

2.3. Empirical Studies on AI-Driven Improvements in Business Processes

Empirical research demonstrates that generative artificial intelligence (AI) technologies significantly enhance business process efficiency and effectiveness within small and medium-sized enterprises (SMEs). The growing body of evidence reveals multifaceted improvements across operational, strategic, and innovative dimensions of business processes, with documented benefits spanning productivity gains, cost reductions, and enhanced decision-making capabilities.

2.3.1. Process Automation and Operational Efficiency

Quantitative evidence indicates substantial improvements in operational efficiency through generative AI implementation. Adeyemo Abidemi (2024) conducted a comprehensive analysis revealing that automation technologies improve productivity in SMEs by up to 30%, while simultaneously reducing manual errors by 25% and enhancing data accuracy through improved employee focus on strategic tasks. These findings align with broader research demonstrating that generative AI facilitates the automation of routine tasks, leading to cost optimization and enhanced operational efficiency (Kostiantyn Zavrazhnyi et al., 2024).

A grounded theory study conducted by Fabian Walke et al. (2025) examined the characteristics of generative AI usage across management, marketing, and development departments within an SME through interviews with ten employees. The research identified productivity increases across all departments, with particularly notable improvements in marketing operations. The study documented significant cost and time savings across organizational functions, alongside improvements in learning processes within development departments and shorter communication pathways in management structures.

2.3.2. Decision-Making Enhancement and Strategic Planning

Empirical evidence consistently demonstrates that generative AI enhances decision-making capabilities within SMEs. Meshel Muzuva et al. (2024) employed a qualitative methodology to evaluate the impact of generative AI on SME productivity in South Africa, conducting in-depth interviews with SME owners and managers. The findings revealed significant improvements in data-driven decision-making, operational efficiencies, and market expansion strategies. The research identified that SMEs previously faced challenges due to limited resources and restricted access to technology, with generative AI

emerging as a solution that enhances operational efficiency and strategic decision-making.

Research indicates that generative AI provides insights and recommendations that enhance decision-making processes, enabling SMEs to make more informed strategic choices (A. Beheshti et al., 2023). The technology's capacity to process and analyze large volumes of data facilitates evidence-based decision-making that was previously inaccessible to resource-constrained SMEs.

2.3.3.Comprehensive Business Function Enhancement

Systematic empirical analysis reveals that generative AI impacts multiple business functions simultaneously. A. Kramarenko (2025) conducted a survey of 63 companies, analyzing academic literature, industry reports, and empirical data to investigate AI implementation perspectives and challenges. The research identified five primary areas where generative AI enhances SME performance: content creation, automated operations, venture business ideation, financial management, and operational optimization.

T. Dinh et al. (2025) conducted a systematic literature review of 50 studies published between 2016 and 2025, identifying prominent AI technologies including machine learning, natural language processing, and generative AI. The review documented applications enhancing efficiency, decision-making, and innovation across sales and marketing, operations and logistics, and finance functions. The findings emphasize the importance of workforce training, robust technological infrastructure, data-driven cultures, and strategic partnerships for successful SME implementation.

2.3.4.Content Creation and Customer Engagement

Empirical studies demonstrate that generative AI revolutionizes content creation processes within SMEs. Florina Bran et al. (2025) examined the transformative impact of generative AI on SMEs, with particular emphasis on content creation, customer engagement, automation, and decision-making functions. The research indicates that generative AI democratizes access to advanced technology, enabling SMEs to compete in global markets and optimize resource allocation.

David M. Townsend (2023) explored the applications of generative AI tools such as ChatGPT for startups and small businesses, documenting opportunities for process optimization, enhanced customer engagement, and growth facilitation. The research demonstrates that these technologies enable SMEs to produce high-quality marketing materials and customer communications more efficiently than traditional methods.

2.3.5. Innovation and Competitive Advantage

Research evidence indicates that generative AI serves as a catalyst for innovation within SMEs. E. Carayannis et al. (2024) investigated how generative AI enhances resilience and competitiveness in SMEs, arguing that the technology offers transformative potential through process automation, enhanced decision-making, and innovation fostering. The study underscores the importance of strategic AI integration and provides evidence that SMEs can leverage generative AI to navigate challenges and capitalize on opportunities in evolving digital landscapes.

