SCIENTIFIC CULTURE
www.sci-cult.com

SCIENTIFIC CULTURE, Vol. 12, No. 4, (2026), pp. 5715-5727
Open Access. Online & Print

DOI: 10.5281/zenodo.12426605

TECHNOLOGY INNOVATION AND ARTIFICIAL INTELLIGENCE IN SOCIAL ENTREPRENEURSHIP: A STRATEGIC PATHWAY TOWARD SUSTAINABLE DEVELOPMENT GOAL IMPLEMENTATION

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Received: 07/06/2025
Accepted: 22/02/2026

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ABSTRACT

The study analyses how technological innovation and artificial intelligence (AI) can develop social entrepreneurship and speed up the implementation of the Sustainable Development Goals (SDGs) by comparing the examples of the United States, the United Kingdom, the United Arab Emirates, and India. With the quantitative, descriptive, and comparative research design, the study relies on secondary data sources like research articles, institutional reports, and international databases to determine the trends in the models of innovation, funding systems, level of technological adoption, and policy support systems. The results indicate that there are significant cross-country differences since developed economies are highly more sophisticated with AI integration and platform-based models whereas emerging economies are interested in frugal, inclusive, and policy-friendly AI applications. These findings demonstrate that AI is both an enabler of social impact that is catalytic in nature, which is moderated by institutional capacity, governance structures and financing architecture. The study results indicate that the sustainability and scalability of an SDG impact is not to be pegged on Technological Intensity alone but on ecosystem coherence, hybrid financing, ethical AI governance, and inclusive innovation strategies on the national level.

KEYWORDS: Social Entrepreneurship, Artificial Intelligence, Technological Innovation, Sustainable Development Goals (SDGs), Entrepreneurial Ecosystems, Comparative Analysis.

1. INTRODUCTION

Innovation has become a fundamental force of social entrepreneurship in the XXI century, largely driven by technology, and has changed the way mission-driven organisations find need, provide services, and increase impact. Unlike the previous generations of social enterprise development, which were largely based on business model development and community networks, the most recent generation leverages low-cost sensors, mobile platforms, cloud analytics, and open data to minimize transaction costs and expansion (Turker and Ozmen 2021). Technological affordances alter the marginal cost of delivery (such as telemedicine and remote learning), machine learning facilitates much more extensive targeting and measuring of impact, and distributed ledgers or digital identity systems enhance the transparency of flows of donors and their verification of beneficiaries (Rengaraj et al., 2024). Above all, technology cannot substitute social strategy, it only increases opportunities to do so, enabling a rapid iteration, a performance measurement (real-time dashboards), and innovative methods to coordinate stakeholders (platform cooperatives, API-based service stacks) that ten years ago were not possible or cost extremely (Skivko 2021). Technology is not seen in the literature as a silver bullet; instead, it is viewed as an infrastructure that is enabling with its social payoff premised on its governance, human-friendly design, and universal access.

In such a technology ecosystem, artificial intelligence (AI) is developing as a catalytic layer: it works on limited human knowledge, automates repetitive triage, and infers signals at scale on noisy data - activities that are directly related to numerous social missions (Singh and Guha 2024). Examples of AI uses include demand-prediction models that use AI to optimize food distribution in urban food banks, natural-language screening to screen legal aid organizations on the importance of pro bono cases, or adaptive learning engines to personalize remedial education to out-of-school children (Xiao and Su 2022). As it is described in larger institutional publications, a significant number of social innovators today use AI to improve the outcomes of healthcare, education, and civic services (e.g., one in four innovators stated the use of AI in healthcare-related innovations in recent multi-stakeholder studies). However, with the positive side there exist documented dangers such as bias in models, data-poverty that favours the vulnerable groups and governance gaps that will increase inequality instead of mitigating it when absent (Gerli et al., 2020). Therefore, participatory data governance and explainable practices of AI have to be incorporated into social-impact AI design in case the benefits are to be shared extensively and conform to social values.

Digital and AI-enabled social entrepreneurship is also a viable way to fast-track few chosen Sustainable Development Goals (SDGs), since digital and artificial intelligence tools facilitate turning high-level objectives into scalable and quantifiable interferences. The examples include remote sensing and AI-based mapping accelerate the process of informal settlements identifying in need of water and sanitation investments (SDG6); mobile micro-finance platforms enhance financial inclusion (SDG8); and AI-enabled precision agriculture can increase yields and minimize inputs (SDG2 and SDG13) (Winanda and Zaakiyyah 2025). Notably, identical technology stack i.e. sensors, data pipelines, predictive models and human-centred interfaces are re-used across SDG areas, generating portfolio efficiencies to social enterprises which solve neighbouring issues (Attah & Yonkor 2025). However, there is a practical deterrent: technology cannot seal systemic financing gaps and replace facilitating public policy. Rather, the most successful direction in various case studies is the hybrid one blended finance, partnerships of the government to access data, and capacity-building facilitating the sustainable stewardship of technology by small social enterprises. Essentially, this cross-sectoral integrated and policy-sensitive methodology is emphasized as an essential element in recent and cross-sector reports as the key to scaling SDG impact which can be measured (Raman et al., 2025).

