level studies exploring the governance and scaling of open social innovation (OSI) are essential to understand how collaborative processes can be sustained and optimized for long-term impact. Such studies should examine the interplay between micro-level factors, like entrepreneurial mindsets, and macro-level influences, such as policy frameworks, to uncover causal pathways that drive systemic change. Additionally, interdisciplinary research on emerging technologies, such as artificial intelligence in social ventures, is needed to assess their potential in enhancing scalability and addressing complex societal needs. This could involve exploring how AI-driven analytics or blockchain-based solutions can improve transparency and efficiency in social impact initiatives. The review calls for concerted action from researchers, practitioners, and policymakers to foster technopreneurship for inclusive innovation, encouraging the development of supportive ecosystems, training programs, and policies that empower technopreneurs to create sustainable and equitable solutions for global challenges.

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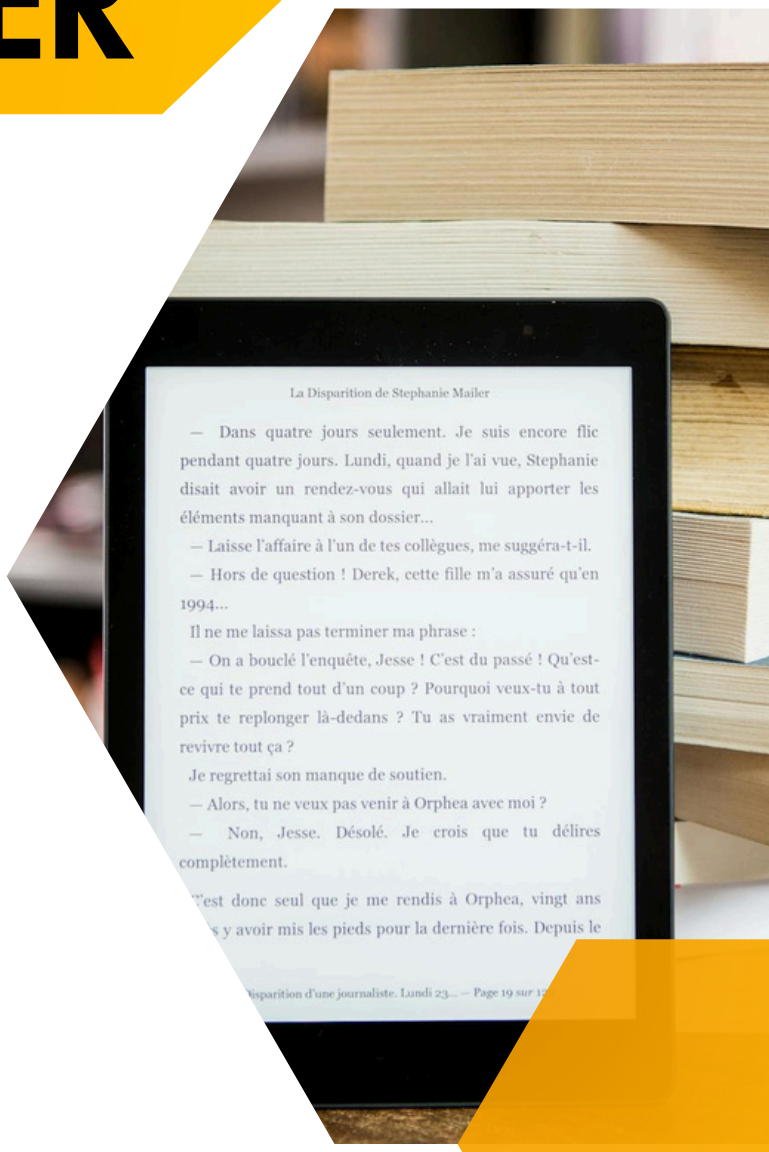

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