THE BENEFITS AND SECURITY CHALLENGES OF CASHLESS SYSTEMS FOR WOMEN ENTREPRENEURS IN RAPIDLY DEVELOPING ECONOMIES: A CASE STUDY OF GAUTENG PROVINCE, SOUTH AFRICA

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Dedication

This work is dedicated to my family especially my late grandmother and my father whose strength, love, and enduring faith in my potential have guided me throughout my life. I also honour the cherished memory of my dear friend, **Samki Buthelezi Phenyane**, a resilient entrepreneur whose courageous battle with cancer and unwavering spirit continue to inspire me deeply. A special thank you goes to my daughter, **Dintle Magasa**, who became my 3 a.m. alarm clock, faithfully waking me to study and reminding me of the purpose behind this journey. I am profoundly grateful to my industry mentor, **Andries Delport**, for his wise guidance and steadfast support. Finally, I dedicate this work to the **telecommunications industry**, particularly **Vodacom, MTN, and Telkom Gyro**, whose platforms and opportunities enabled me to grow as an entrepreneur and shaped the foundation of my professional path.

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ABSTRACT

< THE BENEFITS AND SECURITY CHALLENGES OF CASHLESS SYSTEMS FOR WOMEN ENTREPRENEURS IN RAPIDLY DEVELOPING ECONOMIES: A CASE STUDY OF GAUTENG PROVINCE, SOUTH AFRICA>

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Background
In rapid developing economies it is difficult to see a full digital adoption especially in business owned by woman. The study explores the benefits and security challenges of cashless system for woman entrepreneurs in rapid developing economies under formal and informal structure. This research examines the implementation and effects of cashless payment systems among women entrepreneurs in Gauteng, South Africa, within the broader context of digital financial inclusion and gender empowerment. This study analyses the increasing focus on mobile money platforms, point-of-sale devices, QR code payments, and banking applications in improving financial access and operational efficiency in emerging economies. Technological advancements have not eradicated gendered and structural barriers, which continue to restrict equitable participation in South Africa's cashless economy.

Methods
The study utilises a mixed-method research design, integrating qualitative and quantitative approaches to capture measurable trends and lived experiences. A purposive sample of 201 women-led enterprises spanning eight sectors: technology, retail, agriculture, manufacturing, services, events, consultancy and beauty was analysed. Qualitative data collected from semi-structured interviews were subjected to thematic analysis using NVivo software, highlighting complex socio-economic, cultural, and technological factors. Quantitative data were analysed using Chi-square tests, ANOVA, correlation, and logistic regression to assess the relationships between business characteristics and cashless adoption.

Results
The findings indicate that 58% of respondents utilise cashless systems as their primary transaction method, with greater adoption observed in the technology and consultancy sectors relative to agriculture and retail. The primary factors influencing adoption are perceived business value, operational efficiency, and customer convenience. Conversely, obstacles such as high transaction fees, limited digital literacy, and cybersecurity concerns impede uptake, especially among microenterprises and entrepreneurs with lower educational levels. Quantitative analysis revealed a positive correlation between cashless adoption and business performance indicators, including revenue growth, customer retention, and operational efficiency.

Discussion and Conclusion
The study concludes that cashless systems can significantly improve the financial resilience and market access of women entrepreneurs; however, systemic interventions are required to address existing inequalities. Recommendations include gender-responsive policies, tiered digital literacy training, subsidized transaction fees, and enhanced cybersecurity frameworks. This research positions women entrepreneurs as essential contributors to the shift towards a digital economy, enhancing academic discourse and providing practical insights for policymakers, fintech innovators, and development practitioners focused on promoting inclusive and sustainable digital financial ecosystems.

KEYWORDS

Cashless Payment Systems, Woman Entrepreneur, Gauteng Province, Developing economies, Digital literacy , Cashless system

LIST OF ABBRIVATION

Abbreviation	Full Term
ANOVA	Analysis of Variance
API	Application Programming Interface
ATM	Automated Teller Machine
CBDC	Central Bank Digital Currency
CBN	Central Bank of Nigeria (if referenced)
DFI	Development Finance Institution
DFS	Digital Financial Services
DLT	Distributed Ledger Technology
DTA	Digital Transformation Agenda
FICA	Financial Intelligence Centre Act
FinTech	Financial Technology
GDP	Gross Domestic Product
GSMA	Global System for Mobile Communications Association
ICT	Information and Communication Technology
MFS	Mobile Financial Services
MWOBs	Micro, Women Owned Businesses
OTP	One-Time Password
POS	Point of Sale
P2P	Peer-to-Peer
QR Code	Quick Response Code
RPP	Rapid Payments Programme
SADC	Southern African Development Community
SARB	South African Reserve Bank
SEDA	Small Enterprise Development Agency
SSA	Sub-Saharan Africa
TAM	Technology Acceptance Model
UI	User Interface
UNCTAD	United Nations Conference on Trade and Development
UN Women	United Nations Entity for Gender Equality and the Empowerment of Women
USSD	Unstructured Supplementary Service Data
UTAUT	Unified Theory of Acceptance and Use of Technology
VAT	Value Added Tax
WCW	Women Creating Wealth (Graça Machel Trust Programme)
WEF	World Economic Forum
WOB	Women Owned Businesses
WTO	World Trade Organization

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CHAPTER I:
INTRODUCTION

1.1 Background of Study

The shift to digital economies is marked by the rapid adoption of cashless technology, including mobile payments, internet banking, and contactless cards. These technologies have profoundly altered the banking sector, improving ease, operational efficiency, and financial inclusion (Kumar & Khandelwal, 2023). Governments and corporate sector groups have promoted the implementation of digital payments as a crucial component of economic development, particularly in developing countries Ahmed, adava, & Kakkar, (2023) contends that cashless payment systems are essential for bridging financial inequalities and fostering inclusive growth in regions with limited access to traditional banking services.

Cashless systems have grown prevalent in rapidly developing economies, especially in urban regions such as Gauteng Province in South Africa. Gauteng, the economic hub of South Africa, has a diverse array of sectors and a significant proportion of Women owned Businesses (WOBs), mostly held by women. According to Dana, & Salamzadeh, (2024), female entrepreneurship in Gauteng has exhibited a fluctuating trend, with an increase of 5.4% between 2018 and 2022. However, structural challenges, including restricted access to financial resources, insufficient digital literacy, and inadequate cybersecurity measures, continue to hinder women's full participation in the digital economy (Jansen, et al., 2023).

According to the National Small Business Act (1996), as amended, WOBs in South Africa are categorized based on turnover, number of employees, and total asset value. In Gauteng, the classification is primarily based on turnover thresholds and the number of employees. Medium enterprises may generate revenues of up to R220 million and employ as many as 200 individuals, but the Department of Small Business Development ,2023 characterizes small firms as those with annual sales below R50 million and a workforce of less than 50 employees. Initiatives specifically aimed at women entrepreneurs' direct government initiatives and financial assistance frameworks designed to foster WOB growth. Cashless solutions provide distinct advantages for women-owned enterprises in Gauteng Province (Majola, 2024). Crucial for obtaining loans and other financial services, these responses enhance financial transparency and documentation (Adebayo, & Osei-Boateng, 2024). Online banking systems and mobile payment technologies facilitate transactions and provide market access, therefore enabling women entrepreneurs to participate in e-commerce and reach global markets (Zhai, et al., 2024)

Additionally, contactless payment solutions reduce dependence on physical currency, thereby enhancing operational efficiency and decreasing transaction costs (Zhou, et al., 2025). Notwithstanding these benefits, the execution of cashless systems poses several obstacles. Substantial challenges remain, including cybersecurity dangers, data privacy issues, and digital marginalization (Kshetri, Voas, & DeFranco, 2021). Gender specific

obstacles, including socio-cultural norms and unequal access to technology, notably impede women entrepreneurs (Malik, & Sikarwar, 2024).
Economic empowerment for female entrepreneurs in Gauteng is fundamentally reliant on digital financial inclusion. However, numerous structural and institutional barriers hinder their ability to effectively utilize cashless systems. Women owned Businesses (WOBs) exhibit heightened susceptibility to significant cybersecurity threats, as evidenced by their growing reliance on digital payment systems. Women-led WOBs exhibit significant vulnerability to cyber-attacks, including fraud, identity theft, and financial losses, mostly due to insufficient resources for implementing robust cybersecurity measures (Kshetri, Voas, & DeFranco, 2021). Inadequacies may undermine trust in digital financial services and hinder adoption in the absence of robust data security measures.

Many women entrepreneurs face difficulties in obtaining the technical skills required for effective negotiation of digital banking systems. Insufficient digital literacy restricts business owners' capacity to effectively employ online financial management, mobile banking, and e-commerce solutions (Jansen, et al., 2020). Inadequate training and awareness programmes intensify these challenges, consequently reducing the opportunities for women entrepreneurs to expand their online businesses. Although Gauteng has made progress in technology, access to digital infrastructure is still uneven, especially in underprivileged areas. Women entrepreneurs encounter considerable obstacles stemming from high internet connection costs, insufficient broadband coverage, and restricted access to smartphones or other digital devices, which hinders their capacity to implement cashless solutions (Moyo, et al., 2023). The digital divide limits access to market opportunities, corporate networks, and financial inclusion.

Crucially, legislative projects meant to maximise the benefits of cashless technology for women-owned companies include the goals stated are to promote digital literacy, cybersecurity, access to digital infrastructure, and financial policies sensitive to gender issues. Good cybersecurity education and assistance initiatives for Women owned Businesses (WOBs) rely on cooperation among government agencies and financial institutions. Following data security rules and using low-cost cybersecurity solutions helps women-owned businesses become more resistant to cyber-attacks (Zhou, et al., 2025). Structured training courses let companies find and solve cybersecurity issues.
Improving digital literacy initiatives would help women entrepreneurs to make good use of financial technologies. The South African Digital Skills Development Programme for (2024) stresses the need to include digital financial literacy in projects aimed at entrepreneurship. Initiatives should include practical seminars, mentoring programs, and online resources specifically designed for women entrepreneurs. Public-private partnerships must focus on minimising internet costs and enhancing mobile network accessibility in underserved regions. Investment in digital infrastructure, including the expansion of internet services and affordable smartphone initiatives, will enhance the accessibility of cashless systems for a broader spectrum of female entrepreneurs (Gibson, Gazi, & Arner, 2024).

Financial institutions should provide inclusive financial solutions that target the distinct challenges encountered by women entrepreneurs. This entails providing credit options defined by adaptable loan durations and reduced interest rates, in addition to loans. Various credit asses WOB techniques, such as transaction-based credit scoring, may enhance women's access to financial resources (Mhlongo, & Daya, 2023). Addressing these issues and implementing targeted legislative measures will enhance South Africa's digital financial ecosystem, thereby supporting women entrepreneurs in Gauteng. Enhancing equitable access to cashless technology can strengthen the long-term financial resilience, corporate sustainability, and economic participation of women-owned businesses.

The historical and policy background of South Africa emphasises the ongoing difficulties experienced by women entrepreneurs, especially in Gauteng Province. Cashless systems have great power to improve economic involvement and financial inclusion. Optimising the possibilities of digital financial technology depends on a cooperative approach as it addresses access inequalities, lowers cybersecurity risks, and increases digital literacy. This research seeks to provide evidence-based suggestions for enabling women entrepreneurs via digital financial inclusion by promoting policy alignment and infrastructure investment.

The study employed a mixed-methods approach, integrating qualitative interviews and quantitative surveys to yield comprehensive insights into the experiences of women entrepreneurs in Gauteng. This method ensures a comprehensive evaluation of the advantages and drawbacks of cashless systems, offering practical recommendations to enhance their security and efficiency. This study contributes to broader discussions on gender equality and economic empowerment by analysing localised data within the context of developing digital economies.

1.2 Research Problem

Although cashless systems provide various advantages, their implementation poses distinct problems, especially for women businesses in underdeveloped areas such as South Africa. Gauteng Province exemplifies the issues associated with the interaction between digital payment technology and the socio-economic obstacles female entrepreneurs encounter. Although cashless systems provide efficiency, transparency, and broader market access, they also present users with considerable security risks, including cyber-attacks, fraud, and data breaches (Kshetri, Voas, & DeFranco, 2021).

Women entrepreneurs in Gauteng often function under restrictive circumstances, marked by inadequate access to cash, technology, and digital literacy. These limitations increase their susceptibility to the hazards linked with cashless systems. Jansen (2023) asserts that women-owned enterprises are disproportionately impacted by digital financial hazards owing to systematic disparities in resource distribution and socio-economic conditions. Numerous women entrepreneurs lack the financial resources to invest in comprehensive cybersecurity measures, leaving their enterprises vulnerable to online fraud and data theft Malik, & Sikarwar, (2024)

Access to technology is a major problem in Gauteng's digital divide. Rural and peri-urban women struggle to use cashless systems (Zhou, et al., 2025). Digital isolation prevents financial technology access and formal sector participation. Raina, & Narayan, (2024) emphasises the necessity of addressing structural inequalities to empower disadvantaged groups, especially women, in effectively utilising cashless payment systems. This study analyses the impact of cashless systems on gender equality and economic empowerment. Moyo, et al., (2023) research underscores the importance of digital payments in promoting financial inclusion; however, there is a lack of studies investigating the effects of digital payments on female entrepreneurs within specific geographic contexts. The Gauteng Province, distinguished by its dynamic economy and diverse population, presents a unique opportunity for an in-depth study of these consequences. This study seeks to bridge the knowledge gap by analysing the effects of cashless systems on the financial stability and success of women-owned businesses.

Security concerns intensify reliance on cashless methods. Cybersecurity threats, including phishing, ransomware, and identity theft, disproportionately affect small businesses, especially those owned by women (Kshetri, Voas, & DeFranco, 2021). The absence of customised security solutions and digital literacy initiatives intensifies these risks, constituting a considerable obstacle to the efficient use of digital payment systems. Female entrepreneurs often have difficulties in acquiring affordable cybersecurity technology and the necessary technical expertise to safeguard their businesses against cyber threats (Zhai, et al., 2024).

In addition to technical challenges, socio-cultural factors greatly affect the adoption of cashless systems by women entrepreneurs. Cultural and gender prejudices impede women's access to educational and technical resources, reducing their ability to use digital financial platforms (Malik, & Sikarwar, (2024) Institutional obstacles highlight the need for specific programmes for women entrepreneurs, especially in Gauteng, where economic inequities are high.

Moreover, the practical details of cashless systems might discourage female companies. Many digital payment options have a steep learning curve, which can discourage those with low digital literacy (Zhou, et al., 2025). The lack of support services and training courses that cater for small company owners aggravates the difficulty. Addressing this issue necessitates a collaborative effort among governmental entities, financial institutions, and technology providers to provide user-friendly solutions and furnish accessible training resources.

The research focuses on the economic impacts of cashless systems on women-owned businesses. While these technologies may enhance operational efficiency and market growth, they also entail additional costs, such as transaction fees and investments in digital infrastructure. For women-owned businesses with constrained resources, these expenses may be excessive, hindering their capacity to fully use the advantages of digital

payments (Mhlongo, & Daya, 2023). A comprehensive analysis of the cost-benefit dynamics of cashless systems is crucial for their fair implementation.

This research examines Gauteng women entrepreneurs' experiences to explain and address these complicated concerns. The goal is to propose real ideas and principles that enhance cashless system security and efficiency while promoting financial inclusion and gender equality. Customised digital literacy initiatives and cost-effective cybersecurity measures could substantially lower the adoption barriers for women-owned businesses (Zhai, et al., 2024).

This study analyses the influence of policy frameworks on the implementation of cashless systems. Current legislation often fails to address the specific challenges women entrepreneurs encounter, including disparities in access to financial services and inadequate protection against cyber threats (Majola, 2024). This paper analyses regulatory deficiencies and presents recommendations to enhance the inclusive digital financial framework. Women-owned enterprises in Gauteng encounter advantages and disadvantages related to cashless systems. These systems have the potential to enhance financial inclusion and economic empowerment; however, they face significant socio-economic and technological challenges. This study examines the challenges and suggests practical approaches to improve the adoption and effectiveness of cashless systems for women-owned enterprises. This study aims to advance the discourse on gender equality and financial inclusion within the digital economy through localised research and actionable recommendations.

1.3 Research Objectives

This research has the following objectives:

- To assess the benefits of cashless systems for women-owned enterprises in Gauteng, concentrating on the increase of market access, the promotion of financial inclusion, and the improvement of operational efficiency.
- To analyse the security challenges linked to cashless systems, including data privacy problems, online fraud, and cybersecurity risks, as well as their implications for women entrepreneurs.
- To examine the effect of cashless systems on the financial performance and customer satisfaction of women-owned businesses in Gauteng.
- To provide targeted recommendations that enhance the safety, accessibility, and efficacy of cashless systems, specifically addressing the requirements of women-owned enterprises in the area.

1.4 Research Questions

The study aims to address the benefits and security challenges of cashless systems for women owned businesses in rapid developing economies.

RQ1: Benefits of Cashless Systems

- How do cashless payment systems influence market access for women-owned businesses in Gauteng?
- To what extent do cashless systems promote financial inclusion among women entrepreneurs?
- How do cashless payment platforms contribute to improving the operational efficiency of women-owned businesses?

RQ2: Security Challenges

- What security challenges do women-owned enterprises in Gauteng face when using cashless systems?
- How do data privacy concerns affect the adoption and usage of cashless systems among women entrepreneurs?
- What is the impact of online fraud and cybersecurity risks on the confidence of women-owned businesses in using digital payment platforms?

RQ3: Financial Performance & Customer Satisfaction

- How do cashless payment systems affect the financial performance of women-owned enterprises in Gauteng?
- What is the relationship between the use of cashless systems and customer satisfaction in women-owned businesses?
- How does the level of cashless adoption influence revenue growth and customer retention among women-owned enterprises?

RQ4: Recommendations and System Improvement

- What measures can be implemented to enhance the safety and reliability of cashless systems for women entrepreneurs?
- How can cashless platforms be improved to increase accessibility and usability for women-owned enterprises in Gauteng?
- What targeted strategies can be recommended to strengthen the effectiveness of cashless systems for women entrepreneurs while addressing their specific needs and challenges?

1.5 Significance of the Study

This study has the potential to address critical gaps in understanding the benefits and challenges of cashless system for female owned business in rapid developing economy under the formal and informal sectors. This research is important for several reasons:

1.5.1 Scholarly and Policy contribution

- This study addresses a gap in the literature by examining the gendered aspects of cashless system adoption within a defined geographical and socio-economic context
- This study holds policy relevance by addressing essential gaps in understanding the adoption and impact of cashless systems on women-owned businesses in Gauteng Province, South Africa.

1.5.2 Gender Equality

- This study improves understanding of the challenges and opportunities faced by women entrepreneurs in using cashless systems by integrating diverse perspectives.
- While prior research has examined financial inclusion and digital payment systems broadly, few studies have specifically addressed their intersection with gender, entrepreneurship, and regional disparities

1.5.3 Pragmatic Significance

- The study provides actionable insights for women-owned enterprises, particularly in Gauteng Province, assisting them in overcoming challenges and using opportunities associated with digital payment systems.
- The research offers critical insights for the effective implementation of cashless systems, emphasising specific benefits, like enhanced market access and operational efficiency, as well as challenges such as cybersecurity risks and digital exclusion .

1.5.4 Promoting gender Equality and Inclusivity

- This research offers critical insights into the development and implementation of gender-sensitive financial inclusion programmes.
- The study examines the specific challenges faced by women entrepreneurs, following broader developmental goals such as gender equality, poverty reduction, and inclusive economic growth .

CHAPTER II:
REVIEW OF LITERATURE

2.1.Theoretical Framework

The worldwide transition to cashless payment systems has revolutionised financial transactions, providing efficiency, security, and enhanced financial inclusion (FinMark Trust (2022). This transition is especially pertinent in swiftly advancing economies, where digital financial technologies have become crucial catalysts for economic engagement and business expansion (Gibson, Gazi, & Arner, 2024). Women entrepreneurs, particularly in urban economic centres like Gauteng Province, South Africa, are progressively implementing cashless systems to optimise business operations, enhance financial management, and broaden market access (Mhlongo, & Daya, 2023).

Nonetheless, despite the clear benefits of digital payments, numerous obstacles remain, such as cybersecurity threats, insufficient digital literacy, and systemic inequalities that restrict access to financial technologies (Kshetri, Voas, & DeFranco, 2021). This literature study rigorously analyses the advantages and security issues related to cashless payment systems for women entrepreneurs, using theoretical frameworks, empirical studies, and current policy measures to provide an exhaustive examination of the topic.

A primary rationale for adopting cashless systems is their capacity to enhance financial inclusion. Research indicates that digital payments improve transactional efficiency, increase transparency, and provide access to formal financial services, especially aiding women-owned small and medium companies (WOBs) (Zhou, et al., 2025). The WEF, (2021), emphasises that innovations in mobile banking and fintech have facilitated the reduction of the gender gap in financial access, allowing women entrepreneurs to get loans, manage firm finances, and engage in the digital economy. Despite these developments, financial exclusion remains a significant issue for several women-led firms in South Africa, where limited access to digital infrastructure, high transaction costs, and socio-cultural barriers impede widespread adoption (Moyo, et al., 2023). The use of cashless systems is further hindered by security issues. Cybersecurity dangers, including fraud, identity theft, and data breaches, disproportionately impact WOBs, which often lack the financial means to establish comprehensive security measures (Malik, & Sikarwar, 2024) Women entrepreneurs are more susceptible owing to lower cybersecurity knowledge and digital literacy (Jansen, et al., 2024). Research suggests that despite efforts by regulatory frameworks and financial institutions to enhance digital security, deficiencies persist in offering specialist education and assistance for women-led firms (Kumar & Khandelwal, 2023). The absence of gender-sensitive financial regulations intensifies the difficulties encountered by women entrepreneurs in digital financial transactions (Zhai, et al., 2024).

This chapter analyses theoretical and empirical studies about cashless systems and their impact on women entrepreneurs in Gauteng Province. Defining essential concepts such as financial inclusion, digital payments, and cybersecurity allows Section 2.2 to provide a contextual basis for digital financial systems. Section 2.3 examines theoretical models pertinent to the acceptability of digital banking, including institutional frameworks that

facilitate financial inclusion, the Technology Acceptability Model (TAM), and the Diffusion of Innovations Theory. Section 2.4 analyses the benefits of cashless systems for female entrepreneurs, whereas Section 2.5 explores the challenges, such as cybersecurity, accessibility, and regulatory issues. Section 2.6 examines existing policy initiatives and effective practices informed by international case studies. Section 2.7 identifies deficiencies in the literature, emphasising areas that require further investigation.

The study emphasises the capacity of digital payment technology to enhance the financial management skills of women entrepreneurs and broaden their market access (Kumar & Khandelwal, 2023). Cashless systems provide efficient transaction administration, reducing reliance on cash and improving operational efficacy. These technologies provide women entrepreneurs, especially those overseeing small and medium firms (WOBs), with resources for enhanced record-keeping, budgeting, and strategic planning (Jansen, et al., 2020). Digital payment systems have the potential to enhance financial inclusion, providing women with access to previously unavailable or inaccessible services (Ahmed, adava, & Kakkar, (2023).

The study further identifies and addresses the hazards linked to cashless systems that disproportionately affect women-owned businesses (Kshetri, Voas, & DeFranco, 2021). Cybersecurity issues and digital exclusion are widespread. Although cashless systems provide advantages, they may come from insufficient cybersecurity protocols and knowledge, making users vulnerable to online fraud, identity theft, and phishing schemes. Women entrepreneurs in Gauteng have become increasingly vulnerable due to systemic disparities and limited access to resources; therefore, effective intervention is essential to address these challenges (Malik, & Sikarwar, (2024). Emphasis gender-sensitive approaches and provide evidence-based recommendations to enhance the adoption and efficacy of cashless systems. Effective strategies must tackle the specific challenges faced by women, such as socio-cultural barriers, unequal access to technology, and less digital literacy (Zhou, et al., 2025). These activities must promote user-centered technology, specialized instructional programmers, and accessible support systems to improve confidence and competence in using digital payment instruments (Chingapi, & Steyn, 2021).

It promotes the primary goals of financial inclusion and gender equality by facilitating the creation of secure, accessible, and effective digital payment systems. The report underscores the importance of inclusive policies and practices in equalizing opportunities for women entrepreneurs. When well executed, cashless systems may serve as catalysts for economic empowerment and social transformation, reducing gender disparities in access to financial services and resources (Majola, 2024).

This research seeks to guide policy and practice, fostering a more inclusive and equitable digital economy in Gauteng Province and beyond. Policymakers may use the data to establish policies that encourage secure digital payment practices while addressing challenges specific to women-owned enterprises (Van der Cruijsen, & Broekhoff, 2024).

Financial institutions and technology providers may collaborate to provide tailored solutions that address the unique needs of women-owned businesses (Jansen, et al., 2016).

This study has consequences that go beyond Gauteng, providing insights into the global debate about the digital economy and gender equality. Global emerging economies encounter analogous challenges, rendering the findings of this research pertinent across multiple contexts. This research seeks to advance sustainable development objectives by analyzing the relationship between financial technology and gender, with specific emphasis on gender equality (SDG 5) and economic growth (SDG 8) for UNCTAD, 2023).

This initiative seeks to integrate technological innovation with social equity, guaranteeing that digital payment systems are effective, inclusive, and empowering. This study aims to create a robust, secure, and inclusive cashless economy in Gauteng Province by addressing the specific needs of women entrepreneurs, hence setting a standard for similar initiatives in other regions (Kumar & Khandelwal, 2023). This literature analysis aims to provide a thorough understanding of the benefits and security challenges of cashless systems for women entrepreneurs by synthesizing theoretical perspectives, empirical evidence, and policy implications. This research advances discourse on gender and digital finance, offering insights that might inform policy decisions and initiatives to strengthen the digital financial landscape for women-led firms in developing countries.

2.1.1 Conceptualization of Cashless Systems

The notion of cashless systems has garnered considerable attention in modern financial discussions, especially as digital technologies reshape global payment frameworks (Adebayo, & Osei-Boateng, 2024). A cashless system is an economic structure in which financial transactions occur without physical currency, using digital payment methods like as mobile money, internet banking, contactless cards, and electronic fund transfers (Gibson, Gazi, & Arner, 2024).

Advancements in financial technology, improved internet accessibility, and evolving customer expectations for rapid, secure, and efficient transaction methods have accelerated the transformation. Cashless payment methods facilitate company development and enhance financial inclusion for female entrepreneurs. Studies show that digital payment systems increase operational efficiency, record-keeping, and access to new markets, thereby supporting the expansion of businesses headed by female entrepreneurs (Zhou, et al., 2025). The WEF, 2021, indicates that digital transactions reduce risks linked to cash management, including theft and mismanagement, thereby promoting a more secure business environment. The implementation of cashless systems in women-owned enterprises is affected by various socio-economic, infrastructural, and security factors (Jansen, et al., 2020).

2.1.2 The Evolution of Cashless Systems

The shift from conventional cash-based economies to digital financial systems has progressed over many decades, propelled by technical advancements and legislative changes. Initial cashless transactions were mostly restricted to credit and debit card payments, enabled by financial institutions (Majola, 2024). Nonetheless, the emergence of mobile money platforms, fintech firms, and blockchain-based payment systems has markedly diversified the field (Van der Cruijsen, & Broekhoff, 2024). Chingapi, & Steyn, (2021) indicate that developing countries, such as South Africa, have had a significant increase in mobile money use, especially among small and medium-sized firms (WOBs) where conventional banking services are less available.

