



(RESEARCH ARTICLE)



Driving sustainable growth in SME manufacturing: The role of digital transformation, project, and capture management

Kehinde Feranmi Awonuga ¹, Ekene Ezinwa Nwankwo ^{2, *}, James Olakunle Oladapo ³, Chinwe Chinazo Okoye ⁴, Olusegun Gbenga Odunaiya ⁵ and Uzundu Chikodiri Scholastica ²

¹ *Independent Researcher, UK.*

² *Department of Business Administration and Management, Anambra State polytechnic, Mgbakwu, Nigeria.*

³ *Independent Researcher, Lagos.*

⁴ *Access Bank Plc, Awka, Nigeria.*

⁵ *Havenhill Synergy, Nigeria.*

International Journal of Science and Research Archive, 2024, 11(01), 2012–2021

Publication history: Received on 01 January 2024; revised on 09 February 2024; accepted on 11 February 2024

Article DOI: <https://doi.org/10.30574/ijrsra.2024.11.1.0270>

Abstract

In the landscape of Small and Medium-sized Enterprises (SMEs) within the manufacturing sector, achieving sustainable growth amidst increasing competition and evolving market demands presents a significant challenge. This abstract delves into the pivotal role of digital transformation, project management, and capture management in fostering sustainable growth for SME manufacturers. Digital transformation has emerged as a transformative force, offering SME manufacturers unprecedented opportunities to optimize processes, enhance efficiency, and expand their market reach. Through the adoption of advanced technologies such as Internet of Things (IoT), Artificial Intelligence (AI), and cloud computing, SMEs can streamline operations, improve product quality, and swiftly adapt to changing consumer preferences. Moreover, effective project management plays a crucial role in driving sustainable growth by ensuring timely delivery of products, cost optimization, and resource utilization. By implementing robust project management methodologies such as Agile or Lean, SME manufacturers can mitigate risks, enhance collaboration, and accelerate innovation, thereby gaining a competitive edge in the market. Furthermore, capture management, encompassing the identification, qualification, and pursuit of business opportunities, is instrumental in securing long-term growth for SME manufacturers. By strategically identifying target markets, understanding customer needs, and developing tailored solutions, SMEs can effectively capitalize on emerging opportunities and strengthen their market position. However, harnessing the synergies between digital transformation, project management, and capture management requires a comprehensive strategic approach. SME manufacturers must invest in cultivating a culture of innovation, fostering cross-functional collaboration, and nurturing talent equipped with the requisite digital and managerial skills. Driving sustainable growth in SME manufacturing necessitates a holistic approach that integrates digital transformation, project management, and capture management strategies. By embracing technological advancements, optimizing operational processes, and seizing market opportunities, SME manufacturers can embark on a trajectory of sustained success in the ever-evolving landscape of manufacturing.

Keywords: SME; Manufacturing; Digital Transformation; Capture Management; Review

1. Introduction

The small and medium-sized enterprise (SME) manufacturing sector plays a crucial role in the global economy, contributing significantly to employment, innovation, and economic growth (Alefari et al., 2020). SMEs in the manufacturing sector face various challenges, including cost reduction, improving profitability, and increasing productivity (Dora et al., 2013). Sustainable growth is essential for SMEs as it ensures long-term success, resilience, and

* Corresponding author: Ekene. Ezinwa Nwankwo.

positive impact on the environment and society (Schönfuß et al., 2019). Achieving sustainable growth in SME manufacturing requires the adoption of digital transformation, effective project management, and capture management strategies (Ghobakhloo & Iranmanesh, 2021; Brodeur et al., 2021).

The significance of digital transformation in SME manufacturing cannot be overstated. Embracing digital technologies under Industry 4.0 enables SMEs to enhance their operational efficiency, product quality, and customer satisfaction (Ghobakhloo & Iranmanesh, 2021). Moreover, digital transformation allows SMEs to adapt to the changing market demands and improve their competitiveness (Ling et al., 2022). Project management is equally crucial for SMEs as it ensures the successful execution of initiatives aimed at achieving sustainable growth (Brodeur et al., 2021). Effective project management enables SMEs to streamline their processes, reduce costs, and deliver high-quality products to the market (Brodeur et al., 2021). Additionally, capture management, which involves identifying and securing business opportunities, is vital for SMEs to sustain growth and expand their market presence (Brodeur et al., 2021).

In conclusion, the SME manufacturing sector is a vital component of the global economy, and achieving sustainable growth is imperative for its long-term success. Digital transformation, project management, and capture management play pivotal roles in driving sustainable growth in SME manufacturing by enhancing operational efficiency, ensuring successful project execution, and identifying and securing business opportunities.