The comparative and strategic analysis between the national settings revealed that the configuration of the local institutional frameworks influenced the adoption, diffusion, and performance outcomes of the technology-driven social entrepreneurship in a profound way, meaning the regulatory openness to forms of hybrid enterprises, the richness of the capital market of the respective countries, the maturity of the digital infrastructure, and the strength of the human capital development systems (Kiladze et al., 2024). Their data indicated that these differentiated, country-specific paths would be necessary in strategy formulation, as it could not be consistent in all situations. In developed innovation systems with good research universities, developed venture funding and conducive policy environments, faster prototyping, AI testing, university-industry data partnerships and venture-type scaling models were seen as strategic priorities. On the other hand, in low-resource or emerging contexts, affordability, technological resilience and

inclusivity form the core of strategic plans, like offline-first-based applications, using SMS to provide services, grassroots capacity building, and integration of formal social protection systems (Chatzichristos and Nagopoulos, 2021). The combination of these insights allowed developing a conceptual framework in terms of structured country-level comparative analysis (Yin et al., 2024).

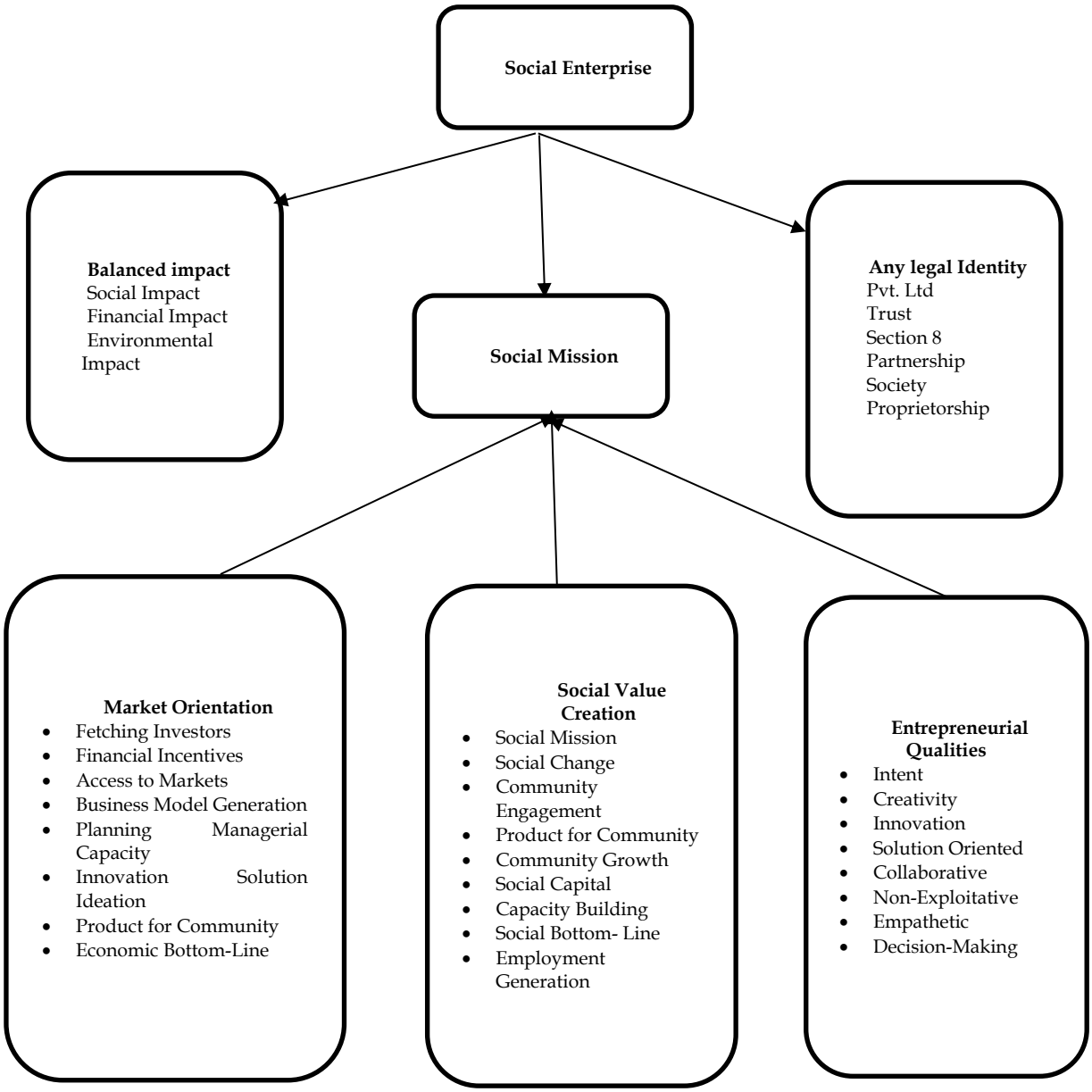

Figure 1: Integrated Model of Social Enterprise and Value Creation Dimensions.
Source: (Sengupta & Sahay 2018)

