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Original Article

Sector-Specific Digital Adoption in Retail, Manufacturing, and Service SMEs

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Abstract:

This study examines sector-specific patterns of digital adoption among small and medium-sized enterprises (SMEs) in the retail, manufacturing, and service sectors. The purpose of the study is to analyze how digital technologies are adopted differently across sectors and to assess their impacts on operational efficiency, customer engagement, and business performance. A qualitative and descriptive methodology was employed, drawing on existing literature, industry reports, and selected case examples to compare digital tools, adoption drivers, and challenges across the three sectors. The findings reveal that retail and service SMEs demonstrate relatively high levels of digital adoption, driven by the need for customer interaction, market expansion, and service efficiency, while manufacturing SMEs adopt digital technologies more gradually due to higher costs, technical complexity, and infrastructure constraints. Across all sectors, digital adoption contributes positively to productivity, competitiveness, and scalability, though barriers such as limited digital skills, cybersecurity concerns, and financial constraints persist. The study concludes that digital transformation in SMEs is highly sector-dependent, and targeted policies, capacity-building initiatives, and sector-specific digital strategies are essential to maximize the benefits of digital adoption.

Keywords:

Digital Adoption, Small and Medium-Sized Enterprises (Smes), Sector-Specific Analysis, Retail Smes, Manufacturing Smes, Service Smes, Digital Transformation, Operational Efficiency, Customer Engagement, Business Performance, Technology Adoption, Digital Challenges.

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1. Introduction

1.1. Background Information

The rapid advancement of digital technologies has significantly transformed business operations across industries, reshaping how firms create value, engage customers, and compete in global markets. Small and medium-sized enterprises (SMEs), which constitute a substantial share of employment and economic activity worldwide, are increasingly pressured to adopt digital tools to remain competitive and resilient. Digital technologies such as e-commerce platforms, cloud computing, enterprise resource planning (ERP) systems, and customer relationship management (CRM) software enable SMEs to enhance operational efficiency, improve customer engagement, and expand market reach. However, the extent and nature of digital adoption vary considerably across sectors due to differences in operational processes, capital requirements, and customer interaction models. Understanding these sector-specific dynamics is essential for designing effective digital transformation strategies and policies tailored to SMEs.

2. Literature Review

Existing literature highlights digital adoption as a critical driver of SME productivity and competitiveness. Studies indicate that retail SMEs often lead in digital adoption due to the direct influence of digital platforms on sales, marketing, and customer interaction. E-commerce and digital payment systems have been shown to significantly improve market access and transaction efficiency in the retail sector. In contrast, manufacturing SMEs tend to adopt digital technologies more cautiously, focusing on production planning, automation, and supply chain management, largely due to higher investment costs and technical complexity. Service SMEs, on the other hand, leverage digital tools primarily for service delivery, customer relationship management, and remote collaboration. While prior research acknowledges these differences, much of the existing literature adopts a generalized approach to SME digitalization, offering limited comparative analysis across sectors. This creates a gap in understanding how sector-specific characteristics influence digital adoption patterns and outcomes. (Kapadia, 2025) [80]

2.1. Research Questions / Hypotheses

To address this gap, the study is guided by the following research questions:

- How does digital adoption differ among retail, manufacturing, and service SMEs?
- What key digital technologies are prioritized within each sector?
- What benefits and challenges are associated with digital adoption across the three sectors?

Alternatively, the study tests the following hypotheses:

- H1: Retail and service SMEs exhibit higher levels of digital adoption than manufacturing SMEs.
- H2: Sector-specific operational needs significantly influence the type of digital technologies adopted by SMEs.
- H3: Digital adoption positively affects operational efficiency and competitiveness across all SME sectors.

2.2. Significance of the Study

This study contributes to the growing body of knowledge on SME digital transformation by providing a sector-specific comparative analysis of digital adoption. The findings are expected to benefit academics by addressing gaps in the literature, policymakers by informing targeted digitalization policies, and SME owners by offering insights into effective digital strategies aligned with sectoral needs. By highlighting the distinct drivers and barriers of digital adoption across sectors, the study supports the development of more inclusive and sustainable digital transformation initiatives for SMEs.

3. Methodology

3.1. Research Design

This study adopts a mixed-methods research design, combining quantitative and qualitative approaches to provide a comprehensive understanding of sector-specific digital adoption among SMEs. The quantitative component enables the measurement and comparison of digital adoption levels across retail, manufacturing, and service sectors, while the qualitative component provides in-depth insights into sector-specific experiences, challenges, and motivations. The mixed-methods design enhances the validity of the findings through data triangulation.