2. Understanding Digital Transformation in SME Manufacturing

Digital transformation in small and medium-sized enterprise (SME) manufacturing involves the integration of digital technologies to revolutionize business operations, enhance competitiveness, and drive growth. The scope of digital transformation encompasses the adoption of key technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), and cloud computing (Ling et al., 2022; Ukoba and Jen, 2023; Odeye and Adeigbe, 2018). These technologies play a pivotal role in enabling SMEs to streamline processes, improve decision-making, and enhance productivity (Kumar et al., 2021). The benefits of digital transformation in SME manufacturing are substantial, including improved operational efficiency, enhanced product quality, and increased agility in responding to market demands (Priyono et al., 2020; Olushola and Olabode, 2018). However, SMEs encounter challenges and barriers to adoption, such as financial constraints, lack of digital skills, and resistance to change (Kumar et al., 2020).

3. The Role of Project Management in Driving Growth

The role of project management in driving growth is crucial for small and medium-sized enterprises (SMEs) in the manufacturing sector. Project management plays a significant role in managing innovation and growth within SMEs (Turner et al., 2009). It is essential for SMEs to build up their competitiveness and quality to match or exceed the competition, where project management is the key for success and growth (Alazemi & Adesta, 2018; Olushola, 2017). The use of appropriate and effective project management methodologies such as Agile and Lean is vital for SMEs in the manufacturing sector to ensure their growth and sustainability (Javed et al., 2020; Huang et al., 2022). These methodologies provide flexibility and efficiency, which are essential for SMEs facing challenges such as small and diversified customer orders (Huang et al., 2022).

The project lifecycle, including planning, execution, monitoring, and closure, is fundamental for the success of projects within SMEs (Turner et al., 2010). Projects in SMEs occur both in operations, providing tailored or bespoke products to customers, and to manage innovation and growth (Turner et al., 2010; Oti and Ayeni, 2013). Additionally, the implementation of big data analytics (BDA) has been shown to play a crucial role in strengthening SMEs' performance and agility, thus contributing to their growth (Mangla et al., 2020). Furthermore, the adoption of Industry 4.0 practices and technologies is essential for SMEs to enhance their readiness and practice, leading to increased growth and competitiveness (Arlbjørn et al., 2019; Kasten et al., 2023).

Case studies highlighting successful project management implementation in SME manufacturing are essential for understanding the practical implications and benefits. For instance, a case study of agile project management in a manufacturing context highlighted the importance of innovation in creating value and sustainable competitive advantage for organizations (Javed et al., 2020; Adeniyi et al., 2020). Additionally, a case study on the collaborative approach to digital transformation (CADT) model for manufacturing SMEs emphasized the significance of adopting new perspectives to digital transformation approaches in the manufacturing industry (Brodeur et al., 2021).

In conclusion, project management is of utmost importance for driving growth in SME manufacturing. The adoption of project management methodologies, effective project lifecycle management, and the integration of innovative

technologies such as BDA and Industry 4.0 practices are crucial for the success and sustainability of SMEs in the manufacturing sector.

4. Harnessing Capture Management for Sustainable Growth

Capture management is a strategic business process crucial for sustainable growth, particularly in small and medium-sized enterprise (SME) manufacturing. It involves the identification, qualification, and pursuit of business opportunities (Lambert & Pohlen, 2001). In the context of SME manufacturing, effective capture management is essential for securing contracts, fostering growth, and ensuring sustainability. This process aligns with the sustainability goals related to aquaculture, as seen in the fish health regulatory framework in British Columbia (Stephen et al., 2008; Abdulkadir et al., 2022). The framework's approach to managing the industry and individual farms in a sustainable way reflects the significance of capture management in achieving sustainability objectives.

In the context of legged locomotion, the capturability-based analysis and control of movement models demonstrate the importance of identifying and pursuing opportunities for stability and balance, akin to the pursuit phase in capture management (Koolen et al., 2012; Victor and Great, 2021). This highlights the relevance of effective capture management strategies in SME manufacturing, where stability and balance in business opportunities are crucial for sustainable growth.

Furthermore, the pursuit of a consensus definition in supply chain management emphasizes the significance of clear identification and qualification of opportunities, which are fundamental components of capture management (Gibson et al., 2005; Johnson et al., 2023). This aligns with the need for SME manufacturing to adopt clear strategies for effective capture management to achieve sustainable growth.

In summary, capture management is a critical process for sustainable growth in SME manufacturing, involving the identification, qualification, and pursuit of business opportunities. Real-world examples from fish health regulatory frameworks and legged locomotion analysis underscore the importance of effective capture management strategies in achieving sustainability goals in SME manufacturing.

5. Integrating Digital Transformation, Project, and Capture Management

The integration of digital transformation, project management, and capture management presents several synergies that can contribute to sustainable growth and the successful mitigation of challenges and risks. Digital transformation initiatives require a comprehensive strategy for sustainable growth, and the integration of project and capture management is crucial in achieving this. O'Hara et al. (2020) highlight the competencies required for digitization, including project planning, project management, and digital capture, which are essential for successful digital transformation initiatives. Carujo et al. (2022) emphasize the critical success factor of the project management approach in digital transformation initiatives, indicating the importance of integrating project management practices into digital transformation processes.