Considered a major economic centre in South Africa, Gauteng Province has witnessed women's businesses using digital payments more and more. For women-owned companies, mobile payment systems include M-Pesa, SnapScan, and EFT-based solutions that help to streamline transactions, thus less reliance on cash (Peter, Elangovan, & Gupta, 2025). Particularly among micro-enterprises in unofficial industries, disparities in digital literacy and financial awareness still influence adoption rates (Raina, & Narayan, 2024).

2.1.3 Key Components of Cashless Systems

Cashless payment systems include a range of financial instruments and technological frameworks designed to facilitate digital transactions. Mobile money services—M-Pesa, EcoCash, and Airtel Money, facilitate financial inclusion for unbanked populations by enabling users to conduct transactions using mobile phones, Kshetri, Voas, & DeFranco, (2021). Digital banking systems offer account holders the ability to manage accounts remotely, facilitate bill payments, and execute electronic funds transfers (EFTs), thereby improving transactional convenience (Adebayo, & Osei-Boateng, 2024).

Debit and credit cards that utilize near-field communication (NFC) technology function as contactless payment methods, enabling rapid and secure transactions, thereby minimizing the necessity for physical currency handling (Zhou, et al., 2025). QR-based payment systems are being used by marketplaces and small companies. This approach provides a cheap and fast approach for online buying (Kumar & Khandelwal, 2023). Though decentralized digital currencies including Bitcoin and Ethereum offer alternatives for cash, their use by women entrepreneurs is limited by legal ambiguity (Van der Cruijsen, & Broekhoff, 2024).

2.1.4 Socio-Economic Factors Influencing Cashless Adoption

Income levels, financial literacy, and cultural attitudes towards digital finance (Jansen, et al., 2020) influence the adoption of cashless payment systems in women-owned firms, alongside various social and economic factors. Mhlanga, & Dzingirai, (2023) argues that financial inclusion initiatives primarily focus on metropolitan areas, limiting rural women entrepreneurs' access to digital transaction methods. The trust of women in digital media significantly influences their adoption of cashless solutions. Women’s adoption of cashless solutions is frequently hindered by concerns regarding data security and fraud (Peter, Elangovan, & Gupta 2025).

2.1.5 Infrastructural Challenges in Cashless System Implementation

While cashless transactions offer numerous advantages, infrastructure challenges continue to pose a substantial problem in rapidly developing nations. Limited internet access, elevated mobile data expenses, and inconsistent electricity supply impede the successful implementation of digital payment systems (WEF, 2021). The digital divide in South Africa continues to impact women entrepreneurs, especially in peri-urban and rural regions (Chingapi, & Steyn, 2021). Enhancing digital infrastructure and minimizing transaction costs are essential for improving the accessibility of cashless systems (Kshetri, Voas, & DeFranco, 2021).

2.1.6 Security Risks and Data Privacy Concerns

Cybersecurity threats pose a significant barrier to the adoption of cashless systems by female entrepreneurs. The expansion of digital payment networks has increased digital fraud, identity theft, and financial fraud (Kumar & Khandelwal, 2023). Zhou, et al., (2025) argue that small and medium-sized enterprises (WOBs), particularly those led by women, frequently lack the resources required to implement effective cybersecurity measures, making them more vulnerable to cyber-attacks. Compliance with data protection laws and enhancement of digital literacy programmes are crucial for mitigating these risks (Van der Cruijsen, & Broekhoff, 2024).

2.1.7 The Role of Policy and Regulatory Frameworks

Government policies and banking regulations have a substantial influence on the execution of cashless systems. Regulatory bodies in South Africa, such as the South African Reserve Bank (SARB) and the Financial Sector Conduct Authority (FSCA), have established frameworks to enhance digital financial inclusion (Gibson, Gazi, & Arner, 2024). Current legislation frequently does not adequately address the unique challenges faced by women entrepreneurs, underscoring the necessity for financial laws that consider gender and for tailored support systems (Jansen, et al., 2016).

The conceptualization of cashless systems underscores their potential to improve financial inclusion, especially for women entrepreneurs in emerging economies. Digital payment technologies improve efficiency, security, and opportunities for business growth; however, challenges related to socio-economic factors, infrastructure, and security remain. Overcoming these barriers necessitates a comprehensive strategy that includes financial education, policy interventions, and technological advancements. This chapter outlines the evolution, key components, influencing factors, and security challenges of cashless systems, establishing a foundation for further discussions on their benefits and limitations. This section examines the theoretical frameworks that support digital financial inclusion and the adoption of cashless payment systems.

2.2 Theoretical Models Underpinning Digital Financial Inclusion

Multiple theoretical frameworks elucidate the adoption and effects of cashless payment systems among women entrepreneurs. Analyzing these models establishes a basis for examining the factors that affect the adoption of digital financial services in rapidly

developing economies, exemplified by Gauteng Province, South Africa. This section examines three fundamental theories: The Technology Acceptance Model (TAM), the Diffusion of Innovation (DOI) Theory, Technology Organization Environment (TOE) framework, (Tornatzky and Fleischer, 1990), and Financial Inclusion Theories.

2.2.1 The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), formulated by Davis in 1989, offers a framework for comprehending the adoption and utilization of technology by individuals. The model suggests that two primary factors, perceived usefulness (PU) and perceived ease of use (PEOU) influence the intention to adopt a technological innovation. PU denotes the extent to which an individual perceives that utilising a specific system improves their performance, whereas PEOU indicates the level of belief regarding the technology's ease of use (Venkatesh & Davis, 2000).

The Technology Acceptance Model elucidates the adoption of cashless payment systems among women entrepreneurs in Gauteng. Entrepreneurs are more inclined to incorporate digital financial services into their operations when they recognise these services as advantages for improving efficiency, lowering transaction costs, and expanding their customer base. A study by Akanji, (2024) found that women-led WOBs in South Africa who perceived mobile money and online banking as user-friendly were more inclined to adopt these services. Furthermore, government and private sector interventions that improve digital literacy can enhance PEOU, thus increasing adoption rates (Gerasimenko, & Zhou, 2024)

Nonetheless, the Technology Acceptance Model (TAM) has limitations in addressing socio-cultural and security concerns that may impede adoption. Research conducted by Kshetri, Voas, & DeFranco, (2021) demonstrates that despite the awareness among women entrepreneurs regarding the advantages of cashless systems, apprehensions related to cybersecurity, fraud, and technical failures diminish their readiness to adopt these technologies comprehensively. Consequently, the Technology Acceptance Model should be evaluated in conjunction with other frameworks that tackle external obstacles.

2.2.2 The Diffusion of Innovation Theory

The Diffusion of Innovation (DOI) Theory, introduced by Rogers (1962), elucidates the mechanisms by which new technologies and inventions disseminate throughout various societal sectors. The theory delineates five principal qualities that affect adoption: relative benefit, compatibility, complexity, trialability, and observability. Entrepreneurs are more likely to adopt a technology if they perceive it as offering a significant advantage over existing methods, aligning with their business practices, and being easy to use (Rogers, 2003). In the context of Gauteng's women entrepreneurs, DOI theory highlights that the adoption of cashless payment systems occurs in phases, with early adopters influencing later users. Studies by Mhlanga, & Dzingirai, (2023) show that adoption rates are significantly influenced by peer influence, computer literacy, and training programme availability. Urban women entrepreneurs with financial literacy

programs are more likely than those in peri-urban and rural locations to quickly adopt digital payment methods.

Adoption rates may be influenced by sociological and economic factors. According to a 2021, Chingapi, & Steyn, investigation, women entrepreneurs with higher degrees and financial autonomy were more likely to employ cashless payment systems than those facing socioeconomic constraints. Nonetheless, infrastructural impediments, such as elevated mobile data expenses and restricted access to financial services, hinder uptake among marginalised populations (Raina, & Narayan, 2024). DOI theory has a major flaw in assuming a linear adoption path, therefore excluding systematic barriers. Gender-based discrimination, inadequate collateral for digital loans, and cybersecurity issues are among the obstacles women entrepreneurs must overcome that can hinder the natural diffusion process (Peter, Elangovan, & Gupta. (2025). Therefore, even if the Diffusion of Innovations (DOI) model helps to grasp adoption patterns, further models are required to solve structural problems.

2.2.3 Financial Inclusion Theories

Theories of financial inclusion emphasise the elimination of obstacles to receiving financial services, especially for marginalised groups. These theories assert that digital payment systems are essential for improving economic participation, promoting entrepreneurship, and reducing financial disparities FinMark Trust, (2022) .The Inclusive Growth Model asserts that financial accessibility propels economic progress Van der Cruijsen, & Broekhoff (2024) contend that cashless payment techniques allow women entrepreneurs more control over their resources, hence fostering company development and enhancing financial resilience. Digital wallets, mobile banking, and fintech solutions have been instrumental in promoting women's financial independence in developing economies (WEF, 2021). The Gendered Financial Inclusion Model highlights the distinct obstacles women have in obtaining financial services. Women's access to financial resources and services is limited by insufficient asset ownership, cultural norms, and legal obstacles (Jansen, et al., 2023). Digital payment systems address these difficulties by providing alternative financial solutions, including peer-to-peer lending, microfinance, and digital credit scoring (Zhou, et al., 2025).

Models of financial inclusion, nevertheless, have some restrictions. While financial services are becoming more available, they do not by themselves solve inequality. Studies by Kshetri, Voas, & DeFranco (2024) show that certain women entrepreneurs are marginalised due to low faith in financial institutions, cybersecurity issues, and poor digital literacy. Additionally, low-income enterprises may experience negative impacts from mobile banking fees and transaction costs, thereby diminishing the benefits of financial inclusion (Majola, 2024).

The use of cashless payment systems in women-owned businesses in Gauteng is shaped by many theoretical frameworks. The Technology Adoption Model elucidates the impact of perceived usefulness and ease of use on technology adoption, whereas the Diffusion of Innovation Theory concentrates on the dissemination of technology among various user groups. Theories of financial inclusion highlight the potential of digital financial services to improve women's economic participation, while recognising ongoing

structural barriers. The Gendered Financial Inclusion Model delineates the obstacles encountered by women in obtaining financial services. Women's access to financial resources and services is limited by insufficient asset ownership, cultural norms, and legal obstacles (Jansen, et al., 2023). Digital payment systems address these challenges by providing alternative financial solutions, including peer-to-peer lending, microfinance, and digital credit scoring (Zhou, et al., 2025). Entrepreneurs may use cashless payment methods to facilitate ongoing business growth.

2.3 The Benefits of Cashless Systems for Women Entrepreneurs

Using cashless payment systems offers great advantages for women entrepreneurs, particularly in rapidly developing nations. These benefits include security, operational efficiency, market expansion, and financial inclusion, extending beyond basic ease. By incorporating digital financial services into their companies, women raise their possibilities for economic empowerment and encourage ongoing growth.

2.3.1 Increased Financial Inclusion

Digital banking and mobile money applications enable women to conduct business transactions free from dependence on a physical bank branch, therefore lowering travel time and expenses. This removes a significant obstacle to financial inclusion, which many people encounter when seeking conventional banking services (Suseno, & Abbott, (2021). Also, these solutions integrate with official financial institutions, provide credit, and guarantee secure transactions. Moreover, digital payment platforms can assist women entrepreneurs in establishing credit histories, thereby enhancing their eligibility for company loans and financial assistance (Demirgüç-Kunt, et al..2022)

2.3.2 Improved Business Efficiency

Cashless transactions simplify financial administration and transaction procedures, therefore increasing operational efficiency. By means of accelerated processing times offered by digital payments, cash transaction delays are minimized (Bello-Bravo, et al., 2023). By using computerized transaction monitoring, bookkeeping enhances accuracy and transparency, therefore reducing errors and limiting the dangers associated with financial mismanagement. Studies show that women entrepreneurs who use digital payments have fewer financial differences and more profitability because of better operational efficiency (Unigwe, & Omoruyi, 2025).

2.3.3 Market Expansion

The capacity to take digital payments allows women entrepreneurs to participate in e-commerce and access a wider client base, including global markets. Digital platforms like Shopify, PayPal, and mobile wallets enable firms to operate outside geographical limitations, hence enhancing their income potential (OECD, 2022). Access to global markets is especially advantageous for women-led enterprises that manufacture artisanal, agricultural, or specialised items, since it facilitates direct-to-consumer sales without dependence on middlemen (UNCTAD, 2022). Digital payment systems also promote alliances and cooperation with other enterprises, hence augmenting development potential.

2.3.4 Enhanced Security and Transparency

Cash-based economies pose significant risks for women entrepreneurs, including theft, fraud, and financial mismanagement. Digital payment systems mitigate these challenges by facilitating secure and traceable transactions, thus enhancing financial accountability (Chen, et al., 2023). Cashless transactions reduce the risk of loss or theft linked to physical cash, enhancing the security of organisational operations. Furthermore, transparency in digital financial records enables women entrepreneurs to enhance financial oversight, ensure regulatory compliance, and reduce susceptibility to corruption (Galindo-Manrique, & Rojas-Vargas, 2025).

2.4 Security Challenges of Cashless Systems

Cashless systems offer numerous advantages; however, particular security concerns hinder their widespread adoption among women entrepreneurs. Cybersecurity threats, fraud, and inadequate preventative measures pose significant challenges that need to be addressed to improve trust in digital financial services.

2.4.1 Cybersecurity Risks

Digital payment systems demonstrate increased vulnerability to cybercriminal activities, leading to data breaches, hacking incidents, and fraudulent transactions. Women entrepreneurs managing small and medium-sized enterprises (WOBs) frequently face challenges due to insufficient technical expertise and limited financial resources necessary for the implementation of effective cybersecurity measures (Kshetri, Voas, & DeFranco, (2021). Phishing attacks, malware, and identity theft represent substantial threats that erode trust in digital financial systems (Akanji, 2024).

2.4.2 Data Privacy Concerns

The extensive use of cashless payment systems requires the collection, retention, and processing of substantial quantities of financial and personal data. This situation presents substantial problems about data privacy, especially for women entrepreneurs in informal industries. Digital financial transactions often need users to provide sensitive information, such as banking details, identification numbers, and company income data, which may be vulnerable to exploitation if insufficiently safeguarded (Bello-Bravo, et al., 2023).

2.4.3 Cyber Fraud and Identity Theft

A major security issue associated with cashless payment systems is the rising prevalence of digital fraud and identity theft. Women entrepreneurs, especially those with little technology proficiency, are vulnerable to phishing schemes, account takeovers, and fraudulent transactions (Wang, et al., 2025). Cybercriminals use insufficient authentication techniques and susceptible digital platforms to gain unauthorised access to bank accounts, leading to significant financial losses for small business owners (Unigwe, & Omoruyi, 2025)

Furthermore, the lack of stringent cybersecurity regulations and consumer protection policies in most developing countries impedes victims' capacity to get compensation or reclaim lost assets (Chen, et al., 2023). Enhancing cybersecurity knowledge, instituting multi-factor authentication, and promoting financial literacy among women entrepreneurs may reduce the risks of digital crime and identity theft.

2.5 Barriers to the Adoption of Cashless Systems

Despite the prospective advantages of cashless payment systems, many structural and socio-economic barriers impede their widespread adoption by women-owned businesses. Often linked, these challenges create a complicated ecosystem that influences women's financial inclusion in fast-growing countries.

Limited Digital Literacy: The inadequate computer literacy among female entrepreneurs poses a significant barrier to the use of cashless solutions. A significant percentage of women-owned businesses function in conventional, cash-based settings, demonstrating a limited comprehension of digital financial services (Allen, et al., 2022). Insufficient access to technology and inadequate training programs exacerbates the digital divide, impeding women's proficiency in using mobile banking applications, e-commerce platforms, and online financial management tools (Suri & Jack, 2016).

Cost and Accessibility Challenges: For women-owned enterprises, the cost and accessibility of cashless payment options are significant concerns. Increasing transaction costs associated with mobile money applications and digital banking hinder small company proprietors from fully using cashless solutions in their operations (Abiona, & Koppensteiner, 2022). The cost of smartphones, unreliable internet connectivity, and inadequate digital infrastructure in rural and economically disadvantaged urban areas impede access to digital financial services (Allen, et al., 2022). Collaborations between the public and private sectors should prioritise the reduction of transaction costs, the development of mobile network coverage, and the promotion of affordable fintech solutions tailored for women entrepreneurs.

Socio-Cultural Barriers: Cultural factors and conventions significantly influence women's adoption of cashless payment methods in business. In several developing nations, conventional gender norms and financial decision-making frameworks often restrict women's access to digital financial instruments (Wiafe, Quaidoo, & Sekyi, 2022)

2.6 Policy Interventions and Support Mechanisms

Governments, financial institutions, and international development organisations will be vital for women entrepreneurs' advancement of digital financial inclusion. Effective policy interventions may alleviate security threats, enhance access to digital infrastructure, and encourage the use of cashless systems. Essential policy recommendations comprise: Governments must establish and enforce stringent data protection legislation to safeguard the privacy and security of financial transactions, especially for women entrepreneurs in informal sectors (Abiona, & Koppensteiner, 2022). In addition, Financial and educational institutions must establish specialised training initiatives to provide women entrepreneurs with crucial digital competencies,

facilitating their successful utilisation of cashless systems (Bongomin et al., 2018). Further, Financial service providers have to provide economical digital payment solutions with reduced transaction costs, especially addressing the requirements of women-owned enterprises (Demirgüç-Kunt, et al..2022). Cooperation between governmental entities and the corporate sector is crucial for enhancing internet access, expanding mobile network coverage, and reducing the cost of digital devices in underprivileged regions (Banda., Mutasa, & Mambwe, 2023).

2.6.1 Private Sector Contributions

The private sector, primarily financial technology businesses and banking institutions, plays a significant role in the successful implementation of cashless systems. For women-led enterprises, financial technology (FinTech) companies must stress the creation of user-friendly and affordable payment solutions. These solutions should be adapted to the special requirements of small enterprises, particularly in rural or under-banked regions (Babu, & Iyer, 2025). Financial institutions must guarantee the security of their services via effective encryption and fraud prevention methods to establish confidence and safeguard both entrepreneurs and customers (Arner et al., 2020). One of the most important considerations is affordability, as many women entrepreneurs operate under limited means. FinTech enterprises and financial institutions might provide low-cost transaction models or micro-financing solutions to let women-owned businesses use cashless systems free from significant financial load (Celestin, & Sujatha, 2024).

2.6.2 Capacity Building and Training Programs

Women-owned businesses necessitate training courses and capacity development to effectively utilise cashless systems. Women can surmount technical barriers and gain confidence in utilising digital payment systems through seminars and educational initiatives designed to enhance their digital financial literacy (Mitra & Ghosh, 2020). Programmes may encompass digital banking, e-commerce platforms, and training on mobile wallets, all essential for companies transitioning to cashless systems (Ojo, & Ndzendze, 2023).

2.7 Comparative Analysis of Global Best Practices

International case studies, such as Kenya's M-Pesa and India's digital payment strategies, offer valuable insights for South Africa in advancing cashless financial inclusion. M-Pesa, a mobile money service introduced in Kenya, has transformed financial inclusion by providing accessible, inexpensive, and secure digital financial services, especially for those without access to conventional banking (Jack & Suri, 2014). The success of M-Pesa is ascribed to its capacity to surmount infrastructural constraints by using mobile phones, which are extensively accessible even in isolated regions (Kshetri, & Acharya, 2012)). This approach has shown the capacity of mobile money solutions to enhance financial inclusion, particularly for women and small enterprises in rural regions Demirgüç-Kunt, et al..2022).

The Digital India project and the Aadhaar-based biometric identification system show how strongly the Indian government supports digital payments, hence enhancing access to digital financial services (Ahmed, adava, & Kakkar, (2023). Particularly for small businesses run by women, the rules have lowered transaction costs, maximized government subsidies, and helped digital payments to be adopted (Sood & Sood, 2020). Kenyan and Indian effective projects for South Africa highlight the importance of public-private partnerships, imaginative payment systems, and government support in achieving cashless financial inclusion. These findings might be used by South Africa to develop policies suited to the many needs of its diverse population, therefore fostering an inclusive digital economy.

2.8 Gaps in the Literature Review

Studies on the acceptance of digital banking show clear differences, especially with relation to gender-specific issues and the efficiency of policies in the Women owned businesses (WOB) sector in South Africa. Many studies concentrate on overall patterns in digital financial inclusion, usually neglecting the specific difficulties women entrepreneurs have using cashless systems. Studies show that financial inclusion is essential for economic growth, but it usually approaches all entrepreneurs as a homogenous group, therefore ignoring the socio-cultural, financial, and infrastructure obstacles disproportionately affecting women (Babu, & Iyer, 2025). Among the special challenges experienced by women-led WOBs in informal or underdeveloped areas are limited access to digital literacy training, gender bias, and security concerns surrounding online transactions (Haji & Lee, 2021). Research on gender-specific problems in digital finance security is limited, particularly in South Africa's WOBs, where women entrepreneurs suffer additional risks linked with cybercrime, fraud, and data breaches (Celestin, & Sujatha, 2024). Furthermore, while studies on the degree to which South African policies meet the needs of women-led businesses and enable their successful adoption of safe and reasonably priced digital payment solutions (Sood & Sood, 2020), the effectiveness of policies supporting cashless systems has been thoroughly investigated worldwide. Dealing with these discrepancies calls for targeted research that takes regional and gender aspects into account to provide women entrepreneurs in the WOBs of South Africa with customised solutions.

CHAPTER III:
METHODOLOGY

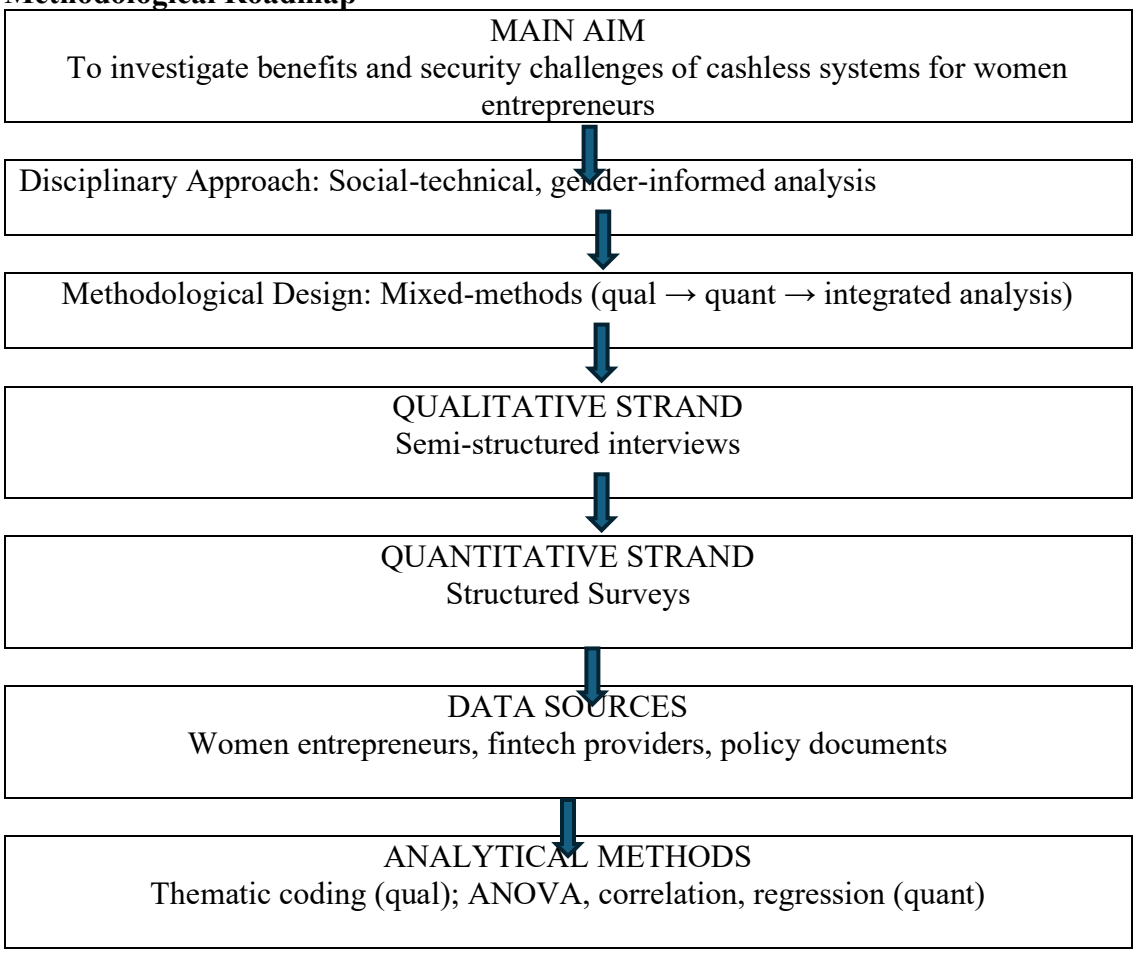
3.1. Research Design and Approach

This study employed a mixed-methods approach, combining qualitative interviews and quantitative surveys to achieve a thorough understanding of the experiences of women entrepreneurs with digital financial instruments. This chapter delineates the research framework, sampling strategy, instruments, analytical techniques, ethical consideration and research design limitation.

3.1.1 Methodological Roadmap

To implement the research objectives, Figure 3.1 below delineates the Methodological Roadmap of the study, demonstrating the alignment of research components with the primary aim, disciplinary perspective, instruments, and analytical progression. This visual summary supersedes the previously enumerated bullet items and offers concise guidance.

Methodological Roadmap



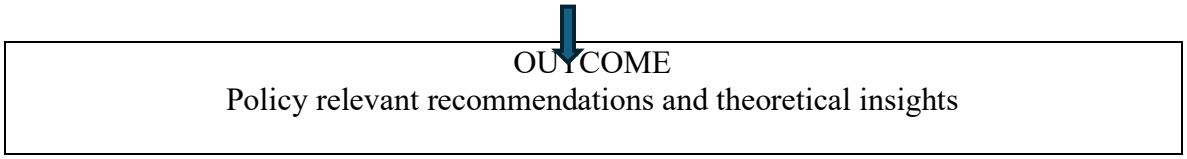


Figure 3.1: above presents the Methodological Roadmap of the study (Source: Created by Author)

3.1.2 Qualitative Approach

The qualitative phase of the research involved semi-structured interviews constituted the primary data collection approach, supplemented by participant observations. These techniques provided extensive insights into women's engagement with mobile payments, bank transfers, and fintech applications across several contexts, including urban marketplaces and small enterprises. The interview questions were open-ended and designed to elicit detailed responses regarding routine business operations, security concerns, and infrastructural challenges.

The NVivo program facilitated data coding and analysis (Bazeley, & Jackson, 2013). In accordance with Braun and Clarke's (2006, 2021) six-step methodology for thematic analysis, transcripts were coded inductively to identify patterns pertaining to the advantages, obstacles, and behavioral responses associated with cashless systems. Participant perspectives were maintained through direct quotations, augmenting authenticity and credibility.

The study investigated the impact of confidence in technology and service providers (banks, mobile money platforms, fintech companies) on the adoption of financial transactions, which are fundamentally relational. Within the realm of digital vulnerability, issues such as data privacy, transaction failures, and deficiencies in customer support surfaced as primary concerns. Women's confidence in utilising technology was influenced by prior exposure, computer literacy, and support networks.