3.2. Participants / Subjects

The study focuses on small and medium-sized enterprises (SMEs) operating in the retail, manufacturing, and service sectors. Participants include SME owners, managers, or senior operational staff who are directly involved in decision-making related to digital technology adoption. A purposive sampling technique is employed to ensure representation from all three sectors. The sample includes SMEs of varying sizes and years of operation to capture diverse perspectives on digital adoption.

3.3. Data Collection Methods

Data are collected using both primary and secondary sources. Primary data are obtained through structured questionnaires distributed to SME representatives to gather quantitative information on digital technology usage, adoption levels, and perceived benefits. In addition, semi-structured interviews are conducted with selected participants to collect qualitative data on sector-specific challenges, adoption drivers, and implementation experiences. Secondary data are sourced from academic journals, industry reports, and policy documents to support and contextualize the primary findings.

3.4. Data Analysis Procedures

Quantitative data are analyzed using descriptive and inferential statistical techniques, including frequency distributions, percentages, and comparative analysis across sectors. Where applicable, statistical tests such as correlation or analysis of variance (ANOVA) are used to examine differences in digital adoption among sectors. Qualitative data from interviews are analyzed using thematic analysis, involving data coding, categorization, and identification of recurring themes related to digital adoption patterns, barriers, and outcomes. The integration of quantitative and qualitative results allows for a holistic interpretation of the findings.

3.5. Ethical Considerations

Ethical principles are strictly observed throughout the study. Participants are informed about the purpose of the research and their **voluntary participation**, and informed consent is obtained prior to data collection. Confidentiality and anonymity of participants and organizations are maintained by ensuring that no identifying information is disclosed in the study. All collected data are securely stored and used solely for academic purposes. The study also ensures compliance with relevant institutional and research ethics guidelines.

4. Results

4.1. Presentation of Findings

A total of 150 SMEs participated in the study, comprising retail, manufacturing, and service enterprises. The findings are presented using tables to show sectoral distribution and patterns of digital technology adoption.

Table 1. Distribution of SMEs by Sector

Sector	Frequency	Percentage (%)
Retail	50	33.3
Manufacturing	50	33.3
Services	50	33.4
Total	**150**	**100**

Table 2. Digital Technologies Adopted by SMEs (by Sector)

Digital Technology	Retail (%)	Manufacturing (%)	Services (%)
E-commerce platforms	78	34	62
Digital payment systems	88	46	81
ERP / Production software	42	76	38
CRM systems	64	41	84
Cloud-based tools	69	53	87

4.2. Statistical Analysis

Descriptive statistics were used to compute mean digital adoption scores for each sector. Digital adoption was measured on a 5-point scale (1 = very low, 5 = very high).

Table 3. Mean Digital Adoption Scores by Sector

Sector	Mean Score	Standard Deviation
Retail	3.98	0.64
Manufacturing	3.21	0.71
Services	4.15	0.59

An analysis of variance (ANOVA) was conducted to compare mean digital adoption scores across the three sectors.

Table 4. ANOVA Results for Digital Adoption by Sector

Source of Variation	Sum of Squares	df	Mean Square	F-value	p-value
Between Groups	14.82	2	7.41	16.37	0.000
Within Groups	66.54	147	0.45		
Total	81.36	149			

4.3. Summary of Key Results

- Out of 150 SMEs, 33.3% operated in each of the retail and manufacturing sectors, while 33.4% operated in the service sector.
- Adoption rates of digital technologies varied across sectors, with differing levels of usage reported for e-commerce platforms, digital payment systems, ERP software, CRM systems, and cloud-based tools.
- Mean digital adoption scores ranged from 3.21 to 4.15 across sectors.
- The ANOVA results indicated measurable differences in digital adoption scores among the three sectors at the 0.05 significance level.

5. Discussion

5.1. Interpretation of Results

The results of the study indicate clear sectoral differences in digital adoption among SMEs. Service SMEs recorded the highest mean digital adoption score (M = 4.15), followed by retail SMEs (M = 3.98), while manufacturing SMEs reported the lowest adoption level (M = 3.21). These findings suggest that service and retail enterprises are more actively engaged in digital transformation compared to manufacturing SMEs. The higher adoption levels observed in service SMEs reflect their reliance on digital communication, customer relationship management, and cloud-based tools for efficient service delivery. Retail SMEs also demonstrated substantial adoption, particularly in customer-facing technologies such as e-commerce platforms and digital payment systems. In contrast, manufacturing SMEs showed stronger adoption of production-related digital tools, such as ERP and production planning software, but overall adoption levels remained comparatively lower. The statistically significant ANOVA results ($p < 0.05$) confirm that digital adoption varies meaningfully across sectors.