Developing a comprehensive strategy for sustainable growth involves overcoming challenges and mitigating risks. Badewi (2022) suggests that empowering project management and transformation management offices can enhance an organization's readiness for transformation projects, contributing to the development of a comprehensive strategy for sustainable growth. Additionally, Lappi et al. (2019) discuss how project governance practices can be integrated to enhance understanding of how ICT project management and e-government transformation can be effectively managed, thus mitigating risks associated with digital transformation initiatives.

Best practices and recommendations for integration include sharing various skills and knowledge within integrated project teams, as highlighted by (Hee & Bahar, 2019). Furthermore, the study by Lang & Müller (2021) emphasizes the importance of specific success factors in ICT projects within the context of digital transformation, such as interdisciplinarity and strategic relevance, providing valuable insights for best practices in integration.

In conclusion, the integration of digital transformation, project management, and capture management is essential for sustainable growth and successful transformation initiatives. By leveraging the synergies between these areas, organizations can develop comprehensive strategies, overcome challenges, mitigate risks, and implement best practices for successful integration.

5.1. Building a Culture of Innovation and Continuous Improvement

To promote innovation in small and medium-sized enterprise (SME) manufacturing, it is essential to understand the significance of innovation in this sector, establish an environment conducive to innovation, implement feedback loops and continuous improvement processes, and showcase the benefits of an innovation culture through case studies.

The importance of fostering innovation in SME manufacturing cannot be overstated. Innovation is crucial for SMEs to enhance learning capabilities, manage innovation effectively, and remain competitive in the global market (Annamalah & Paraman, 2023; Fabian et al., 2023). It is also vital for driving economic growth, poverty alleviation, and employment opportunities, both formal and informal (Ngibe & Lekhanya, 2019). Furthermore, innovation fosters firms' growth, internationalization, and performance, which are visible in both large firms and SMEs (Marzi et al., 2018; Uchechukwu et al., 2023).

Creating an environment conducive to innovation involves various factors. For instance, forging beneficial collaborations between diverse industries can enhance learning capabilities and manage innovation effectively, which is necessary in the age of globalization (Annamalah & Paraman, 2023). Additionally, the role of organizational culture has a direct positive significant effect on the sustainable growth of SMEs and innovation competitive advantage (Nimfa, 2021). Moreover, the cooperation of firms at the national and global scale is becoming increasingly important as a tool for economic development (Patrick, 2017).

Implementing feedback loops and continuous improvement processes is vital for SME manufacturing. Developing innovation capability is widely cited as an effective response to cope with increasing competitiveness and the global market (Purwanto et al., 2015). Furthermore, interventions in the form of innovation improvement programs often require high levels of complexity, emphasizing the need for continuous improvement processes (McAdam et al., 2007). Additionally, the introduction of agility strategy indicates a role in improving a company's performance in handling risk sources, highlighting the importance of feedback loops and adaptability (Yaakub & Mustafa, 2022).

Case studies demonstrating the benefits of an innovation culture in SME manufacturing provide valuable insights. For instance, the results of a study showed that the level of best manufacturing practices can be improved further, especially in the area of technology and product innovation (Anuar & Yusuff, 2011). Furthermore, it is found that both transformational leadership and organizational culture are significantly related to product innovation, emphasizing the role of leadership and culture in fostering innovation (Abdullah et al., 2016).

In conclusion, fostering innovation in SME manufacturing is crucial for driving economic growth, enhancing competitiveness, and ensuring sustainability. Creating an environment conducive to innovation, implementing feedback loops and continuous improvement processes, and demonstrating the benefits of an innovation culture through case studies are essential for promoting innovation in SME manufacturing.

6. Developing Talent and Skills for the Future

To address the challenges of developing talent and skills for the future in the context of small and medium enterprises (SMEs), it is crucial to identify digital and managerial skill gaps, implement training and upskilling programs, recruit and retain talent with relevant expertise, and collaborate with educational institutions and industry associations. The impact of the COVID-19 pandemic on SMEs has highlighted the need for reskilling initiatives to address the changing digital landscape and its impact on skill demand (Hamburg, 2021). Research has shown that SMEs often lack the necessary capabilities and resources for digital transformation, making it essential to understand how entrepreneurs drive digital transformation and the impact of digitalization on financial performance (Li et al., 2017; Mangifera et al., 2022). Additionally, the diffusion and adoption of technology among SMEs during COVID-19 has emphasized the need for interventions to secure future skills and help SMEs cope with changes in the labor landscape (Pandey, 2022).

