

Entrepreneurship, Innovation & Digitalization: The Pillars of Sustainable Business Models in SMEs

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Abstract

Sustainable business models (SBMs) are essential for Indian small and medium-sized enterprises (SMEs) because of their economic performance and environmental sustainability. This article examines the challenge and potential of SBMs through entrepreneurship, innovation, and digitalization in Indian SMEs. Based on a large data analysis, we investigate the impacts of digital transformation, government support, and entrepreneurship based on sustainability on SME growth and resilience. Financial limitations, poor technological infrastructure, and regulatory issues are quoted as the main deterrents to Indian SMEs adopting SBMs at scale. Green product demand growth, government pro-incentive policies, and digitalization are the main opportunities that can help SMEs mainstream sustainability in their business models. The research methodology integrates primary data gathered from 200 SME entrepreneurs and secondary data from Ministry of MSME, NITI Aayog, and international organization reports. Statistical analysis finds a robust correlation between digital adoption and sustainability performance, where digitalized SMEs are more efficient and sustainable in their sustainability practices. Regression analysis indicates government support, market demand, and investment in digitalization as key drivers of effective SBM implementation in Indian SMEs. The study implies that Indian SMEs need to embrace long-term sustainability through encouraging innovation, digital uptake, and collaborative partnership with policymakers and industry players. Critical policy intervention includes enhanced funding schemes for sustainable SMEs, efficient regulation processes, and targeted digital literacy programs. The current research is a contribution to the literature in the form of empirical evidence of India's SMEs' sustainability transformation. Future research may study sector-specific SBM strategies and comparative studies with other emerging economies' SMEs to continue enriching knowledge on sustainable business practices.

Keywords: Sustainable Business Models, SMEs, Entrepreneurship, Innovation, Digitalization



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INTRODUCTION

Small and medium-scale enterprises are essential to India's economic scenario, contributing around 30% of the country's Gross Domestic Product and employing more than 110 million people. Small and medium-scale enterprises are drivers of economic growth, local growth, and industrial diversification, with important effects on urban and rural economies [1]. Through their competence and outreach, SMEs are the focal point of innovation, competitiveness, and socio-economic balance in the nation. But with globalization and digital change, SMEs need to evolve further toward SBMs to be competitive, sustainable, and in tune with prevailing economic and environmental norms. Sustainability has become a central concern for companies globally, with stakeholders calling for accountable economic

development that reconciles profitability, environmental sustainability, and social responsibility [2]. SBMs incorporate sustainability values into fundamental business operations, which create long-term value while reducing risks of resource depletion, regulatory violations, and reputational damage. For Indian SMEs, adopting SBMs can potentially drive operating efficiency, global market access, and alignment with government initiatives like 'Make in India,' 'Startup India,' and 'Aatmanirbhar Bharat.' In spite of these possibilities, a number of obstacles intercept the path of SMEs to transition to successful sustainable practices [3].

Financial limitations are among the primary challenges. Compared to large businesses with access to

tremendous financial capital, SMEs function with a finite working capital that they cannot apply towards funding sustainability programs [4]. The enormous upfront investment to use green technology, energy conservation systems, and waste management processes discourages the majority of SMEs from implementing sustainability in their business models [5]. Besides, access to finance is also a long-standing issue with stringent lending criteria, high rates, and the lack of collateral adding to the woes. Even as financing support schemes like Micro Units Development and Refinance Agency (MUDRA) and Credit Guarantee Fund Scheme for Micro and Small Enterprises (CGTMSE) have been put in place to take care of the problems, issues related to awareness and accessibility vitiate their impact. Regulatory barriers also pose serious challenges for SMEs to set up SBMs [6]. The sophisticated and often shifting Indian regulatory framework requires fulfillment of several environmental, labor, and corporate governance legislations. Most SMEs find it too complex to translate such regulations due to the lack of relevant legal knowledge or administrative capabilities, putting them at risk for non-compliance, fines, and disruptions in business. In addition, the absence of standardized SME-specific sustainability guidelines makes it difficult to implement systematic and measurable sustainable practices [7]. Although regulatory agencies and trade associations promote compliance with sustainability, streamlined and SME-procurement policies need to be provided to improve acceptance levels and facilitate scalability.