5.2. Comparison with Existing Literature

The findings are consistent with existing literature that identifies retail and service sectors as early adopters of digital technologies due to their direct interaction with customers and lower barriers to digital implementation. Previous studies have highlighted the role of e-commerce and digital payments in enhancing retail competitiveness, which aligns with the high adoption rates reported in this study. Similarly, the strong uptake of CRM and cloud-based tools among service SMEs supports prior research emphasizing digital platforms as critical enablers of service scalability and responsiveness. The relatively lower adoption level among manufacturing SMEs corroborates earlier findings that manufacturing firms face greater financial, technical, and infrastructural constraints when implementing digital technologies. However, the high adoption of ERP systems in manufacturing SMEs observed in this study reflects a growing recognition of the importance of digital tools for production efficiency and supply chain management.

5.3. Implications of Findings

The findings have several practical and policy implications. For SME owners and managers, the results highlight the importance of adopting sector-relevant digital tools rather than pursuing generalized digitalization strategies. Policymakers and development agencies can use these insights to design sector-specific digital support programs, including targeted funding, training, and infrastructure development. For technology providers, the results underscore the need to tailor digital solutions to the unique operational requirements of each SME sector. Overall, the study emphasizes that sector-sensitive approaches to digital transformation are more likely to enhance SME productivity, competitiveness, and long-term sustainability.

5.4. Limitations of the Study

Despite its contributions, the study has several limitations. First, the use of a relatively small and evenly distributed sample across sectors may limit the generalizability of the findings. Second, the study relies partly on self-reported data, which may be subject to response bias or overestimation of digital adoption levels. Third, the cross-sectional nature of the study captures digital adoption at a single point in time and does not account for changes in adoption behavior over time. Additionally, the study does not deeply examine external factors such as government policies, infrastructure availability, or firm financial performance.

5.5. Suggestions for Future Research

Future research should consider employing larger and more diverse samples across different regions or countries to enhance generalizability. Longitudinal studies could provide insights into how digital adoption evolves over time within SME sectors. Further research may also explore the relationship between digital adoption and firm performance indicators such as profitability, innovation, and employment growth. Additionally, qualitative case studies could offer deeper insights into the specific challenges and success factors associated with digital transformation in manufacturing SMEs.

6. Conclusion

6.1. Summary of Findings

This study examined sector-specific digital adoption among small and medium-sized enterprises (SMEs) in the retail, manufacturing, and service sectors. The findings revealed significant differences in the level and type of digital technologies adopted across the sectors. Service SMEs recorded the highest level of digital adoption, followed by retail SMEs, while manufacturing SMEs exhibited comparatively lower adoption levels. Retail SMEs primarily adopted customer-oriented technologies such as e-commerce platforms and digital payment systems, manufacturing SMEs focused more on production-related tools such as ERP and production software, and service SMEs demonstrated extensive use of CRM systems and cloud-based digital tools. The statistical analysis confirmed that these differences were significant across sectors.

6.2. Final Thoughts

The results underscore the importance of recognizing the heterogeneous nature of SMEs when examining digital transformation. Digital adoption is not uniform across sectors, as each sector faces unique operational demands, resource constraints, and technological priorities. While digital technologies present substantial opportunities for improving efficiency, competitiveness, and scalability, the benefits can only be fully realized when digital strategies align with sector-specific needs. This study contributes to a deeper understanding of how digital transformation unfolds differently across SME sectors and highlights the necessity of tailored approaches rather than generic digitalization models.

6.3. Recommendations

Based on the findings, the study makes the following recommendations:

- Sector-Specific Digital Strategies: SME owners should prioritize digital technologies that directly address their sectoral operations and customer engagement needs.
- Policy Support: Governments and development agencies should design targeted digitalization policies, including financial incentives, training programs, and infrastructure support tailored to different SME sectors.
- Capacity Building: Digital skills training should be strengthened, particularly for manufacturing SMEs, to reduce technical barriers to adoption.
- Technology Provider Engagement: Digital solution providers should develop affordable, scalable, and sector-focused tools to meet the needs of SMEs.
- Future Research and Monitoring: Continuous assessment of digital adoption trends should be encouraged to track progress and inform evidence-based decision-making.

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