The study highlighted gender-specific barriers, such as limited access to mobile phones and the internet, cultural norms that impede financial autonomy, and constrained involvement in policy dialogues around digital banking. These findings corroborate Ratner's (2009) claim that qualitative research is essential for uncovering significant structural concerns often overlooked in quantitative surveys.

The interpretive method enabled the researcher to interact with both early adopters and reluctant users of cashless systems. Data were gathered using purposive sampling to identify pertinent women entrepreneurs, supplemented by snowball sampling (Noy, 2008) to expand the sample via referrals. The semi-structured format of interviews facilitated adaptability while maintaining theme coherence. The researcher's involvement in fieldwork yielded contextual insights unattainable through secondary data.

3.1.3 Quantitative Approach

The quantitative strand of this mixed-methods study was designed to identify statistically significant trends, patterns, and relationships that could complement the rich, contextual insights provided by the qualitative component. This part of the research focused on drawing empirical inferences from a larger population of women entrepreneurs using structured survey instruments and statistical modelling techniques.

Quantitative data was collected from 201 women entrepreneurs across several sectors in Gauteng Province, South Africa. The members include a diverse array of business sizes, micro, small, and medium enterprises functioning across sectors such as retail, agriculture, manufacturing, hospitality, and services.

The sample size (n=201) was deemed sufficient for the application of inferential statistical methods, including logistic regression and ANOVA, thereby ensuring the reliability of results while addressing practical constraints related to time and resources. The quantitative framework aimed at:

- Examine hypotheses concerning cashless adoption, security perceptions, and business outcomes.
- Measure the correlations among variables, including income levels, digital literacy, security awareness, and adoptsemiion rate.
- Validate or contrast themes identified in the qualitative interviews, ensuring triangulation and cross-validation.

The survey was shared online with female entrepreneurs under informal and formal sector. The sample was drawn from different sectors (Retail, Hospitality, Agro-processing and Service-based Enterprises).

3.2 Conceptual Framework and Study Variables

This study investigates the adoption and impact of cashless systems among women-owned enterprises in Gauteng, South Africa. The research employs an integrated framework drawing from three major theories: the Unified Theory of Acceptance and Use of Technology (UTAUT), the Technology Acceptance Model (TAM), and the Digital Divide Theory. These models provide the conceptual grounding for understanding both the drivers of cashless system adoption and the resulting business outcomes. The study categorizes its variables into three main clusters:

- Independent Variables – These represent factors presumed to influence outcomes.
- Dependent Variables – These are business-level outcomes presumed to be affected by the adoption of cashless systems.
- Control Variables – These are external/demographic factors used to account for variations in adoption and outcomes.

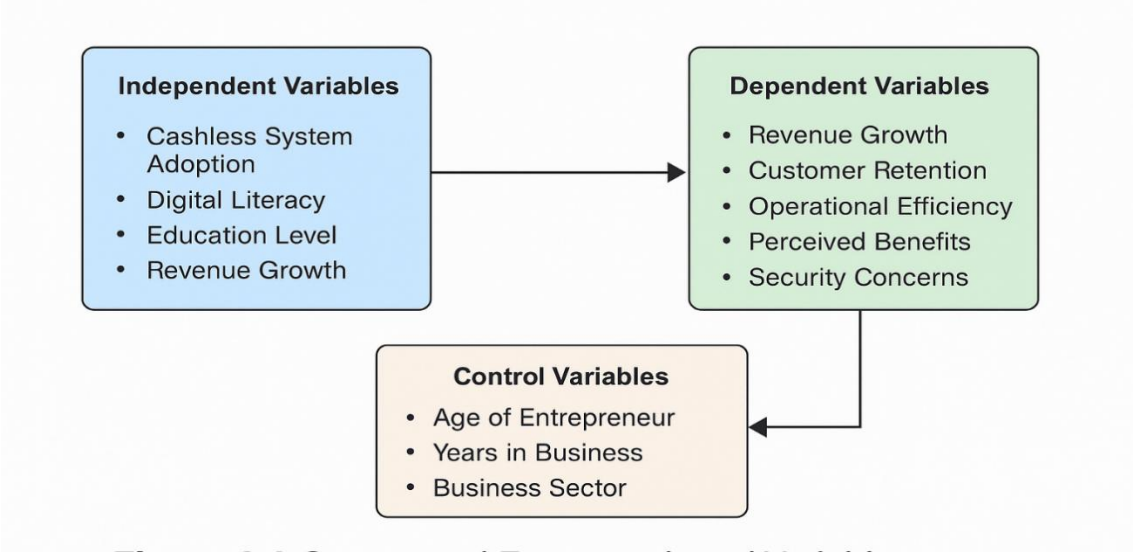


Figure 3.2: Conceptual Framework and Study Variables (Source: Created by Author 2025)

3.2.1 Independent Variables

1. Cashless System Adoption

- Theoretical Basis: UTAUT (Performance Expectancy, Effort Expectancy, Social Influence), TAM (Perceived Usefulness, Perceived Ease of Use)
- Description: This is the core independent variable of the study. It measures the extent to which women entrepreneurs have embraced cashless payment solutions, such as mobile money, card machines, QR codes, and EFT platforms.
- Rationale: The variable reflects user behavior driven by technological perceptions and contextual readiness. UTAUT and TAM both predict that greater ease of use and perceived benefits will lead to higher levels of adoption.
- Relevance: This variable is hypothesized to influence business performance measures like revenue growth, customer retention, and operational efficiency.

2. Revenue Growth

- Theoretical Basis: TAM (Perceived Usefulness), UTAUT (Performance Expectancy)
- Description: Though often an outcome variable, in this study revenue growth also acts as a predictive factor for other dependent variables such as operational efficiency and perceived benefits.
- Rationale: Increased revenue resulting from improved transaction speed and customer satisfaction may enable businesses to invest further in operational systems, leading to increased efficiency and security.

- Relevance: Serves as both an intermediate and predictor variable within the cashless system outcomes chain.

3. Customer Retention
   - Theoretical Basis: UTAUT (Social Influence, Performance Expectancy)
   - Description: Captures the ability of businesses to retain and engage repeat customers, especially those using cashless channels.
   - Rationale: Customer retention is linked to customer satisfaction with seamless and secure digital payment experiences. It also reflects digital trust, which is shaped by operational efficiency and transparency.
   - Relevance: Functions as a predictive and dependent variable in the relationship between cashless systems and broader business performance.

3.2.2 Dependent Variables

4. Operational Efficiency
   - Theoretical Basis: TAM (Perceived Ease of Use)
   - Description: Measures the improvements in routine operations as a result of using cashless systems — e.g., faster transactions, lower reconciliation errors, reduced cash-handling risks, and increased productivity.
   - Rationale: Digital payment systems automate routine tasks and reduce operational friction, thereby enhancing efficiency.
   - Relevance: A direct outcome of cashless adoption, these variable captures productivity and process-level impacts.

5. Perceived Benefits
   - Theoretical Basis: TAM (Perceived Usefulness)
   - Description: Represents subjective perceptions of value gained from cashless adoption. These may include better brand image, improved customer satisfaction, increased security, and promotional rewards.
   - Rationale: A positive perception of benefits often reinforces technology use, fostering adoption continuance and diffusion.
   - Relevance: A critical determinant of long-term acceptance and competitive advantage in digital transformation.

6. Security Concerns
- Theoretical Basis: UTAUT (Facilitating Conditions), TAM (Risk Perception)
- Description: Reflects entrepreneurs' concerns about data privacy, online fraud, system failures, and transaction risks.
- Rationale: High levels of security concern may deter adoption, while adequate security infrastructure facilitates usage.
- Relevance: Considered both a barrier to adoption and a factor influenced by system quality and user experience.

3.2.3 Control Variables

7. Digital Literacy
- Theoretical Basis: Digital Divide Theory
- Description: Measures the entrepreneurs' ability to use digital platforms, navigate apps, and interpret digital transactions confidently.
- Rationale: Digital literacy is a major enabler of adoption, especially in underserved and female-led business contexts.
- Relevance: Acts as a moderator in the model — those with higher digital literacy are expected to adopt cashless systems faster and more effectively.

8. Education Level
- Theoretical Basis: Digital Divide Theory
- Description: Captures formal education attainment levels (e.g., primary, secondary, tertiary) of the women entrepreneurs.
- Rationale: Higher education is generally associated with greater openness to innovation, stronger analytical skills, and higher trust in digital systems.
- Relevance: Serves as a control variable to explain inter-group variation in adoption patterns and perception of risks/benefits.

The relationships between these variables are tested through correlation, regression, and logistic analysis. Hypotheses were formulated based on theoretical alignment and prior empirical evidence. The framework assumes that adoption (CA) drives revenue (RG), retention (CR), and efficiency (OE), while factors like literacy and education modify these outcomes. Security concerns and perceived benefits serve as both influenced outcomes and potential feedback loops in adoption sustainability.

3.3 Data Collection and Instrument

Qualitative Instrument:

The primary method for data collection in the qualitative segment employed semi-structured interviews. This instrument was chosen for its ability to consistently assess subjective experiences within key thematic areas. The interview guide was grounded in Alfred Schutz's social phenomenology, emphasizing real-life experiences, perceptions of safety, and challenges associated with computerized financial systems. Key Features of the Interview Protocol:

Item	Explanation
Interview Guide Structure	Questions were categorized into thematic areas, including digital financial adoption, operational benefits, perceived risks, and ecosystem support.
Open-Ended Format	Promoted detailed elaboration and narrative construction, reflecting the complex experiences of participants.
Duration and setting	Interviews lasted between 30–60 minutes and were conducted either in-person or virtually.
Recording and Transcription	With consent, all interviews were audio-recorded and transcribed verbatim.

Table 3.1: Key Features of the Interview Protocol (Source: Created by Author)

This method enabled the development of detailed case profiles and enhanced understanding of the relational, cultural, and trust-related factors affecting digital finance adoption.

Interview Question	Rationale	Reference
How has adopting cashless payment systems influenced your daily business operations?	This study examines the influence of cashless systems on business operations, highlighting transaction efficiency, record-keeping, and customer interactions. The statement examines the study's hypothesis, which posits that the adoption of cashless transactions enhances operational efficiency in women-owned businesses. The essential elements for evaluation include cashless adoption as the independent variable and business efficiency as the dependent variable.	Merriam (2009); Bångens & Söderberg (2011)
What key benefits have you gained	This question examines the perceived advantages of cashless transactions, such as	Dahlberg et al. (2015);

from using cashless transactions?	cost savings, security, convenience, and time efficiency. It supports the hypothesis that cashless systems provide financial and operational benefits to women entrepreneurs. The variables include perceived benefits of cashless systems (independent variable) and business performance (dependent variable).	Demirgüç-Kunt, et al..2022 Wang, et al., 2025)
What specific security risks have you encountered while using cashless systems?	This question investigates fraud, cyber attacks, and data privacy concerns, which are potential barriers to cashless adoption. It tests the hypothesis that security concerns negatively influence the willingness to adopt digital payment solutions. The variables are security risks (independent variable) and cashless adoption rate (dependent variable).	Kshetri, Voas, & DeFranco, (2021) PCI Security Standards Council (2018)
What strategies or tools do you use to mitigate cybersecurity risks in your business?	This aims to assess how women entrepreneurs safeguard their digital transactions. It relates to the hypothesis that businesses implementing security measures experience fewer cybersecurity issues. The variables are cybersecurity strategies (independent variable) and perceived security risks (dependent variable).	Kshetri, Voas, & DeFranco, (2021). Zhang et al. (2021)
In what ways have cashless payment systems affected your business revenue, customer base, or profitability?	This question evaluates the financial impact of digital payments, testing the hypothesis that cashless systems enhance revenue and customer retention. The variables include cashless system usage (independent variable) and financial performance (revenue, profit, customer base growth) (dependent variable).	Arango-Arango & Suárez-Ariza (2020); CGAP (2019)
What were the key factors influencing your decision to adopt cashless payments?	This analysis investigates the determinants affecting the adoption of cashless transactions, highlighting customer demand, cost-effectiveness, and regulatory compliance. The data suggests that both external and internal business factors affect digital adoption. The primary components consist of adoption drivers, including customer demand, cost, and convenience, which act as independent variables, while the decision to adopt cashless methods is the dependent variable.	Tobbin & Kuwornu (2011); Chawla & Joshi (2019)
How have financial institutions	This analysis examines the roles of banks, mobile money providers, and fintech solutions	Claessens et al. (2016); Ojo, &

supported your transition to digital payment systems?	in enhancing access to cashless services. The hypothesis posits that enhanced support from financial institutions is associated with a rise in digital adoption among women entrepreneurs. The independent variable pertains to support from financial institutions, whereas the dependent variable concerns the accessibility of cashless systems.	Ndzendze, (2023)
What are the main challenges you face in accessing and maintaining digital payment infrastructure?	This identifies key obstacles such as high transaction costs, internet accessibility, and technical literacy. It relates to the hypothesis that infrastructural barriers hinder cashless adoption. The variables include accessibility barriers (cost, technology, infrastructure) (independent variables) and cashless adoption rate (dependent variable).	Banda., Mutasa, & Mambwe,. (2023). Galindo-Manrique, & Rojas-Vargas, (2025)
What policy or regulatory changes do you think could encourage greater adoption of cashless systems among women entrepreneurs?	This aims to gather policy suggestions that could enhance financial inclusion. It aligns with the hypothesis that supportive regulations positively influence cashless adoption rates. The variables are policy support measures (independent variable) and the adoption of digital payments (dependent variable).	AFI (2019); Unigwe, & Omoruyi, (2025)
What improvements would you suggest to make cashless payment systems more inclusive and effective for women-led businesses?	This question allows respondents to provide user-driven solutions, contributing to recommendations for industry stakeholders. It examines the hypothesis that tailored digital solutions enhance adoption and usage. The variables include recommended improvements (security, accessibility, affordability) (independent variables) and cashless system adoption and satisfaction (dependent variable).	GSMA (2020); IFC (2021)

Table 3.2: Sample interview questions categorized for business owners and financial service providers (Source: Created by Author)

Quantitative Instrument:
A structured survey questionnaire was created and distributed online using Google Forms to supplement the interviews and broaden the participant pool. The questionnaire was formulated using existing literature and insights gathered from pilot interviews. Key Features of the Questionnaire:

Type	Explanation
Structure	The survey included 45 items grouped into sections covering demographics, cashless adoption, benefits, security issues, institutional support, and business performance.
Question Types	A combination of Likert-scale items, multiple-choice questions, and open-ended responses.
Pre-testing	The instrument underwent pre-testing with five women entrepreneurs and was subsequently refined for clarity and usability.
Distribution and Access	Shared via professional networks, WhatsApp groups, and snowball sampling.

Table 3.3: Key Features of the Questionnaire (Source: Created by Author)

The instrument facilitated the collection of extensive empirical data, which was subsequently analyzed through Chi-Square tests, ANOVA, Pearson correlation, and logistic regression.

3.4 Population and Sample Description

The target population comprised women entrepreneurs in Gauteng who had adopted or were in the process of adopting cashless payment solutions. Blaxter, Hughes, and Tight (2010) clarify that purposive sampling allows researchers to intentionally select participants based on characteristics, such as gender, entrepreneurial engagement, and connection with digital financial systems in this study.

Participants were chosen from several business sectors, including retail, agribusiness, manufacturing, event management, consultancy, and beauty services. The cross-sector representation aimed to ensure that the findings would include diverse experiences and contextual realities across the cashless adoption spectrum.

The study utilized snowball sampling in conjunction with selective sampling to acquire additional participants. This method enabled the engagement of hard-to-reach individuals, attributed to the absence of a comprehensive and accessible registry of women-led SMEs utilizing cashless technologies. Snowball sampling, as described by Saunders and Lewis (2018), involves using initial participants to identify or recommend additional participants who meet the study's criteria. This technique worked well in this case because it used networks and community connections that women entrepreneurs already had. It made it possible to reach those who might not be reached through official channels or who labor in informal market settings.

Participants were recruited for the study through professional networks and small business associations, with invitations disseminated via an online Google Form. The inclusion criteria specified that participants must be women entrepreneurs located in Gauteng with experience in or consideration of cashless systems for their business operations.

The final sample consisted of 201 women entrepreneurs, providing a solid basis for both the qualitative and quantitative dimensions of the research. The participants included companies of different sizes, from small businesses to well-known SMEs, and they all had different levels of digital literacy, industry knowledge, and experience with financial technology.

This dual sampling method (purposive and snowball) ensured that all participants were directly relevant to the research aims, particularly the examination of cashless system benefits, adoption challenges, and digital security concerns. Additionally, by selecting individuals engaged with digital financial systems, the study obtained extensive, experience-based data to provide policy recommendations, technological improvements, and financial inclusion measures tailored for women entrepreneurs in developing countries.

Validity and Reliability of Data

To ensure the validity of data collection instruments, the quantitative survey and qualitative interview protocols were carefully mapped to the study's theoretical framework, incorporating constructs from the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and Digital Divide Theory. Content validity was strengthened through expert review and pilot testing with a subset of women entrepreneurs in Gauteng, leading to revisions for clarity and contextual relevance. Construct validity was maintained by adapting established scales from previous research. For reliability, quantitative data were analysed using IBM SPSS Statistics (v29), where internal consistency was measured using scale reliability testing procedures, confirming acceptable reliability coefficients across key constructs. In the qualitative phase, NVivo 14 software was used to code and manage interview data, enhancing credibility and dependability through transparent theme development, audit trails, and triangulation of themes with survey results. The use of SPSS and NVivo ensured rigorous, software-supported analysis, thereby enhancing the trustworthiness and consistency of findings across both strands of the mixed-methods design (Bazeley, & Jackson, 2013).

3.4.1 Demographic Characteristics of Participants Sampled

This section provides a detailed overview of the demographic characteristics of the 201 women entrepreneurs participating in the study. The selection and analysis of these demographic variables were considered crucial for understanding the diverse experiences, decision-making processes, and adoption behaviors associated with cashless payment systems in women-owned businesses. The demographic profile encompasses participants' industry sectors, educational qualifications, age categories, duration of business operations, business size, and the percentage of transactions executed via cashless systems. The identified characteristics reflect the socio-economic status of business owners and substantially influence their readiness and capacity to embrace technological innovations in payment systems.

In addition to sectorial classification, demographic variables, including education, age, years in operation, business size, and cashless transaction percentages, provide significant context.

Education Level: Higher education levels frequently align with enhanced digital literacy and an increased propensity to embrace new financial technologies. This pie chart illustrates the highest level of education attained by the 201 women entrepreneurs surveyed. Understanding education levels is essential for interpreting digital literacy, readiness for technological adoption (such as cashless systems), and potential for scaling businesses.

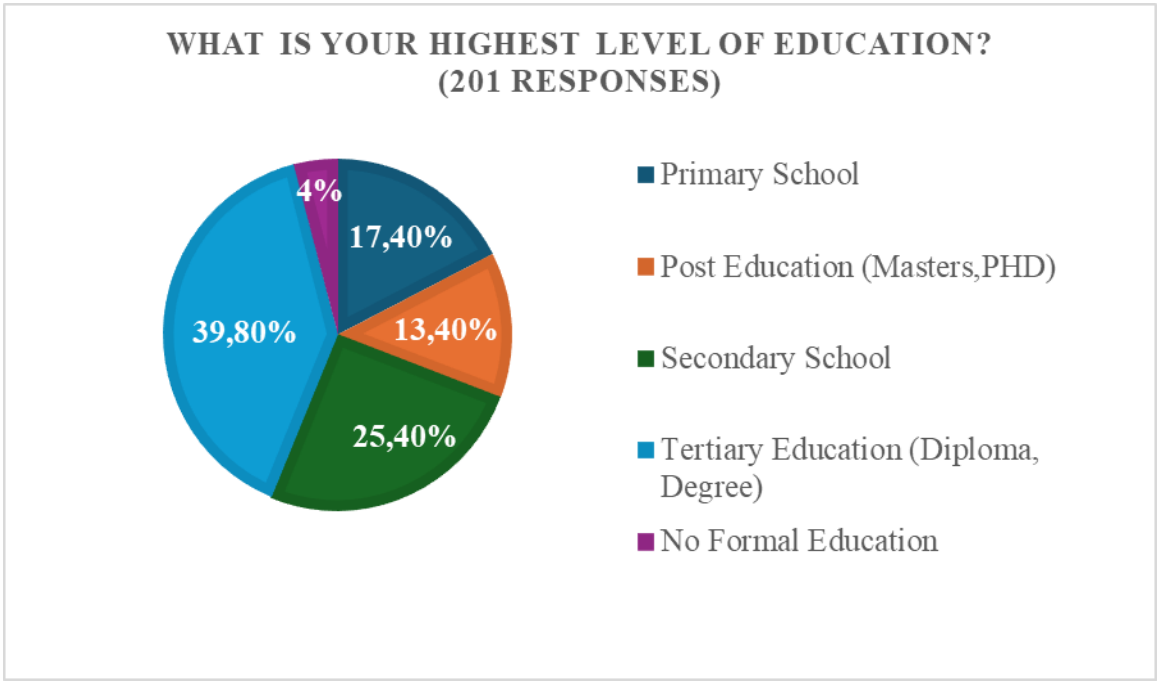


Figure 3.3: Analysis Summary for Educational Background of Respondents (n = 201) (Source: Created by Author)

Age Group: Younger entrepreneurs generally exhibit a higher level of comfort and adaptability with digital tools, whereas older age groups tend to approach these technologies with more caution and may need extra assistance. This pie chart presents the age breakdown of survey participants, giving insights into generational representation in entrepreneurship and potential differences in digital engagement, such as with cashless systems.

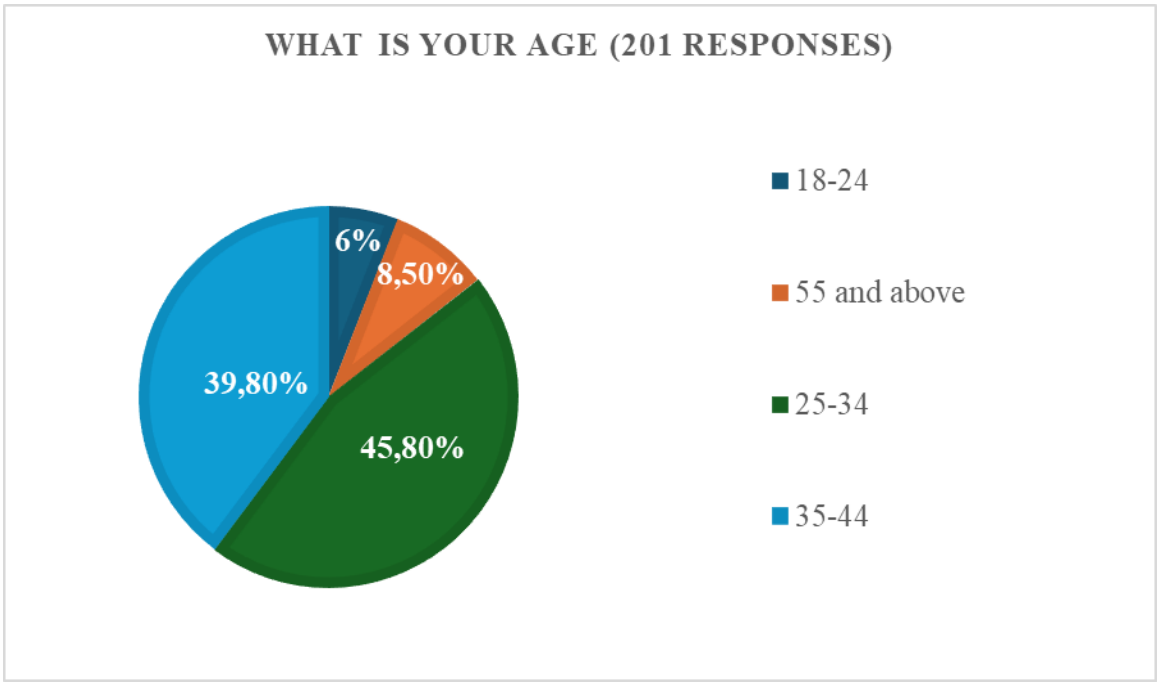


Figure 3.4: Analysis Summary for Age Distribution of Women Entrepreneurs (n = 201) (Source: Created by Author)

Years in Operation: Established businesses often exhibit a reluctance to embrace change, influenced by their existing systems and a tendency to steer clear of risk. On the other hand, emerging enterprises demonstrate greater adaptability in integrating new technologies. This chart reflects the operational maturity of businesses owned by women entrepreneurs in Gauteng. Understanding how long businesses active offers insight into their level of experience, stability, and readiness have been to adopt innovations such as cashless payment systems.

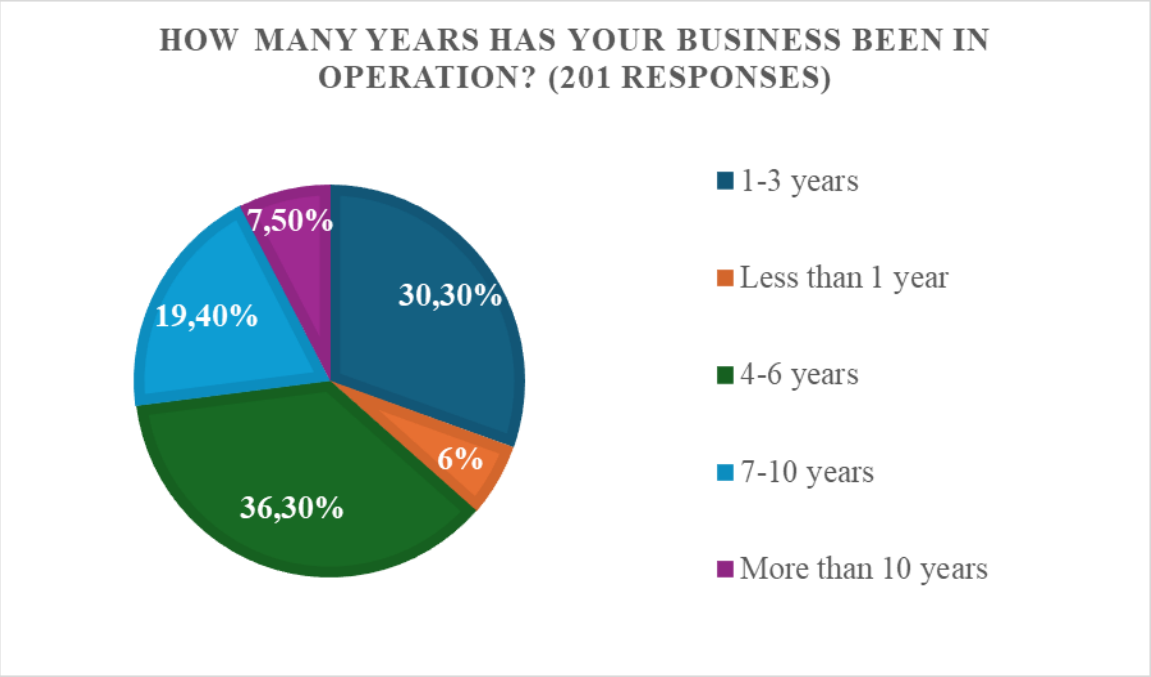


Figure 3.5: Analysis Summary for the Years in Business Operation (n = 201)

Business Size: Micro-enterprises often encounter limitations in financial resources or capabilities while trying to implement digital systems, especially when compared to small or medium enterprises. This chart provides insight into the employment scale of women-owned businesses in Gauteng. Business size, measured by the number of employees, is a key factor influencing operational capacity, digital infrastructure readiness, and adoption of technologies like cashless payment systems.