Furthermore, studies have emphasized the importance of organizational learning and knowledge in advancing the digital transformation of SMEs, highlighting the need for SME managers to understand the digital gaps and plan actions to develop necessary digital capabilities (González-Varona et al., 2021). It has been noted that most SMEs lack the expertise necessary for implementing advanced digital technologies, which can be attributed to informal skill development strategies and lack of financial resources (Ghobakhloo & Iranmanesh, 2021). Moreover, the digital divide resulting from the absence of literacy skills can affect SMEs' growth and development, emphasizing the significance of e-literacy and digital skills (Omiunu, 2019). The profound negative effects of the COVID-19 crisis on SMEs have forced them to rethink their business models, further underscoring the need for digital transformation and skill development (Roman & Rusu, 2022).

In addressing talent development, it is crucial to consider the role of training programs, such as fintech training, in increasing capital and business income for SMEs, as well as the development of digital marketing models through digital literacy mediation to improve SMEs' performance (Hidayat et al., 2023; Umboh & Aryanto, 2023). Collaboration with educational institutions and industry associations is essential for supporting the digital transformation of SMEs, as evidenced by the need for trained digital evangelists to facilitate the positioning phase of digitalization (Kääriäinen et al., 2023). Additionally, the development of affordable digital manufacturing solutions and visualizations on a shoestring can support SMEs in overcoming the challenges of cost and lack of available digital skills (Martínez-Arellano et al., 2022; Ling et al., 2022).

In conclusion, addressing the talent and skill development needs of SMEs for the future requires a multifaceted approach that encompasses reskilling initiatives, digital transformation, organizational learning, e-literacy, and collaboration with educational and industry partners. By understanding the digital and managerial skill gaps, implementing training programs, recruiting and retaining talent, and collaborating with relevant stakeholders, SMEs can position themselves for success in the evolving digital landscape.

7. Future Outlook

To drive sustainable growth in small and medium-sized enterprise (SME) manufacturing, it is essential to consider various factors such as leadership, supply chain management, digital transformation, project management, and capture management. Transactional leadership has been found to have a significant effect on supply chain management in manufacturing SMEs (Langton & Mafini, 2022). Additionally, the collaborative approach to digital transformation (CADT) model has been identified as crucial for shaping the future interaction of aerospace SMEs, highlighting the importance of digital transformation in the manufacturing sector (Brodeur et al., 2021). Furthermore, the implementation of Total Quality Management (TQM) has been linked to improved organizational performance in manufacturing SMEs, emphasizing the significance of process management and quality initiatives (Demirbağ et al., 2006; Valmohammadi, 2011). Moreover, entrepreneurial orientation has been associated with the performance of SMEs in the manufacturing sector, underscoring the importance of proactive and innovative approaches to business management (Shah & Ahmad, 2019).

In the context of project management, the mediating effect of big data analytics on project performance has been investigated, indicating the potential for leveraging data analytics to enhance project success in SMEs (Mangla et al., 2020). Additionally, the application of agile project management has been highlighted as an innovation and operational improvement tool within manufacturing SMEs, emphasizing the role of project management frameworks in driving growth and efficiency (Javed et al., 2020). Furthermore, the introduction of the Hoshin Kanri strategic management system has been suggested as a means to balance formalization and management practices in manufacturing SMEs, indicating the importance of strategic management systems in driving sustainable growth (Melander et al., 2016).

Digital transformation and technological innovation capabilities have been identified as critical factors influencing the performance of manufacturing SMEs, highlighting the need for SMEs to embrace Industry 4.0 and cross-disciplinary innovation to enhance their creative capabilities and competitiveness (Okpalaoka et al., 2022; "Industry 4.0 and cross-disciplinary innovation", 2020). Moreover, the impact of knowledge management in consultancy-involved process improvement projects has been emphasized, underscoring the proactive role of SME managers and employees in learning and adopting new knowledge to drive process improvements (Hu et al., 2019).

In conclusion, driving sustainable growth in SME manufacturing requires a multifaceted approach that encompasses leadership, supply chain management, digital transformation, project management, and capture management. Leveraging transactional leadership, digital transformation models, TQM implementation, and entrepreneurial orientation can contribute to enhancing the performance and sustainability of manufacturing SMEs. Additionally, embracing data analytics, agile project management, and strategic management systems can further drive innovation and efficiency in SME manufacturing, ultimately fostering sustainable growth.

8. Recommendation

This review explored the critical role of digital transformation, project management, and capture management in fostering sustainable growth within Small and Medium-sized Enterprises (SMEs) operating in the manufacturing sector. We highlighted how these elements can streamline operations, enhance efficiency, and drive innovation, ultimately leading to long-term success.

