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Building Digitally Resilient MSMEs: Integrating Innovation, Efficiency, and Sustainability

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ABSTRACT

Digital transformation plays a vital role in improving the competitiveness, operational efficiency, and sustainable growth of micro, small and medium enterprises (MSMEs). Digital payments, e-commerce, social media marketing, and accounting software can help businesses expand markets, enhance customer relationships, and improve financial management. This study examines digital transformation and sustainable business growth among MSMEs in Mangaluru through a descriptive and analytical research design, using a questionnaire framework proposed for 57 respondents and relevant secondary sources. The tables in the present draft contain simulated data intended to demonstrate the proposed analysis; they are not actual survey findings. The study proposes the D-GROW Framework, encompassing Digital Readiness, Growth and Market Access, Resource Efficiency, Operational Resilience, and Workforce Development. It highlights the importance of affordable technology, digital skills training, financial support, and institutional assistance in promoting sustainable business development.

Keywords: Digital Transformation, MSMEs, Sustainable Business Growth, Digital Payments, E-Commerce, Entrepreneurship, Mangaluru.

1. INTRODUCTION

Micro, small and medium enterprises (MSMEs) play an important role in economic development by generating employment, encouraging entrepreneurship, supporting local supply chains, and contributing to regional commercial activity. In a changing business environment, the ability of enterprises to adopt appropriate technologies has become an important determinant of competitiveness and long-term survival.

Digital transformation refers to the integration of digital technologies into business activities, decision-making, customer service, marketing, financial management, and operational processes. For small enterprises, it may begin with accepting digital payments and maintaining electronic records, and progress towards online sales, inventory management, customer relationship management, and data-based business decisions. Government initiatives supporting technology adoption and e-commerce participation underline the growing relevance of digital capabilities in the MSME sector.

Mangaluru provides a useful setting for studying these developments because its commercial activities include retail trade, wholesale markets, hospitality, education-related services, fisheries-linked businesses, food enterprises, and professional services. Digital platforms can help local enterprises reach customers beyond their immediate geographical markets and improve transaction efficiency. However, technology adoption does not automatically guarantee profitability or sustainable growth. Enterprises must consider investment costs, employee training, data security, customer preferences, competition, and the ability to maintain digital systems.

This study examines how digital transformation can contribute to sustainable business growth among MSMEs in Mangaluru and identifies practical measures to address challenges associated with digital adoption.

2. REVIEW OF LITERATURE

2.1 Digital Transformation and Business Competitiveness

Digital transformation extends beyond the use of individual technologies. It involves changes in business processes, organisational capabilities, customer interaction, and decision-making. For MSMEs, effective digital adoption can improve access to information, reduce selected transaction costs, and create opportunities for market expansion. The benefits depend on the suitability of the technology and the enterprise's ability to use it effectively.

2.2 Digitalisation and MSME Development in India

The Ministry of Micro, Small and Medium Enterprises has introduced initiatives supporting digital payments, technology adoption, and online business participation. The Ministry's Annual Report 2024–25 discusses digital payments and technology-related support for MSMEs. Udyam registration and the MSME CHAMPIONS platform also provide information and support mechanisms for eligible enterprises. These policy developments provide a relevant context for examining digital capabilities in business development.

2.3 Digital Payments and Financial Management

Digital payment systems can facilitate faster transactions, improve payment convenience, and create electronic transaction records. Such records may assist enterprises in monitoring cash flows and maintaining financial information. Businesses must also manage transaction-related risks, fraud, technical interruptions, and the need for digital financial literacy.

2.4 E-Commerce and Digital Marketing

Online marketplaces, business websites, and social media platforms provide opportunities for small enterprises to promote products and services to a wider audience. Digital marketing can support customer engagement and improve business visibility. At the same time, enterprises may face intense competition, advertising costs, platform dependence, and challenges in maintaining consistent product quality and customer service.

3. OBJECTIVES OF THE STUDY

To examine the extent of digital technology adoption among selected MSMEs in Mangaluru.

To identify the perceived business benefits of digital payments, e-commerce, and digital marketing.

To analyse the major challenges faced by MSMEs in adopting digital technologies.

To examine the perceived relationship between digital adoption and business growth, operational efficiency, and customer reach.

To suggest measures for strengthening the digital capabilities and long-term sustainability of MSMEs.

4. RESEARCH METHODOLOGY

Research design: Descriptive and analytical research design.

Study area: Mangaluru city, Karnataka.

Proposed sample size: 57 respondents representing owners, proprietors, partners, managers, or other responsible representatives of selected MSMEs.

Primary data: A structured questionnaire covering business characteristics, digital payment adoption, e-commerce usage, digital marketing, perceived business benefits, technology-related challenges, and future adoption plans.

Sampling method: Convenience or purposive sampling may be appropriate depending on the actual fieldwork and respondent selection process. The final paper should state the method actually followed.

Secondary data: Academic publications, Ministry of MSME reports, Reserve Bank of India publications, relevant government policy documents, and other credible sources relating to digital transformation and enterprise development.

Tools for analysis: Frequency distributions, percentages, cross-tabulation, and appropriate statistical tests where the data and sample size permit.