Priyanka Gupta and R. Singh (2025) employed a mixed-methods approach incorporating case studies, surveys, and interviews to examine the transformative potential of ChatGPT and other generative AI technologies. The research highlights that generative AI serves as a catalyst for business transformation by improving decision-making, streamlining operations, and fostering customer-centric innovations, particularly benefiting small and resource-constrained businesses.

2.3.6. Risk Management and Specialized Applications

Emerging empirical evidence demonstrates generative AI's application in specialized business processes. E. Leonard et al. (2026) explored generative AI's benefits within risk management cycles, presenting a conceptual case study in the food and beverage sector. The research demonstrates AI's iterative application across risk management phases: identification, comprehension, assessment, treatment, and monitoring, illustrating practical applications in risk assessment and decision-making enhancement.

2.3.7. Implementation Challenges and Success Factors

Empirical studies consistently identify implementation challenges alongside documented benefits. Meshel Muzuva et al. (2024) highlighted barriers including lack of technical expertise, initial setup costs, and concerns over data

security. Similarly, A. Kramarenko (2025) identified limited access to industry data, insufficient financial resources, lack of technical expertise, and challenges with data integration as primary adoption barriers.

Research emphasizes that successful implementation requires strategic planning and organizational support. T. Dinh et al. (2025) identified workforce training, robust technological infrastructure, data-driven cultures, and strategic partnerships as critical success factors. Kumaran Rajaram and Patrick Nicolas Tinguely (2024) introduced strategic dimensions for generative AI deployment, including employee competency, effective leadership, organizational culture, collaboration, and third-party relationships.

The empirical evidence demonstrates that generative AI represents a transformative technology for SME business process improvement, offering substantial opportunities for efficiency gains, innovation, and competitive advantage when strategically implemented with appropriate organizational support and infrastructure.

References

Adeyemo Abidemi. (2024). The role of technology and automation in streamlining business processes and productivity for SMEs. *International Journal of Entrepreneurship*.

Beheshti, A., Yang, J., Sheng, Q. Z., Benatallah, B., Casati, F., Dustdar, S., Nezhad, H. M., Zhang, X., & Xue, S. (2023). ProcessGPT: Transforming business process management with generative artificial intelligence. *2023 IEEE International Conference on Web Services (ICWS)*.

Bran, F., Bodislav, D., Călin, A., & Mănescu, A. M. (2025). Empowering SMEs through generative AI: Opportunities, challenges, and strategic implications for sustainable innovation. *European Journal of Sustainable Development*.

Carayannis, E., Dumitrescu, R., Falkowski, T., & Zota, N.-R. (2024). Empowering SMEs "Harnessing the potential of Gen AI for resilience and competitiveness". *IEEE Transactions on Engineering Management*.

Dinh, T., Vu, M., & Tran, G. (2025). Artificial intelligence in SMEs: Enhancing business functions through technologies and applications. *Inf.*

Gupta, P., & Singh, R. (2025). Generative AI in business transformation: The role of AI in operational efficiency, innovation, and ethical implications. *JIMS8M The*

Journal of Indian Management & Strategy.

Kramarenko, A. (2025). Artificial intelligence for small and medium business: Perspectives and challenges. *Journal of Engineering Management and Competitiveness.*

Leonard, E., Sheehan, B., Mullins, M., & Shannon, D. (2026). Generative AI for enhanced risk management in SMEs. *Journal of Risk Research.*

Muzuva, M., Zhou, H., & Zondo, R. (2024). Has generative AI become of age. *International Journal of Research In Business and Social Science.*

Rajaram, K., & Tinguely, P. N. (2024). Generative artificial intelligence in small and medium enterprises: Navigating its promises and challenges. *Business Horizons.*

Townsend, D. M. (2023). Leveraging generative AI tools like ChatGPT for startups and small business growth. *Entrepreneur & Innovation Exchange.*

Walke, F., Klopfers, L., & Winkler, T. J. (2025). Leveraging generative AI and ChatGPT in SMEs: A grounded model. *Hawaii International Conference on System Sciences.*

Zavrzhnyi, K., Kulyk, A., & Antunes de Abreu, O. (2024). The innovative impact of generative artificial intelligence on digital business transformation. *Економіка розвитку систем.*