

Digital Transformation of Small Business in the Most Fragile and Marginalized Segments of the Economy

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Abstract: Digital transformation extends beyond merely adopting technology; it encompasses structural changes and innovations across business operations, accelerating decision-making processes. This study was conducted to support small business owners at the economic grassroots in enhancing their competitiveness and adapting effectively to the rapidly changing market environment through data-driven decision-making. Small business owners often face significant constraints in digital transformation due to limited capital, workforce, and knowledge. The key obstacles hindering digital transformation include low awareness of digital technologies, absence of skilled personnel, and lack of financial resources. To address these issues, this study proposes a four-step approach: data collection, storage, analysis, and improvement, and presents a practical model for implementing digital transformation centered around cost-effective digital tools and actionable strategies. Digital transformation can increase market responsiveness, maximize efficiency, and create long-term growth opportunities for small business owners. This research underscores that a tailored approach considering the practical constraints of small business owners and a phased implementation plan can lower the barriers to digital transformation and lay the foundation for its successful realization.

Keywords: Small Business; Digital Transformation; Data-Driven Decision Making; POS Systems; Cloud Storage

1. Introduction

Digital transformation extends beyond merely adopting technology; it encompasses structural changes and innovations across business operations, accelerating decision-making processes. This study was conducted to support small business owners at the economic grassroots in enhancing their competitiveness and adapting effectively to the rapidly changing market environment through data-driven decision-making. Particularly, small business owners often face significant constraints in digital transformation due to limited capital, workforce, and knowledge. The focus of this research was on proposing accessible, low-cost solutions to overcome these barriers.

2. Theoretical Framework

Digital transformation is essential for quickly capturing and responding to changes in customer needs and market trends. However, the key obstacles hindering digital transformation for small business owners include low awareness of digital technologies, absence of skilled personnel, and lack of financial resources. Existing research on digital transformation has predominantly focused on large enterprises, leaving a significant gap in understanding the unique challenges and opportunities facing small businesses at the economic margins.

This study draws on theories of technology adoption, organizational learning, and competitive strategy to construct a framework appropriate for resource-constrained small business environments. The emphasis on incremental, low-cost approaches reflects the practical realities faced by micro-enterprises and sole proprietorships.

3. Materials and Methods

This study employs a qualitative research methodology based on literature review, case analysis, and practical tool evaluation. The four-step digital transformation framework (collection, storage, analysis, improvement) was developed through systematic analysis of existing small business digital transformation cases and available low-cost digital tools. Practical applicability was assessed based on accessibility, cost, technical complexity, and potential business impact.

4. Results

4.1 Four-Step Digital Transformation Framework

To address the barriers facing small businesses, this study proposes a four-step approach: data collection, storage, analysis, and improvement.

In the data collection phase, the use of POS (Point of Sale) systems and survey tools was suggested as efficient methods for gathering data. POS systems provide transactional data that can inform inventory management, sales trends, and customer purchasing patterns without requiring significant technical expertise from business owners.

In the storage phase, the emphasis was on low-cost solutions utilizing spreadsheets and cloud storage. Cloud-based storage solutions provide cost-effective, scalable data management capabilities that were previously accessible only to larger enterprises.

The analysis phase involved basic statistical analysis and customer segmentation techniques to interpret the data. Simple analytical approaches using widely available tools enable business owners to extract actionable insights without requiring advanced data science capabilities.

The improvement phase suggested enhancing automation and accessibility to convert data insights into tangible business outcomes. Automation of routine data collection and reporting tasks reduces the ongoing burden on business owners while ensuring consistent data capture.

4.2 Tool Evaluation

A range of cost-effective digital tools appropriate for small business implementation were evaluated, including Google Sheets for data storage and basic analysis, Google Sites for customer-facing digital presence, and various free or low-cost POS applications. These tools collectively provide a comprehensive digital infrastructure accessible to businesses with limited technology budgets.

5. Discussion

Digital transformation can increase market responsiveness, maximize efficiency, and create long-term growth opportunities for small business owners. The proposed four-step framework provides a structured yet flexible pathway for businesses at various stages of digital maturity. By starting with basic data collection and progressively building analytical and automation capabilities, small businesses can pursue digital transformation incrementally without overwhelming resource commitments.

The key obstacles—low digital awareness, absence of skilled personnel, and financial constraints—can be addressed through targeted education and support programs. Government and private sector initiatives should focus on providing accessible training resources, subsidized digital tools, and peer learning networks to support small business digital transformation.

6. Conclusion

This research underscores that digital transformation is a critical task for the survival and growth of small businesses, highlighting that data utilization and technology adoption are key to securing sustainable and gradual competitive advantages. A tailored approach that considers the practical constraints of small business owners and a phased implementation plan can lower the barriers to digital transformation and lay the foundation for its successful realization. Future research should examine the outcomes of small business digital transformation initiatives across different industry sectors and geographic contexts to refine and validate the

proposed framework.

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