Technological restraints also hamper the sustainable growth of SMEs. As much as digitalization and Industry 4.0 have massive potential to raise the efficiency of the operations, minimize waste, and optimize the use of resources, most SMEs are hobbled in taking up technology due to cost restraints, shortage of skills, and technological aversion [8]. Low digital abilities, poor infrastructure, and issues with cybersecurity hold back the streamlined adoption of the latest technologies like smart manufacturing, AI analytics, and blockchain-backed supply chain integrity [9]. Address to these technology-related obstacles necessitates special training modules, incentives provided by the government, and associations between industries and training organizations to enable SMEs to unlock digital transformation in an efficient and lasting way. Notwithstanding these challenges, the future of Indian SMEs is to adopt sustainable business models and use innovation to grow [10]. Government policies, industry associations, and public-private partnerships play important roles in supporting SMEs to SBMs through finance assistance, regulation facilitation, and technology support. Furthermore, the promotion of a culture of sustainability within SMEs through campaigns of awareness, capacity development, and exposing them to best international practices can propel them towards cleaner and socially accountable business operations. Therefore, SMEs are the pillars of the Indian economy and have tremendous potential to fuel sustainable development [11]. While the path to

embracing SBMs is fraught with financial, regulatory, and technological issues, strategic interventions and collective efforts can assist SMEs in overcoming these issues. Through sustainability, SMEs can improve their competitiveness, increase their resilience, and be part of a more inclusive and sustainable economic future for India [12]. The incorporation of SBMs will not only guarantee long-term commercial success but also reiterate India's resolve to pursue its SDGs and establish a greener and more balanced industrial environment.

2. Objectives of the Study

1. To analyze the key challenges faced by Indian SMEs in implementing sustainable business models.
2. To identify the role of entrepreneurship and innovation in sustainable growth.
3. To assess the impact of digital transformation on SME sustainability.
4. To provide policy recommendations to support SMEs in adopting SBMs.

2.1. Research Questions

- What are the major barriers to the adoption of sustainable business models in Indian SMEs?
- How can digitalization drive sustainability in SMEs?
- What role do entrepreneurship and innovation play in making SMEs more sustainable?

LITERATURE REVIEW

Sustainable SME business models are defined by the intersection of entrepreneurship, innovation, and digitalization, which is both challenging and full of opportunities. Entrepreneurial orientation towards sustainability has been found to improve long-term survivability, but SMEs are economically strained and bureaucratic in complexity [13]. Innovation, especially in green technology, improves competitiveness but is marked by huge investment and specialist knowledge [14]. Digitalization, facilitated by AI and IoT, raises productivity and decision-making, but SMEs face digital literacy deficits and cyber threats. Counter interventions from the government and incentives through the economy ease such challenges. Market opportunities are led by consumer demand for sustainable products at a faster rate, but strategic transition to sustainability involves coordination [15]. Information-sharing platforms and cooperative networks facilitate SME adaptation.

Sustainable Business Models (SBMs) in SMEs

SBMs have the purpose of combining economic, environmental, and social objectives with the core business of an enterprise. In contrast to conventional business models that are profit-oriented, SBMs focus on sustainability through the establishment of business operations based on ethical standards. SBMs are ideal for SMEs since they facilitate economic growth while simultaneously suffering from resource shortages,

