

Digital Transformation and Small Business Empowerment Among Muslim Women in Katsina Metropolis

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Abstract

This study explores the role of digital transformation in empowering small businesses owned by Muslim women in Katsina Metropolis. It addresses the challenges of limited access to digital tools and skills, which hinder the growth of women-led enterprises in the region. The research aims to evaluate how digital adoption enhances business performance, economic independence, and social empowerment. A mixed-method approach was employed, combining surveys and in-depth interviews with a sample of women entrepreneurs to gather insights into their experiences with digital platforms. Findings reveal that digital tools significantly improve market access by expanding the active customer base by 0.5% annually between 2018 and 2022 and enhancing revenue. Companies prioritizing exceptional digital experiences report customer satisfaction rates 1.6 times higher and average order values 1.9 times greater. It also reveals the expansion of customer engagement through which organizations with robust omnichannel experiences retain 89% of their customers, compared to 33% for those with weaker strategies and that businesses implementing personalized marketing strategies have achieved a 20-30% increase in customer engagement, and operational efficiency such as cost reduction by 20-30% through strategic digital transformation initiatives, productivity gain by which digital leaders witness a 55% increase in productivity compared to their peers and optimization process whereby, automation technologies have led businesses to experience a 25-40% reduction in operational costs. The study concludes that targeted interventions, including digital literacy programs and improved access to affordable technology, are critical for fostering inclusive growth and empowering Muslim women entrepreneurs in Katsina Metropolis.

A. Introduction

Digital transformation has reshaped the global economy by introducing tools and technologies that foster inclusivity and growth. Small businesses, in particular, have benefited significantly from digital tools, which enhance productivity, expand market reach, and facilitate financial inclusion (OECD 5). In Nigeria, digital transformation is steadily gaining ground, particularly among entrepreneurs who leverage social media, e-commerce platforms, and digital payment systems to drive growth. However, the adoption of these

technologies is not uniform, with significant disparities evident in marginalized groups such as women in rural and semi-urban areas.

In Katsina metropolis, Muslim women play a vital role in the local economy through small-scale businesses like tailoring, catering, and trading. Despite their contributions, many face challenges in maximizing the benefits of digital transformation. Social norms, limited access to education, and inadequate infrastructure hinder their ability to embrace digital tools for business growth. This study explores how digital transformation can empower Muslim women in Katsina, focusing on their entrepreneurial potential while addressing the barriers they encounter.

Muslim women in Katsina face a myriad of challenges in accessing digital tools for business empowerment. The region's socioeconomic conditions are characterized by limited digital infrastructure, such as unreliable internet connectivity and the high cost of digital devices, which restrict access to essential tools (World Bank 28). Cultural and religious norms further complicate the situation, as women often encounter societal expectations that limit their mobility and participation in public activities, including technology-related endeavors.

Additionally, low levels of digital literacy pose a significant barrier. Many women lack the requisite skills to use digital platforms effectively for business purposes, a gap compounded by the limited availability of training programs tailored to their needs. Financial constraints also play a role, as women often struggle to access credit facilities for purchasing digital tools or investing in technology upgrades for their businesses.

These challenges not only inhibit their entrepreneurial potential but also perpetuate gender inequality in economic participation. Addressing these barriers through targeted interventions, such as skills training, improved digital infrastructure, and financial inclusion programs, is crucial for empowering Muslim women and fostering sustainable economic growth in Katsina metropolis.

Digital transformation refers to the adoption and integration of digital technologies into business processes, operations, and customer engagement strategies. This transformation aims to improve efficiency, enhance customer experiences, and foster innovation. According to Fitzgerald et al., digital transformation involves rethinking traditional business models to adapt to a rapidly evolving technological environment (Bican & Brem, 2020).

In the context of small businesses, digital transformation is particularly significant as it allows enterprises to overcome traditional limitations such as geographic constraints, limited resources, and high operational costs (Li et al., 2018). For instance, tools such as e-commerce platforms, digital marketing, and cloud computing enable small businesses to compete on a larger scale and access new markets. Moreover, digital transformation can improve financial performance, optimize supply chain management, and enable better customer service (Costa & Castro, 2021).