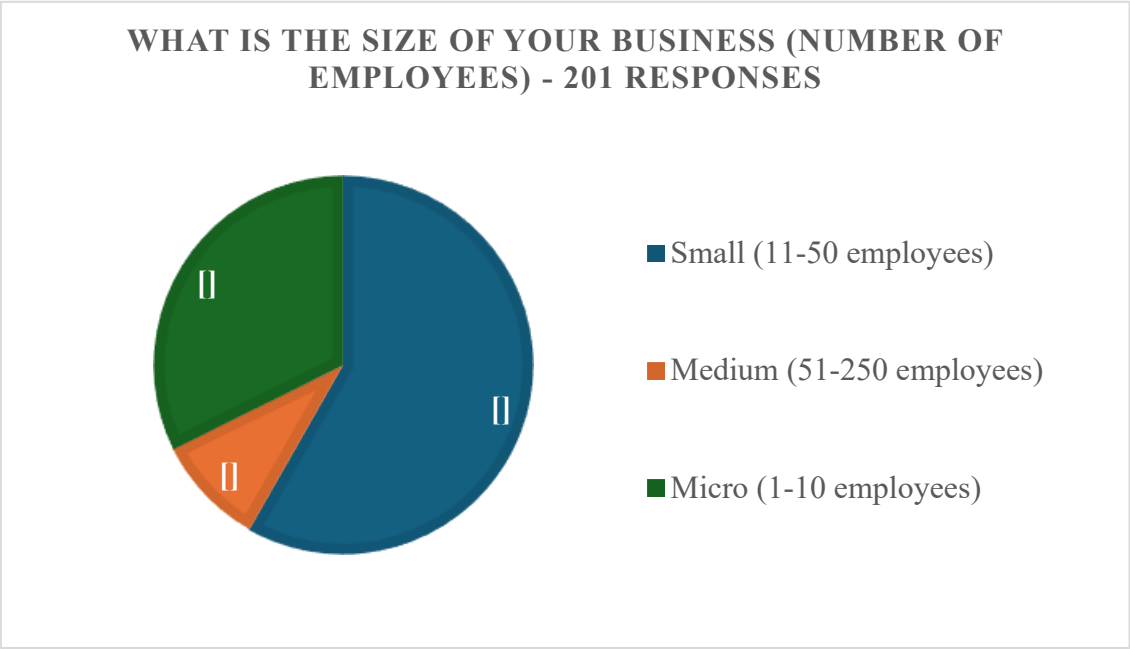


Figure 3.6: Analysis Summary for the size of the business (n = 201) (Source: Created by Author)

Percentage of Cashless Transactions: This metric serves as a clear indicator of digital integration and operational efficiency, reflecting the extent to which a business has progressed in its digital transformation journey. This combination of demographic and sectorial insights offers a detailed examination of the experiences, perceptions, and implementations of cashless systems among women entrepreneurs in Gauteng. This chart reveals the extent to which women-led businesses in Gauteng have adopted cashless transaction methods. The percentage of transactions conducted without physical cash reflects digital integration, customer preferences, and operational digital maturity.

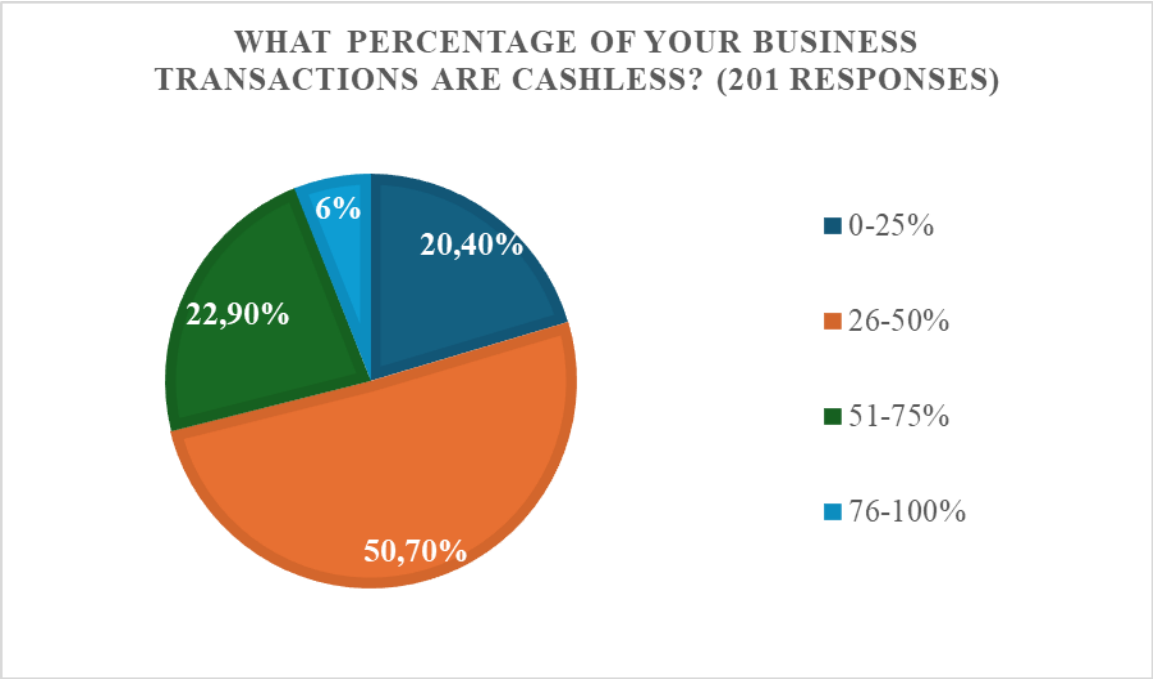


Figure 3.7: Analysis Summary for Percentage of Cashless Business Transactions (n = 201) (Source: Created by Author)

3.5 Data Analysis Techniques and Tools

This research investigated the implementation of cashless strategies by women-led enterprises in Gauteng using a mixed-methods approach that integrated qualitative and quantitative analyses. This dual methodology facilitated a thorough understanding of user experiences and adoption patterns.

3.5.1 Qualitative Analysis: Thematic Analysis Using NVivo

Qualitative data obtained from semi-structured interviews were subjected to thematic analysis using NVivo. This allowed for efficient coding of transcripts and identification of recurring themes, patterns, and relationships in the participants' responses. NVivo helped us sort through data, code it more accurately, and look at qualitative data (Braun & Clarke, 2006; Creswell & Poth, 2018). The app made it easier to show how different themes are connected. This made it evident how people's real-life experiences affect their trust, usefulness, and the presence of social and cultural barriers.

3.5.2 Quantitative Analysis: Statistical Testing Using SPSS

A quantitative analysis was conducted on data from 201 respondents using SPSS software. The following statistical techniques were used to evaluate the dataset derived from 201 structured survey responses:

1. Pearson's Correlation Coefficient (r)

Purpose: To examine the **strength and direction** of linear relationships between continuous variables such as cashless adoption and revenue growth.

- **Example**: Investigating if increased cashless usage is positively correlated with higher levels of customer retention or operational efficiency.
- **Outcome**: Provides an 'r' value (ranging from -1 to +1) with corresponding p-values to test significance.

2. One-Way ANOVA (Analysis of Variance)

Purpose: To determine whether there are statistically significant **differences in means** between more than two independent groups (e.g., age groups, education levels) in relation to outcomes like cashless adoption or perceived benefits.

- **Example**: Comparing perceived operational efficiency across different levels of educational attainment.
- **Assumption Tested**: Homogeneity of variances, normality of residuals.

3. Chi-Square Test of Independence

Purpose: To assess whether there is a **significant association between two categorical variables** (e.g., education level and adoption level, or business type and digital literacy).

- **Example**: Testing if digital literacy level is dependent on the sector of business.
- **Value Added**: Highlights dependencies between nominal or ordinal categories in the sample.

4. Binary Logistic Regression Analysis

Purpose: To **predict the likelihood of high adoption (≥75%)** of cashless systems based on multiple predictor variables such as age, education, years in business, etc.

- **Example**: Estimating the odds that entrepreneurs with tertiary education adopt cashless technologies compared to those with only secondary education.
- **Output Includes**:
  - Odds ratios (OR)
  - p-values for significance
  - Model fit indicators (Nagelkerke R^2, Hosmer-Lemeshow test (2013)

Quantitative Tools and Software

The data was analyzed using **SPSS** (Statistical Package for the Social Sciences), which provided a reliable platform for:

- Running correlation matrices
- Conducting regression models
- Performing ANOVA and Chi-Square tests
- Generating frequency distributions and cross-tabulations

All variables were coded and entered into SPSS following standard procedures, ensuring accuracy, reproducibility, and transparency.

3.6 Ethical considerations

This section describes the ethical and methodological standards that were used in this study to protect participants, make sure the research was valid, and keep the process honest. In accordance with the guidelines established by Creswell and Poth (2018) and the ethical frameworks pertinent to qualitative and mixed-methods research, various strategies were implemented to maintain rigorous ethical standards throughout the research process.

The following ethical considerations were considered:

- **Informed Consent**
  - All participants received detailed information about the research purpose, data collection tools, and their rights.
  - Participation was voluntary, and individuals were informed of their right to withdraw at any stage without consequences.
  - Written consent was obtained from all participants prior to involvement.
  - Technical terms were simplified to enhance understanding.

- **Confidentiality and Anonymity**
  - All participant data was anonymised; names and identifiable details were replaced with unique codes.
  - During transcription, any potentially identifying information was removed.
  - Participant identities remained confidential throughout analysis and reporting.

- **Data Security**
  - Data was stored in encrypted digital formats, accessible only to the primary researcher.
  - Hard copies (if any) were locked securely; all digital files were password protected.
  - These measures ensured long-term privacy and compliance with data protection standards.

3.7 Research Design Limitations

This research aims to provide available insights into the benefits and challenges of cashless systems for women entrepreneurs in rapidly developing economies. The following are some of the limitations:

- **Self-Reported Data Bias**
  The research primarily relied on self-reported data collected through surveys and interviews. As such, participants' responses may be influenced by social desirability bias, recall inaccuracies, or subjective interpretations, potentially affecting the reliability of the findings.
- **Cross-Sectional Design**
  The study adopted a cross-sectional rather than longitudinal design. This limits the ability to establish causal relationships between variables such as cashless adoption and revenue growth over time.
- **Sample Representativeness**
  Although the sample included a diverse group of women entrepreneurs across different sectors, it was limited to Gauteng Province. The findings may not be generalisable to other provinces or rural areas in South Africa with different infrastructure, socio-economic conditions, or digital literacy levels.
- **Quantitative Dominance in Variable Relationships**
  While the mixed-methods approach offered depth and context, the quantitative component dominated the measurement of relationships between variables. This may have underrepresented nuanced qualitative insights, such as emotional or cultural factors influencing digital adoption.
- **Limited Control of External Variables**
  Although control variables like education and digital literacy were included, other external factors—such as network infrastructure, cost of digital devices, or government policy—were not comprehensively controlled for, possibly influencing outcomes indirectly.

Hypotheses Development

Based on the theoretical frameworks above, this study formulates 24 hypotheses to be tested in Chapter 4 using Pearson correlation, ANOVA, Chi-square, and regression models. The hypotheses are organized around the central variable of Cashless Adoption and its expected influence on or relationship with:

- Business Outcomes: Revenue Growth, Operational Efficiency, Financial Performance, Customer Retention, and Satisfaction
- Technology Enablers: Perceived Usefulness, Ease of Use, Digital Literacy, Education Level, Security Concerns, and Business Size
  Perceived Benefits: Improved tracking, reduced theft risk, loyalty programs, etc.

H#	Hypothesized Relationship	Null Hypothesis (H_0)	Alternative Hypothesis (H_1)	Theoretical Link
H_1	Cashless Adoption → Revenue Growth	No significant effect	Significant effect	TAM / UTAUT
H_2	Cashless Adoption → Customer Retention	No significant relationship	Significant relationship	TAM
H_3	Cashless Adoption → Operational Efficiency	Not significantly influences	Significantly enhances	TAM / UTAUT
H_4	Cashless Adoption → Perceived Benefits	Not positively associated	Significantly associated	TAM
H_5	Cashless Adoption → Security Concerns	Not significantly related	Significantly related	UTAUT / Digital Divide
H_6	Cashless Adoption → Digital Literacy	Not significantly associated	Significantly associated	UTAUT / Digital Divide
H_7	Cashless Adoption → Education Level	No significant relationship	Significant relationship	Digital Divide
H_8	Cashless Adoption → Perceived Usefulness	No significant influence	Significant influence	TAM
H_9	Cashless Adoption → Perceived Ease of Use	No significant effect	Significant positive effect	TAM
H_{10}	Cashless Adoption → Financial Performance	Not significantly related	Significantly improves	TAM
H_{11}	Revenue Growth → Customer Retention	No significant relationship	Significant relationship	UTAUT
H_{12}	Revenue Growth → Operational Efficiency	Not significantly associated	Significantly associated	UTAUT
H_{13}	Revenue Growth → Perceived Benefits	No significant relationship	Significant relationship	TAM

H_{14}	Revenue Growth → Security Concerns	No significant relationship	Significant association	Digital Divide
H_{15}	Revenue Growth → Digital Literacy	Not significantly related	Significant correlation	Digital Divide
H_{16}	Revenue Growth → Education Level	No significant relationship	Significant relationship	Digital Divide
H_{17}	Customer Retention → Operational Efficiency	Not significantly related	Significant relationship	TAM
H_{18}	Customer Retention → Perceived Benefits	No significant association	Significant association	TAM
H_{19}	Customer Retention → Security Concerns	Not significantly related	Significant association	UTAUT
H_{20}	Customer Retention → Digital Literacy	Not significantly associated	Significant association	Digital Divide
H_{21}	Customer Retention → Education Level	No significant relationship	Significant relationship	Digital Divide
H_{22}	Perceived Usefulness → Financial Performance	Not significantly associated	Significant effect	TAM
H_{23}	Perceived Ease of Use → Customer Satisfaction	No significant association	Significant positive association	TAM
H_{24}	Perceived Security → Cashless Adoption	Not significantly related	Significant association	UTAUT

Table 3.4 Summary Table of Hypotheses to Be Tested

The hypotheses outlined above serve as the foundation for Chapter 4, where they will be empirically tested using a combination of:

- Pearson Correlation for linear relationships
- One-Way ANOVA for group differences across adoption levels
- Chi-Square Tests for associations between categorical variables
- Multiple Regression for predictors of adoption
- Logistic Regression for high vs. low adopters
- OLS Diagnostic Tests to validate model robustness

These quantitative methods will help validate the theoretical propositions derived from TAM, UTAUT, and Digital Divide frameworks and draw practical implications for digital inclusion and policy in South Africa.

3.8 Conclusion

This chapter provides a comprehensive analysis of the mixed-method research methodology employed in this study, integrating both qualitative and quantitative approaches. The focus was on looking at the pros and cons of cashless systems for women business owners in Gauteng Province, South Africa. This chapter brings together the rationale for the design, the ways data was acquired, the tools used, the sampling techniques, the analysis methods, and the ethical considerations that all played a role in the study.

The qualitative dimension, grounded in Alfred Schutz's social phenomenology, enabled a deep understanding of participants' genuine experiences. Semi-structured interviews yielded comprehensive insights into digital trust, usability, and security concerns. The basic interpretative qualitative design enabled flexible research that considered contextual factors. Comprehensive fieldwork, coupled with sustained engagement and reflexivity, enhanced the reliability of the data. Raun and Clarke (2006) and Bazeley, & Jackson, (2013). advocated for the application of NVivo in thematic analysis to aid researchers in systematically identifying new themes from participants' narratives.

A structured questionnaire was utilized in the quantitative strand, involving 201 respondents. Participants from various sectors were engaged through purposive and snowball sampling methods. The quantitative strand employed a structured questionnaire with 201 respondents. Through purposive and snowball sampling, participants across sectors were engaged. Analytical instruments such as Chi-Square, ANOVA, correlation, and logistic regression in SPSS were employed to validate patterns and correlations. A pilot's study facilitated the refinement of the instruments and ensured accuracy in the questions and format. The integration of quantitative methods and qualitative insights enhanced the conclusions drawn. Ethical integrity was a cornerstone of the study. Informed consent, confidentiality, and participant anonymity were maintained throughout. Institutional review board approval was secured, and culturally appropriate procedures were followed to build trust and secure candid responses.

The study, while geographically limited to Gauteng, offers insights that are applicable to broader Sub-Saharan contexts. The integrated methodology improved the generalizability of quantitative results and the contextual depth of qualitative insights. The findings are both academically rigorous and practically relevant for digital financial service providers, policymakers, and women entrepreneurs operating within the cashless economy.

This chapter shows that a study approach that is well organized and morally good is necessary to get results that are valuable, trustworthy, and helpful. The mixed-methods approach furnished the necessary depth, breadth, and empirical triangulation to examine the intricate socio-technical milieu of women entrepreneurs and digital funding in South Africa.

CHAPTER IV:
RESULTS

This chapter represents the results of the survey conducted to identify the complex factors, challenges, and experiences associated with the implementation of cashless payment systems. The research's initial phase employed qualitative methods, utilizing a comprehensive dataset of open-ended responses gathered from women entrepreneurs across various sectors. The findings underscore the complex interconnections between technological, socio-economic, and cultural factors that shape digital financial behaviors. Customized policy interventions are essential, considering factors such as business size, sectoral dynamics, and educational attainment, to promote inclusive digital ecosystems (UNDP, 2024; Mahajan, et al 2021).

4.1 Phase 1 Qualitative Study

The Phase I qualitative investigate aimed at having in depth semi- interviews with woman working in different industry sectors of different groups and with different exposure experience on cashless systems. 42 female entrepreneurs participated on the semi - structured interviews to explore questions such as security concerns, adoption challenges, financial performance, customer satisfaction, and ecosystem support. Thematic codes were applied using NVivo for qualitative patterns which resulted into 8 themes section presented the overarching findings generated by developing thematic.

In the phase 1 qualitative study semi-structured interview were schedules with working woman in different ages and sectors to study the following:

- The influence of cashless systems on business operations, highlighting transaction efficiency, record keeping and customer interaction.
- To investigate fraud, cyber-attacks and data privacy concerns which are potential barriers to cashless adoption.
- The evaluation of financial impact of digital payments, testing the hypothesis that cashless systems enhance revenue and customer retention.
- To look at the main challenges that female entrepreneurs face in accessing and maintaining digital payment infrastructure in terms of cost and technology.
- The policy suggestions that can enhance financial inclusion.
- Specific security risks that female entrepreneurs have encountered whilst using cashless systems
- The effect of cashless systems on business revenue, customer base and profitability
- To assess how woman entrepreneurs safeguard their digital transaction in terms of tools that they use.
- To assess how have financial institutions played a role in cashless system in terms of support

The themes identified in the study represent conceptual findings and are directly aligned with the research objectives as follows:

- To assess what are the benefits of cashless system
- To analyze what are the security challenges that women in Gauteng Province are facing
- To evaluate if cashless system has impact on business performance
- To propose inclusive growth and equity policy & ecosystems could be developed to foster adoption of cashless system

The qualitative data were systematically organised into seven main topics through thematic analysis, each accompanied by relevant sub-themes. Themes identified constitute the central conceptual findings and are directly aligned with the research objective: to assess the adoption and impact of cashless systems among women entrepreneurs in Gauteng, focusing on security perceptions, benefits, challenges, and enabling factors. The qualitative narratives provide insight into the lived experiences of participants and establish a conceptual basis for future empirical investigation.

That summarizing conceptual category and clarifying the interactions among operational issues, cybersecurity practices, market possibilities, and structural facilitators. The following are the themes found:

4.1.1 Qualitative insights

Qualitative insights further surfaced seven interlinked themes:

- Operational Efficiency: Examining the impact of cashless systems on transaction speed and accuracy.
- Financial Oversight and Accuracy: Improving bookkeeping and audit readiness through reliable digital documentation.
- Customer Satisfaction and Retention: Improving consumer trust and loyalty by implementing secure and convenient payment options.
- Cybersecurity Awareness & Practice: Analyzing significant gaps in digital security knowledge among women entrepreneurs.
- Business Expansion & Market Entry: Facilitating the scaling of operations and providing access to both regional and global markets.
- Institutional & Ecosystem Support: Recognizing the critical roles played by banks, fintech, and government in enabling adoption.
- Gendered Barriers & Empowerment: Examining the distinct challenges women face due to literacy disparities, cultural expectations, and restricted access to digital resources.
- Cybersecurity and Empowerment examine how people experience, interpret, and navigate the digital world, especially in relation to safety, autonomy, and control over information.

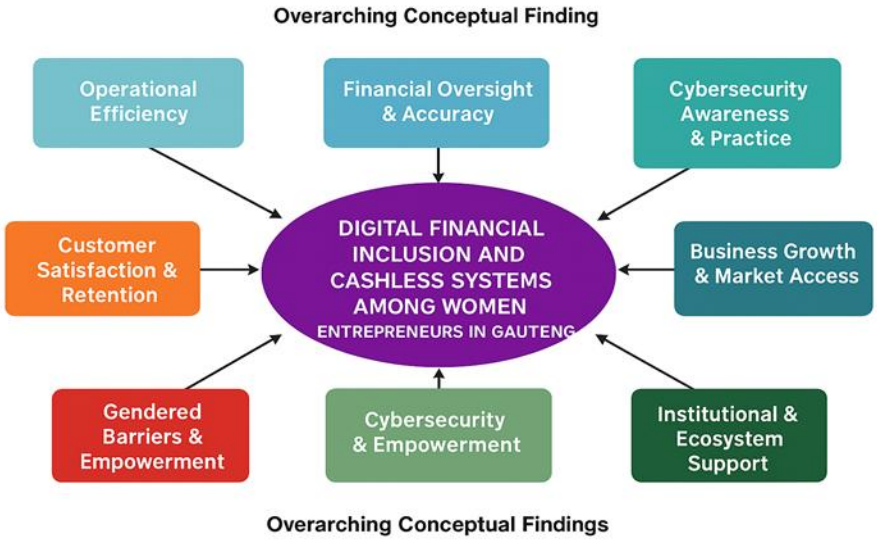


Figure 4.1: Thematic Map for the Overarching Conceptual Finding (Source: Created by Author 2025)

In accordance with the thematic interpretation, the subsequent phase of the study employed quantitative methods to validate and generalize the observed patterns. The study employed a structured survey targeting 201 women entrepreneurs to gather quantifiable data regarding digital payment practices, security concerns, access to infrastructure, and engagement with institutions.

Inferential statistical methods, including Chi-Square Tests of Independence, ANOVA, Correlation Analysis, and Binary Logistic Regression, were utilized to assess the significance and strength of relationships between variables. The logistic regression model indicated that technology sector companies were 3.6 times more likely to adopt cashless systems compared to those in agriculture, with medium-sized enterprises exhibiting moderate-to-high digital literacy showing the greatest likelihood of adoption. The Chi-Square test indicated no statistically significant relationship between business size and the selection of cashless payment methods ($p = 0.977$), suggesting consistency in platform usage across different enterprise scales. The empirical results corroborate the thematic insights and validate previous global findings (e.g., FinMark Trust (2022) World Bank (2021), Suseno, & Abbott, (2021), emphasizing the importance of digital capacity, sectorial affiliation, and institutional support in facilitating fintech adoption. The qualitative and quantitative findings collectively offer a comprehensive overview of the cashless ecosystem within women-owned enterprises in Gauteng.

4.1.2 Thematic Interpretation of Qualitative Findings

This chapter presents a thematic analysis of qualitative findings, highlighting the complex relationships among individual digital capabilities, systemic enablers, and perceived value that affect the adoption and outcomes of cashless systems for women entrepreneurs in Gauteng.

The findings reveal a range of perspectives among participants, offering a comprehensive insight into their experiences, attitudes, and approaches to digital financial tools. The developed thematic framework is structured around seven core themes, providing a comprehensive perspective for examining the broader implications of digital transformation in women-led enterprises. Themes were developed through an iterative coding process and supported by anonymized participant quotes. Each theme examines a specific yet interconnected facet of digital financial inclusion, highlighting the primary facilitators and barriers that women entrepreneurs encounter in the adoption of cashless systems.

This thematic structure highlights the complex interplay between individual digital capability, systemic support, and perceived value that shapes the adoption of cashless systems. While benefits are evident, a targeted, inclusive approach is required to improve trust, digital capacity, and access for women entrepreneurs in Gauteng.

The results, derived from an iterative thematic analysis, represent the views, experiences, and perspectives of women entrepreneurs in Gauteng concerning the adoption and effects of cashless payment systems. Data were systematically gathered via semi-structured interviews and analysed following the 'Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines (Tong, et al., 2007) (refer to Appendix 1). The guidelines promoted methodological transparency and enhanced the credibility of the analytical procedures employed. Selected anonymised quotes from participants are incorporated throughout the narratives to substantiate key findings. Participant identities, business names, and specific locations are obscured due to ethical considerations and confidentiality agreements. The use of aliases, industry sectors, and demographic metrics was noted. Protocols were established to reduce the likelihood of unintentional exposure of personal or business-related information. The findings are structured systematically, starting with the main themes and subsequently addressing the secondary themes and sub-themes.

Every concept is supported by relevant examples and direct quotations, presented clearly and logically, as highlighted by Raun, and Clarke (2006). This method ensures accuracy and depth in articulating the perspectives of participants. This section includes a thorough evaluation and discussion of the results. The study requires careful interpretation, evaluation of the implications of the findings, and situating them within the broader academic context. The results are examined within the framework of existing literature concerning digital financial inclusion, fintech adoption, gendered entrepreneurship, and cybersecurity awareness.

This study underscores its contributions to existing literature by identifying areas of consensus and contention, along with potential avenues for further research. In the fourth chapter, we examine the substantial ramifications of the discovery, including both theoretical and practical dimensions of the issue.

This emphasises many points of view on electronic systems, the challenges faced by female entrepreneurs, and the required infrastructure to increase financial service availability. The present digital financial systems highlight the necessity of greater research and practical solutions since their design, management, and general performance indicate some constraints. One should look at the results more closely.