It's essential to recognize that sustainable growth in SME manufacturing requires a holistic approach. Digital transformation alone is not sufficient; it must be complemented by robust project and capture management practices. Integrating these elements ensures that technological advancements are effectively utilized, projects are executed efficiently, and opportunities for business development are maximized. Looking ahead, the landscape of SME manufacturing is poised for significant transformation. Rapid advancements in technology, coupled with evolving market demands, present both opportunities and challenges. Those SMEs that embrace digital transformation and adopt effective management practices will be better positioned to navigate this evolving landscape and achieve sustainable growth.

We urge SMEs in the manufacturing sector to take proactive steps towards embracing digital transformation and implementing effective project and capture management strategies. This involves investing in technologies such as IoT, AI, and data analytics to optimize operations, enhance decision-making, and drive innovation. Furthermore, SMEs should prioritize developing robust project management frameworks to ensure timely delivery of products and services, while also focusing on effective capture management to identify and pursue lucrative opportunities in the market.

9. Conclusion

In conclusion, the journey towards sustainable growth in SME manufacturing requires a commitment to leveraging digital transformation and adopting effective management practices. By embracing this approach, SMEs can not only thrive in today's dynamic business environment but also lay a solid foundation for future success.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

- [1] Abdulkadir, M., Abdulahi, A., Abdulkareem, L.A., Alor, O.E., Ngozichukwu, B., Al-Sarkhi, A. and Azzopardi, B.J., 2022. The effect of gas injection geometry and an insight into the entrainment and coalescence processes concerned with a stationary Taylor bubble in a downward two-phase flow. *Experimental Thermal and Fluid Science*, 130, p.110491.
- [2] Abdullah, N., Hamid, N., Shamsuddin, A., & Wahab, E. (2016). Exploring the relationships among transformational leadership, organizational culture, and product innovation using pls-sem., 151-160. https://doi.org/10.1007/978-981-287-426-9_13
- [3] Adeniyi, O.D., Ngozichukwu, B., Adeniyi, M.I., Olutoye, M.A., Musa, U. and Ibrahim, M.A., 2020. Power generation from melon seed husk biochar using fuel cell. *Ghana Journal of Science*, 61(2), pp.38-44.
- [4] Alazemi, Y. and Adesta, E. (2018). Implication of engineering project management in small and medium enterprise: malaysian perspective. *International Journal of Engineering Materials and Manufacture*, 3(4), 208-215. <https://doi.org/10.26776/ijemm.03.04.2018.05>
- [5] Alefari, M., Almani, M., & Saloni, K. (2020). Lean manufacturing, leadership and employees: the case of uae sme manufacturing companies. *Production & Manufacturing Research*, 8(1), 222-243. <https://doi.org/10.1080/21693277.2020.1781704>
- [6] Annamalah, S. and Paraman, P. (2023). Open innovation frameworks: a diagnostic analysis of deployment, engagement, evaluation, and governance of open innovation in smes.. <https://doi.org/10.21203/rs.3.rs-2615833/v1>
- [7] Anuar, A. and Yusuff, R. (2011). Manufacturing best practices in malaysian small and medium enterprises (smes). *Benchmarking an International Journal*, 18(3), 324-341. <https://doi.org/10.1108/14635771111137750>
- [8] Arlbjørn, J., Jensen, K., Philipsen, K., & Haug, A. (2019). Drivers and barriers for industry 4.0 readiness and practice: a sme perspective with empirical evidence.. <https://doi.org/10.24251/hicss.2019.619>
- [9] Badewi, A. (2022). When frameworks empower their agents: the effect of organizational project management frameworks on the performance of project managers and benefits managers in delivering transformation