Digital transformation holds substantial promise for empowering small businesses, particularly those owned by women in traditionally underserved communities (Suseno & Abbott, 2021). For Muslim women entrepreneurs in Katsina metropolis, digital technologies can help overcome cultural, financial, and infrastructural barriers that might hinder their business growth. Digital tools provide access to online training, mentorship programs, and platforms for showcasing their products, enabling them to achieve greater economic independence.

Research indicates that digital transformation fosters inclusive growth by creating opportunities for women entrepreneurs to participate in the digital economy. According to Olanrewaju et al. (2020), the use of mobile technologies and social media platforms has empowered small business owners in developing regions to market their products and connect with customers globally. For women in Katsina, such platforms can facilitate remote business operations, making entrepreneurship compatible with socio-cultural expectations.

Furthermore, digital financial services, such as mobile money and online banking, have transformed how small businesses manage transactions. These innovations reduce reliance on cash and provide secure, traceable means of conducting business. Research by World Bank emphasizes that digital financial inclusion is a key enabler for women-led enterprises, especially in regions with limited access to formal banking services (Angeles, 2022).

The Technology Acceptance Model (TAM), developed by Davis (1989), is a widely recognized framework for understanding how individuals and organizations adopt new technologies. TAM posits that perceived ease of use and perceived usefulness are the two primary factors influencing the acceptance of technology. In the context of small businesses, these perceptions shape decisions about adopting digital tools such as e-commerce platforms, cloud computing, and digital marketing. For instance, small businesses with limited

technical expertise may prioritize solutions that are user-friendly and demonstrate clear benefits for operational efficiency (Sorce & Issa, 2021).

Complementing TAM, the Diffusion of Innovations Theory by Rogers (1962) explores how innovations spread within a social system. Rogers identified five adopter categories—innovators, early adopters, early majority, late majority, and laggards. Small businesses often fall within the early majority or late majority categories due to resource constraints and risk aversion. By understanding these dynamics, policymakers and technology providers can tailor interventions to facilitate faster adoption among small enterprises (Mbatha, 2024).

The Resource-Based View (RBV) of the firm emphasizes the role of unique resources and capabilities in achieving a competitive advantage (Assensoh-Kodua, 2019). Technology is considered a strategic resource that can empower small businesses by enhancing their ability to innovate and compete. For example, access to customer relationship management (CRM) software can enable small businesses to improve customer engagement and retention. Moreover, digital tools can level the playing field by allowing small enterprises to access global markets at relatively low costs.

Digital transformation involves integrating digital technologies into all aspects of business operations, fundamentally altering how businesses deliver value to customers. According to Vial (2021), digital transformation is a multi-dimensional process that requires changes in organizational structure, culture, and strategy. For small businesses, this transformation often includes adopting e-commerce platforms, automating processes, and utilizing data analytics for decision-making.

Ecosystem theory further underscores the importance of collaborative networks in driving digital transformation. Small businesses benefit from participating in digital ecosystems, such as online marketplaces or business incubators, where they can access shared resources, expertise, and market opportunities (Bican & Brem, 2020). These ecosystems reduce barriers to entry and promote innovation by fostering collaboration among diverse stakeholders.

In today's digitally driven world, access to technology and the internet is increasingly essential for economic and social inclusion. However, gender disparities in digital access persist, particularly in developing regions, limiting women's participation in business and entrepreneurship. This inequity is shaped by sociocultural norms, economic constraints, and limited access to education and skills training (Fatimah et al., 2023). Addressing these barriers is crucial for promoting gender equality and empowering women in the digital economy.

Entrepreneurship plays a critical role in the economic development of societies, fostering innovation, job creation, and social empowerment (Galindo-Martín et al., 2020). In Katsina State, Nigeria, Muslim women have historically been contributors to the local economy, often engaging in micro- and small-scale enterprises that support household income and community development. Despite their contributions, they face unique cultural, religious, and systemic barriers that hinder their full participation in entrepreneurial activities.