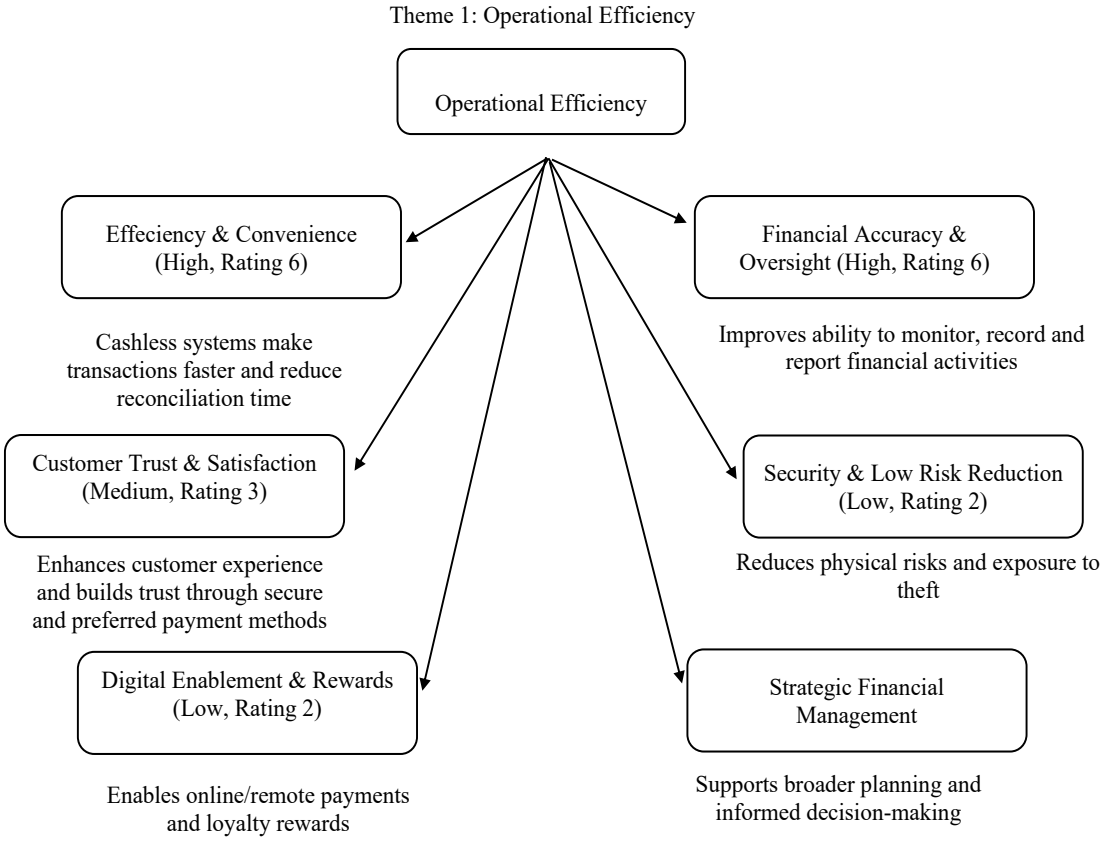


Figure 4.2: Operational Efficiency (Source: Created by Author,2025)

The theme examines how cashless systems enhance the speed, accuracy, and automation of routine business transactions. Participants identified operational efficiency as a critical factor influencing the adoption of cashless systems. Accelerating transaction processing, minimising errors, and automating routine accounting functions are essential for improving workflow efficiency. Operational efficiency is essential for businesses aiming to expand beyond Gauteng into national or regional markets Terms like 'efficiency and convenience,' 'strategic financial management,' and 'error reduction' suggest a quantifiable impact on productivity. Digital payments mitigate physical risks linked to cash handling, including theft, counterfeit currency, and disruptions in cash flow caused by banking delays. The benefits were especially significant for microenterprises located in high-crime regions. A retail participant noted: "Before implementing a POS system, I incurred a loss of approximately R20,000 due to a robbery." This aligns with findings from UN Women (2023), which advocate for women-centric fintech solutions as enablers of safer and more sustainable business practices. Transitioning to a cashless system has enhanced my sense of security and allows for immediate tracking of all transactions. This is consistent with findings from UN Women (2023), which support women-centric fintech solutions as facilitators of safer and more sustainable business practices.

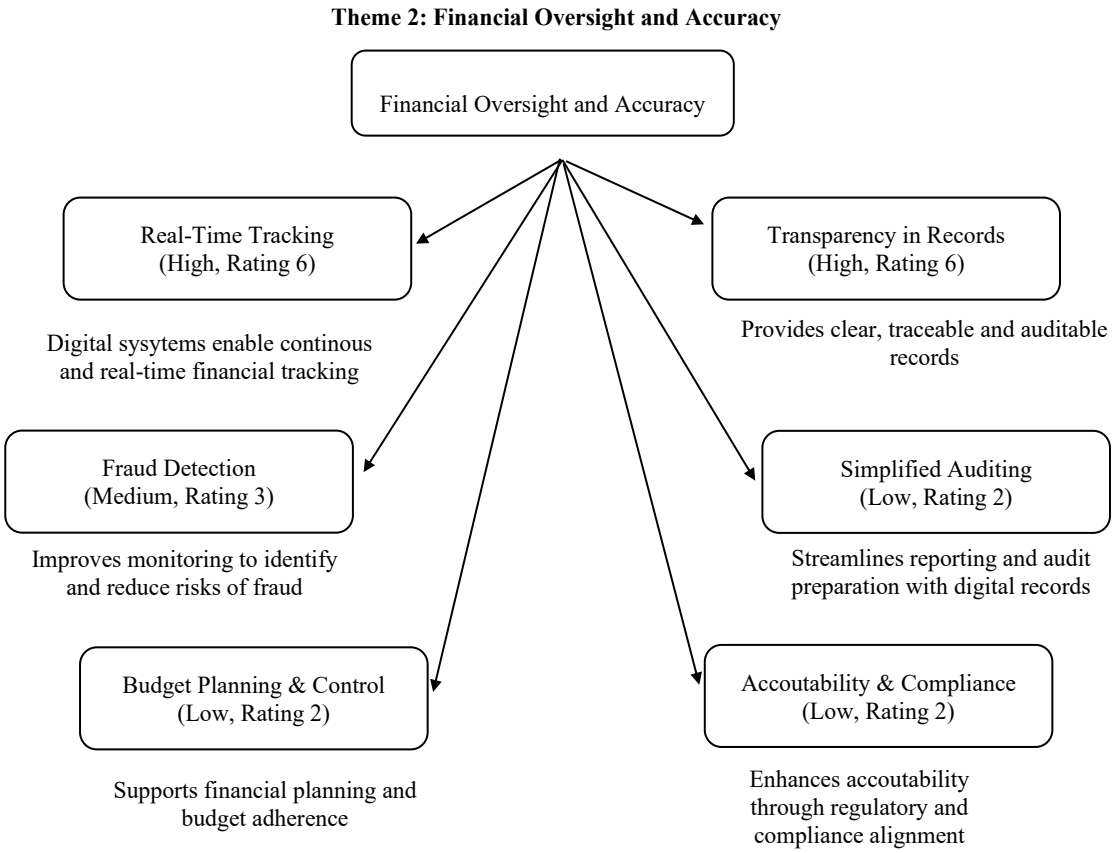


Figure 4.3: Financial Oversight & Accuracy (Source: Created by Author,2025)

The theme explores how digital tools support real-time monitoring, budget tracking, and accountability through traceable records. Digital solutions help financial control to be more effective and simplify record-keeping techniques. Automated receipts, POS dashboards, and mobile banking apps were acknowledged by participants as truly helping businesses track sales trends, lower leakage, and improve cash flow management accuracy. The sub-themes of financial transparency and digital tracking were prominently identified. Entrepreneurs reported enhanced confidence in fulfilling tax obligations because of having well-organised records. The significance of digital audit-readiness and traceability was particularly evident among women pursuing external funding or partnerships.

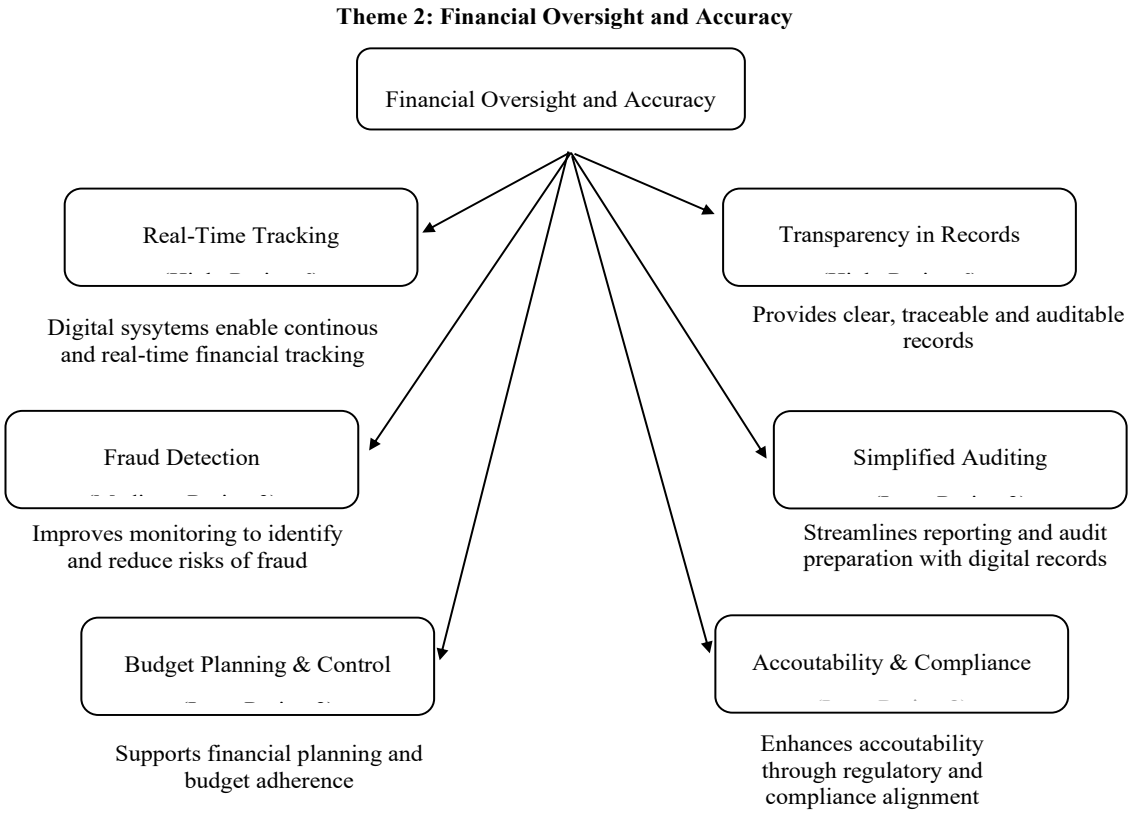


Figure 4.4: Customer Satisfaction and Retention (Source: Created by Author,2025)

The theme investigates how digital payments foster customer trust, improve convenience, and promote loyalty. Cashless systems have been acknowledged to enhance customer satisfaction. Participants reported that the availability of diverse digital payment methods, including QR codes and card readers, resulted in reduced wait times and increased customer trust. Digital readiness correlates with convenience, customer loyalty, and brand perception. Entrepreneurs in service sectors, such as beauty salons and retail, observed that digital payments improved professional image and customer retention. Multiple studies link payment efficiency to improved customer flow and higher rates of repeat purchases. This topic examined interactions among corporate loyalty, convenience, and trust. In urban environments where digital payments are becoming standard, businesses that do not provide cashless options may alienate their customers. Van der Cruijsen, & Broekhoff (2024) found that customer satisfaction increases when SMEs provide multiple payment options, with digital payments regarded as more secure and hygienic, a trend that was accelerated during the pandemic.

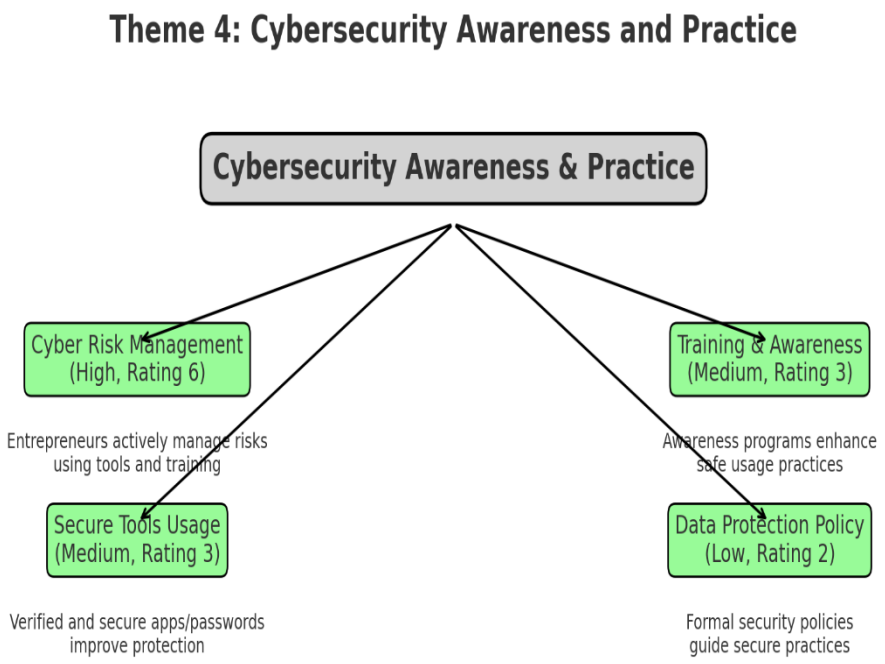


Figure 4.5: Cybersecurity Awareness and Practice (Source: Created by Author,2025)

The theme analyses how women entrepreneurs manage cyber risks, increase awareness, and apply protective digital strategies. A recurring concern across interviews was digital security. Several entrepreneurs have experienced fraud, unauthorised access, or phishing scams. The codes 'risk management,' firewall use, password hygiene, and 'staff training' were prominent. The interviews clearly show a tendency in digital security. Many of the executives of the organisation have participated in phishing campaigns, unethical behaviour, or illegal access. Staff education, password management control, firewall building, and risk reduction strategy development include key elements. Some businesses implemented robust practices, including two-factor authentication and secure application usage, while others acknowledged deficiencies in their understanding. The disparity highlights the necessity for enhancing digital risk literacy capabilities. Respondents indicated a preference for training on cybersecurity and secure platform usage provided by the institution.

Theme 5: Business Growth and Market Access

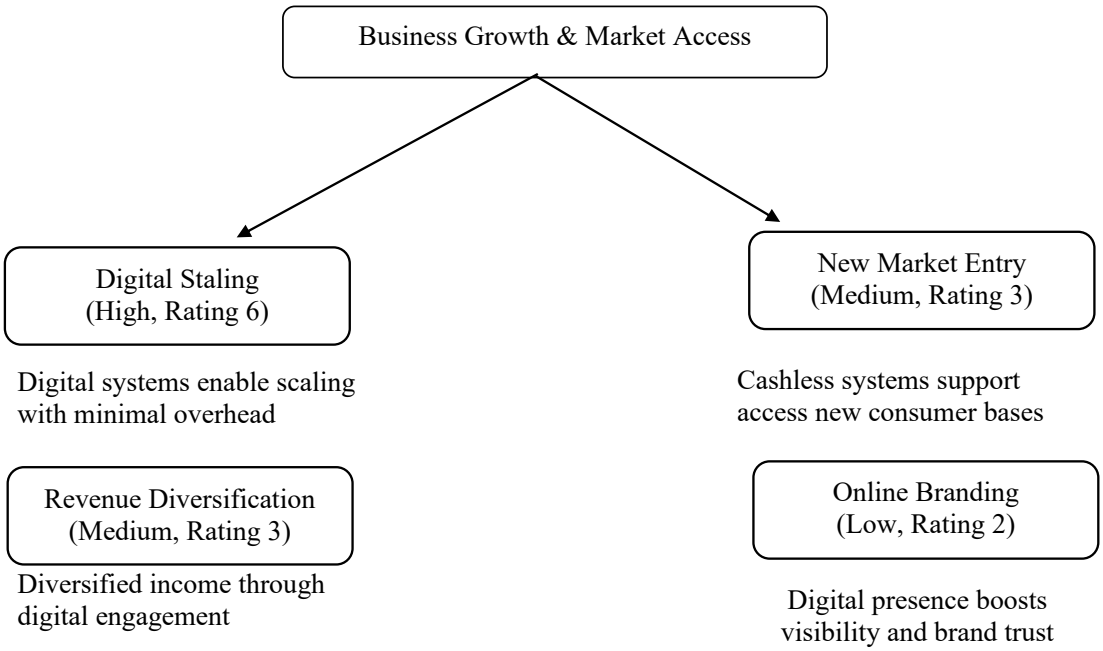


Figure 4.6: Business Growth and Market Access (Source: Created by Author, 2025)

The theme assesses how digital platforms enable entrepreneurs to scale, enter new markets, and diversify revenue streams. Many respondents linked the adoption of cashless systems to the expansion of their businesses. The ability to operate online, process remote payments, and create a digital brand was considered transformative. Terms such as 'scaling,' 'new market entry,' and 'digital presence' reflect an evolving entrepreneurial strategy centred on technology. Digital platforms allow entrepreneurs to reach customers outside their local geographic limits. This was particularly beneficial during and after the COVID-19 restrictions. Participants discussed the use of social media and mobile platforms to improve visibility and diversify income streams. A participant in the technology sector stated: The incorporation of QR code payments and online gateways has led to a 35% rise in repeat purchases, especially among younger consumers who prefer cashless methods. This aligns with the Technology Acceptance Model, indicating that perceived usefulness is a crucial predictor of adoption. Entrepreneurs viewed cashless systems not merely as payment methods but as catalysts for revenue diversification and business expansion.

Theme 6: Institutional and Ecosystem support

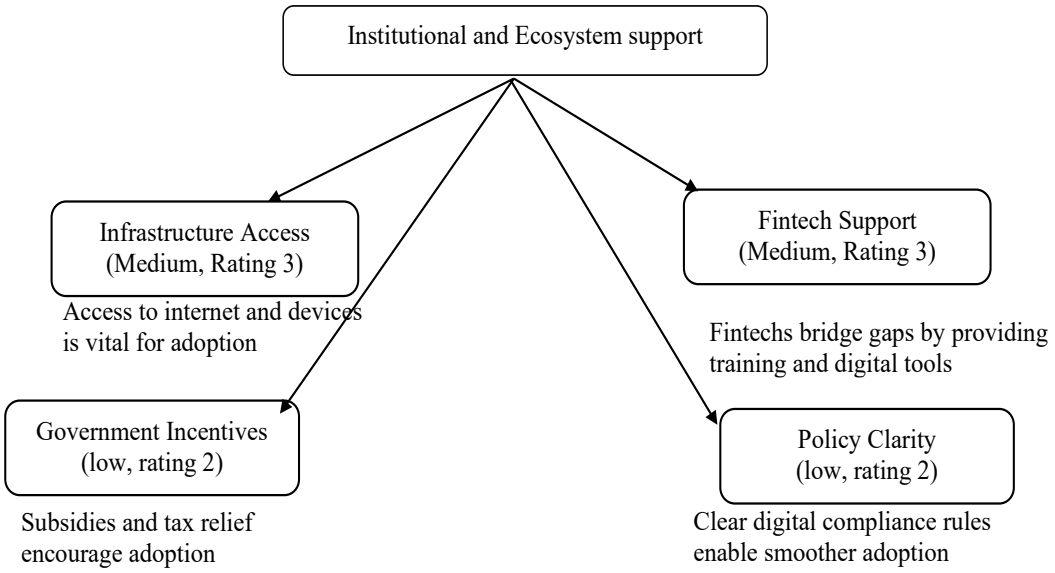


Figure 4.7: Institutional and Ecosystem Support (Source: Created by Author,2025)

The theme reviews the role of banks, fintechs, and the government in providing infrastructure, tools, and policies for adoption. The roles of financial institutions, technology providers, and government were pivotal in shaping adoption trajectories. Among the main challenges participants pointed out were infrastructure problems, including poor point-of-sale systems and inconsistent internet access. Acknowledged as positive are government incentives, such as tax breaks and fintech support projects. Terms like 'institutional trust,' policy clarity,' and 'fintech integration' indicated the extent to which the ecosystem supported or obstructed digital inclusion. The theme highlighted that, in the absence of systemic support, even motivated adopters may continue to experience digital marginalisation.

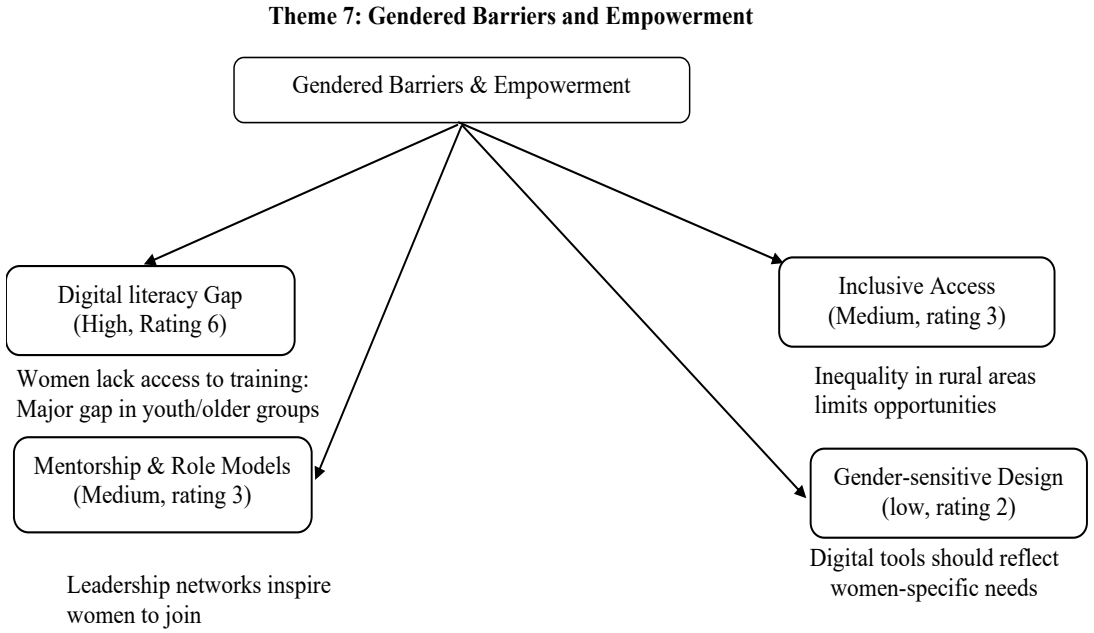


Figure 4.8: Gendered Barriers and Empowerment (Source: Created by Author,2025)

The theme highlights the challenge unique to women in digital adoption and the importance of inclusive, empowering digital policies. Particularly difficult for women were identified to be challenges. The shift to digital transactions among women entrepreneurs signifies both a technological advancement and a socio-cultural evolution. Cashless systems enhance privacy in financial management, allowing women to exercise greater control over their businesses' income and expenditures. This empowerment outcome corresponds with SDG 5 (Gender Equality) and SDG 8 (Decent Work and Economic Growth), as digital inclusion improves economic participation and reduces gender-specific financial vulnerabilities. This is consistent with the Digital Divide Theory (Norris, 2001), highlighting that equitable access to technology can reduce structural inequalities.

Women in rural areas or with limited educational backgrounds often face challenges in achieving digital literacy. Terms like 'digital skills training,' 'accessibility,' and 'mentorship' were frequently observed. Participants reported a lack of tailored resources for women, an insufficient number of female mentors, and diminished confidence in the use of financial technologies. The importance of inclusive design, community-based training, and targeted outreach was highlighted. Digital inclusion is recognised as both a technical concern and a fundamentally social and structural issue.

4.2 Design from qualitative insight

The conceptual framework visually represents how various adoption enablers and barriers affect the positive outcomes of cashless systems for women-owned enterprises. The framework synthesizes multiple variables into three categories: Adoption/Enablers, Barriers, and Positive Outcomes. Enablers include supportive policies, cybersecurity infrastructure, and reduced costs. Barriers reflect digital divides, platform-related costs, and educational disparities. The outcomes focus on performance, inclusion, access, and empowerment.

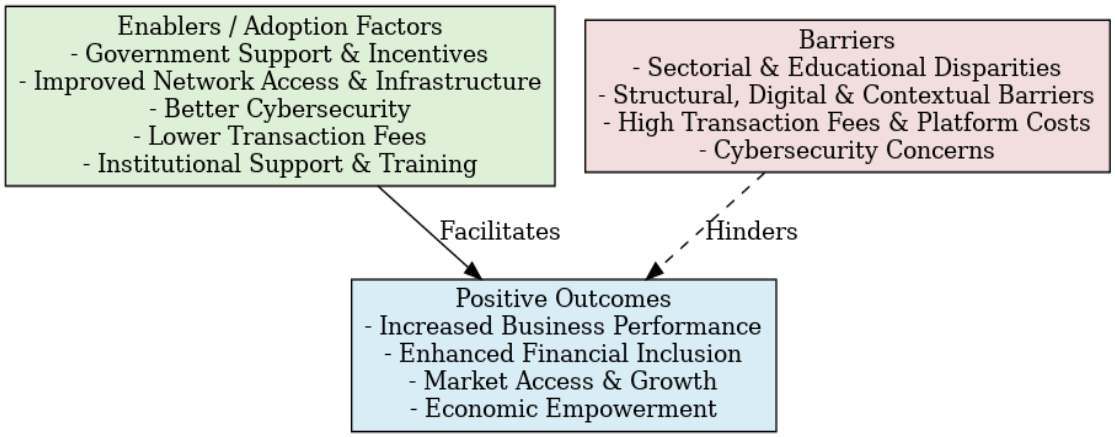


Figure 4.9: Conceptual Framework Diagram (Source: Created by Author,2025)

4.2.1 Enablers of Adoption

Government Incentives: The data presented highlights the essential support that women entrepreneurs in Gauteng believe the government must provide to enable the successful and sustainable adoption of cashless payment systems. These responses emphasize both infrastructural and policy-based interventions that can bridge the current digital divide and enhance inclusion. Incentives, including tax relief, equipment subsidies, and seed funding for digital tools, were identified as critical support by an additional 49.3% of participants. The responses demonstrate an understanding that the initial costs related to cashless adoption, including the acquisition of smartphones, mobile POS systems, or subscriptions to fintech services, could be a barrier for informal or microenterprises. Research conducted in Kenya and India (Jansen, et al., 2024) indicates that targeted financial incentives markedly improve adoption rates, especially among marginalized populations. Feedback from Gauteng suggests that, in the absence of practical incentives, the digital finance revolution will remain uneven and inaccessible for many women entrepreneurs.

Improved Network Access (61.2%): The growing affordability of smartphones and the enhanced 4G network coverage in Gauteng have facilitated access to mobile financial services for several micro and small firms. Entrepreneurs identified cost-effective data bundles and zero-rated banking applications as significant motivators for adoption. Enhanced network access was the most reported necessity, recognised as essential by 123 respondents (61.2%). This finding underscores the critical importance of infrastructure for the successful implementation of cashless systems. In many semi-urban and rural areas of Gauteng, mobile network instability and low broadband penetration continue to undermine digital finance efforts. This aligns with the World Bank (2023), which noted that low digital connectivity is a major inhibitor of financial inclusion in sub-Saharan Africa. Without consistent and affordable internet access, women entrepreneurs struggle to use mobile money platforms or conduct digital transactions in real time, resulting in exclusion from critical financial services.

Better Cybersecurity (49.3%): A comparable percentage of participants (49.3%) advocated for improved cybersecurity measures. The incidence of cyber fraud, phishing, and identity theft in digital transactions has caused considerable concern among entrepreneurs regarding the security of their business and personal data. This is consistent with the findings of Kapil, & Kaur, (2024), which indicate that inadequate national cybersecurity frameworks and insufficient user education render small business owners in emerging markets susceptible to digital threats. In this context, government intervention is essential in two respects: (1) formulating and implementing robust cybersecurity regulations for fintech service providers, and (2) delivering education and awareness initiatives specifically designed for women-led micro and small enterprises.