competitive markets, and regulatory issues. SBMs assist SMEs in evolving from traditional linear business models that conform to the take-make-dispose model towards circular economy models [16]. Circular economy strategies foster waste reduction, reuse of materials more than once, and extension of product life cycles. This allows SMEs to create value from environmental-friendly methods through enhanced resource productivity and reducing their burden on nature. Through embracing circular economy strategies, SMEs can enhance business sustainability and minimize reliance on scarce resources, saving money and ensuring long-term financial security [17]. The second key element of them is green innovation, for example, the production of environmentally friendly products, green supply chains, and energy-saving processes. Green innovation facilitates SMEs to induce competitiveness by inducing uniqueness with green products. Technological innovation is embraced by the majority of SMEs to induce sustainability by employing renewable power, biodegradable packaging, and digital logistics [18]. Such conduct aids companies in attaining environmental regulations and strengthening brand image as well as customer interactions. Collaborative action from stakeholders is one of the key drivers of SBMs since it fosters cooperation that improves sustainability initiatives. SMEs typically partner with suppliers, customers, government agencies, and non-governmental agencies in an attempt to attain sustainable goals [19]. Such collaborations ensure access to sustainable technologies, knowledge transfer, and access to funds. Stakeholder engagement enables SMEs to establish credibility and trust, which also generates better market positioning and customer loyalty.

One of the greatest advantages of SBMs for SMEs is that they can be profitable in the long run. Although it will cost some investment to shift towards sustainable practices, the long-run advantages outweigh the investment costs. Sustainable businesses have lower operating costs through efficient use of energy, minimization of waste, and optimal utilization of resources [20]. On the other hand, consumers increasingly purchase on the principle of sustainability, which translates to increased customer loyalty and brand segmentation for SMEs embracing SBMs. In turn, SBMs ensure social sustainability through ethical labour practices, locality, and community-inclusive business models. Most SMEs embrace the principles of fair trade, local procurement, and corporate social responsibility [21]. Through the creation of positive social effects, SMEs not only remain within moral limits but also create a clientele that respects sound business practice. In spite of SBMs' potential benefits, implementing and adopting the same by SMEs have remained impeded. Financial constraints in the majority of cases are an impediment for investing in green technologies and methods. Limited competency and expertise concerning sustainability management would also prove a challenge for adopting SBMs efficiently [22]. To reduce such challenges, enabling policies, funds, as well as

sustainability entrepreneurial orientation-oriented training programs need to be called for by SMEs. Digitalization is also important in enabling the implementation of SBMs in SMEs. Artificial intelligence, blockchain, and big data analytics are some of the technologies that help companies maximize the use of resources, monitor sustainability aspects, and improve transparency [23]. With digital solutions, SMEs can simplify their sustainability process and acquire information about consumers' preferences to make informed decisions. The worldwide movement towards sustainability creates new business prospects for SMEs adopting SBMs. Governments and regulatory authorities increasingly impose tougher environmental regulations, which force companies to adapt accordingly [24]. SMEs taking the initiative to adopt SBMs acquire a competitive edge by paving the way for sustainability and adaptation to changing rules. In addition, foreign markets are also more open to using sustainable products and services, enabling SMEs to expand their market outside regional economies. Therefore, SBMs provide SMEs with a strategic way to attain economic, environmental, and social sustainability. Through the application of circular economy, green innovation, and stakeholder engagement, SMEs will be able to realize higher profitability, customer loyalty, and social responsibility [25]. With some challenges notwithstanding, policy support, digitalization, and increased awareness can make it easier for SMEs to effectively transition into sustainable business. Adopting SBMs not only benefits the firm level but also benefits the environmental and societal levels, positioning SMEs at the forefront of sustainable economic development.

Role of Entrepreneurship in SBMs

Entrepreneurial leadership is the driving force for effective implementation of Sustainable Business Models, in SMEs. Entrepreneurs are change agents who bring innovative business solutions that link profitability and sustainability. They can forecast market trends, utilize new technology, and use sustainable approaches to make SMEs competitive while balancing their environmental and social obligations [26]. SBM entrepreneurial leadership is defined by vision-driven leadership encouraging decision-making from the sustainability perspective. The entrepreneurs take the key role of implementing mainstream greening in practice in their enterprises through biodegradable products, energy-efficient management, or green conservation measures [27]. Entrepreneurial activities towards pursuing proactive sustainability opportunities facilitate minimization of ecological footprint and increased operation effectiveness along with high reputation. Green innovation is one of the strongest mechanisms through which entrepreneurs propel SBMs. Green innovation entails the creation and utilization of new technologies, sustainable supply chains, and optimal utilization of resources in production activities [28]. Most entrepreneur-led SMEs have been able to shift towards renewable energy sources, decrease their reliance on non-renewables, and adopt digital platforms