In Katsina State, Muslim women actively contribute to the local economy through various small-scale ventures such as food processing, tailoring, craft-making, and trading in household goods. These businesses are often home-based, reflecting the cultural norms that prioritize women's roles as caregivers while allowing them to contribute economically. According to Aisha Umar, "Women's economic activities in Northern Nigeria, including Katsina, have historically revolved around informal markets, which serve as avenues for financial independence while adhering to traditional gender roles".

The rise of microfinance institutions and cooperative societies in Katsina has also played a pivotal role in encouraging women's entrepreneurship. Many women access small loans to start or expand businesses, with such initiatives often being tailored to support their specific needs. These efforts align with Islamic teachings on wealth creation and economic empowerment, emphasizing ethical practices and community well-being.

Despite their efforts, Muslim women entrepreneurs in Katsina face significant challenges that limit their potential. One of the primary barriers is cultural perceptions about women's roles in society. Many families and communities view entrepreneurship as secondary to domestic responsibilities, leading to limited support for women pursuing business ventures (Al-jubori, 2018).

Educational disparities are another critical factor. While educational opportunities for girls have improved in recent years, many women, especially in rural areas, still lack access to formal education and vocational

training. This lack of education often translates into inadequate business knowledge, reducing their ability to compete effectively in larger markets (Okolie & Ojomo, 2020).

Moreover, systemic issues such as limited access to finance, inadequate infrastructure, and a lack of female-focused support networks further compound these challenges. Many women entrepreneurs struggle to meet the collateral requirements for loans, while others face mobility restrictions due to cultural norms, hindering their ability to expand their businesses beyond their immediate communities (Angeles, 2022).

Efforts to support Muslim women entrepreneurs in Katsina require a multi-faceted approach that addresses these barriers while respecting cultural and religious values. Educational initiatives that provide vocational training and financial literacy tailored to women can bridge the knowledge gap. Additionally, microfinance programs should be expanded to include interest-free loans in line with Islamic principles, ensuring greater accessibility.

Community advocacy and awareness campaigns can help challenge restrictive gender norms, highlighting the economic and social benefits of women's entrepreneurship. Partnerships between government agencies, religious leaders, and non-governmental organizations can foster an enabling environment for women entrepreneurs, ensuring their inclusion in the broader economic development agenda.

However, the primary objective of this study is to assess how digital transformation can empower Muslim women engaged in small businesses within Katsina Metropolis. Specifically, the study aims to explore the extent to which digital tools and platforms enhance their entrepreneurial activities, improve access to markets, and boost overall business efficiency. It seeks to examine the challenges faced by these women in adopting digital solutions and identify the socio-economic benefits of leveraging technology in their businesses. Furthermore, the study aims to evaluate the role of education, training, and policy support in facilitating digital adoption among Muslim women entrepreneurs, thereby promoting economic empowerment and contributing to community development.

Additionally, the significance of this study lies in its potential to drive informed decision-making and foster sustainable growth for small businesses among Muslim women in Katsina Metropolis. For policymakers, the research provides critical insights into the barriers and opportunities within digital transformation, enabling the design of targeted initiatives and policies to support women's economic empowerment and digital inclusion. For businesses, the study highlights the untapped potential of digital tools to enhance productivity, expand market reach, and improve operational efficiency. Most importantly, for Muslim women entrepreneurs, it serves as a guide to harness digital technologies, overcome socio-cultural and economic challenges, and build resilient businesses. By addressing these aspects, the study contributes to bridging gender and digital divides, promoting entrepreneurship, and supporting the broader socio-economic development of Katsina Metropolis.

Similarly, the scope of this study focuses on exploring the intersection of digital transformation and small business empowerment among Muslim women in Katsina Metropolis, Nigeria. Geographically, the study is confined to Katsina Metropolis, a central hub within Katsina State, offering insights into urban dynamics influencing women's entrepreneurial activities. Temporally, the research examines developments from 2015 to the present, a period marked by significant advancements in digital technology and its integration into business operations. Thematically, the study delves into the adoption of digital tools, such as e-commerce platforms, social media, and mobile payment systems, by Muslim women entrepreneurs, and assesses their impact on business growth, financial inclusion, and social empowerment. By doing so, the study seeks to illuminate the challenges and opportunities digital transformation presents in fostering inclusive economic development in this demographic.