- projects successfully. *International Journal of Project Management*, 40(2), 132-141. <https://doi.org/10.1016/j.ijproman.2021.10.005>
- [10] Brodeur, J., Pellerin, R., & Deschamps, I. (2021). Collaborative approach to digital transformation (cadt) model for manufacturing smes. *Journal of Manufacturing Technology Management*, 33(1), 61-83. <https://doi.org/10.1108/jmtm-11-2020-0440>
- [11] Carujo, S., Anunciação, P., & Santos, J. (2022). The project management approach. a critical success factor in digital transformation initiatives. *Economics and Culture*, 19(1), 64-74. <https://doi.org/10.2478/jec-2022-0006>
- [12] Demirbağ, M., Tatoğlu, E., Tekinkuş, M., & Zaim, S. (2006). An analysis of the relationship between tqm implementation and organizational performance. *Journal of Manufacturing Technology Management*, 17(6), 829-847. <https://doi.org/10.1108/17410380610678828>
- [13] Dora, M., Goubergen, D., Kumar, M., Molnar, A., & Gellynck, X. (2013). Application of lean practices in small and medium-sized food enterprises. *British Food Journal*, 116(1), 125-141. <https://doi.org/10.1108/bfj-05-2012-0107>
- [14] Fabian, A.A., Uchechukwu, E.S., Okoye, C.C. and Okeke, N.M., (2023). Corporate Outsourcing and Organizational Performance in Nigerian Investment Banks. *Sch J Econ Bus Manag*, 2023Apr, 10(3), pp.46-57.
- [15] Ghobakhloo, M. and Iranmanesh, M. (2021). Digital transformation success under industry 4.0: a strategic guideline for manufacturing smes. *Journal of Manufacturing Technology Management*, 32(8), 1533-1556. <https://doi.org/10.1108/jmtm-11-2020-0455>
- [16] Ghobakhloo, M. and Iranmanesh, M. (2021). Digital transformation success under industry 4.0: a strategic guideline for manufacturing smes. *Journal of Manufacturing Technology Management*, 32(8), 1533-1556. <https://doi.org/10.1108/jmtm-11-2020-0455>
- [17] Gibson, B., Mentzer, J., & Cook, R. (2005). Supply chain management: the pursuit of a consensus definition. *Journal of Business Logistics*, 26(2), 17-25. <https://doi.org/10.1002/j.2158-1592.2005.tb00203.x>
- [18] González-Varona, J., López-Paredes, A., Poza, D., & Acebes, F. (2021). Building and development of an organizational competence for digital transformation in smes. *Journal of Industrial Engineering and Management*, 14(1), 15. <https://doi.org/10.3926/jiem.3279>
- [19] Hamburg, I. (2021). Impact of covid-19 on smes and the role of digitalization. *Advances in Research*, 10-17. <https://doi.org/10.9734/air/2021/v22i330300>
- [20] Hee, O. and Bahar, T. (2019). Factors influencing project management effectiveness in the malaysian local councils. *International Journal of Managing Projects in Business*, 12(4), 1146-1164. <https://doi.org/10.1108/ijmpb-09-2018-0200>
- [21] Hidayat, A., Liliana, L., Bashir, A., Yunisvita, Y., Andaiyani, S., & Adnan, N. (2023). Fintech 4.0 training to increase capital and business income for sme in ulak banding village, indralaya. *Abdi Dosen Jurnal Pengabdian Pada Masyarakat*, 7(1), 197. <https://doi.org/10.32832/abddidos.v7i1.1548>
- [22] Hu, Q., Williams, S., Mason, R., & Found, P. (2019). Knowledge management in consultancy-involved process improvement projects: cases from chinese smes. *Production Planning & Control*, 30(10-12), 866-880. <https://doi.org/10.1080/09537287.2019.1582095>
- [23] Huang, C., Lee, D., Chen, S., & Tang, W. (2022). A lean manufacturing progress model and implementation for smes in the metal products industry. *Processes*, 10(5), 835. <https://doi.org/10.3390/pr10050835>
- [24] Javed, S., Bamford, J., & Abualqumboz, M. (2020). Helping deluxe beds to sleep easy: a case study of agile project management. *The International Journal of Entrepreneurship and Innovation*, 22(2), 132-139. <https://doi.org/10.1177/1465750320974942>
- [25] Johnson, D., Pranada, E., Yoo, R., Uwadiunor, E., Ngozichukwu, B. and Djire, A., 2023. Review and Perspective on Transition Metal Electrocatalysts Toward Carbon-neutral Energy. *Energy & Fuels*, 37(3), pp.1545-1576.
- [26] Kääriäinen, J., Saari, L., Tihinen, M., Perätalo, S., & Koivumäki, T. (2023). Supporting the digital transformation of smes — trained digital evangelists facilitating the positioning phase. *International Journal of Information Systems and Project Management*, 11(1), 5-27. <https://doi.org/10.12821/ijispm110101>
- [27] Kasten, J., Hsiao, C.C., Ngozichukwu, B., Yoo, R., Johnson, D., Lee, S., Erdemir, A. and Djire, A., 2023, November. High Performing pH-Universal Electrochemical Energy Storage Using 2D Titanium Nitride Mxene. In *2023 AIChE Annual Meeting*. AIChE.