2. SOCIAL ENTREPRENEURSHIP ECOSYSTEMS IN THE US, UK, UAE, AND INDIA

The United States has a rich philanthropic industry, established impact-investment markets and an extremely huge nonprofit ecosystem - factors that are conducive to complex, technology-driven social enterprises that strive to achieve national reach. According to recent national entrepreneurship diagnostics, an increasing proportion of U.S. entrepreneurs now openly seek to maximize social and environmental impact (reported at about 60% in one recent national GEM analysis), and U.S. social ventures tend to use university research partnerships, incubators, and corporate innovation labs as a source of technical talent and datasets (Darwish et al., 2020). The U.S. is therefore exceptional in speedy technical creativity (AI/ML talent, cloud potential) and productised scaling (SaaS to nonprofit operations, telehealth structures). However, the industry is also fragmented: different state regulations, inconsistent public procurement

patterns, and the ongoing problem of sustainable revenue models of mission-first organisations (Dixit et al., 2024). This has implications on practitioners as it is probable that the pathway design will involve blended finance (philanthropy + outcome-based contracts) and robust evidence creation (RCTs or quasi-experimental impact evaluation), and collaboration with the public agencies to gain access to data and procurement footholds (Aljaberi 2024).

The UK has one of the institutionalised social enterprise sectors in Europe: it is estimated that there are approximately 131,000 social enterprises in the UK, generating an annual turnover of about PS78 billion and returning much surplus value to its missions - an ecosystem facilitated by specialised intermediaries, government procurement experiments, and a long life of social finance instruments (Kruse 2021). The UK social enterprise sector is often integrated both trading models with mission locks (charitable or community interest company forms) and is marked by the merging of social value into the local public procurement. In the UK sector, the diffusion of technology is more likely to focus on service-delivery technologies (digital inclusion, social prescribing platform) and operational modernisation technologies (CRM, impact reporting) (Pathak and Mukherjee 2021). But according to the recent barometer surveys, their financial health is mixed with less organisations reporting profit than previous years and strains due to increased labour costs which indicates strategic requirements of revenue diversification and digitisation that reduces administrative burden. To put it briefly, the UK has a policy-abundant climate and a vast array of support resources, yet the social enterprises need to be provided with specific technical support to translate the digital capacity into the sustainable scale (James et al., 2024).

Entrepreneurship in the UAE is abnormally facilitating more recent Global Entrepreneurship Monitor (GEM) studies have ranked the UAE first in the world in the 2023/24 cycle in terms of entrepreneurial ecosystem conditions indicating high levels of governmental support, ease of business formation, and proactive public programmes to encourage innovators (James et al., 2024). It is a highly ranked environment which has facilitated fast experimentation with technology enabled social enterprise, such as state sponsored accelerators that match startups with civic problems, and investment vehicles that focus on impact outcomes associated with the national agenda like Emiratisation and sustainable cities (Slaoui, C. B.2022). The UAE model emphasizes that concentrated actionable policy leadership and active association of the populace may generate rapid enabling circumstances to the technology-based social innovators, yet as pointed out by observers, the domestic civil society capacities and regional reach can be extended to generate long-term grassroots effects.

India is a highly diverse and pluralistic social enterprise ecosystem in which scale is not fuelled by institutional funnels but by distributed social innovations in response to local bottlenecks. The advantages of India are a high number of mission-driven entrepreneurs, an active flow of CSR (Corporate Social Responsibility) funds, and growing digital infrastructure of the population (e.g., Aadhaar-based identity, UPI payments) that reduces the marginal cost of expanding digital solutions (Pathak and Mukherjee 2021). In the past year, national reports and industry stories highlight the ability of tech innovation (mobile platforms, frugal sensors, AI to work in low-resource settings, and more) to create interventions in the education, healthcare, and livelihoods sectors at extremely large scale. Nevertheless, the financing gaps at the growth phase, inter-state regulatory heterogeneity, and the inability to measure the impact rigorously are common to the Indian social venture (Oberoi et al., 2020). Good strategic routes in this case include the use of local partners (NGOs, state health systems), viable offline technologies at low costs, and catalytic grants to derisk early scaling. National prize programmes and foundation awards, which specifically target tech-driven social solutions are examples of ecosystem support (Chopra 2020).

Aim of the Study

The analysis discusses how technological innovation, specifically artificial intelligence, can be used to develop social entrepreneurship and increase the measurable social impact within a variety of national ecosystems. It aims at comparatively examining how social enterprises in the United States, United Kingdom, United Arab Emirates, and India use digital tools to respond to complicated social issues and add to the realization of Sustainable Development Goals (SDGs). Moreover, the study determines the country-specific strategic trajectories, institutional facilitators, and outcomes of innovation leading to scalability, sustainability, and inclusiveness in the technology-enabled social entrepreneurship frameworks.