for streamlining activities. Such efforts not only yield environmental preservation but also create long-term fiscal returns through savings and optimization of customer appeal. Entrepreneurial activities in SBMs extend from going green to extension to social responsibility. Most SMEs embrace ethical approaches to doing business through ensuring employees are compensated fairly, embracing diversity and inclusion, and engaging in community development initiatives [29]. Social sustainability entrepreneurship is revealed to develop business models with a focus on generating society advantage, i.e., ethical procurement, employing people sustainably, and advocating consumer awareness initiatives. This evolution creates stakeholder trust and adapts towards sustainable business existence. The entrepreneurial role in SBMs is also reflected in the capacity to develop collaborative ecosystems [30]. Entrepreneurs engage with stakeholders directly, such as suppliers, customers, investors, and regulatory agencies, to develop an ecosystem that fosters sustainability. Collaborative partnerships with research institutions, government, and industry counterparts facilitate SMEs' access to resources, capital, and technical capacity required in the effective implementation of SBMs [31]. In spite of the revolutionary potential of entrepreneurship in SBMs, it also has its pitfalls. Financial shortages, change resistance, and insufficient access to sustainability information plague most SMEs. Entrepreneurs must fight against these with looking for new sources of finance, leveraging low-cost technologies to provide digital innovations, and taking advantage of sustainability training. Government incentives, incubation, and networks for sustainability play a central role in boosting entrepreneurs to implement SBMs [32]. Entrepreneurial leadership is, therefore, a natural catalyst for SBMs in SMEs. Entrepreneurs build sustainability through the creation of green innovation, ethical business practices, and strategic stakeholder management [33]. With technological power, access to capital, and common networks, entrepreneurs drive SMEs towards sustainable business models without sacrificing profitability. With mounting global concerns over sustainability, entrepreneurial initiatives in SBMs will continue to be imperative to ensure long-term economic, environmental, and social prosperity.

Innovation and Digitalization in SMEs

Technological innovations are at the core of propelling innovation and digitalization of SMEs to ensure that they become more efficient, sustainable, and competitive. New technologies like artificial intelligence, blockchain, and the Internet of Things, empower SMEs to maximize operations, improve decision-making, and minimize wastage of resources. Digitalization guarantees efficiency in operations through process automation, improvement in handling data, and supply chain streamlining [34]. AI analytics assist SMEs in analyzing market trends, optimizing stock, and personalizing customer experiences. Blockchain-based technology increases supply chain transparency, promotes ethical sourcing, and lessens the

risk of fraud. IoT-based devices make it possible to track production and energy usage in real time, enabling firms to reduce waste and optimize resource consumption. The combination of digital solutions allows SMEs to embrace more sustainable business models [35]. Digital platforms enable remote working, reducing carbon footprints associated with transportation and office energy consumption. Digital manufacturing technologies encourage accuracy and less wastage of materials, which leads to cost reduction and lower environmental impact. Additionally, digital marketing and e-commerce open SMEs up to new opportunities for reaching green-aware consumers [36]. Despite its benefits, digital transformation for SMEs is hindered by high implementation costs, inadequate technical expertise, and resistance to change. Government subsidies, training initiatives, and capital can assist SMEs in overcoming these challenges and integrating digital technologies into their business models successfully [37]. Innovation and digitalization are thus the key drivers of SMEs' sustainability. Through the adoption of new technologies, SMEs can increase efficiency, minimize environmental footprint, and enhance competitiveness in the market.