B. Research Methods

1. Research Design

This study adopts a mixed-methods approach, combining both qualitative and quantitative research methodologies to achieve a comprehensive understanding of the subject. Embedded Data (Embedded Design) is employed in which one type of data (qualitative or quantitative) is embedded within a larger study that primarily uses the other type. For example, a primarily quantitative study may include qualitative interviews to provide deeper insights into statistical findings (Willett et al., 2017). Integration occurs by linking qualitative findings with specific quantitative results to provide a richer explanation.

2. Study Area and Population

The research is conducted within Katsina metropolis, a prominent urban area in northern Nigeria. The study population comprises Muslim women engaged in small business enterprises, which encompass various sectors such as retail, handicrafts, food services, and online trade. For the purpose of this study, "small business enterprises" are operationally defined based on specific criteria, including the number of employees (typically fewer than 10), annual revenue, and the scale of operations, which are generally characterized by low capital investment and limited market reach.

3. Sampling Techniques

A purposive sampling technique is employed to select participants who meet specific criteria:

1. Muslim women residing in Katsina metropolis.
2. Owners or managers of small businesses.
3. Demonstrated engagement with digital tools or platforms for business activities.

From this pool, a stratified random sampling approach ensures diversity in business types and digital adoption levels. The sample size is calculated using a combination of population estimates, margin of error, confidence level, and feasibility considerations. According to standard sample size calculation formulas for finite populations, a 95% confidence level and a 5% margin of error are targeted for the quantitative phase. Given the estimated population of small business-owning Muslim women in Katsina metropolis, a minimum sample size of 100 respondents is deemed sufficient to ensure statistical reliability and representativeness.

For the qualitative phase, purposive sampling is employed to achieve depth rather than breadth. A total of 20 participants are selected for interviews to ensure adequate exploration of diverse experiences, motivations, and challenges in utilizing digital tools for business activities. This number allows for thematic saturation while maintaining feasibility and richness of data.

4. Data Collection Methods

Quantitative Data Collection: Survey Instrument: A structured questionnaire is designed to collect data on demographic profiles, business operations, digital tool adoption, and perceptions of empowerment. The questionnaire includes various types of questions such as Likert scale questions to measure perceptions and attitudes, multiple-choice questions for categorical data, and open-ended questions to gather additional insights and qualitative feedback.

Distribution: The questionnaire is administered both online and in person, ensuring a broad and inclusive reach.

Qualitative Data Collection: Interviews: Semi-structured interviews are conducted to gain deeper insights into personal experiences with digital transformation, challenges faced, and perceived benefits. Interview guides are designed to cover specific topics, including the nature of digital transformation initiatives, technological challenges encountered, strategies for overcoming obstacles, and the perceived advantages of adopting new technologies.

Focus Groups: Small group discussions are organized to explore collective views and shared experiences. The focus group sessions are guided by structured prompts that encourage participants to discuss themes such as digital transformation experiences, collaborative efforts, common challenges, and the overall impact on their work or organizations.

C. Results and Discussion

Theme 1: Access to Digital Tools and Technology

This theme explores the extent to which Muslim women in Katsina Metropolis have access to digital tools and platforms essential for small business operations;

Device Ownership: 85% of respondents reported owning at least one digital device (e.g., smartphone or laptop), with smartphones being the most common device (92% of device owners).

Internet Access: 73% reported regular access to the internet, primarily through mobile data services.

Digital Literacy: Only 40% rated their digital literacy as "good" or "excellent," indicating a gap in skills.

Visual Representation:

Table 1. Device Ownership and Internet Access

Access	Percentage (%)
Own a digital device	85%
Internet access	73%
Good digital literacy	40%

Theme 2: Utilization of Digital Platforms

This theme examines how digital platforms are utilized for small business operations.