3. LITERATURE REVIEW

The literature showed that models of innovation and systems of policy differed greatly across regional

and national ecosystems, which led to the claim of difference in cross countries. Regional embeddedness was a determining factor in the functioning of social enterprises in India, which can also be seen in the example of Kerala and Gujarat, where local institutional participants and ecosystem stakeholders had a strong impact on the direction of innovation (KP & Shajahan, 2025; Pathak & Mukherjee, 2021). The further comparative analysis of the UK and Australia policy also confirmed that even structurally close economies demonstrated different discursive and policy approaches to social enterprise due to institutional priorities (Mason et al., 2021). Likewise, Sharafi (2022) demonstrated that the innovation ecosystem in the UAE was influenced by the diversification policy and regulatory changes and, thus, differed with the Western policy. All these results implied that AI-based social enterprises existed in context-dependent models of innovation influenced by localized governance and regulatory regimes and ecosystem maturity.

There was also a significant difference between the funding mechanisms and institutional support in the developed and emerging economies. The models of social entrepreneurship in Southeast Asia were subject to the influence of synergy among the approaches of the populations, international cooperation, and the institutions of the area, leading to the formation of differentiated clusters of development (Prushkivska et al., 2025). In India, the digital technologies and cross-sector alliance as opposed to formal venture capital systems alone served as scalable solutions to SDGs at Bottom of the Pyramid (Goyal et al., 2021). Meanwhile, the ecosystems of developed countries were oriented to organized entrepreneurial fields based on dynamic capabilities and formal markets of financial resources (Mago & van der Merwe, 2023). As Dixit et al. (2025) also showed, the role of intellectual and social capital has been shown to stimulate risk-resilient approaches in uncertain settings. These differences proved the existence of significant differences in funding flows, access to capital, and models of institutional financing in the US, the UK, UAE, and India.

Contextual divergence was also manifested in alignment with Sustainable Development Goals (SDGs). It was also found that digital innovation, partnerships, and institutional enablers were also part of SDGs through social enterprises, although geographical alignment mechanisms differed (Raman et al., 2025; Attah and Yonkor, 2025). European deliberate sustainable communities focused on the micro level practice and on extensive networks to promote SDGs 12, 13, and 16 (Nogueira et al., 2024). Conversely, Indian businesses tended to fill the institutional gaps in the peri-urban area with some scalable digital products (Goyal et al., 2021). Moreover, in digitalization literature, the inequality between regions was emphasized in terms of technological transparency, institutional preparedness, and inequality (Xanthopoulou and Sahinidis, 2025). In this way, comparative evidence proved the hypothesis that the systems of innovation, funding schemes, support in policy, and alignment with SDGs varied considerably between AI-based social enterprises in developed and emerging environments.

H1: There was a significant difference in innovation models, funding mechanisms, policy support structures, and SDG alignment among AI-driven social enterprises operating in the US, UK, UAE, and India.

The analysed literature posited that the evolved entrepreneurial ecosystems showed better technological systems and further development of innovation ability. The systematic reviews of the ecosystems of the developed countries showed that digital transformation, dynamic capabilities, and institutional maturity contribute to an increased level of innovation (Mago & van der Merwe, 2023). The policy comparisons of the UK as corpus revealed that the focus was placed on models of employment and structured firms with greater institutionalized support (Mason et al., 2021). Besides, the mapping studies on digitalization and SDGs reported artificial intelligence, blockchain, and advanced ERP systems as prevalent technologies in the European setting (Xanthopoulou and Sahinidis, 2025). Raman et al. (2025) also added that AI and blockchain integration enhanced SDG contributions, especially in developed economies more so in highly innovative ones. These results all showed that more systematic AI adoption and strategic digital integration was shown in developed contexts.

On the other hand, emerging markets like India and the UAE were an expression of changes but relatively limited technological integration. In India, the study on ecosystems placed more importance on the incorporated institutional support in the regions than on profound technological complexity (KP & Shajahan, 2025; Pathak & Mukherjee, 2021). Although scalability was implemented with the help of digital resources, especially when it came to tackling the issue of the Bottom of the Pyramid, the implementation of technology was more commonly aimed at cost-effectiveness and reach and not necessarily premium-quality AI integration (Goyal et

al., 2021). Sharafi (2022) noted that the ecosystem of innovation in the UAE had developed considerably; nonetheless, a change in the structure was needed to break the institutional barriers of the past. Likewise, in the GCC countries, the entrepreneurial engagement was determined by the perceptual and demographic factors, which reflect the changing and not completely developed digital ecosystems (Shahid Satar et al., 2023). These results indicated relatively moderate levels of AI integration in the new market.

Moreover, intellectual and social capital was found to offset the infrastructural constraints in the emerging economies. Dixit et al. (2025) were also able to demonstrate that social and intellectual capital enhanced the opportunity recognition and resistance to uncertainty even in the moderately high technology intensity environment. Agarwal et al. (2020) have focused on differentiating the competency development and situational adaptability among Indian women social entrepreneurs, and human capital, as an alternative to the developed digital systems. Kiladze et al. (2024) made another important differentiation between CSR and social entrepreneurship and focused on the strategic marketing and hybridisation instead of mainly technological-driven innovation. Altogether, these studies supported the idea that developed economies were more technologically intensified and more successful in their strategies of AI integration than emerging economies.