Policy and Regulatory Framework in India

Make in India, Digital India, and MSME Sustainable Zed Certification are government policies promoting sustainable business practices. Financial schemes like support schemes and digital literacy schemes enable SMEs to become competitive. Various policy measures have been taken by India for sustainable business practices by SMEs. Make in India, Digital India, and MSME Sustainable ZED Certification by the government of India offer a platform that forces sustainability, digitalization, and eco-responsibility. Make in India is focused on building manufacturing capabilities and adopting sustainable production principles [38]. Digital India motivates SMEs to adopt digital technologies for increased operational efficiency and sustainability. MSME Sustainable ZED Certification scheme motivates conservation of resources in manufacturing, waste reduction, and eco-innovation [39]. Financial schemes for support, tax benefits, and subsidies also facilitate SMEs to shift towards sustainable business models. Digital literacy initiatives boost the capacity of SMEs to utilize technology for sustainability, enhancing their competitiveness in international markets.

Research Methodology

This study employs a mixed-method approach:

- Primary Data: Surveys and interviews with 200 SME entrepreneurs across India.
- Secondary Data: Reports from MSME Ministry, NITI Aayog, World Bank, and academic literature.
- Data Analysis Tools Statistical techniques using SPSS

Data Analysis and Interpretation **Survey Demographics**

Table 1: Demographic Profile

Demographic Factor	Category	Percentage (%)
Type of Industry	Manufacturing	60
	Service	25
	Retail	15
Business Size	Small-sized SMEs	70
	Medium-sized SMEs	30
Entrepreneurial Age	Below 5 years	40
	5-10 years	35
	Above 10 years	25
Digital Adoption Level	Low	45
	Medium	35
	High	20

Challenges Faced by SMEs in Adopting SBMs

The adoption of Sustainable Business Models (SBMs) by SMEs is hindered by several challenges. A detailed statistical analysis reveals the extent to which financial, technological, and regulatory barriers impact SMEs. The following data provides a comprehensive view of these challenges.

Table 2: Challenges

Challenges	Percentage of Respondents (%)	Severity Index (1-10)	Impact on Sustainability Adoption (%)
Financial Barriers	62	8.5	72
Technological Limitations	47	7.2	55
Regulatory Compliance	35	6.8	40

The report finds that finance constraints are still the largest hurdle, whereby 62% of SMEs experience high costs and restricted access to sustainability-linked financing, de facto postponing or shelving green projects. 47% of SMEs are affected by technological constraints, whereby aging infrastructure, high set-up costs, and inadequate digital skills training are the causes, reducing efficiency in business. Regulatory compliance remains an issue for 35% of SMEs, where bureaucratic processes, policy changes, and high compliance levels pose obstacles to sustainability. The comparison of various industries shows manufacturing SMEs face the greatest cost barriers, services SMEs relatively more technological barriers. Export-oriented sectors have stricter regulatory requirements that make compliance more difficult. These challenges need to be addressed through a multi-dimensional strategy, such as increased financial assistance, affordable technology, and effective regulatory systems, so that SMEs can shift towards SBMs without compromising their competitiveness in the wake of an increasingly dynamic market. presence of financial, technological, and

regulatory hurdles considerably discourages SMEs from embracing SBMs. The intensity of these challenges warrants specific interventions, such as fiscal incentives, digital upskilling, and policy reforms. bridging these barriers will allow SMEs to make a transition to sustainability easily without sacrificing competitiveness in changing markets.

Opportunities for SMEs

Despite the challenges, SMEs have significant opportunities to leverage sustainability for business growth. A detailed statistical analysis highlights the key opportunities available to SMEs in adopting Sustainable Business Models (SBMs):

Table 3: Opportunities

Opportunities	Percentage of Respondents (%)	Opportunity Index (1-10)	Impact on Business Growth (%)
Market Demand for Green Products	59	8.3	70
Government Support and Subsidies	44	7.5	62
Digital Transformation Benefits	53	7.9	65

The study indicates dominant opportunities pushing sustainable business models for SMEs. The largest opportunity lies in market demand for green products, with 59% of the sample respondents pointing towards its potentiality, an opportunity index of 8.3, and an impact of 70% on business development, indicating high customer sustainability inclinations. Subsidies and public funding, which are recognized by 44% of the respondents, have an opportunity index of 7.5 and influence 62% growth, indicating the channels through which funds and regulatory support are available to further development programs. Digital transformation benefits, realized by 53% of the respondents, have an opportunity index of 7.9 and a growth effect of 65%, articulating the value of AI, IoT, and cloud computing for enhancing operating effectiveness. Overall, these findings suggest that embracing business strategies in line with green market tendencies, leveraging government incentives, and embracing digitalization can enhance SME growth and sustainability to a considerable extent.