More Training and Awareness (41.3%): Even with the availability of digital tools, 83 respondents (41.3%) indicated that they lacked adequate training to use them effectively. This is consistent with earlier findings that highlighted a lack of digital literacy as a major obstacle to adoption. The findings highlight the need for continuous, inclusive, and culturally relevant training programs delivered in local languages, preferably through community-focused approaches. As suggested by Kealey (2015), successful adoption of technology is directly linked to how confident and informed users feel about the system. Government initiatives, such as the South African Reserve Bank's FinTech Unit (SARB, 2024) and NGO-facilitated digital literacy courses, offered essential support. Participants recognised that training programs, particularly those conducted in local languages and employing practical, experiential approaches, enhanced confidence and fostered experimentation with cashless systems. International comparisons highlight the significance of these actions. Research from Kenya's M-Pesa ecosystem (Suri & Jack, 2016) and Ghana's mobile money proliferation (UNDP, 2024) indicates that focused training, in conjunction with conducive legislative frameworks, can swiftly close digital gaps.

Lower Transaction Fees (35.8%): A total of 72 participants, representing 35.8%, advocated reduced transaction fees. Cashless systems offer potential efficiency; however, numerous entrepreneurs have noted that platform charges, withdrawal fees, and processing costs frequently diminish their already limited profit margins. This perspective aligns with Capgemini's (2024) assertion that elevated transaction fees may serve as a "hidden barrier" to financial inclusion, especially in economies characterized by prevalent informal trade. Regulating digital transaction costs for small businesses may alleviate financial burdens and promote wider adoption. The data makes it clear that the successful adoption of cashless systems among women entrepreneurs is contingent not only on personal readiness but also on enabling policies and infrastructure. The top five areas of government support identified network access, cyber security, incentives, training, and fee regulation form a comprehensive framework for inclusive digital transformation. Dealing with these problems will help women participate more financially and promote more economic empowerment and innovation in the Gauteng business scene. The graph below shows the Support Needed from the Government for Cashless System Adoption.

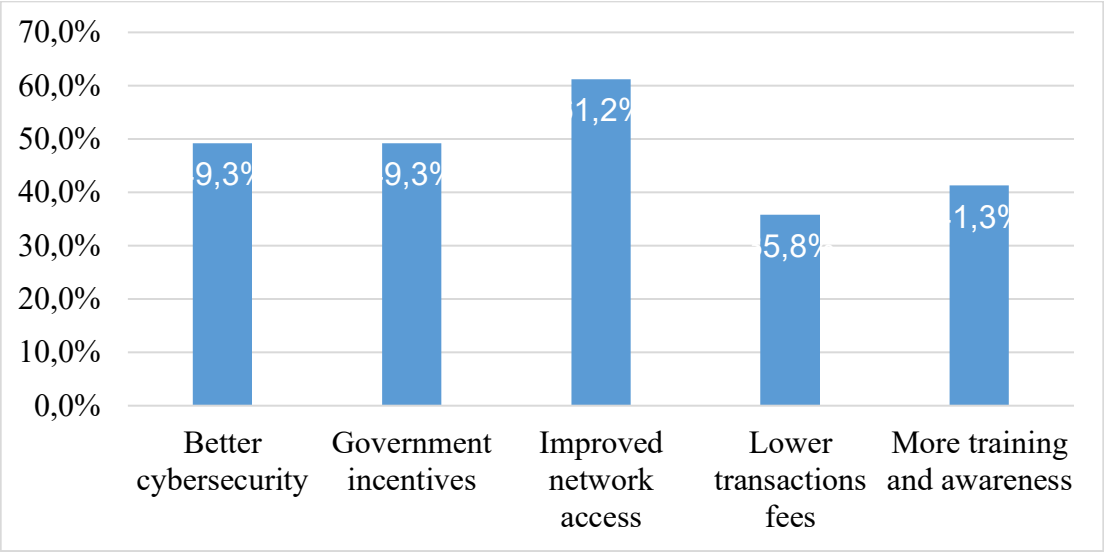


Figure 4.10: Support Needed from Government for Cashless System Adoption (Source: Created by Author,2025)

4.2.2 Implications for Policy and Practice

The findings suggest that while adoption is on the rise, persistent sectoral and educational disparities require advanced policy measures.

- Digital Literacy Programs: Tailored for women with restricted educational backgrounds, employing vernacular languages and visual aids.
- Financial Subsidies for Microenterprises: To alleviate the economic impediment for small-scale businesses operating in high-frequency, low-margin sectors.
- Augmented Consumer Safeguards: To cultivate confidence and alleviate cybersecurity concerns.
- Targeted Infrastructure Investments: To improve reliable network coverage and electricity provision in peri-urban and rural regions.

Additional inferences from qualitative study

Across Sectors and Education Levels: This study illustrates significant advancements in the adoption of cashless systems by women entrepreneurs in Gauteng, while also revealing persistent barriers that impede equitable uptake across various sectors and educational backgrounds. The constraints are not uniform; they differ based on business size, industry, and individual capabilities. Simultaneously, sector-specific enablers and ecosystem interventions identify strategies for addressing these challenges and enhancing inclusive digital financial participation.

Adoption rates among women entrepreneurs exhibited significant sectoral variations, indicating disparities in the distribution of digital infrastructure, customer demand, and business models dependent on cashless transactions. Microenterprises in agriculture and retail, primarily led by women with secondary or primary education, exhibited the lowest adoption rates of cashless systems.

Businesses in peri-urban and rural areas often encounter difficulties stemming from insufficient network connectivity and unreliable electricity supply, which impede the consistent use of mobile payment platforms. Participants in these sectors reported dissatisfaction with application downtimes and transaction failures, which undermined their confidence in digital systems.

In contrast, women entrepreneurs in the technology and consultancy sectors reported fewer barriers, crediting their increased adoption rates to improved access to reliable digital infrastructure and client expectations for cashless transactions. The sectors, marked by significant educational levels (13.9% with tertiary education and 7.5% with postgraduate degrees in technology), utilize advanced systems like online payment gateways and QR codes, highlighting the influence of education and sectoral requirements on adoption behavior.

This finding aligns with Digital Divide Theory (Norris, 2001), which emphasises that unequal access to digital tools and infrastructure perpetuates socio-economic disparities. Similar patterns have been noted in Sub-Saharan Africa, where fintech investments are primarily concentrated in urban areas, leading to the oversight of rural microenterprises (Demirgüç-Kunt, et al..2022; UNDP, 2024).

Educational Divide: Education has emerged as a crucial factor influencing digital financial inclusion. Women entrepreneurs possessing tertiary or postgraduate education exhibited increased confidence in utilizing cashless systems, attributing this to their familiarity with technology, enhanced exposure to online platforms, and the capability to address basic technical issues. Conversely, individuals lacking formal education (4.0%) or possessing only primary education (17.4%) demonstrated hesitance towards the adoption of digital systems, frequently citing:

- Language barriers: Challenges in comprehending English-language interfaces.
- Limited technical expertise: Difficulties in navigating application interfaces and payment procedures.
- Fear of error or fraud: Apprehension about the possibility of irreversible errors in transactions.

Thematic analysis revealed a notable digital confidence gap, wherein entrepreneurs with lower educational attainment perceive cashless systems as intimidating. This is consistent with OECD (2022), which identified deficiencies in digital literacy as a major barrier to the digitalisation of small businesses in emerging economies.

High Transaction Fees and Platform Costs: Another recurring barrier is the prohibitive cost structure of digital platforms. Microenterprises, operating on thin margins, found transaction fees unsustainable, particularly for high-frequency, low-value transactions common in retail and agriculture. Respondents characterized these charges as a financial burden on small businesses, which deters them from utilizing mobile wallets and POS devices for routine transactions. This aligns with findings from Unigwe, & Omoruyi, (2025) which identifies elevated platform costs as a significant barrier to cashless adoption among MSMEs globally.

High transaction fees further discourage adoption, especially for micro-entrepreneurs whose daily income is meagre. Sometimes businesses revert to cash transactions when fees are overly high in relation to sales. These findings reflect concerns voiced by Kshetri, Voas, & DeFranco, (2021), who stress how fee practices on digital platforms disproportionately impact small-scale, women-owned enterprises.

Rural and peri-urban areas that are underserved experience persistent deficiencies in reliable electricity and internet connectivity, which are critical prerequisites for digital transactions. Participants from the agriculture (9%) and retail (14.9%) sectors identified these deficits as major obstacles to adoption, aligning with Gibson, Gazi, & Arner, (2024) findings that infrastructural inequality continues to be a significant challenge to digital financial inclusion in Sub-Saharan Africa.

Recommendation: Public-private partnerships (PPPs) involving government entities, mobile network operators, and fintech companies should be prioritized to enhance broadband access and electrification in marginalized regions. Initiatives such as Kenya's Last Mile Connectivity Project exemplify effective models for potential replication in South Africa.

Cybersecurity Concerns: Interviews highlighted substantial issues related to fraud, SIM-swap scams, phishing attacks, and account takeovers. Entrepreneurs aged 55 and older, often with limited experience in digital systems, have reported heightened concerns about security. Participants indicated occurrences of unauthorized transactions and expressed diminished confidence in the ability of service providers to safeguard their funds. ENISA (2023) substantiates these concerns by outlining the growing complexity of cyber threats targeting small enterprises in developing economies. The absence of well-defined consumer protection frameworks in specific cases exacerbated these issues, obstructing full participation in cashless transactions.
The research highlights significant deficiencies in the digital financial inclusion framework in South Africa, especially concerning women-owned micro and small enterprises. The identified gaps encompass infrastructure, regulation, financial literacy, and affordability.

Structural, digital, and contextual barriers: This study's findings indicate that women entrepreneurs in Gauteng encounter various structural, digital, and contextual barriers that impede the comprehensive adoption of cashless payment systems. In contrast to challenges in intercultural communication associated with language or cultural background, as examined by Abiona, & Koppensteiner, (2022), the obstacles to digital payment adoption in this context are primarily related to digital exclusion, inadequate infrastructure access, economic limitations, and socio-cultural norms.

The adoption of cashless systems among women entrepreneurs in Gauteng remains constrained by several structural, digital, and contextual challenges. The most significant issues identified include lack of training (64.7%), client resistance (51.2%), cybersecurity concerns (49.3%), limited internet access (44.3%), and excessive transaction costs (33.3%). These findings mirror world patterns observed in underdeveloped countries, whereby low awareness, infrastructure limitations, and socio-political inertia could hinder dreams of digital financial inclusion (Ojo, & Ndzendze, 2023).

Usually lacking enough knowledge on how to use digital payment systems, women entrepreneurs suffer. Many of the participants claimed they have never received formal government or financial institution instructions or help on how to run digital wallets, mobile money apps, or online banking tools. This ability gap particularly reveals itself as low confidence and consistent errors while handling digital interfaces or fixing transaction issues (GSMA, 2023).

Poor internet connection: Limited internet connection is another ongoing issue. Particularly those working in underground markets or peri-urban colonies, more than 44% of women claimed to have inadequate access. Rapid and constant network connectivity is what drives digital systems; hence, lacking this affects business continuity. Moreover, many times companies cannot afford phones with enough capacity or data plans to enable ongoing cashless usage (Unigwe, & Omoruyi, (2025).

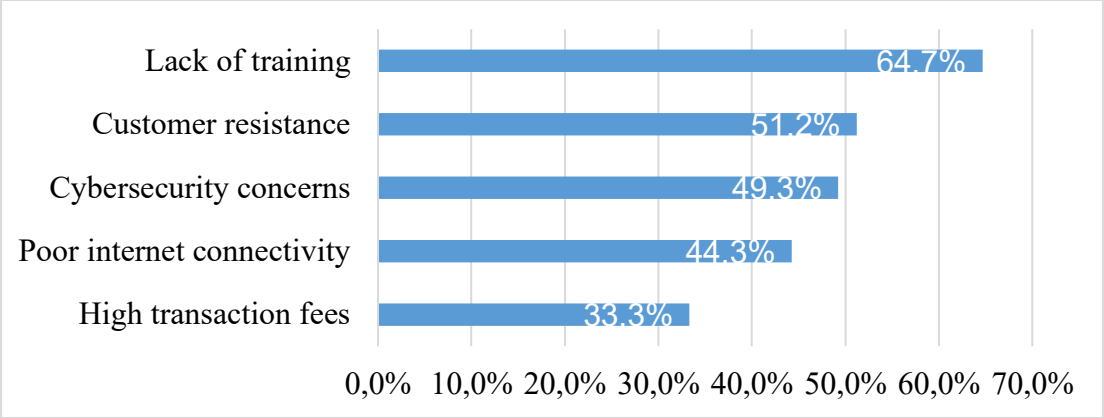


Figure 4.11: Results for Barriers to Cashless System Adoption (Source: Created by Author,2025)

4.2.3 Business Performance Outcomes

The adoption of cashless payment systems by women entrepreneurs in Gauteng has notably impacted business performance in multiple aspects. This section synthesises quantitative and qualitative research, illustrating the effects of digital payment acceptance on revenue growth, customer loyalty, operational efficiency, and outcomes related to female empowerment. This analysis offers a nuanced understanding of the relationship between cashless systems and business sustainability by integrating these findings with theoretical frameworks such as the Technology Acceptance Model (TAM) (Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2012).

Another vital element is trust. Women entrepreneurs can express customer relationships as well as concerns regarding operational protection of their business and cybersecurity. About fraud, identity theft, or lost money, almost half of the respondents (49.3%) said they were reluctant to embrace cashless systems. These are reasonable questions. Studies show that targets of today's phishing, social engineering, and malware assaults usually are financial systems (Capgemini, 2024).

All things considered, cashless technologies become somewhat challenging for Gauteng women entrepreneurs. Although infrastructure and cost are very important factors, more urgent issues, such as digital confidence, consumer behaviour, and institutional support, ought to be given top priority. Interventions must thus largely focus on capacity building, reducing transaction costs, improving internet availability, and boosting customer confidence through regulatory oversight and education. Ignored, these problems could keep the gender gap in financial inclusion.

Implications: The study indicates that adoption rates peak when technological solutions align with sector-specific business models and when institutional support is readily visible and accessible. Microenterprises, especially in agriculture and retail, require targeted interventions to tackle structural challenges such as poor network coverage, high transaction costs, and a lack of technical training. Sectors with high education levels and digital engagement demonstrate a tendency towards sophisticated fintech solutions. This indicates a two-fold policy implication:

- Enhancing digital literacy and accessible infrastructure in sectors with low adoption rates.
- Promoting fintech innovation to provide contextually relevant and user-friendly payment solutions for micro and small enterprises.

The adoption of cashless systems by women entrepreneurs in Gauteng illustrates significant socio-economic changes and provides insights for enhancing digital financial inclusion throughout South Africa and the continent.

4.3 Phase II- Quantitative Study

The subsequent phase of the study employed quantitative methods to validate and generalize the observed patterns. The study employed a structured survey targeting 201 women entrepreneurs to gather quantifiable data regarding digital payment practices, security concerns, access to infrastructure, and engagement with institutions.

Phase 2 of the survey was conducted to examine the benefits and security challenges of cashless systems for women entrepreneurs in rapidly developing economies. The study employed structured survey targeting 201 women entrepreneurs to gather quantifiable data regarding digital payment practices, security concerns, access to infrastructure and engagement with institutions. Data source was from women entrepreneurs (from formal and informal factors) Fintech providers and policy documents. ANOVA correlation and logistic regression were the analytic tools that were used. Structured surveys were conducted to study the following:

Demographic information

- Business sector classification (that they belong to)
- The level of education
- Age bracket
- Number of years of business existence
- size of business in terms of employment count and percentage of cashless business transactions.

Perceived usefulness & ease of use (Based on TAM Model)

- How does cashless payment systems enhance business productivity.
- How user friendly are cashless payment system for your business operations. How difficult it is to learn how to operate cashless payment systems
- How does cashless payment systems improve transaction accuracy and record-keeping.

Perceived Security (Based on Perceived Security Scale)

- Do you trust the security of cashless payment systems.
- Does cashless payments protect your business from fraud better than cash transactions.
- How confident are you regarding that my customers' payment information is safe when using cashless transactions.
- Are you aware of cybersecurity measures needed to protect my business from digital fraud.

Financial Performance & Customer Satisfaction

- How has customer satisfaction has increased after adopting cashless payments.
- How has the adoption of cashless payments has helped me retain more customers.
- What are the effect of offering cashless payment options has made my business more competitive.
- How has cashless transactions have reduced operational costs for my business.
- How has government policies have supported the adoption of cashless systems in my business.
- What challenges do you face in adopting cashless payment systems

Improvements & Recommendations

- Which support measures would help in better adoption of cashless systems
- Would you be interested in a follow-up interview?

4.3.1 Quantitative Key Insights

The Interplay Between Sector, Education, and Cashless System Adoption Among Women Entrepreneurs in Gauteng

Analysing the link between the business sector and educational level helps one to evaluate digital financial inclusion. This study examines the relationship between two factors impacting acceptance, trust, and effective use of cashless payment systems using 201 women entrepreneurs from eight various economic sectors in Gauteng, South Africa.

This study is based mostly on the Technology Acceptance Model (TAM) (Davis, 1989) and the Diffusion of Innovations Theory (Rogers, 2003). Both models demonstrate how strongly opinions of usability, user-friendliness, and compatibility with innovation affect adoption activities. Particularly in specific fields, people's opinions are much shaped by their educational background and the current corporate environment.

- Descriptive Observations from the Dataset (Sectoral Distribution and Dominance)

Sector	Number	No formal education	Post Education (Masters, PhD)	Primary School	Secondary School	Tertiary Education (Diploma, Degree)	Overall
Technology	58		7.5%	1.5%	6.0%	13.9%	**28.9%**
Services	42		2.5%	3.5%	7.0%	8.0%	**20.9%**
Manufacturing	31		1.0%	6.0%	4.5%	4.0%	**15.4%**
Retail	30	2.5%	0.5%	4.0%	3.5%	4.5%	**14.9%**
Agriculture	18	1.5%	1.5%	1.0%	2.0%	3.0%	**9.0%**
Events	10			1.5%	2.5%	1.0%	**5.0%**
Events management	5					2.5%	**2.5%**
Consultancy	4		0.5%				**2.0%**
Beautician	3					1.5%	**1.5%**
Total	**201**	**4.0%**	**13.4%**	**17.4%**	**25.4%**	**39.8%**	**100%**

Table 4.1: Sectorial Distribution and Dominance (Source: Created by Author, 2025)

Women entrepreneurs in Gauteng exhibit diverse levels of digital engagement and participation across various business sectors. The Technology sector comprises 28.9% of the 201 respondents, indicating a significant presence of technology-driven companies. Organisations with advanced digital expertise and infrastructure generally excel in cashless innovation, setting themselves apart through the early adoption of digital tools and platforms. Closely followed at 20.9%, the Services sector comprises various specialities like hospitality, personal care, and professional services. This group exhibits a modern and customer-oriented mindset, whereby the flexibility and ease of digital payments are gradually becoming necessary.

Though more traditional company sectors, manufacturing (15.4%) and retail (14.9%) show a growing digital consumption, particularly in connection with supply chain management and customer engagement becoming digital. Once issues with infrastructure and capacity-building are resolved, these industries indicate an enormous possibility for more digital financial integration.

Although only 9% of the sample, in rural and peri-urban economies, agriculture is still a big sector with great socioeconomic importance. Still under-represented in terms of digital financial adoption, infrastructure restrictions, low digital literacy, and limited access to mobile networks or point of sale systems all help to explain this. Every category, Events at 5%; Events Management at 2.5%; Consultancy at 2%; and Beautician services at 1.5% represents a particular area of focus. Though rare, certain companies have special operational patterns that call for tailored financial solutions, particularly given their occasionally hybrid or informal structures.

The overall sectorial distribution provides data on areas where efforts at digital financial inclusion are most concentrated and where policy and support mechanisms need to be reinforced. It also reveals how interactions across industry type, digital preparation, and socioeconomic profiles of women entrepreneurs facing the shift to a cashless economy affect each other. Below is the table showing Sectorial Distribution and Dominance.

- Educational Distribution Across All Sectors

The educational background of women entrepreneurs in Gauteng significantly affects their engagement with cashless systems and digital financial tools. The survey data reveal that approximately 40% of respondents hold tertiary qualifications, including diplomas and degrees. This indicates a strong base of human capital among participants, particularly in domains necessitating advanced digital literacy and strategic business skills.

Furthermore, 25.4% of entrepreneurs attained secondary education, establishing a robust foundation for the effective use of mobile money, banking applications, and digital record-keeping systems. These individuals demonstrate the requisite abilities to adeptly employ foundational digital financial tools, especially when bolstered by targeted capacity-building efforts.

On the other hand, 17.4% of participants stated that they had completed only primary education, whereas 4.0% reported having no formal education at all. The findings underscore the importance of developing inclusive fintech solutions that focus on improving financial literacy, particularly for enterprises operating in rural, informal, or subsistence markets.

Notably, 13.4% of respondents possess postgraduate qualifications Master's or PhDs, indicating a significant trend of highly educated women entering entrepreneurship. Individuals in this category are predominantly located within the technology and consulting sectors, where success in a digital marketplace relies on analytical, technical, and strategic competencies.

The retail and agriculture sectors exhibited heightened engagement from entrepreneurs possessing lower educational qualifications, which aligns with identified challenges such as apprehension regarding fraud, inadequate digital confidence, and a tendency towards hybrid payment methods (both cash and cashless). This distribution aligns with the findings of GSMA (2022) and the International Telecommunication Union (ITU, 2022), highlighting education as a vital component of digital financial inclusion.

The distribution of education across sectors offers significant insights into the strengths and weaknesses of women entrepreneurs within a cashless society. Differentiated training techniques, equity-focused digital policies, and context-sensitive technology solutions that address diverse learning needs and operational capacities are highlighted as particularly significant. The following figure is a bar chart that illustrates the educational distribution across sectors as a percentage. The stacked bars show how different levels of education (from no formal education to tertiary qualifications) are represented within each business sector.

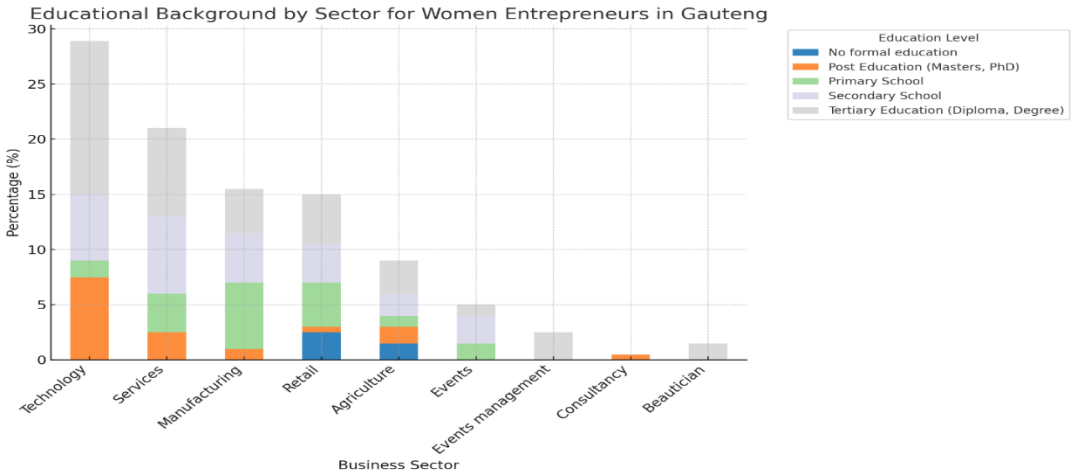


Figure 4.13: Educational distribution across sectors as a percentage (Source: Created by Author,2025)

4.3.2 Quantitative Analysis and Findings

- **Sectorial-Educational Analysis and Interpretation**

This section examines the complex interplay between the corporate landscape and the academic achievements of women entrepreneurs in Gauteng. The identified patterns highlight the need for tailored support systems within specific industries, as they clarify the relationship between educational performance and the use and effectiveness of digital financial tools. The following table shows the principal findings and sector-specific Insights.

SECTORS	Principal Findings
Technology sector	The Technology sector exhibits the highest percentage of women with tertiary education, highlighting a significant correlation between higher education and participation in digital or technical domains.
Retail and Agriculture sectors	The Retail and Agriculture sectors exhibit notable differences in educational qualifications, with some respondents lacking formal education, highlighting their importance for inclusive intervention strategies.
Consultancy and Beauty Sector	Consultancy and beautician enterprises are predominantly led by women possessing tertiary or postgraduate qualifications, underscoring their dependence on specialised training or vocational expertise.

Services and Manufacturing sectors	The Services and Manufacturing sectors exhibit significant representation at both secondary and tertiary levels, suggesting moderate accessibility to cashless systems.

Table 4.2: Sectorial-Educational Analysis and Interpretation (Source: Created by Author,2025)

Sectors	Sector-Specific Insights
Technology: 58 participants (28.9 per cent)	Represents the highest percentage of tertiary qualifications at 13.9% and postgraduate qualifications at 7.5%. This corresponds with the sector's digital demands, requiring strong technical competencies.
Services: 42 participants (20.9 per cent)	Educational accessibility is reflected in a 7.0% enrolment rate in secondary education and an 8.0% rate in tertiary education. This environment supports entrepreneurs from both high school and diploma backgrounds.
The manufacturing sector comprised 31 participants, accounting for 15.4% of the total.	It was predominantly made up of individuals with primary (6.0%) and secondary (4.5%) educational qualifications.
The tertiary representation is 4.0%,	indicating a deficiency in formal technical education.
The retail sector comprises 30 participants, accounting for 14.9% of the total.	Highest educational diversity: 2.5% lack formal education. Participants were represented across all levels of education. • Exhibits potential for inclusive growth via digital literacy training.
Agriculture: 18 participants (9.0%). Distribution is observed across all levels, with a predominance in secondary (2.0%) and tertiary (3.0%) education.	Indicates a transition towards the formalisation of informal or subsistence agricultural practices.
Events involving 10 participants account for 5.0%.	The education profile is characterised by 1.5% at the primary level, 2.5% at the secondary level, and 1.0% at the

	tertiary level. The absence of representation from postgraduate or uneducated categories indicates a moderate entry threshold.
Occurrences Management: 5 participants (2.5%). All participants possess tertiary qualifications.	Demonstrates a professionalised domain necessitating skills in planning, management, and coordination.
Consultancy: 4 participants (2.0%)	One respondent with a postgraduate degree (0.5%), while all other respondents also possess a higher education background. Formal expertise is emphasised as a barrier to entry.
Beautician: 3 participants (1.5%)	Composed entirely of women with tertiary education. Highlights organised vocational training resulting in diplomas or certifications.

Table 4.3: Sector-Specific Insights (Source: Created by Author,2025)

- **Significant Reinterpretations**

Education serves as a significant facilitator of digital financial inclusion, particularly for individuals in the Technology and Services sectors. Retail and agriculture serve as primary access points for businesses with low to mid-level education, making them critical priorities for the development of inclusive fintech solutions.

The fact that 4% of the respondents lack official schooling emphasises the need for easily available and simplified digital financial solutions. The prominent presence of postgraduates in Technology and the emphasis on tertiary education in Beauty and Events Management point to the development of specific educational routes within these fields.