H2: AI-driven social enterprises in developed economies (US and UK) exhibited significantly higher technological adoption intensity and more advanced AI integration strategies compared to those in emerging economies (India and UAE).

When properly institutionalized in terms of ecosystems, the literature consistently demonstrated that the adoption of technology resulted in a better sense of scalability and sustainability. The study of SDG-oriented social entrepreneurship found that the long-term impact was reinforced by the innovative business models, digital solutions, and intersectoral partnerships (Attah and Yonkor, 2025; Raman et al., 2025). It was discovered that digital transformation increased the levels of transparency, operational effectiveness, and inclusive innovation (Xanthopoulou and Sahinidis, 2025). The use of scalable digital strategies and partnerships helped businesses to bridge institutional gaps in peri-urban India (Goyal et al., 2021). These results proved that technological sophistication, in the context of enabling policy frameworks, increased sustainability and SDG performance.

The literature on institutional entrepreneurship also revealed that social enterprises could institutionalize and grow when the conditions in the field were conducive and when they were governed by decentralized structures (Chatzichristos and Nagopoulos, 2021). Kerala region ecological capabilities played a key role in the growth and stability of enterprises (KP & Shajahan, 2025). Likewise, established entrepreneurial ecosystems based on the framework and the theory of dynamic capabilities provided by Isenberg were demonstrated to promote the economic growth and socio-economic resolution of issues (Mago and van der Merwe, 2023). As Prushkivska et al. (2025) discovered, synergistic collaboration between the government and the businesses is what makes the models of social enterprises sustainable in Southeast Asia. All these studies affirmed the fact that the institutional support increased the gains of technological adoption.

In addition, education, capital networks and social capital were found to be complementary factors in long-term impact. Entrepreneurial skills and risk-taking ability were increased within the enterprise pedagogy program, which contributed to improved sustainability potential (Yasin & Khansari, 2021). Dixit et al. (2025) highlighted the importance of intellectual capital and risk-absorber strategies in overcoming the uncertainty. Nogueira et al. (2024) referred to collaborative networks as the means of scaling micro-level innovations of sustainability. Agarwal et al. (2020) also emphasized the development of competencies as the key to a long-term social impact. Therefore, the literature evidence was strongly corroborating the assumption that AI-based social enterprises that are highly technologically adopted and possess strong institutional backing can be more easily scaled, more sustainable, and have a higher SDG impact potential.

H3: AI-driven social enterprises with higher levels of technological adoption and stronger institutional support demonstrated significantly greater scalability, sustainability, and long-term SDG impact potential.

4. RESEARCH METHODOLOGY

The study adopted a quantitative, descriptive, and comparative research design to examine the role of technological innovation and artificial intelligence (AI) in strengthening social entrepreneurship and accelerating Sustainable Development Goal (SDG) implementation across four national ecosystems: the United States, the United Kingdom, the United Arab Emirates, and India. The research relied exclusively on secondary data sources, including peer-reviewed journal articles, institutional reports (e.g., GEM

reports, AI strategy documents), policy papers, international databases, and ecosystem assessments published between 2020 and 2025. A structured comparative framework was developed to analyse key dimensions such as innovation models, funding mechanisms, technological adoption intensity, AI integration strategies, governance structures, and SDG alignment. The unit of analysis was AI-driven social enterprises operating within these national contexts, and cross-country comparison was undertaken to identify structural similarities and divergences in ecosystem configurations.

For hypothesis testing (H1, H2, and H3), a thematic and analytical synthesis approach was applied to categorize evidence under predefined variables—innovation intensity, institutional support, financing architecture, technological sophistication, scalability, sustainability, and SDG impact potential. Comparative matrices and tabular analysis were used to systematically contrast developed (US, UK) and emerging economies (India, UAE). The study employed conceptual model integration, drawing on ecosystem theory and institutional theory, to interpret patterns of AI adoption and performance outcomes. Reliability was ensured through triangulation of multiple credible secondary sources, while analytical validity was maintained by aligning findings with established theoretical frameworks in social entrepreneurship and digital innovation. Although the study did not incorporate primary data, the comparative methodology provided structured empirical insights into how AI-enabled social enterprises operate within distinct governance and economic environments.

5. RESULTS BASED ON OBJECTIVES

Objective 1: To conduct a comparative analysis of AI-driven social enterprises across the US, UK, UAE, and India in terms of innovation models, funding mechanisms, policy support, and SDG alignment.

The comparative analysis shows that there is a considerable difference in innovation models and models of funding in the four countries. In the United States, AI-based social enterprises are mainly driven by venture-oriented ecosystems having strong university-industry relationships, developed R&D systems, and impact investment systems (Rahman 2025). The models of innovation focus on high-speed prototyping, scalable platform solutions, and data-driven AI applications in the health sector, education, and climate technology. The process of funding is strongly dependent on venture capital, philanthropic foundations, blended finance, and corporate ESG funds (Albous et al., 2025). The social enterprise policy framework in the United Kingdom supports AI social enterprises and is relatively more structured in terms of innovation funds provided by the government and intermediaries in social investment. The UK model incorporates community-oriented innovation and public procurement systems, including social impact bonds, and it is more deeply institutionalized (Dahri et al., 2025).