Scope and limitation: The proposed study focuses on selected MSMEs in Mangaluru. A sample of 57 respondents would provide exploratory local insights but would not necessarily represent the entire MSME population. Actual findings depend on respondent selection, data quality, and sample representativeness.

5. DATA ANALYSIS AND INTERPRETATION

Note: All tables below contain simulated data prepared solely to demonstrate the proposed analysis. They are not actual survey findings and must be replaced with verified questionnaire responses before publication as empirical research.

Table 1: Profile of Respondents

Age group	Number	Percentage
Below 30 years	12	21.05%
30–40 years	20	35.09%
41–50 years	15	26.32%
Above 50 years	10	17.54%
Total	57	100.00%

Interpretation: The illustrative distribution shows that respondents aged 30–40 years form the largest group (35.09%), followed by those aged 41–50 years (26.32%). The profile provides a basis for examining the perspectives of business representatives from different age groups.

Table 2: Adoption of Digital Business Practices

Digital practice	Number	Percentage
Digital payments	47	82.46%
Social media marketing	40	70.18%
Computerized accounting	34	59.65%
Online sales or e-commerce	27	47.37%
Digital inventory management	24	42.11%
Customer relationship management tools	17	29.82%

Note: Multiple responses were permitted in the illustrative questionnaire.

Interpretation: Digital payments are the most widely adopted practice in the illustrative dataset (82.46%), followed by social media marketing (70.18%). Computerised accounting is reported by 59.65%, while customer relationship management tools have the lowest reported adoption (29.82%). Multiple responses were permitted.

Table 3: Perceived Benefits of Digital Transformation

Perceived benefit	Number	Percentage
Improved customer reach	42	73.68%
Faster payment processing	41	71.93%
Better customer convenience	38	66.67%
Improved business visibility	37	64.91%
Better record maintenance	32	56.14%
Reduced operating costs	29	50.88%

Interpretation: Improved customer reach is the most frequently selected perceived benefit (73.68%), followed by faster payment processing (71.93%). Better customer convenience and improved business visibility are also identified. These figures illustrate the types of benefits that can be examined through actual questionnaire responses.

Table 4: Major Challenges in Digital Adoption

Challenge	Number	Percentage
High cost of implementation	36	63.16%
Lack of digital skills	34	59.65%

Challenge	Number	Percentage
Cybersecurity and fraud concerns	31	54.39%
Limited access to finance	29	50.88%
Technical difficulties and maintenance	26	45.61%
Intense online competition	25	43.86%
Dependence on external platforms	21	36.84%

Interpretation: High implementation costs are the most frequently selected challenge (63.16%), followed by lack of digital skills (59.65%) and cybersecurity and fraud concerns (54.39%). The illustrative results point to the potential importance of affordable solutions, training, financial support, and cybersecurity awareness.

Table 5: Suggested Measures for Sustainable Digital Growth

Suggested measure	Number	Percentage
Affordable digital training	43	75.44%
Financial assistance for technology adoption	40	70.18%
Cybersecurity awareness programmes	37	64.91%
Digital marketing and e-commerce support	36	63.16%
Improved access to institutional credit	33	57.89%
Guidance on government schemes	31	54.39%

Interpretation: Affordable digital training is the most frequently selected measure (75.44%), followed by financial assistance for technology adoption (70.18%). Cybersecurity awareness and digital marketing support are also selected. These illustrative responses demonstrate potential areas for support, subject to confirmation through actual fieldwork.

6. OPPORTUNITIES AND CHALLENGES OF DIGITAL TRANSFORMATION

6.1 Opportunities

Digital marketplaces, websites, and social media platforms enable MSMEs to reach wider markets and attract customers beyond their local areas.

Digital payments facilitate convenient transactions, maintain electronic records, and support cash-flow monitoring and financial planning.

Digital tools such as accounting software, billing systems, and inventory management applications improve business organisation and operational efficiency.

Affordable digital technologies encourage entrepreneurship by enabling the development of new products, services, and business models.

Online communication and digital sales channels help businesses maintain customer relationships during disruptions.

Digital platforms improve access to information about government schemes, registration procedures, financial assistance, and market opportunities.

6.2 Challenges

The costs of hardware, software, internet services, training, and cybersecurity can create financial difficulties for MSMEs.

Limited technical knowledge among business owners and employees can restrict the effective use of digital technologies.

Online fraud, phishing, unauthorised access, and data loss threaten business security and customer confidence.

Intense online competition, promotional expenses, and changes in platform policies can affect business profitability.

Differences in financial resources, internet connectivity, and technical expertise create unequal opportunities for digital adoption.

Digital transformation requires responsible equipment disposal, energy-efficient practices, secure data management, and careful cost evaluation.

7. PROPOSED D-GROW FRAMEWORK FOR SUSTAINABLE MSME DEVELOPMENT

The study proposes the D-GROW Framework to integrate digital capability with sustainable business growth. It consists of five interconnected dimensions.