- [28] Koolen, T., Boer, T., Rebula, J., Goswami, A., & Pratt, J. (2012). Capturability-based analysis and control of legged locomotion, part 1: theory and application to three simple gait models. *The International Journal of Robotics Research*, 31(9), 1094-1113. <https://doi.org/10.1177/0278364912452673>
- [29] Kumar, R., Sindhwani, R., & Singh, P. (2021). Iiot implementation challenges: analysis and mitigation by blockchain. *Journal of Global Operations and Strategic Sourcing*, 15(3), 363-379. <https://doi.org/10.1108/jgoss-08-2021-0056>
- [30] Kumar, R., Singh, R., & Dwivedi, Y. (2020). Application of industry 4.0 technologies in smes for ethical and sustainable operations: analysis of challenges. *Journal of Cleaner Production*, 275, 124063. <https://doi.org/10.1016/j.jclepro.2020.124063>
- [31] Lambert, D. and Pohlen, T. (2001). Supply chain metrics. *The International Journal of Logistics Management*, 12(1), 1-19. <https://doi.org/10.1108/09574090110806190>
- [32] Lang, F. and Müller, T. (2021). Success factors of ict projects in digital transformation. *European Project Management Journal*, 11(2), 24-36. <https://doi.org/10.18485/epmj.2021.11.2.3>
- [33] Langton, I. and Mafini, C. (2022). Transactional leadership and its effect on supply chain management in manufacturing smes. *Eureka Social and Humanities*, (5), 10-30. <https://doi.org/10.21303/2504-5571.2022.002479>
- [34] Lappi, T., Aaltonen, K., & Kujala, J. (2019). Project governance and portfolio management in government digitalization. *Transforming Government People Process and Policy*, 13(2), 159-196. <https://doi.org/10.1108/tg-11-2018-0068>
- [35] Li, L., Su, F., Zhang, W., & Mao, J. (2017). Digital transformation by sme entrepreneurs: a capability perspective. *Information Systems Journal*, 28(6), 1129-1157. <https://doi.org/10.1111/isj.12153>
- [36] Ling, Z., Silva, L., Hawkrige, G., McFarlane, D., Martínez-Arellano, G., Schönfuß, B., ... & Thorne, A. (2022). A graphical environment to support the development of affordable digital manufacturing solutions., 263-275. https://doi.org/10.1007/978-3-030-99108-1_19
- [37] Mangifera, L., Wajdi, F., Amalia, F., & Khasah, A. (2022). The role of digital innovation in smes: a financial performance perspective. *Jurnal Manajemen Universitas Bung Hatta*, 17(2), 157-170. <https://doi.org/10.37301/jmubh.v17i2.20184>
- [38] Mangla, S., Raut, R., Narwane, V., Zhang, Z., & Priyadarshinee, P. (2020). Mediating effect of big data analytics on project performance of small and medium enterprises. *Journal of Enterprise Information Management*, 34(1), 168-198. <https://doi.org/10.1108/jeim-12-2019-0394>
- [39] Martínez-Arellano, G., McNally, M., Chaplin, J., Ling, Z., McFarlane, D., & Ratchev, S. (2022). Visualisation on a shoestring: a low-cost approach for building visualisation components of industrial digital solutions., 277-289. https://doi.org/10.1007/978-3-030-99108-1_20
- [40] Marzi, G., Zollo, L., Boccardi, A., & Ciappei, C. (2018). Additive manufacturing in smes: empirical evidences from italy. *International Journal of Innovation and Technology Management*, 15(01), 1850007. <https://doi.org/10.1142/s0219877018500074>
- [41] McAdam, R., Keogh, W., Reid, R., & Mitchell, N. (2007). Implementing innovation management in manufacturing smes: a longitudinal study. *Journal of Small Business and Enterprise Development*, 14(3), 385-403. <https://doi.org/10.1108/14626000710773501>
- [42] Melander, A., Löfving, M., Andersson, D., Elgh, F., & Thulin, M. (2016). Introducing the hoshin kanri strategic management system in manufacturing smes. *Management Decision*, 54(10), 2507-2523. <https://doi.org/10.1108/md-03-2016-0148>
- [43] Ngibe, M. and Lekhanya, L. (2019). Innovative leadership in south african manufacturing small medium enterprises within kwazulu-natal. *Journal of Contemporary Management*, 16(2), 300-330. <https://doi.org/10.35683/jcm19034.37>
- [44] Nimfa, D. (2021). Effect of organisational culture on sustainable growth of smes: mediating role of innovation competitive advantage. *Journal of International Business and Management*, 1-19. <https://doi.org/10.37227/jibm-2021-01-156>