Conversely, the United Arab Emirates (UAE) is an example of a state-based innovation ecosystem with risks to the adoption of AI being consistent with national digital transformation directions. Incubators led by the government, sovereign wealth funds, and regulatory sandboxes aid the experimentation of AI, especially smart cities, sustainability, and optimization of the operation of the government (Almerri 2024). In the meantime, AI-related social enterprises in India work in the high-innovation, resource-limited setting, focusing on the low-cost, scalable, and inclusive options, including low-bandwidth platforms, agritech AI tools, fintech systems to include the poor, and rural edtech (Beidollahkhani 2025). In India, a mix of impact investors, CSR funds, multilateral development agencies, and startup accelerators is the financing structure which is a hybrid form of financing.

The US and UK are more developed politically and SDG-wise (in terms of their governance system, ethical AI practices as well as the quantified social impact measurement reflect SDGs 3 (Health), 4 (Education), 8 (Economic Growth), and 13 (Climate Action). The UAE model is characterized by a high level of top-down policy consistency, as AI-oriented enterprises are strategically oriented to national sustainability visions and SDG priorities, especially the climate innovation (SDG 13) and sustainable cities (SDG 11) (Stevenson et al., 2021). India is highly SDG consistent in its fight against poverty (SDG 1), financial inclusion (SDG 8), agriculture productivity (SDG 2), and the presence of digital infrastructures such as digital public goods, but there are issues with data control and digital equity (Ronnebring 2022). All in all, high-capability ecosystems (US, UK) are oriented to scalability and capital depth, the UAE is oriented to strategic alignment through the state, and India is oriented to frugal innovation and mass accessibility. Based on the results, despite the fact that AI is a catalytic layer in all its settings, institutional capacity, regulatory frameworks, and financing models moderate its impact in generating SDG results (Ozawa-Meida et al., 2021).

Table 1: Comparative Summary of AI-Driven Social Enterprise Ecosystems.

Country	Innovation Model	Funding Mechanisms	Policy Support	Primary SDG Alignment
United States	Venture-driven, platform scalability, data-intensive AI	Venture capital, philanthropy, ESG funds, blended finance	Moderate federal regulation, strong private innovation ecosystem	SDG 3, SDG 4, SDG 8, SDG 13
United Kingdom	Community-embedded, hybrid public-private innovation	Social impact bonds, public grants, social investment funds	Strong social enterprise policy & procurement frameworks	SDG 3, SDG 4, SDG 10, SDG 13
UAE	State-led, strategic AI deployment in smart systems	Sovereign funds, government incubators, innovation grants	National AI strategies, regulatory sandboxes	SDG 11, SDG 13, SDG 9
India	Frugal, inclusive, low-cost AI innovation	CSR funds, impact investors, multilateral agencies	Digital public infrastructure initiatives, startup support schemes	SDG 1, SDG 2, SDG 8, SDG 9

Objective 2: To analyze differences in technological adoption intensity and AI integration strategies within social enterprises across developed (US, UK) and emerging economies (India, UAE).

The review shows that social businesses in developed societies like the United States and the United Kingdom exhibit an increased intensity of technology marked by the developed digital infrastructures and well-developed data ecosystems and the pervasive application of AI to business and strategic activities (Thomas et al., 2025). In such settings, AI is integrated into organizational platforms, such as predictive analytics to target beneficiaries, automated decision support systems, impact measurement dashboards, and scalable platforms on the cloud (Soomro et al., 2024). The adoption model is also highly invested, highly specialized and backed by venture capital markets, links between universities and industries, and established ethical AI models. Machine learning algorithms, natural language processing, and real-time analytics to optimize their outcomes are commonly used in social enterprises in such economies (Steiner et al., 2025). In addition, AI integration strategies are usually proactive and innovation-oriented, which aim at competitive advantage, scalability, and cross-sector partnerships. Sustained adoption intensity is further supported by the institutional trust, regulatory clarity, and digital literacy (Diaz-Arancibia et al., 2024).

Conversely, the developmental economies like India and the United Arab Emirates (UAE) have a varied integration of AI patterns based on infrastructural capacities and government participation. In the UAE, technological intensity is rather high as there are rigorous AI plans, smart cities, and significant sovereign investment in digital transformation (Okereke et al., 2024). Nonetheless, the implementation of AI usually has a centralized coordination and alignment with the national development agendas. India is a unique case with frugal innovation and inclusive technology change. Although adoption rates might be disproportionate because of challenges in digital divides, the social enterprises in India prefer low-cost, scalable AI applications, including mobile platforms, low-bandwidth applications, agritech analytics, and fintech credit scoring systems, that are specifically tailored to serve underserved people (Pala and Patel 2025). The strategies of AI integration in India are focused on accessibility, affordable, and social inclusion instead of sophisticated automation. In this way, when the developed economies are characterized by the depth of AI sophistication, the emerging ones exhibit models of adaptive and context-based integration that are oriented towards the maximum reach and developmental effects (Farhana et al., 2025).