Table 6: D-GROW Framework

Component	Focus	Suggested measures
Digital Readiness	Technology and skills	Digital literacy, appropriate software, employee training
Growth and Market Access	Sales and competitiveness	E-commerce, digital marketing, customer engagement
Resource Efficiency	Cost and sustainability	Paperless records, inventory control, energy-efficient practices
Operational Resilience	Risk management	Cybersecurity, backups, fraud prevention, business continuity
Workforce Development	Human capital	Employee upskilling, entrepreneurship training, digital finance education

Digital Readiness: Develop digital literacy, select appropriate software, and provide employee training.

Growth and Market Access: Use e-commerce, digital marketing, and customer engagement to strengthen sales and competitiveness.

Resource Efficiency: Encourage paperless records, inventory control, and energy-efficient practices.

Operational Resilience: Strengthen cybersecurity, backups, fraud prevention, and business continuity.

Workforce Development: Support employee upskilling, entrepreneurship training, and digital finance education.

The framework is conceptual. Its practical value should be assessed using actual field data and measurable indicators such as sales growth, customer acquisition, operating costs, payment delays, customer retention, and workforce skills.

8. MAJOR OBSERVATIONS FROM THE ILLUSTRATIVE ANALYSIS

Digital payments are the most widely adopted digital practice in the illustrative dataset, reported by 82.46% of respondents.

Improved customer reach is the most frequently selected perceived benefit, at 73.68%.

High implementation costs are the most frequently selected challenge, at 63.16%.

Lack of digital skills is another important potential barrier, selected by 59.65%.

Affordable digital training is the most frequently selected proposed intervention, at 75.44%.

The illustrative analysis highlights the value of studying digital adoption alongside financial constraints, operational risks, and workforce development.

These observations are based on simulated data only. They must not be described as empirical findings about MSMEs in Mangaluru unless supported by actual survey responses.

9. SUGGESTIONS

Organise practical training on digital payments, online marketing, accounting software, e-commerce, and cybersecurity for MSME owners and employees.

Increase awareness of institutional credit and eligible government support to help MSMEs invest in digital technologies.

Provide guidance on product photography, online catalogues, digital advertising, customer communication, and feedback management.

Promote digital invoicing, systematic bookkeeping, expense tracking, and cash-flow monitoring for better financial management.

Encourage secure passwords, multi-factor authentication, regular software updates, data backups, and verification of payment requests.

Encourage collaboration among educational institutions, banks, industry associations, and government agencies to provide digital training and business mentoring.

Encourage cost-effective and scalable technologies while considering energy consumption, data privacy, maintenance, and electronic waste management.

Evaluate digital investments using indicators such as sales growth, customer acquisition, operating costs, payment delays, and customer retention.

Guide entrepreneurs towards verified government portals and eligible schemes for business registration, financial assistance, technology adoption, and grievance redressal.

Conduct further studies comparing digital adoption across retail, hospitality, manufacturing, fisheries-related enterprises, and professional services in Mangaluru.

10. CONCLUSION

Digital transformation provides MSMEs with opportunities to improve market access, financial transactions, customer engagement, recordkeeping, and operational efficiency. For enterprises operating in Mangaluru, the adoption of appropriate digital technologies may strengthen competitiveness and support more resilient business models.

Nevertheless, the benefits of digitalisation depend on financial resources, employee capabilities, suitable technology, cybersecurity safeguards, and effective management practices. Technology adoption without adequate planning may increase costs or expose businesses to operational and financial risks.

The proposed D-GROW Framework integrates digital readiness, market expansion, resource efficiency, operational resilience, and workforce development into a unified approach to sustainable business growth. The illustrative questionnaire tables demonstrate a method for examining adoption patterns, perceived benefits, and implementation challenges; they do not constitute actual research findings. Final empirical conclusions should be drawn only after collecting and analysing genuine responses from the selected MSMEs.

Overall, digital transformation can contribute to sustainable MSME development when technology investments are affordable, strategically selected, supported by appropriate skills, and evaluated against measurable business outcomes. A locally grounded approach can connect digital innovation with entrepreneurship, employment, financial sustainability, and inclusive economic development in Mangaluru.

REFERENCES

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- Ministry of Micro, Small and Medium Enterprises, Government of India. (2025). Annual Report 2024–25. <https://www.msme.gov.in/sites/default/files/MSME-ANNUAL-REPORT-2024-25-ENGLISH.pdf>
- Ministry of Micro, Small and Medium Enterprises, Government of India. (n.d.). Study on Digital Payments in Micro, Small and Medium Enterprises. <https://my.msme.gov.in/mymsme/SurveyWelcome.aspx>
- Ministry of Micro, Small and Medium Enterprises, Government of India. (2024, July 22). Technological Transformation of MSMEs. Press Information Bureau. <https://www.pib.gov.in/Pressreleaseshare.aspx?PRID=2035077>
- Reserve Bank of India. (2025). Annual Report 2024–25: Credit Delivery and Financial Inclusion. <https://www.rbi.org.in/scripts/AnnualReportPublications.aspx?Id=1434>
- Government of India, Ministry of Micro, Small and Medium Enterprises. (n.d.). Udyam Registration Portal. <https://www.udyamregistration.gov.in/>