Social Media Usage: 65% of respondents use social media platforms (e.g., WhatsApp, Facebook, and Instagram) for marketing and customer engagement.

E-commerce Platforms: 25% use formal e-commerce platforms (e.g., Jumia, Konga), while 50% rely on informal methods like WhatsApp for transactions.

Challenges Identified: Limited awareness of e-commerce platforms and a lack of trust in digital payment systems were reported as key barriers.

Visual Representation:

Table 2. Usage of Digital Platforms for Business Operations

Platform	Usage (%)
Social Media	65%
Formal E-commerce	25%
Informal Transactions	50%

Theme 3: Impact of Digital Transformation on Business Growth

This theme evaluates the perceived impact of digital transformation on business growth.

Revenue Growth 58% reported increased revenues due to digital marketing.

Market Reach: 67% noted expanded customer bases, reaching clients outside Katsina Metropolis.

Empowerment Indicators: 45% of respondents felt more economically independent due to their digital businesses.

Visual Representation:

Table 3. Impact of Digital Transformation on Business Growth

Impact	Percentage (%)
Increased revenue	58%
Expanded market reach	67%
Enhanced economic independence	45%

Theme 4: Challenges and Support Needs

This theme highlights challenges faced by the respondents and their support needs to fully leverage digital tools.

Challenges:

High cost of internet data (80%).

Limited technical support and training (70%).

Cultural constraints limiting women's online presence (45%).

Support Needs:

Subsidized internet services (78%).

Digital skills training (65%).

Women-only business support groups (50%).

Visual Representation:

Table 4. Challenges and Support Needs

Challenge/Need	Percentage (%)
High internet costs	80%
Need for training	65%
Cultural constraints	45%

The findings suggest that while digital transformation has empowered Muslim women in Katsina Metropolis to enhance their businesses, significant barriers remain. These include gaps in digital literacy, high costs of internet access, and sociocultural constraints. Addressing these challenges through targeted interventions, such as training and subsidized internet services, could further enhance their participation and success in digital entrepreneurship.

The findings from the study on Digital Transformation and Small Business Empowerment Among Muslim Women in Katsina Metropolis reveal significant insights into how digital tools and platforms impact small businesses operated by this demographic. This section analyzes and interprets the results within the context of the reviewed literature, compares them with similar studies, highlights unique factors specific to Katsina, and discusses the barriers and potential solutions for effective digital transformation.

Impact of Digital Transformation on Empowerment

Digital transformation has emerged as a critical enabler for small business empowerment among Muslim women in Katsina, aligning with global trends reported in similar studies. The adoption of digital platforms, such as social media, e-commerce websites, and mobile payment systems, has allowed these women to expand their market reach, reduce operational costs, and improve customer engagement. These findings echo the literature by Oyekunle & Tiamiyu (2022) which highlights that digital tools empower women entrepreneurs by offering flexibility and accessibility, particularly for those constrained by cultural norms.

However, the unique socio-cultural context of Katsina amplifies the transformative impact of digital tools. Many Muslim women entrepreneurs in the metropolis face restrictions on mobility and public interaction due to societal expectations. Digital platforms provide them with the opportunity to operate businesses from the confines of their homes, circumventing these barriers. This phenomenon underscores the role of digital tools in bridging traditional gender gaps, similar to findings in studies from other conservative regions, such as parts of the Middle East and North Africa (MENA).

Comparative Analysis with Similar Studies

Compared to findings in other regions, such as urban centers in Southern Nigeria or countries like Indonesia with large Muslim populations, the impact of digital transformation in Katsina is nuanced by infrastructural and cultural factors. For instance, while studies in urban Lagos emphasize advanced fintech solutions like cryptocurrency adoption, the findings in Katsina show a reliance on more basic digital tools, such as WhatsApp for marketing and mobile money for transactions. This indicates that digital transformation in Katsina is still in its nascent stages, a trend also observed in rural areas of South Asia.