Table 2: Comparative Technological Adoption and AI Integration.

Dimension	Developed Economies (US, UK)	Emerging Economies (India, UAE)
Adoption Intensity	High and organization-wide	Moderate to high (context dependent)
Infrastructure	Advanced digital & cloud ecosystems	Rapidly expanding, uneven in India; strong state-backed in UAE
AI Sophistication	Advanced ML, NLP, predictive modelling	Applied AI, mobile-based systems, strategic AI deployment
Integration Strategy	Proactive, innovation-led, scalability-focused	Adaptive, inclusion-oriented, policy-aligned
Funding Support	Venture capital, impact funds, R&D grants	Sovereign funds (UAE), CSR & impact capital (India)
Governance Framework	Established AI ethics & compliance standards	Developing governance (India), centralized regulatory oversight (UAE)
Primary Objective	Efficiency, scale, competitive advantage	Accessibility, social inclusion, national development goals

Objective 3: To compare scalability, sustainability, and long-term SDG impact potential of the organizations.

The comparative study of scalability, sustainability and the long-term SDG impact potential of AI-induced social enterprises represents structural fluctuation between developed and emerging economies. In developed economies, including the United States and the United Kingdom, the acceleratory force behind scalability is mostly due to the presence of developed digital ecosystems, well-developed venture capital, and well-developed regulatory frameworks that promote high-speed technological diffusion (Biscaro 2024). The platform based and data intensive AI models that are adapted to social enterprises in these regions can be replicated in other geographies at rather low marginal costs. The various funding methods, including impact investment, philanthropic foundation, ESG-capital, and government procurement, make them more financially sustainable (Nogueira et al., 2024). Secondly, properly developed monitoring and evaluation systems can enable the entities to directly equate the AI performance metrics to SDG metrics, which will make them more responsible and increase the likelihood of measuring the long-term impacts. Nonetheless, their viability may be strongly reliant on sustained financial support, technological improvements and regulatory certainty (Jimenez et al., 2021).

Instead, the model of emerging economies, including India and the UAE, show divergent channels of sustainability and SDG influence. Scalability in such cases is frequently determined by adaptive models of innovation as opposed to high capital intensity. In social enterprises, affordability, inclusion, and contextual customization of AI tools focus on the application of AI tools to local development problems (Awan 2021). Although growth can be slower than in developed economies, such organizations can often have greater grassroots integration and cohesion. Hybrid financing mechanisms, including CSR contribution, sovereign funding initiative, multilateral agencies, and public-private partnerships, support sustainability (Moallemi et al., 2020). Notably, the concept of AI application in the emerging economies is tightly connected to the priorities of national development and SDG localization, especially when it comes to such areas as agriculture, financial inclusion, healthcare access, and climate resilience. Hence, the developed-country business might grow faster with technological advancement; however, the emerging-economy models tend to be more long-term SDG integrated with its inclusive and policy-appropriate strategies (Moallemi et al., 2020).

6. DISCUSSION

Findings discussion supports the case that technological innovation and artificial intelligence (AI) are catalytic enablers as opposed to determinant agents of social enterprise success. The intensity of technological adoption is in AI-based social enterprises is stronger in the United States and the United Kingdom, and it is attributable to the established innovation networks, the presence of venture capital, and robust partnership relationships between universities and industries between countries, which all increase the scaled up and SDG-aligned. This is in line with Mago and van der Merwe (2023) who highlighted that established entrepreneurial ecosystems have structural benefits of innovation diffusion and impact creation. Likewise, Mason et al. (2021) emphasized the important role of the policy discourse and institutional framing in operationalizing the social enterprise models in the UK context. On the other hand, the results show that India and the UAE have more context-oriented strategies of AI integration influenced by institutional architecture and state intervention. The Sharafi (2022) analysis indicated that the UAE innovation ecosystem is associated with a good governmental orientation that enhances the use of strategic AI implementation. The model of frugal and inclusive innovation prevails in India, which is also reflected by Goyal et al. (2021), who established that scalable SDGs solutions in peri-urban India are strongly dependent on digital affordability and partnership-based solutions. Therefore, as the economy of developed countries has a level of technological depth, emerging economies focus on adaptive inclusiveness and alignment of their policies as the key force behind AI-enabled social entrepreneurship.

Moreover, the comparative comparison of scalability and long-term SDG impact prospects puts the focus on the structural divergences that are tamed by the governance frameworks, financing systems, and maturity of the ecosystems. The economies of the developed world are more integrated with the measurement systems of impact and AI performance dashboards, which allows better alignment with SDG indicators, which contributes to the findings of Attah and Yonkor (2025) that the strong impact measurement system leads to better SDG contribution. Raman et al. (2025) also shared the same perception by arguing that AI and blockchain were digital tools that enhance institutional

alignment with SDGs 4, 8, and 9 by developing measurable pathways to innovation. Nevertheless, even when there is more advanced technology, sustainability in such regions is still reliant on the repetitive cycles of funding and stability in regulations.