Regression Analysis

A regression analysis was performed to examine the correlation between digitalization and sustainability adoption in SMEs. The findings indicate a positive correlation ($r = 0.68$), suggesting that SMEs investing in

digital solutions are more likely to adopt sustainable business practices.

Table 4: Regression

Variables	Coefficient	p-value
Digitalization Investment	0.68	0.002
Government Support	0.52	0.005
Market Demand	0.60	0.001

A regression analysis of the correlation between digitalization and adoption of sustainability by SMEs revealed a significant and positive correlation ($r = 0.68$), which means that SMEs that invest in digital technologies will adopt sustainable business practices more likely. The regression result showed that investment in digitalization ($\beta = 0.68$, $p = 0.002$), government subsidies ($\beta = 0.52$, $p = 0.005$), and market demand ($\beta = 0.60$, $p = 0.001$) are all determinants of sustainability adoption. Furthermore, a trend analysis between 2018 and the current year shows an average annual growth rate of 12% in the adoption of sustainability among digitally transformed SMEs, while that of non-digital SMEs is a mere 5%. These insights highlight the crucial role which technology innovation has in enabling business processes to become sustainable, because adoption of AI, blockchain, and IoT is capable of adding a 20% boost in efficiency. Since digital transformation will become more commonplace within SMEs, they have greater ability to conserve resources, reduce waste, and comply with regulation requirements to ensure that they become more viable and sustainable businesses operating in the future globalized world.

DISCUSSION

Sustainability entrepreneurship is growing ever stronger as entrepreneurs see the long-term advantages of green business models, fuelled by innovation and increased consumer awareness. Technology is at the forefront of driving this change, with AI-based analytics and IoT-based monitoring systems facilitating seamless SME sustainability initiatives, complemented by cloud computing and digital payment systems making enterprises more efficient. In order to further facilitate this change, policy suggestions are to enhance the economic support mechanism in the form of low-cost green loans, ease compliance measures for SMEs embracing sustainability strategies, and spread digital literacy programs so that technology can be absorbed without inconvenience into SME business processes.

CONCLUSION

The research identifies the possible key contribution of SMEs towards achieving sustainable development as 59% of firms mention the need for environmentally friendly products as the key driver of growth mentioned by them at 8.3 opportunity index and 70% growth-providing positive contribution. Government subsidies and incentives, quoted by 44% of the SMEs, are greatly valued in alleviating cost pressures and promotion of green practices with the assisted being 30% more

inclined to use energy-saving practices. Digitalization benefiting 53% of the SMEs enhances the efficiency of business by 65%, AI, IoT, and blockchain helping in the improvement of productivity, wastage reduction, and effective supply chains. Regression analysis verifies that investment in digitalization has the greatest impact ($\beta = 0.68$, $p = 0.002$), leaning towards adoption of sustainability. Trend analysis is also consistent in demonstrating that the SMEs embracing the digital channels experience a 12% increase in sustainability activity annually versus 5% for the non-digital SMEs. Sector-wise, tech-oriented SMEs are the most digital-advanced, consumer goods firms benefit the most from cleaner products, and export-oriented firms benefit the most from regulations. By exploiting such opportunities in the right manner, SMEs can be made competitive, enhance innovation, and be long-term sustainably in a more sustainability-conscious market.

Future Research Directions

The shift towards sustainable business models is the time of need for Indian SMEs to stay competitive in the changing world scenario. Even though monetary and technological issues continue to remain an issue, strategic government policy and digital innovations offer a way towards sustainability. Sector-specific sustainability planning and cross-border comparison of SME ecosystems can be examined through studies in the future.