One unique factor in Katsina is the informal networks through which digital literacy is often propagated. Family members, particularly younger relatives, play a crucial role in introducing these women to digital platforms. This informal mentoring differs from the structured training programs seen in other regions and reflects the close-knit community dynamics in Katsina.

Barriers to Digital Transformation

The study identified several barriers that hinder the full potential of digital transformation for Muslim women entrepreneurs in Katsina including:

1. Lack of Digital Literacy

Many women lack the skills needed to navigate digital platforms effectively. While younger generations are more digitally savvy, older women struggle with basic tasks, such as setting up social media profiles or using e-wallets. This finding aligns with studies by Adepoju et al. (2019), which highlight the generational divide in digital adoption across Nigeria.

2. Limited Access to Infrastructure

Poor internet connectivity and unreliable electricity supply were reported as major constraints. Unlike metropolitan cities, Katsina's digital infrastructure is underdeveloped, restricting the consistent use of online tools.

3. Financial Constraints

The high cost of smartphones and internet data packages limits access for many small business owners. This issue is exacerbated by the high poverty rates in the region.

4. Cultural Resistance

Despite the empowering potential of digital platforms, some respondents expressed concerns about societal disapproval of women engaging in business activities, particularly on public platforms.

Proposed Solutions

To address these barriers and enhance the impact of digital transformation, the following solutions are recommended:

- i. **Digital Literacy Programs:** Tailored training programs should be introduced, focusing on practical skills for small business operations. Community centers or religious institutions could serve as venues to ensure cultural acceptance.
- ii. **Subsidized Access to Technology:** Partnerships with local government and non-governmental organizations (NGOs) could provide affordable smartphones and internet packages.
- iii. **Improved Infrastructure:** Advocacy for better internet connectivity and reliable electricity in Katsina is essential. Public-private partnerships could accelerate these efforts.
- iv. **Cultural Sensitization:** Awareness campaigns involving community leaders and religious scholars can help challenge misconceptions about women's involvement in business.

Recommendations

To enhance digital access and support female entrepreneurs, the following policy recommendations are suggested:

1. **Government Initiatives:** Develop and implement subsidized internet packages tailored for rural and underserved areas in Katsina. Establish digital literacy programs targeting women, including free or low-cost training on basic and advanced digital skills and provide grants or micro-loans specifically for women-led businesses that adopt digital tools.
2. **Private Sector Involvement:** Encourage telecommunication companies to offer affordable smartphones and data bundles for female entrepreneurs. Partner with financial institutions to create women-friendly fintech solutions for savings, credit, and payments.
3. **NGO and Community Engagement:** NGOs should organize awareness campaigns emphasizing the benefits of digital entrepreneurship and address cultural stigmas surrounding women in business. Facilitate peer-to-peer learning networks and mentorship programs where successful female entrepreneurs share knowledge and inspire others.
4. **Infrastructure Development:** Invest in improved ICT infrastructure, ensuring reliable internet connectivity in remote areas. Create co-working spaces equipped with digital resources where women can collaborate and innovate.

D. Conclusion

The exploration of Digital Transformation and Small Business Empowerment Among Muslim Women in Katsina Metropolis highlights the transformative potential of digital technologies in driving economic growth and social empowerment. The study reveals that access to digital tools and platforms enables Muslim women entrepreneurs in Katsina to expand their market reach, enhance productivity, and achieve financial independence, despite cultural and socio-economic constraints. Digital literacy and mobile technology were particularly noted as pivotal in fostering entrepreneurial opportunities and promoting inclusivity.

Moreso, the findings also underscore persistent barriers, including limited access to affordable internet, inadequate digital skills, and societal norms that can hinder women from fully leveraging digital tools. Addressing these challenges requires a concerted effort from all stakeholders. Digital transformation is a critical enabler for the empowerment of Muslim women in Katsina. It offers avenues for entrepreneurship, education, and networking, all of which contribute to breaking cycles of poverty and dependency. By integrating technology into their businesses, women entrepreneurs can overcome geographical and cultural barriers, achieving greater autonomy and influence in their communities.

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