However, emerging economies appear resilient because of hybrid financing, CSR-driven capital flows, and localized partnerships, which is in line with Dixit et al. (2025) who stressed the role of social and intellectual capital in overcoming uncertainty. Besides, Chatzichristos and Nagopoulos (2021) also emphasised that the long-term institutionalisation of social entrepreneurship depends on institutional embeddedness and civil legitimacy. Thus, the discussion supports the fact that the intensity of AI varies substantially in the framework of various contexts, but the ultimate viability of sustainable SDG influence depends on the institutional coherence, ecosystem support, and strategic alignment of technological innovation and social mission goals.

7. CONCLUSION

The study concludes that technological innovation and artificial intelligence (AI) have become strategic facilitators of social entrepreneurship, which has had a major influence on the scalability, sustainability, and alignment towards Sustainable Development Goal (SDG) in national ecosystems. The evidence of H1 and H2 are definitely comparative as the results indicate that there are significant differences in the innovation models, funding mechanisms, and levels of technological adoption between the United States, the United Kingdom, the United Arab Emirates and India based on AI-driven social enterprises. The level of sophistication of AI integration is higher in developed economies like the US and UK, with well-developed markets of venture capital, well-organized policymaking, and a digital infrastructure. Such ecosystems allow prototyping fast, scaling the platform, and creating effective SDG-connected impact measurement systems. On the contrary, emerging economies, especially India, focus on frugal, inclusive and accessibility-based AI solutions, whereas the UAE is more indicative of a strategically state-oriented AI deployment plan in following an agenda of national sustainability. Thus, although AI serves as a catalytic layer in all settings, institutional capacity, governance system, and the development of an ecosystem have a strong moderate effect on the degree of adoption and the extent to which AI is operationalized.

Moreover, the study confirms the H3 hypothesis by establishing the fact that the increased level of technological adoption and high institutional support put a substantial positive influence on the issues of scalability and long-term SDG impact potential. In advanced economies, diversified sources of funds, ethical systems of AI control, and verified systems of monitoring enhance sustainability and quantifiable social results. Nevertheless, the models are still capital continuity and regulative stability sensitive. Conversely, emerging economies demonstrate that the deep-seated SDG embeddedness, particularly in such spheres as poverty alleviation, financial inclusion, sustainable cities, and climate resilience, could be attained by means of adaptive innovation, hybrid types of financing (CSR, sovereign funds, multilateral agencies), and localized partnerships. Even though the level of technological sophistication can be different, the ultimate parameter of long-term sustainability is the coherence of the ecosystem, inclusive design, and the alignment of the strategic policy, and not AI intensity. In general, the results confirm that technology-savvy social entrepreneurship is a possible and situation-specific source of expedited SDG implementation, as long as it is facilitated by promoting institutional and financial frameworks.

8. IMPLICATIONS OF THE STUDY

The study has valuable theoretical, managerial, and policy ramifications as it shows that the social entrepreneurship integration of artificial intelligence (AI) should be connected with institutional capability, financing structure, and SDG localization plans so that the implementation has a quantifiable effect. The results imply that policymakers ought to construct varied ecosystem assistance systems — venture-linked innovation benefits in the developed economies and inclusion-oriented digital infrastructure benefit in the emerging situations.

The study emphasizes the necessity of practitioners to incorporate ethical AI governance, impact measurement dashboard, and hybrid financing models into organizational strategy. Moreover, development agencies and CSR organizations can use such insights to allocate resources to scalable social ventures that can be technology-enabled, and whose innovation measures can be directly scaled to SDG measures.

9. LIMITATIONS OF THE STUDY

The study is constrained by the use of secondary data sources such as published research articles, institutional reports as well as comparative ecosystem analysis that can be limiting in terms of

providing empirical validation at the organizational level. The lack of collection of primary data by AI-based social enterprises can act as a limiting factor in achieving real-time operational issues, measures of financial performance, and subtle governance practices. Moreover, the comparative framework concentrates on only four national ecosystems, which may not be necessarily generalized to other regional settings. Cross-country differences in reporting standards of data, policy settings, and effects measuring structures can also impact on comparative interpretation.

10. FUTURE RESEARCH DIRECTIONS

The study of the future ought to be under a mixed-method or longitudinal design with the introduction of primary survey data, case-studies, and performance analytics of AI-driven social enterprises to prove and expand the current results. Further extension of comparative analysis to other emerging and developed economies would also help to improve the generalizability across regions. The more narrowly tuned analysis of the industry-specific AI use, such as climate-tech, agritech, and digital health, can provide a better understanding of SDG-specific trends of innovation.

Also, study on ethical AI governance, digital equity and algorithmic accountability in social enterprise ecosystems, especially in low resource, should be undertaken in future to be able to comprehend how inclusive technological strategies can create sustainable SDGs outcomes.

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