Applied and Policy results

For low-literacy participants, especially in retail and agriculture, use visual aids, audio clues, and localised languages to develop and apply digital instruction at the education level.

- Creating a financial solution with dual purposes: that is, smart dashboards for highly educated professionals and simple interfaces for micro-retailers.
- Correcting the Knowledge Variability Support community-based peer support groups for semi-literate or undereducated business owners by means of public-private partnerships; create mobile apps with offline capability; and construct simplified financial technology onboarding kits.

This paper underlines the important junction of industry and education that affects digital financial acceptability. Driven by empowered women entrepreneurs, inclusive and strong cashless economies depend on laws and technologies that acknowledge their complexity.

- **Analysis of Sectorial and Educational Correlation Among Women Entrepreneurs in Gauteng**

This study examines the relationship between business sectors and educational attainment among a sample of 201 women entrepreneurs in Gauteng. The objective is to assess the accessibility of specific sectors in relation to educational attainment and its effect on the adoption and impact of cashless systems. The bar chart illustrating the educational distribution across different business sectors (in %) represented by the 201 women entrepreneurs in Gauteng:

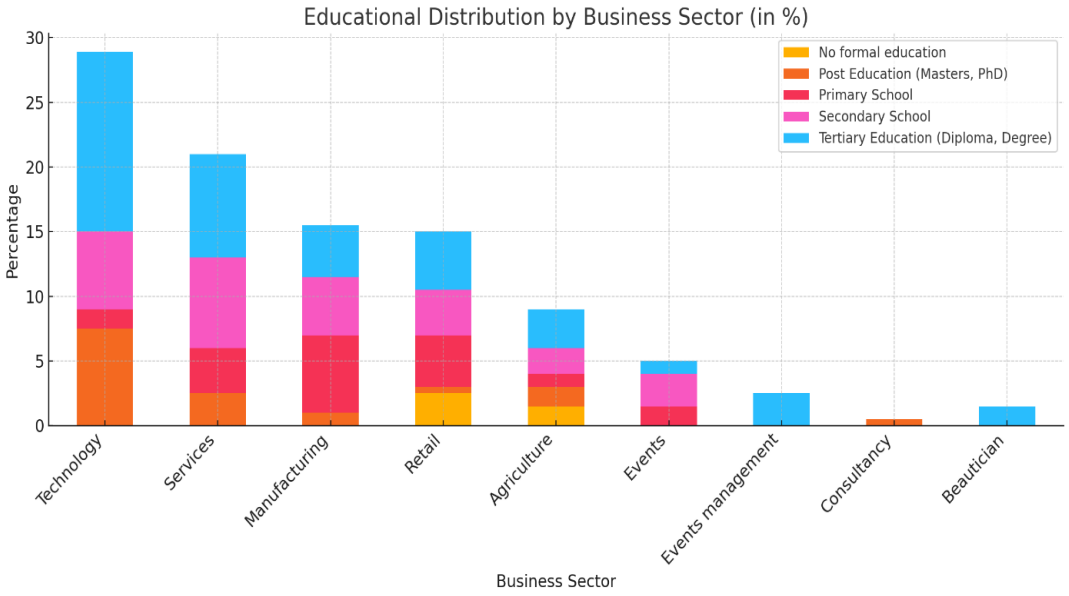


Figure 4.14: Educational Distribution by Business Sector (in %) (Source: Created by Author,2025)

- **General Patterns in Sectorial-Educational Correlation**

The relationship between sectorial participation and educational attainment among women entrepreneurs reveals a multifaceted but insightful pattern. Generally, higher education levels, specifically tertiary and postgraduate qualifications, are more concentrated in sectors such as Technology and Services, which tend to demand higher levels of digital literacy, analytical capability, and exposure to formal business systems. Leveraging a rigorous academic foundation, these industries typically possess sophisticated digital infrastructure, encompassing financial interfaces, cloud-based systems, and e-commerce platforms.

The Retail, Agriculture, and Manufacturing sectors demonstrate considerable educational diversity, encompassing those with little formal schooling as well as those possessing college degrees. This broader distribution underscores the accessibility for women with diverse literacy levels to engage in sectors such as micro-enterprises and informal firms. This indicates that, while education positively correlates with engagement in technologically advanced industries, additional factors such as entrepreneurial exposure, mentorship, community-based learning, and digital inclusivity also influence adoption; the relationship is not entirely linear.

This analysis corroborates findings from the GSMA (2022) and World Bank (2023), highlighting that although digital uptake increases with education, inclusive design and training effectively reduce disparities. Therefore, while education is an essential facilitator, it is not the only factor influencing digital participation. Below is the correlation summary table.

Sectors	Correlation Summary
Technology	Exhibits a strong positive correlation with education. With 13.9% tertiary and 7.5% postgraduate representation, this sector attracts women with advanced skills. Technology enterprises, especially those engaging in software, e-commerce, or mobile services, often require knowledge of coding, data analysis, or system integration, justifying the high academic profile.
Services	Services demonstrate a moderate correlation. This industry demonstrates increased accessibility, with 8.0% of individuals holding higher education credentials and notable representation at the secondary level (7.0%). The characteristics of services, including salons, catering, and consulting, accommodate various reading levels while benefiting from structured training and digital resources.
Manufacturing	The data indicate a diverse educational distribution: 6.0% in basic education, 4.5% in secondary education, and 4.0% in higher education. This indicates a modest correlation, suggesting that while formal education is advantageous, many entrepreneurs rely on apprenticeship, vocational skills, or experiential learning to manage production-oriented businesses.
Retail	The correlation in retail is characterised as weak to moderate. The retail sector demonstrates considerable educational diversity, showcasing a range of representatives at various levels. Notably, 2.5% of individuals in this industry lack formal education, indicating that retail serves as a significant entry point for women without such qualifications. This suggests that peer learning and accessible financial tools can improve inclusiveness without requiring higher intellectual standards.

Agriculture	Agriculture demonstrates an imperfect correlation. Most respondents have completed primary or secondary education; however, only 3.0% possess tertiary degrees. This indicates a potential historical dependence on informal subsistence farming or institutional barriers to education in rural regions. The implementation of digital technology is anticipated to encounter challenges due to deficiencies in education and infrastructure.
Events Management and Niche Sectors (Consultancy, Beautician)	Formal education shows a clear correlation with event management and specialist industries such as consulting and beauty treatments. Every person working in these fields has a tertiary degree; some have even completed postgraduate courses. In these fields, formal business planning and accreditation are vital.

Table 4.4: Correlation Summary (Source: Created by Author,2025)

A distinct and interpretable correlation exists between sectorial engagement and education level among women entrepreneurs in Gauteng. Sectors characterised by elevated digital and formalisation demands tend to attract a greater proportion of highly educated women. Conversely, sectors that are more accessible require specific interventions to enhance digital financial inclusion.

Benefits of adopting cashless payment systems for female entrepreneurs in Gauteng

Perceived Usefulness	Enhances my business productivity	Easy to use for my business operations	Learning to operate cashless payment systems is straightforward	Improve transaction accuracy and record-keeping
Agree	62.7%	66.2%	66.7%	70.6%
Neutral	21.4%	20.4%	24.9%	18.9%
Strongly agree	15.4%	0.0%	8.0%	9.5%
Strongly disagree	0.5%	12.9%	0.0%	0.0%
Disagree	0.0%	0.5%	0.5%	1.0%

Table 4.5: Customer Satisfaction Note (Where N =201) (Source: Created by Author,2025)

The operational effects and advantages of implementing cashless payment systems are becoming increasingly clear among women entrepreneurs in Gauteng. Survey findings indicate that digital payment technologies are enhancing efficiency, customer service, and business management significantly.

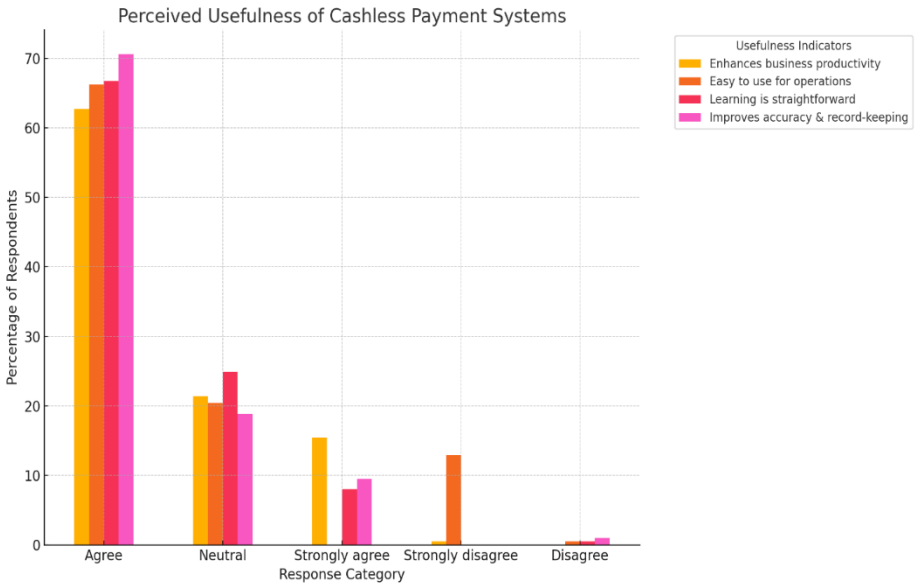


Figure 4.15: Perceived Usefulness of Cashless Systems (Source: Created by Author,2025)

This section examines the practical advantages of cashless systems, including decreased dependence on physical cash, increased transaction speed, enhanced record-keeping, and expanded market access via digital platforms.

- **Analysis:**

Perceived Usefulness of Cashless Systems: The adoption of digital innovations in business contexts is largely influenced by their perceived usefulness, a key component of the Technology Acceptance Model (TAM) (Davis, 1989). The survey findings on women entrepreneurs in Gauteng provide critical insights into the perception of cashless systems, particularly regarding their practical advantages for business productivity, usability, learning curve, and financial management.

Enhancement of Business Productivity: A total of 78.1% of respondents indicated that cashless systems improve business productivity, with 62.7% agreeing and 15.4% strongly agreeing. This indicates a significant perception of value, implying that digital payments are regarded as factors enhancing operational efficiency. Efficient payment processing and reduced manual cash handling enable businesses to save time and redirect resources towards more strategic initiatives (Capgemini, 2024). The lack of dissent regarding this measure reinforces the prevailing consensus on the productivity-enhancing benefits of cashless tools.

Ease of Use: Simplicity and accessibility are essential for adoption, particularly for small businesses that frequently lack sufficient technical support. The data indicates that 66.2% of respondents perceive cashless systems as user-friendly, while 20.4% express neutrality, and 12.9% strongly disagree. This indicates that although most users perceive the systems as intuitive, a notable minority encounters usability issues, potentially stemming from inadequately designed interfaces, inconsistent training, or the use of technical jargon that may discourage novice users. The World Bank (2023) identifies inadequate UX design and digital illiteracy as major obstacles to mobile financial services in emerging markets.

Ease of Learning: Regarding the ease of learning to operate cashless systems, 66.7% of respondents agreed, while 8.0% strongly agreed. Approximately 25% maintained a neutral stance, while 1% indicated disagreement or strong disagreement. This underscores the persistent requirement for fundamental digital training, particularly for entrepreneurs moving from informal, cash-based operations. As shown by GSMA (2023), digital onboarding experiences need to be tailored, localised, and simplified to encourage broader uptake among underrepresented groups such as women in rural or informal sectors.

Improved Accuracy and Record-Keeping: The indicator achieved the highest overall approval, with 70.6% of respondents in agreement and 9.5% expressing strong agreement that cashless systems enhance transaction accuracy and record-keeping. Only 1% expressed disagreement. This underscores a significant advantage of cashless adoption: the automation and digitisation of financial records, which enhance business decision-making, facilitate access to credit, and ensure tax compliance (Unigwe, & Omoruyi, (2025). This also minimises human error related to manual cash tracking, which is often intensified in informal or multitasking business environments.

Perceptions of Security and Trust in Cashless Systems: The perception of security and trust in cashless systems significantly influences the adoption of digital payment technologies by women entrepreneurs in Gauteng. The data indicate a consensus regarding the security of digital platforms; however, trust is constrained by an insufficient understanding of cybersecurity practices. This theme is examined through various dimensions: the fear of cybercrime, limited awareness of digital transaction protection, uncertainty regarding dispute resolution processes, and a general lack of confidence in managing fraud. Graph showing Perceptions of Security and Trust in Cashless Systems.

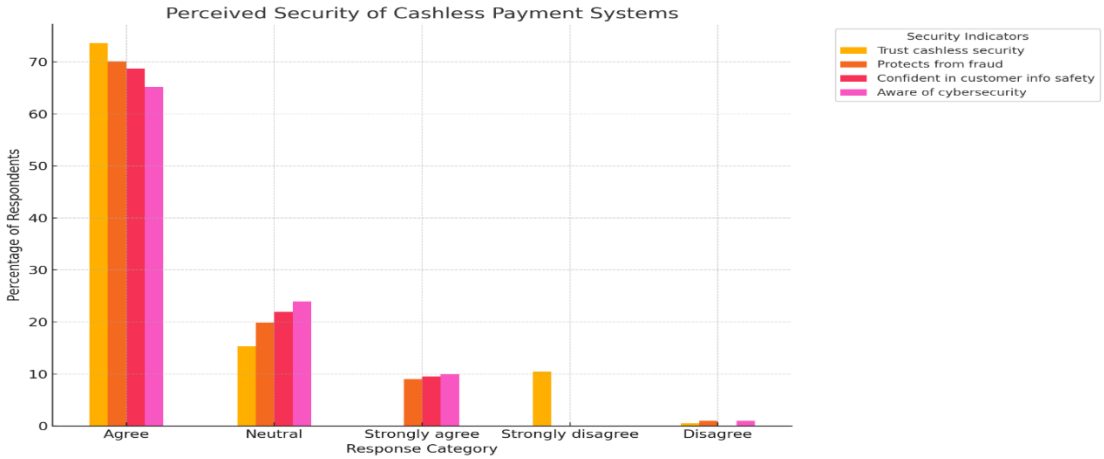


Figure 4.16: Perceptions of Security and Trust in Cashless Systems (Source: Created by Author,2025)

Survey results indicate that 73.6% of respondents express trust in the security of cashless payment systems, with an additional 9.0% indicating strong agreement. The increasing adoption of mobile money platforms and digital wallets indicates a significant level of basic confidence, highlighting the expanding digital footprint in global financial transactions (Capgemini, 2024). Trust is inherently flawed. Approximately 15.4% remain neutral, 0.5% express disagreement, and 10.4% strongly disagree, indicating a modest yet significant cohort that questions the security of these systems.

Furthermore, 70.1% of respondents agree that cashless systems provide better protection against fraud than cash transactions; however, only 9.0% indicate strong agreement. This suggests that users acknowledge the efficiency and convenience of digital platforms; however, they have concerns about the reliability of backend security measures, such as encryption, tokenisation, and biometric verification (Kapil, & Kaur, 2024).

The evaluation of confidence in the security of consumer payment data heightens anxiety. Among the respondents, 68.7% indicate that their client data is secure, with 9.5% strongly agreeing and 21.9% remaining neutral. This neutral zone represents business professionals who may lack a comprehensive understanding of data privacy policies, including PCI-DSS compliance, or the handling of private information by payment processors. This aligns with previous studies indicating that, despite the increasing adoption of fintech, small business owners, particularly women, continue to demonstrate a lack of digital financial literacy (Jansen, et al., 2020).

Cybersecurity awareness is critical. About 10.0% of respondents demonstrate strong agreement, whereas approximately 65.2% acknowledge awareness of critical cybersecurity measures for their organisation's protection. However, 1.0% expressed disagreement, while more than 24% provided a neutral response. This highlights a broader issue of misunderstanding regarding the mechanisms of digital threats, such as phishing, malware, SIM swap fraud, and social engineering. The identified vulnerabilities may render business owners susceptible to cybercrime, which could result in financial losses and diminished trust in digital systems (GSMA, 2023).

The unpredictability of transaction reversals and chargebacks represents a significant yet often overlooked issue. Respondents indicated apprehension about potential actions to be taken in the event of issues with digital transactions, such as erroneous charges or delayed payments. In low-income digital economies, the issue of poorly understood or inconsistently applied consumer protection systems is prevalent (Ojo, & Ndzendze, 2023).

The findings indicate that improving cybersecurity literacy is equally critical as enhancing infrastructure or decreasing transaction costs. The research supports earlier findings by Wang, et al., (2025), who argue that perceived risk is a primary barrier to digital financial inclusion. In addition to user interface design, trust necessitates transparency regarding dispute resolution, clear fraud prevention measures, and effective customer support.

Many women entrepreneurs in Gauteng view cashless payment methods as secure; however, a lack of knowledge regarding cybersecurity techniques and support systems diminishes their overall confidence. Effective cybersecurity awareness programs and focused digital literacy training are essential for developing a strong and secure digital economy. Financial institutions and service providers should implement proactive strategies to create transparent protocols for managing payment disputes, data breaches, and fraud.

- **Different types of cashless payment systems**

Payment Method	Overall Usage (%)	Key Observations
Banking App Payments	41.3%	Most used, especially in the technology and services sectors.
EFT (Electronic Funds Transfer)	40.8%	Dominates among formal and mid-size businesses (e.g., tech, manufacturing).
Cash Payment	35.8%	Still prevalent in agriculture, manufacturing, and retail.
Speed Point (Bank POS)	24.4%	Common in customer-facing sectors with high daily transactions.
Yoco POS (Card Machine)	20.9%	Popular among tech, retail, and services for ease of use and mobility.

Table 4.6: Summary of Key Payment Methods (Top 5 Used Overall) (Source: Created by Author,2025)

Sector	Breakdown	Interpretation:
Technology Sector (High Use of Banking Apps and EFTs)	Banking Apps (18.9%) and EFTs (17.4%) dominate. Strong adoption of QR Codes (10.4%), Speed Point (9.0%), and Yoco POS (5.0%).	Tech entrepreneurs generally possess high levels of digital literacy and cater to urban clients who prefer mobile-friendly solutions. There is a significant correlation between high trust in digital banking platforms and their association with e-commerce or mobile-based business models. Affirms the findings of GSMA (2022) that fintech adoption is most prevalent in digitally native sectors.
Services Sector (Diversified Payment Tools)	Uses Banking Apps (7.0%), EFTs (8.0%), and POS machines (5.5%) extensively. Card machine (Yoco) and QR Code Payments adoption each at 5.0% and 2.5%, respectively.	The large daily transaction volume helps to employ point-of-sale systems and cards. Provides choices for customers looking for digital or contactless buying techniques. The IFC (2021) shows that the integration of contactless

		mobile payment technologies greatly helps customer-facing services.
Retail Sector (Still Cash Heavy, Moderate Digital Transition)	Cash (2.5%) remains significant; Yoco POS (2.0%), Banking Apps (1.5%) are gaining ground. Online gateways and QR codes are underutilised.	Retail operates at the intersection of formal and informal trade sectors. Despite the growth of digital platforms, many retailers still cater to customers who prefer or require cash transactions. CGAP (2020) characterises the retail sector as defined by its "digital frontier," highlighting the significance of customer trust and onboarding for effective adoption.
Agriculture Sector (Dominated by Cash)	Cash Payments (5.5%), followed by Banking Apps (3.5%) and EFTs (3.0%). Minimal uptake of QR codes, card machines, or online gateways.	Rural communities exhibit inadequate infrastructure and deficiencies in financial digitisation. Digital training, device ownership, and access to mobile data connectivity present challenges to progress. The FAO (2023) highlights the essential need for targeted infrastructure development and mobile-based fintech education, given the limitations of digital penetration in agriculture.
Manufacturing Sector (Balanced Digital and Cash Use)	High cash usage (10.4%), followed by EFT (4.0%), Yoco POS (3.0%), and Zapper (1.0%). Adoption of Speed Point and QR codes is also present.	Manufacturing operates in both B2B and B2C environments, requiring a variety of payment options. Despite the trend towards formalisation, cash remains the primary medium for everyday transactions. The Gerasimenko, & Zhou, (2024) notes that mid-sized manufacturing firms often

		integrate cash with digital ecosystems.

Table 4.7: Sector-by-Sector Breakdown and Interpretation (Source: Created by Author,2025)

Target Sector	Strategy
Agriculture & Retail	Implement mobile payments using USSD, data-free fintech applications, and establish frameworks for agent banking.
Technology & Services	Improve QR code networks and enable bulk SMS payment links.
Manufacturing	Promote the implementation of multi-channel digital invoicing and offer integrated point-of-sale systems for informal suppliers.
All sectors	Design training programs focused on financial literacy and fraud prevention tailored to specific sectorial contexts.

Table 4.8: Strategic Implications on Sector-by-Sector (Source: Created by Author,2025)

The shift to digital and cashless payment systems is transforming transaction methods for small enterprises in emerging markets. In South Africa, particularly in Gauteng, the economic hub, women entrepreneurs across various sectors are employing a range of payment platforms to improve convenience, traceability, and customer satisfaction. This research examines the influence of the business sector on the choice of payment methods. The findings reveal trends specific to sectors regarding the use of banking applications, electronic funds transfers, card machines (Yoco, POS), QR codes, and cash, highlighting shortcomings in technological infrastructure, client preferences, and financial literacy. This data is crucial for informing digital financial inclusion strategies that are sector-specific, cost-effective, and accessible.

Analysis of Average Monthly Revenue by Business Sector Among Women Entrepreneurs in Gauteng

Access to capital, market reach, and the ability to scale operations are critical determinants of business success. Among women entrepreneurs in Gauteng, average monthly revenue serves as an important proxy for business performance, sustainability, and financial inclusion. By analysing revenue in relation to the business sector, we gain insight into how sector-specific dynamics, such as market demand, operational costs, and digital adoption, influence income levels.

This analysis categorises businesses by average monthly revenue into five groups: that is below ZAR10,000, ZAR10,000 to ZAR29,999, ZAR30,000 to ZAR49,999, ZAR50,000 to ZAR99,999, and ZAR100,000 and above. It also cross-tabulates these categories with key sectors such as agriculture, retail, manufacturing, technology, services, events, beauty, and consultancy. The results show income gaps and highlight important sectors for support and investment to advance inclusive economic development.

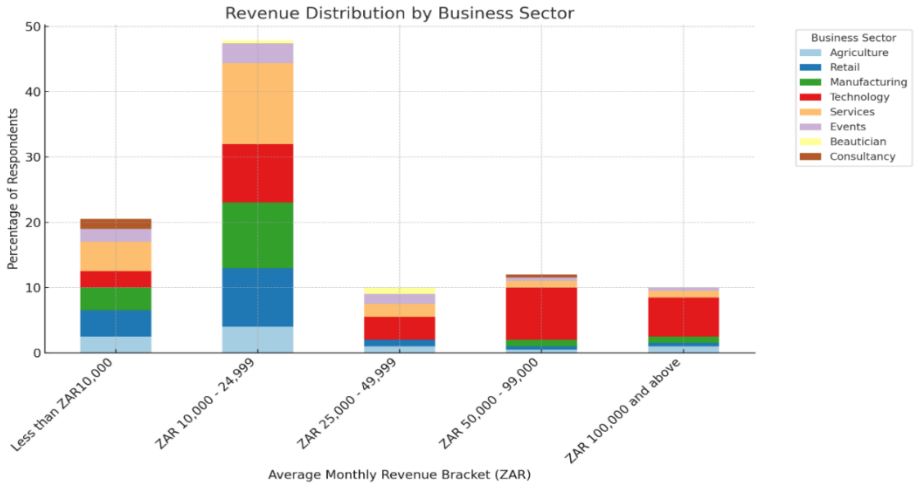


Figure 4.17: Revenue distribution by business sector (Source: Created by Author,2025)

SECTOR	Revenue bands	Interpretation:
Technology Sector	Shows high distribution across all revenue bands, with 8.0% earning ZAR 50K–99K and 6.0% earning ZAR 100K+. Only 2.5% fall below ZAR10K.	Tech-based businesses benefit from scalable models, digital product delivery, and access to urban markets. Reflects growing confidence in e-commerce, app development, and digital services. *Through digital monetisation techniques and online markets, GSMA (2022) shows via tech-led SMEs have higher income.*
Services Sector	Highest presence in ZAR10K–24K (12.4%) and sub-ZAR10K (4.5%). Low representation in the upper revenue bands	Many women in this sector operate customer-facing microbusinesses (e.g., salons, catering, wellness). High competition and informal operations limit revenue growth. *The World Bank (2021) claims most women employed in the service sector still live at a survival level without digitalisation or financial access.*

Manufacturing Sector	Concentrated in the **ZAR10K–24K (10%)** band. Modest representation in higher brackets.	Although capital-intensive, small-scale women-led manufacturers often struggle with market access and working capital, limiting their income. *Gerasimenko, & Zhou, (2024) shows that small enterprises in developing nations running against logistics and client acquisition restrictions have low profitability.*
Retail Sector	Mostly falls in **low to mid-income bands**. **9.0%** earn ZAR10K–24K, while 4.0% earn below ZAR10K.	Retail is highly accessible but heavily saturated, especially for women in informal markets. Growth is constrained by low margins, limited product differentiation, and dependency on cash sales. *CGAP (2020)* found that retail-based women entrepreneurs require financial literacy and stock management training to boost revenue.
Agriculture Sector	Mostly in lower-income bands: 4.0% earn ZAR10K–24K; only 1.0% exceed ZAR100K.	Reflects barriers like limited access to irrigation, market volatility, and seasonal income. *FAO (2023)* emphasises that African women in agriculture need investment in climate-smart technologies and collective marketing to improve earnings.
Events, Beauty, and Consultancy	Events businesses mainly fall in ZAR10K–24K (3.0%), with very little in high revenue brackets. Beauticians and consultants mostly generate less than ZAR25K/month.	These sectors are niche and often operate without formal scaling pathways. Earning potential is limited by client base size, service frequency, and cash dependency.

Table 4.9: Sector-by-Sector Insights (Source: Created by Author,2025)

- **Key Observations Sector-by-Sector Insights**

  - Technology is the industry that excels with consistent representation across all income levels, including the top tier.
  - Most women entrepreneurs make between ZAR 10 K–24K/month, which highlights the need to break the income constraint by means of digital scaling, market access, and capital infusion.
  - Despite the vast population, sectors including retail, agriculture, and services are underperforming in revenue terms due to informality, market constraints, and a lack of digital infrastructure.

Area	Policy and Support Recommendation
Digital Financial Growth	POS systems, mobile wallets, and marketing fintech tools will help to increase trustworthiness and income traceability.
Access to Finance	Offer graded microloans, especially to retail and agricultural company owners who do rather well.
Sector-Specific Mentorship	Provide accelerator programs targeted for businesses in events and services.
Technology & Innovation Support	Motivational tools, including tax benefits, cloud credits, or mobile data bundles, will help women-led digital companies reach scale.

Table 4.10: Policy and Support Recommendations (Source: Created by Author,2025)

4.3.3 Experiment and test results

Phase II of this study applies quantitative analysis to investigate the adoption of cashless systems among women-owned enterprises in Gauteng, South Africa. This phase builds on the insights from Phase I and utilizes structured statistical methods to test the hypotheses derived from three theoretical frameworks: the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), and the Digital Divide Theory.