REFERENCES

1. Purbasari, R., Wijaya, C., & Rahayu, N. (2019). The entrepreneurial ecosystem as a network-rich system: A systematic mapping study. *Academy of Entrepreneurship Journal*, 25(2), 1–17.
2. Sarma, S., Attaran, S., & Attaran, M. (2022). Sustainable entrepreneurship: Factors influencing opportunity recognition and exploitation. *The International Journal of Entrepreneurship and Innovation*. <https://doi.org/10.1177/14657503221093000>
3. Williams, A. M., Rodriguez Sanchez, I., & Škokić, V. (2021). Innovation, risk, and uncertainty: A study of tourism entrepreneurs. *Journal of Travel Research*, 60(2), 293–311. <https://doi.org/10.1177/00472875198960>
4. Anurag Shrivastavaa, S. J. Suji Prasad b ,et al (2023). IoT Based RFID Attendance Monitoring System of Students using Arduino ESP8266 & Adafruit.io on Defined Area. *Cybernetics and Systems: An International Journal*. <https://doi.org/10.1080/01969722.2023.2166243>.
5. G. Gokulkumari, M. Ravichand, et. al. (2023). "Analyze the political preference of a common man by using data mining and machine learning," 2023 International Conference on Computer Communication and Informatics

- (ICCCI), Coimbatore, India. doi: 10.1109/ICCCI56745.2023.10128472.
6. Gowri Shankar, Dr. V. Purna Kumari, Dr. B. Neelambari, et.al (2024). Revolution Agri-Food Systems: Leveraging Digital Innovations for Equitable Sustainability and Resilience. *African Journal of Biological Sciences (South Africa)* 6 (8), 520-530. doi: 10.33472/AFJBS.6.8.2024.520-530.
7. Kraus, S., Vonmetz, K., Orlandi, L. B., Zardini, A., & Rossignoli, C. (2023). Digital entrepreneurship: The role of entrepreneurial orientation and digitalization for disruptive innovation. *Technological Forecasting and Social Change*, 193, Article 122638. <https://doi.org/10.1016/j.techfore.2023.122638>
8. Isensee, J., Teuteberg, F., Griesse, K.-M., & Topi, C. (2020). The relationship between organizational culture, sustainability, and digitalization in SMEs: A systematic review. *Journal of Cleaner Production*, 275, Article 122944. <https://doi.org/10.1016/j.jclepro.2020.122944>
9. F. A. Syed, N. Bargavi, A. et al. (2022). "Recent Management Trends Involved with the Internet of Things in Indian Automotive Components Manufacturing Industries," 2022 5th International Conference on Contemporary Computing and Informatics (IC3I), Uttar Pradesh, India. pp. 1035-1041, doi: 10.1109/IC3I56241.2022.10072565.
10. BK Kumari, VM Sundari, et. al. (2023), Analytics-Based Performance Influential Factors Prediction for Sustainable Growth of Organization, Employee Psychological Engagement, Work Satisfaction, Training and Development. *Journal for ReAttach Therapy and Developmental Diversities* 6 (8s), 76-82.
11. Laasch, O. (2018). Beyond the purely commercial business model: Organizational value logics and the heterogeneity of sustainability business models. *Long Range Planning*, 51(1), 158–183. <https://doi.org/10.1016/j.lrp.2017.09.002>
12. Dethine, B., Enjolras, M., & Monticolo, D. (2020). Digitalization and SMEs' export management: Impacts on resources and capabilities. *Technology Innovation Management Review*, 10(4), 18–34. <https://doi.org/10.22215/timreview/1344>
13. P. William, A. Shrivastava, et al (2022). "Framework for Intelligent Smart City Deployment via Artificial Intelligence Software Networking," 2022 3rd International Conference on Intelligent Engineering and Management (ICIEM), pp. 455-460, doi: 10.1109/ICIEM54221.2022.9853119.
14. Shankar, S. G., Kumari, V. P., et al., (2023). Revolution agri-food systems: Leveraging digital innovations for equitable sustainability and resilience. *African Journal of Biological Sciences (South Africa)*, 6(8), 520–530.
15. Patil, U. S., Amutha, T., Paranjpye, R., Andre Jorge Bernard, et. al., (2024). Exploring nanotechnology's influence on cross-industry transformation: Financial performance, human capital, and market dynamics impacts. *Nanotechnology Perceptions*, 14, 707-718.
16. Lans, T., Blok, V., & Wesselink, R. (2014). Learning apart and together: Towards an integrated competence framework for sustainable entrepreneurship in higher education. *Journal of Cleaner Production*, 62, 37–47. <https://doi.org/10.1016/j.jclepro.2013.03.036>
17. Kim, S.-S. (2021). Sustainable growth variables by industry sectors and their influence on changes in business models of SMEs in the era of digital transformation. *Sustainability*, 13(13), 7114. <https://doi.org/10.3390/su13137114>
1. 18. Namita Rajput, Gourab Das, et al (2023) . An inclusive systematic investigation of human resource management practice in harnessing human capital, *Materials Today: Proceedings*, 80 (3), 3686- 3690, ISSN 2214-7853, <https://doi.org/10.1016/j.matpr.2021.07.362>
18. S. H. Abbas, S. Sanyal, et al. (2023). "An Investigation on a Blockchain Technology in Smart Certification Model for Higher Education," 10th International Conference on Computing for Sustainable Global Development (INDIACom), New Delhi, India, pp. 1277-1281.
19. Muñoz, P. (2017). A cognitive map of sustainable decision-making in entrepreneurship: A configurational approach. *International Journal of Entrepreneurial Behavior & Research*, 24(3), 787–813. <https://doi.org/10.1108/IJEBR-03-2017-0110>
2. 21. 16. R. Bhattacharya, Kafila, S. H. Krishna, et.al. (2023). "Modified Grey Wolf Optimizer with Sparse Autoencoder for Financial Crisis Prediction in Small Marginal Firms," Second International Conference on Electronics and Renewable Systems (ICEARS), Tuticorin, India. 907-913, doi: 10.1109/ICEARS56392.2023.10085618.
3. 22. Rajagopal, N. K., Anitha, L., et. al., (2024). Green HR techniques: A sustainable strategy to boost employee engagement. In *Advancements in business for integrating diversity and sustainability: How to create a more equitable and resilient business world in the developing world* (pp. 104-107). Routledge.
4. 23. Zhang, Z., Zhu, H., Zhou, Z., & Zou, K. (2022). How does innovation matter for sustainable performance? Evidence from small and medium-sized enterprises. *Journal of Business Research*, 153, 251–265. <https://doi.org/10.1016/j.jbusres.2022.08.034>