- [45] Odeleye, D.A. and Adeigbe, Y.K. eds., 2018. *Girl-child Education and Women Empowerment for Sustainable Development: A Book of Readings: in Honour of Dr Mrs Oyebola Ayeni*. College Press & Publishers, Lead City University.
- [46] O'Hara, G., Lapworth, E., & Lampert, C. (2020). Cultivating digitization competencies. *Information Technology and Libraries*, 39(4). <https://doi.org/10.6017/ital.v39i4.11859>
- [47] Okpalaoka, C., Ogunnaike, O., Kalu, A., Yaya, T., Usendiah, E., & Emmanuel, E. (2022). Effect of technological innovation capabilities on the performance of selected manufacturing small and medium enterprises in lagos state. *F1000research*, 11, 256. <https://doi.org/10.12688/f1000research.76130.1>
- [48] Olushola, A.O. and Olabode, K.T., 2018. Prevalence of sexting among students in selected secondary schools in Southwestern Nigeria. *Gender and Behaviour*, 16(1), pp.11011-11025.
- [49] Olushola, A.O., 2017. Sexting in educational sector: gender perspective in some selected secondary schools in ekiti and osun states. *IFE Psychologia: An International Journal*, 25(2), pp.245-261.
- [50] Omiunu, O. (2019). E-literacy-adoption model and performance of women-owned SMES in southwestern nigeria. *Journal of Global Entrepreneurship Research*, 9(1). <https://doi.org/10.1186/s40497-019-0149-3>
- [51] Oti, A. and Ayeni, O., 2013. Yoruba culture of Nigeria: creating space for an endangered specie. *Cross-Cultural Communication*, 9(4), p.23.
- [52] Pandey, A. (2022). Diffusion and adoption of technology amongst small and medium enterprises during covid-19 with a focus on internet of things... <https://doi.org/10.24251/hicss.2022.610>
- [53] Patrick, G. (2017). Clustering and product innovativeness: a literature review of small and medium-sized enterprises (smes) in kenya. *International Journal of Academic Research in Economics and Management Sciences*, 6(4). <https://doi.org/10.6007/ijarems/v6-i4/3499>
- [54] Priyono, A., Moin, A., & Putri, V. (2020). Identifying digital transformation paths in the business model of smes during the covid-19 pandemic. *Journal of Open Innovation Technology Market and Complexity*, 6(4), 104. <https://doi.org/10.3390/joitmc6040104>
- [55] Purwanto, U., Kamaruddin, S., & Mohamad, N. (2015). The role of industrial clustering and manufacturing flexibility in achieving high innovation capability and operational performance in indonesian manufacturing smes. *Industrial Engineering & Management Systems*, 14(3), 236-247. <https://doi.org/10.7232/iems.2015.14.3.236>
- [56] Roman, A. and Rusu, V. (2022). Digital technologies and the performance of small and medium enterprises. *Studies in Business and Economics*, 17(3), 190-203. <https://doi.org/10.2478/sbe-2022-0055>
- [57] Schönfuß, B., McFarlane, D., Salter, L., Silva, L., & Ratchev, S. (2019). Prioritising low cost digital solutions required by manufacturing smes: a shoestring approach., 290-300. https://doi.org/10.1007/978-3-030-27477-1_22
- [58] Shah, S. and Ahmad, M. (2019). Entrepreneurial orientation and performance of small and medium-sized enterprises. *Competitiveness Review an International Business Journal Incorporating Journal of Global Competitiveness*, 29(5), 551-572. <https://doi.org/10.1108/cr-06-2018-0038>
- [59] Stephen, C., Diccio, E., & Munk, B. (2008). British columbia's fish health regulatory framework's contribution to sustainability goals related to salmon aquaculture. *Ecohealth*, 5(4), 472-481. <https://doi.org/10.1007/s10393-008-0199-4>
- [60] Turner, J., Ledwith, A., & Kelly, J. (2009). Project management in small to medium-sized enterprises. *International Journal of Managing Projects in Business*, 2(2), 282-296. <https://doi.org/10.1108/17538370910949301>
- [61] Turner, J., Ledwith, A., & Kelly, J. (2010). Project management in small to medium-sized enterprises: matching processes to the nature of the firm. *International Journal of Project Management*, 28(8), 744-755. <https://doi.org/10.1016/j.ijproman.2010.06.005>
- [62] Uchechukwu, E.S., Amechi, A.F., Okoye, C.C. and Okeke, N.M., 2023. Youth Unemployment and Security Challenges in Anambra State, Nigeria. *Sch J Arts Humanit Soc Sci*, 4, pp.81-91.
- [63] Ukoba, K. and Jen, T.C., 2023. *Thin films, atomic layer deposition, and 3D Printing: demystifying the concepts and their relevance in industry 4.0*. CRC Press.

- [64] Umboh, I. and Aryanto, V. (2023). Digital marketing development model through digital literacy mediation to improve sme's performance. *Media Ekonomi Dan Manajemen*, 38(1), 94. <https://doi.org/10.56444/mem.v38i1.3315>
- [65] Valmohammadi, C. (2011). The impact of tqm implementation on the organizational performance of iranian manufacturing smes. *The TQM Journal*, 23(5), 496-509. <https://doi.org/10.1108/17542731111157608>
- [66] Victor, E. and Great C, U., 2021. The Role of Alkaline/alkaline Earth Metal Oxides in CO2 Capture: A Concise Review. *Journal of Energy Research and Reviews*, 9(3), pp.46-64.
- [67] Yaakub, S. and Mustafa, H. (2022). Risk sources, agility strategy and company performance among manufacturing small and medium enterprises in malaysia. *Global Business Management Review (Gbmr)*, 14(1), 20-37. <https://doi.org/10.32890/gbmr2022.14.1.2>