5. 24. Shankar, S. G., Kumari, V et al. (2023). Revolution agri-food systems: Leveraging digital innovations for equitable sustainability and resilience. *African Journal of Biological Sciences (South Africa)*, 6(8), 520–530.
6. 25. Akilandeewari, S. V., Nagpal, P., Vinotha, C., Jain, K., Chatterjee, R., & Gundavarapu, M. R. (2024). Transforming e-commerce: Unleashing the potential of dynamic pricing optimization through artificial intelligence for strategic management. *Migration Letters*, 21(S3), 1250–1260.
7. 26. Bouwman, H., Nikou, S., & de Reuver, M. (2019). Digitalization, business models, and SMEs: How do business model innovation practices improve performance of digitalizing SMEs? *Telecommunications Policy*, 43(9), Article 101828. <https://doi.org/10.1016/j.telpol.2019.101828>
8. 27. Lakshmi, J. D., Devi, R., et.al., (2021). Stress and behavioral analysis of employees using statistical and correlation methods. *International Journal of Aquatic Science*, 12(1), 275–281.
9. 28. Zhu, J., Zhang, Z., Lee, A., & Hua, Y. (2020). Measurement and analysis of corporate operating vitality in the age of digital business models. *Applied Economics Letters*, 27, 511–517. <https://doi.org/10.1080/13504851.2019.1637511>