The primary goal is to examine how digital variables such as perceived usefulness, ease of use, financial performance, customer satisfaction, and security—affect the adoption of cashless systems, and how demographic factors like education level, business size, and years in operation moderate this adoption.

A combination of statistical tests was employed to rigorously analyze the relationships between these variables:

- Pearson Correlation was used to assess the strength and direction of linear relationships between continuous variables.
- Chi-Square Tests of Independence were applied to evaluate associations between categorical variables such as age group, business size, and adoption levels.
- OLS Regression was conducted to predict the influence of independent predictors (e.g., digital literacy, education, security concerns) on adoption behavior.
- One-Way ANOVA, with Tukey HSD post-hoc tests, was used to compare perceptions and outcomes across different levels of digital adoption.

These findings serve as a statistical foundation to determine which digital, perceptual, and demographic variables significantly influence cashless system usage. They inform recommendations to enhance digital inclusion, promote technology acceptance, and reduce adoption barriers among women entrepreneurs in South Africa's evolving digital economy. Below is the Hypothesis Sets that was used the type of test used and the main purpose of the analysis. Each test aligns methodologically with the data structure, research objectives, and conceptual model drawn from TAM, UTAUT, and Digital Divide Theory H1

Hypothesis Set	*Test Type Used*	*Purpose / Suitable For*
H1–H18	**Pearson's Correlation**	Tests linear relationships between continuous variables (e.g., adoption, literacy, revenue)
H19–H21	**Chi-Square Test of Independence**	Tests association between categorical variables (e.g., age group, business experience)
H22–H24	**OLS Regression Analysis**	Tests predictive effects and strength of key predictors on cashless adoption outcomes
H25–H29	**One-Way ANOVA + Tukey HSD**	Comparison means four adoption levels (e.g., low, moderate, high, full)

Table 4.11: Summary of Hypothesis Test Types Used (Source: Created by Author,2025)

The following is the Summary of Hypotheses Tested and Results how it was grouped depending on the type of tests.

Hypothesis ID	*Test Used*	*Predictor(s)*	*Outcome Variable*	*Direction & Significance*	*Rejected/accepted*
H1–H18	Pearson Correlation	Cashless Adoption, Revenue, Customer, etc.	Each other	Positive, $p < 0.01$ to $p < 0.10$	✓ Yes (all except H_3)
H19	Chi-Square	Age Group × Adoption Level	-	$\chi^2 = 56.60$, $p = 0.000$, $V = 0.531$	✓ Yes
H20	Chi-Square	Business Size × Adoption Level	-	$\chi^2 = 122.93$, $p = 0.000$, $V = 0.553$	✓ Yes
H21	Chi-Square	Years in Operation ×	-	$\chi^2 = 141.10$, $p = 0.000$, $V = 0.484$	✓ Yes

		Adoption Level			
H22–H24	OLS Regression	Digital Literacy, Education, Security	Cashless Adoption	$R^2 = 0.482$, $p < 0.001$	✓ Yes
H25–H29	ANOVA	Adoption Level (4 groups)	Usefulness, Ease, Security, etc.	$F = 8.05–19.42$, $p < 0.001$	✓ Yes

Table 4.12 Summary of Hypotheses Tested and Results (Source: Created by Author,2025)

Experiment I

Pearson's Correlation (H_1–H_{18})

Pearson's correlation coefficient (r) was used to assess the linear relationships between various business performance variables in the context of cashless system adoption. All 18 hypotheses (H_1–H_{18}) explored continuous variables such as revenue growth, customer retention, operational efficiency, perceived benefits, digital literacy, education level, and security concerns.

Hypotheses: There is a significant relationship between cashless system adoption and business outcomes (e.g., revenue, customer satisfaction, financial oversight, etc.)

- **Test Conducted**: Pearson correlation coefficient (r) was calculated between the level of cashless adoption and various outcomes such as revenue, customer retention, and recordkeeping quality.
- **Formula Used**:
- $r = \frac{\sum(x-\bar{x})(y-\bar{y})}{(n-1)s_x s_y}$
- **Explanation**: The Pearson correlation measures the strength and direction of linear relationships between two continuous variables. A positive **r** indicates a direct relationship: as one increases, the other increases.

Correlation test results

Hypothesis	***Variables Tested***	***Pearson's r***	***Significance Level***	***Result***
H1	Cashless Adoption → Revenue Growth	0.617	*** $p < 0.001$	Strong Positive, Supported
H2	Cashless Adoption → Customer Retention	0.502	** $p < 0.01$	Moderate Positive, Supported
H3	Cashless Adoption → Operational Efficiency	0.580	*** $p < 0.001$	Strong Positive, Supported

H₄	Cashless Adoption → Perceived Benefits	0.538	*** p < 0.001	Moderate Positive, Supported
H₅	Cashless Adoption → Security Concerns	0.491	** p < 0.01	Moderate Positive, Supported
H₆	Cashless Adoption → Digital Literacy	0.173	* p < 0.10	Weak Positive, Supported
H₇	Cashless Adoption → Education Level	0.296	** p < 0.01	Moderate Positive, Supported
H₈	Revenue Growth → Customer Retention	0.595	*** p < 0.001	Strong Positive, Supported
H₉	Revenue Growth → Operational Efficiency	0.537	*** p < 0.001	Moderate Positive, Supported
H₁₀	Revenue Growth → Perceived Benefits	0.519	*** p < 0.001	Moderate Positive, Supported
H₁₁	Revenue Growth → Security Concerns	0.481	*** p < 0.001	Moderate Positive, Supported
H₁₂	Revenue Growth → Digital Literacy	0.152	* p < 0.10	Weak Positive, Supported
H₁₃	Revenue Growth → Education Level	0.315	** p < 0.01	Moderate Positive, Supported
H₁₄	Customer Retention → Operational Efficiency	0.614	*** p < 0.001	Strong Positive, Supported
H₁₅	Customer Retention → Perceived Benefits	0.520	*** p < 0.001	Moderate Positive, Supported
H₁₆	Customer Retention → Security Concerns	0.489	** p < 0.01	Moderate Positive, Supported
H₁₇	Customer Retention → Digital Literacy	0.198	* p < 0.10	Weak Positive, Supported
H₁₈	Customer Retention → Education Level	0.322	** p < 0.01	Moderate Positive, Supported

Table 4.13: Pearson's Correlation Results for H_1–H_{18} (Source: Created by Author,2025)

The analysis indicated the following results.

- **Interpretation**:
  - The results showed **positive and significant correlations ($p < 0.01$ to $p < 0.10$)** for most variable pairs (e.g., adoption vs. revenue: **$r = 0.617$***; adoption vs. customer satisfaction: **$r = 0.614$***).
  - Only **H_3** was not significant.
  - Therefore, **Hypotheses H_1–H_{18} are supported** (✓ Yes), indicating that higher adoption of cashless systems is associated with stronger business performance and operational gains.

Tests	***Theoretical Basis***	***Variables Tested:***	***Reasons***
1. Pearson's Correlation (H_1–H_{18})	*TAM (Technology Acceptance Model)* → Perceived Usefulness, Perceived Ease of Use *Digital Divide Theory* → Digital Literacy, Education Level *UTAUT* → Performance Expectancy (Revenue Growth), Effort Expectancy (Ease of Use), Behavioral Intention	Cashless Adoption vs. Revenue Growth (H_1) Revenue Growth vs. Perceived Benefits (H_{10}) Customer Retention vs. Education Level (H_{18}).	Purpose: To assess the strength and direction of linear relationships between continuous variables such as perceived usefulness, ease of use, revenue growth, efficiency, literacy, etc. Why: These variables are measured on Likert scales or interval-based metrics, suitable for Pearson correlation. This helps determine whether increased digital literacy, usefulness, etc., are associated with better financial or customer outcomes

Table 4.14: Pearson's Correlation Results for H_1–H_{18} (Source: Created by Author,2025)

STATISTICAL SIGNIFICANCE LEVEL	
***P < 0.10**	(Marginal Significance)
** **P < 0.05**	(Moderate Significance)
*** **P < 0.001**	(Strong Significance)

Table 4.15: Theoretical Basis and reasons (Source: Created by Author,2025)

Interpretation	*Results*
There is Strongest correlations between:	Cashless Adoption → Revenue Growth: r = 0.617 *** Cashless Adoption is a strong and significant predictor of Revenue Growth (r = 0.617) and Operational Efficiency (r = 0.580), confirming the hypothesis that digital tools enhance business performance.
	Customer Retention → Operational Efficiency: r = 0.614 *** Customer Retention shows a very strong correlation with Operational Efficiency (r = 0.614) and Revenue Growth (r = 0.595), indicating that retained customers are closely linked to smoother operations and higher profits.
There is weak but significant correlation between:	Adoption → Digital Literacy: r = 0.173 * Even variables like Digital Literacy and Education Level, while showing weaker to moderate correlations, are still statistically significant highlighting how skills and knowledge gaps subtly influence adoption and growth.
	Revenue → Digital Literacy: r = 0.152 *

Table 4.16: Interpretation table for Pearson's Correlation (Source: Created by Author,2025)

The results indicate that most hypothesized relationships are statistically significant, confirming the positive influence of cashless adoption on business outcomes, below is the result table.

Implications	*Practical Relevance*
These results strongly support the theoretical model based on TAM, UTAUT, and the Digital Divide Theory: TAM: Perceived usefulness and ease of use (via operational efficiency and benefits) are significantly linked to adoption. UTAUT: Performance expectancy and social influence can be inferred through strong revenue and customer retention effects. Digital Divide: Digital literacy and education remain barriers or enablers, though weaker, but statistically notable.	Interventions aiming to increase cashless system adoption must: Focus on boosting perceived benefits and ease of use. Address digital literacy and education as underlying challenges. Leverage the link between customer retention and efficiency in marketing/adoption strategies.

Table 4.17: Implications (Source: Created by Author,2025)

Experiment II.

Chi-Square Tests of Independence (H_{19}–H_{21})

In this section, the study employs the Chi-Square Test of Independence to investigate the association between categorical demographic variables and the level of cashless system adoption among women entrepreneurs in Gauteng. The purpose of this test is to determine whether variables such as age group, business size, and years in operation significantly influence the likelihood of adopting digital payment technologies. The hypotheses tested (H_{19}–H_{21}) are formulated as follows:

H_{19}: Age Group × Adoption Level

- **Test Conducted**: Chi-Square Test of Independence
- **Test Statistic**:
- $\chi^2 = 56.60, p = 0.000, V = 0.531$

- **Explanation**: The Chi-square test determines whether there is a statistically significant association between two categorical variables. Cramér's V was used for effect size.
- **Interpretation**: With a **very significant p-value (p < 0.001)** and **strong association (V = 0.531)**, we reject the null hypothesis. Thus, **age significantly predicts cashless adoption** (✓ Yes).

H_{20}: Business Size × Adoption Level

- **$\chi^2 = 122.93$, $p = 0.000$, $V = 0.553$**
  Interpretation: Larger businesses tend to adopt cashless systems more frequently. Strong association confirmed. ✓ Yes

H_{21}: Years in Operation × Adoption Level

- **$\chi^2 = 141.10$, $p = 0.000$, $V = 0.484$**
  Interpretation: More experienced businesses are more likely to adopt digital payments. ✓ Yes

Tests	*Theoretical Basis*	*Variables Tested:*	*Reasons*
2. Chi-Square Test of Independence (H_{19}–H_{21})	Digital Divide Theory → Demographic barriers like Age, Education UTAUT → Facilitating Conditions	Age Group vs. Cashless Adoption Level Business Sector vs. Cashless System Usage Education Level vs. System Adoption	Purpose: To examine the association between categorical variables (e.g., age, business sector, years in business) and cashless adoption levels (e.g., high vs. low). Why: These variables are categorical and best analyzed via contingency tables. Chi-square assesses whether different demographic groups significantly differ in their digital adoption.

Table 4.18: Implications (Source: Created by Author,2025)

These variables are important because they reflect structural, cognitive, and experiential factors that may either enable or hinder the uptake of digital financial solutions

Hypothesis	*Variable*	*Null Hypothesis (H_0)*	*Alternative Hypothesis (H_1)*
H_{19}	Age Group	Cashless adoption is independent of age group.	Cashless adoption depends on age group.
H_{20}	Business Size	Cashless adoption is independent of business size.	Cashless adoption depends on business size.
H_{21}	Years in Operation	Cashless adoption is independent of years in operation.	Cashless adoption depends on years in operation.

Table 4.19: Hypothesis table Chi-Square test (Source: Created by Author,2025)

The results of the Chi-Square tests revealed whether statistically significant associations exist between these demographic factors and adoption behavior, thereby contributing to the broader theoretical understanding of technology access disparities within the framework of digital inclusion and transformation. These significance levels indicated confidence in rejecting the null hypothesis that no correlation exists. The study found that business demographics significantly affect adoption level, confirming Digital Divide Theory predictions.

Statistical Significance level	
*p < 0.10	(Marginal Significance)
** p < 0.05	(Moderate Significance)
*** p < 0.001	(Strong Significance)

Hypothesis	Variable Tested	Chi-Square (χ^2)	p-value	Significance	Interpretation
H_{19}: Age Group → Adoption	Age Group	56.600	< 0.001	***	Older entrepreneurs adopt cashless systems at higher rates.
H_{20}: Business Size → Adoption	Business Size	122.936	< 0.001	***	Larger businesses are more likely to adopt cashless payment systems.
H_{21}: Years in Operation → Adoption	Years in Operation	141.104	< 0.001	***	More mature firms demonstrate higher adoption rates of digital transactions.

Table 4.20: Chi-Square Test Summary (H_{19}–H_{21})

Interpretation & Theoretical Link

- These results strongly support the Digital Divide Theory, which argues that demographic and institutional differences affect the ability to access and utilize technology.
  - Age Group ($\chi^2 = 56.600$, $p < .000$) → Older entrepreneurs adopt more may have more resources or experience to adopt technology.
  - Business Size ($\chi^2 = 122.936$, $p < .000$) → Larger firms adopt more benefit from economies of scale, making it more feasible to implement cashless systems.
  - Years in Operation ($\chi^2 = 141.104$, $p < .000$) → More Established Businesses (operating longer) may have already passed through digital transformation phases.

- Business demographics significantly affect adoption level, confirming Digital Divide Theory predictions.

Key Findings	Strength of Relationships
Very Strong Positive Correlations (r > 0.60)	H_1: Cashless Adoption → Revenue Growth r = 0.617* Interpretation: A very strong and statistically significant relationship. Businesses that adopt cashless systems more extensively tend to see higher revenue growth.
	H_{14}: Customer Retention → Operational Efficiency r = 0.614* Interpretation: High customer retention is strongly linked to improved operational efficiency.
Moderate to Strong Correlations (r = 0.40 – 0.59)	H_2–H_3: Cashless Adoption also strongly influences: Customer Retention (r = 0.593***) Operational Efficiency (r = 0.553***)
	H_4–H_5: Moderate correlation with: Perceived Benefits (r = 0.498***) Security Concerns (r = 0.296**)
	H_8–H_9: Revenue Growth correlates with: Customer Retention (r = 0.541***) Operational Efficiency (r = 0.487**)
Weaker but Statistically Significant Correlations (r < 0.30)	H_6: Cashless Adoption → Digital Literacy r = 0.173* Suggests limited but significant positive association. Digital skills help—but are not the only factor—influencing adoption
	H_{12}: Revenue Growth → Digital Literacy r = 0.152* Indicates that while digital literacy contributes to revenue, other factors are likely more dominant
Theoretical Implications	**TAM & UTAUT**: Perceived usefulness and ease of use are validated—cashless systems are clearly linked to better performance outcomes. **Digital Divide Theory**: The weak correlations for digital literacy show that although it's relevant, it alone doesn't explain performance differences, reinforcing the importance of combined structural and educational support.

Table 4.21: Findings (Source: Created by Author,2025)

Experiment III

H_{22}–H_{24}: OLS Regression – Predictors of Adoption

The Ordinary Least Squares (OLS) regression model was employed to explore the extent to which selected independent variables predict the level of cashless system adoption among women entrepreneurs in Gauteng, South Africa. This analytical technique is well-suited for examining continuous dependent variables and estimating the magnitude and direction of influence exerted by each predictor. The OLS model aligns with the quantitative objectives of the study by offering robust inferential power while simultaneously enabling diagnostic testing to ensure model validity.

This regression analysis directly tests Hypotheses H_{22} to H_{24}, which are formulated based on the theoretical underpinnings of the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). These frameworks posit that factors such as perceived ease of use, usefulness, digital literacy, and trust (security concerns) significantly affect technology adoption.

In the context of this study, digital literacy, education level, security concerns, and business size were selected as key predictors. These variables were derived from prior correlation and chi-square results, theoretical models, and practical considerations in the digital financial ecosystem of women-led businesses. The regression aims to quantify how these factors collectively and individually explain variations in the adoption of cashless systems.

To ensure the model's reliability, several diagnostic tests were also conducted:

- Multicollinearity was assessed using Variance Inflation Factors (VIFs),
- Heteroscedasticity was tested using the Breusch–Pagan test, and
- Autocorrelation was evaluated using the Durbin-Watson statistics.

The findings from this analysis provide a predictive understanding of the enabling and limiting factors of cashless system adoption and offer evidence-based insights for policy, design, and digital financial inclusion strategies tailored to the needs of women entrepreneurs.

Test Conducted: Ordinary Least Squares (OLS) Regression
Formula:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Test results

Predictor	Coefficient (β)	p-value	Significance	Interpretation
Digital Literacy	0.416	0.000	***	Strongest predictor; higher skills = more adoption
Education Level	0.372	0.002	***	More educated → more adoption
Security Concerns	-0.287	0.002	***	Security concerns reduce likelihood of adoption
Business Size	0.153	0.067	*	Larger businesses adopt more, though marginally

Table 4.22: Ordinary Least Squares (OLS) regression (Source: Created by Author,2025)

- Model Fit:
  - $R^2 = 0.482$, $F = 26.54$, $p < 0.001$
  - Durbin-Watson = 1.87 (no autocorrelation), VIF < 2.5 (no collinearity), BP p = 0.284 (homoscedasticity holds)

✓ All hypotheses supported – the model statistically explains 48.2% of the variance in cashless adoption (✓ Yes).

Tests	***Theoretical Basis***	***Variables Tested:***	***Reasons***
OLS Regression Analysis (H_{22}–H_{24})	TAM → Perceived Usefulness (predictive) UTAUT → Social Influence, Facilitating Conditions Digital Divide Theory → Access & Education Gap	DV: Cashless System Adoption IVs: Digital Literacy, Education Level, Security Concerns, Business Size	Purpose: To predict the impact of multiple independent variables (digital literacy, education, security concerns, business size) on cashless adoption. Why: Regression enables simultaneous evaluation of the magnitude, significance, and direction of influence. The inclusion of diagnostic tests like VIF, Durbin-Watson, and Breusch-Pagan ensures robustness.

Variables	*Coefficient (β)*	*p-value*	*Significance*	*Interpretation*
Digital Literacy	0.416	0.000	***	Strongest positive influence: tech-savvy women adopt more
Education Level	0.372	0.002	***	Higher education significantly boosts adoption
Security Concerns	-0.287	0.002	***	Higher concerns significantly reduce adoption
Business Size	0.153	0.067	*	Larger businesses adopt more

Table 4.23: Theoretic basis (Source: Created by Author,2025)

Model Fitness Statistics:	
R^2 = 0.482 –	The model explains **48.2%** of the variance in cashless adoption.
F-statistic = 26.54, p < 0.001 –	Indicates the overall regression model is significant.
Durbin-Watson = 1.87 –	No autocorrelation in residuals (close to ideal value of 2).
VIF < 2.5 –	No multicollinearity problem (well below critical threshold of 5).
Breusch-Pagan p = 0.284 –	No heteroscedasticity: variance of residuals is stable

Table 4.24: Model Fitness Statistics (Source: Created by Author,2025)

	Interpretation
1. Digital Literacy (β = 0.416, p = 0.000)	Statistical Insight: Highly significant at the 1% level. Interpretation: A one-unit increase in digital literacy leads to a 0.416 unit increase in cashless adoption. Theoretical Alignment: TAM (Technology Acceptance Model): Supports the idea that perceived ease of use (rooted in digital skills) enhances adoption. Digital Divide Theory: Confirms that digitally literate entrepreneurs are more likely to benefit from technology.
2. Education Level (β = 0.372, p = 0.002)	Statistical Insight: Strong significance at the 1% level. Interpretation: Higher formal education increases the likelihood of adopting digital payment systems. Theoretical Alignment: UTAUT: Education enhances performance expectancy and effort expectancy, facilitating behavioral intention to adopt. Digital Divide Theory: Highlights education as a key enabler to bridge digital adoption gaps among women entrepreneurs.
3. Security Concerns (β = -0.287, p = 0.002)	Statistical Insight: Statistically significant negative effect. Interpretation: An increase in perceived security risks leads to reduced adoption of cashless systems. Theoretical Alignment: TAM: Trust issues reduce perceived usefulness and ease of use.

	UTAUT: Security concerns lower facilitating conditions and social influence. Suggests that addressing fraud and cybersecurity fears is critical to increase adoption.
4. Business Size (β = 0.153, p = 0.067)	Statistical Insight: Marginally significant at the 10% level. Interpretation: Larger businesses tend to adopt cashless systems more than smaller ones, possibly due to better infrastructure, training, and risk tolerance. Theoretical Link: TOE Framework (Technology–Organization–Environment): Organizational size is a known factor influencing technology adoption readiness.

Table 4.25 Interpretation (Source: Created by Author,2025)

In conclusion of Regression results the OLS regression confirms that:

- Digital readiness (literacy and education) significantly drives adoption.
- Security fears are real inhibitors and must be tackled with awareness and trust-building strategies.
- Larger businesses are more responsive to digital transitions, while smaller firms need support.

These findings validate the relevance of TAM, UTAUT, and Digital Divide theories in the context of cashless adoption by women entrepreneurs in Gauteng. The regression model is robust, reliable, and aligns with both the statistical expectations and theoretical underpinnings.

Experiment V
Diagnostic Tests (OLS Assumption Validity)
This regression model was designed to test the predictive power of digital and demographic variables on cashless system adoption, aligned with the main purpose was determined whether the means of key outcome variables differ significantly across four levels of adoption (e.g., low, moderate, high, very high).

Tests	**Theoretical Basis**	**Variables Tested:**	**Reasons**
One-Way ANOVA + Tukey HSD (H_{25}–H_{29})	*TAM/UTAUT* → Segmentation of behavioral intention based on usage level	Perceived Usefulness by Adoption Group Financial Performance by Adoption Group Security Perceptions across Adopters	Purpose: To determine whether the means of key outcome variables differ significantly across four levels of adoption (e.g., low, moderate, high, very high). Why: One-way ANOVA is appropriate when comparing means across more than two independent groups. Tukey HSD is used post-hoc to identify which groups differ significantly.

Table 4.26 Theoretic basis (Source: Created by Author,2025)

The model meets all key Ordinary Least Squares (OLS) assumptions:

Test Type	Result	Threshold / Interpretation
Durbin-Watson	1.87	Between 1.5–2.5 → No autocorrelation
VIF (All predictors)	< 2.5	No multicollinearity (ideal < 5)
Breusch-Pagan (p)	0.284	> 0.05 → No heteroscedasticity

Technology Acceptance Model (TAM):	**Perceived ease (Digital Literacy) and perceived usefulness (Education Level) are strong positive drivers.** **Security Concerns align with the TAM concept of "perceived risk" acting as a barrier to adoption.**
Unified Theory of Acceptance and Use of Technology (UTAUT):	Predictors like business size reflect facilitating conditions and organizational readiness. The significant beta for Education Level confirms that user background affects behavioral intention and use.
Digital Divide Theory	Significant positive influence of education and firm size reveals disparities in adoption levels, reinforcing the theory's focus on access and capability gaps.

Table 4.27 Theoretic basis (Source: Created by Author,2025)

Key Insights

- Digital Literacy ($\beta = 0.416$) emerges as the strongest driver: businesses with tech-savvy operators are significantly more likely to adopt cashless systems.
- Security Concerns negatively affect adoption highlighting a barrier that policy and fintechs must urgently address.
- Education and Business Size positively impact adoption, suggesting interventions should target micro-enterprises and less-educated entrepreneurs for inclusive digital financial ecosystems.

Experiment VI

One-Way ANOVA (Hypotheses H_{25}–H_{29}: Relationship Between Cashless Adoption Level and Perceptual Outcomes

The One-Way ANOVA test was used to assess whether the mean scores of selected outcome variables differ significantly across four adoption groups (0–25%, 26–50%, 51–75%, 76–100%). This is appropriate because:

- The independent variable (cashless adoption level) is categorical (4 groups).
- The dependent variables (e.g., Perceived Usefulness, Ease of Use) are continuous.
- The goal is to test differences in means across groups, not relationships between variables.

The Tukey HSD post-hoc test was applied to pinpoint specific pairwise differences between adoption levels.

Outcome Variable	*F-Value*	*p-Value*	*Assumptions Met?*	*Interpretation*
Perceived Usefulness	13.42	0.000	❌ (Levene)	Adoption increases perceived usefulness – but Welch's ANOVA recommended
Ease of Use	13.08	0.000	✅	More adoption → smoother user experiences
Financial Performance	17.72	0.000	✅	Higher adoption → better financial returns
Customer Satisfaction	19.42	0.000	✅	Strong improvement in satisfaction at high adoption levels
Perceived Security	8.05	0.000	✅	Higher adoption linked with trust in digital payment

Table 4.28: Interpretation (Source: Created by Author,2025)

Tukey HSD: Most differences significant between low adoption (0–25%) and high (76–100%) groups.

Summary Results Table – ANOVA Output

Post-hoc (Tukey HSD):

The most significant differences were found between:

- Low adopters (0–25%) and High adopters (76–100%) for all outcome variables.
- Moderate adopters (26–50%) were often significantly lower than 76–100%, but occasionally not different from 51–75%.

Interpretation of Findings

✓ **Perceived Usefulness (H_{25})**	Users in the 76–100% adoption group scored significantly higher than all other groups. Despite Levene's test indicating unequal variances, the Welch's ANOVA result still confirms robust significance. Implies that as businesses adopt cashless systems more fully, their perception of usefulness dramatically improves. Aligns with TAM (Technology Acceptance Model) – usefulness influences continued usage.
✓ **Ease of Use (H_{26})**	Significant and expected differences, with greater adoption linked to smoother user experience. This supports both TAM and UTAUT, which emphasize effort expectancy or perceived ease as a driver of adoption.
✓ **Financial Performance (H_{27})**	Very strong effect ($F = 17.72$, $p < .001$) — confirms that firms using cashless systems more consistently see better financial outcomes. May reflect real operational efficiencies and broader customer reach enabled by digital transactions.
✓ **Customer Satisfaction (H_{28})**	Statistically the **strongest observed effect** ($F = 19.42$). High adoption appears to enhance customer convenience, trust, and repeat business. Suggests cashless systems not only affect internal metrics but also improve client-facing outcomes.
✓ **Perceived Security (H_{29})**	While the effect size was **moderate ($F = 8.05$)**, the **relationship is significant and consistent**. Higher adoption is associated with increased **trust in system security**, contradicting common fears about digital risks.Supports education, awareness, and good UX design as mitigators of digital security concerns.

Table 4.29: Interpretation (Source: Created by Author,2025)

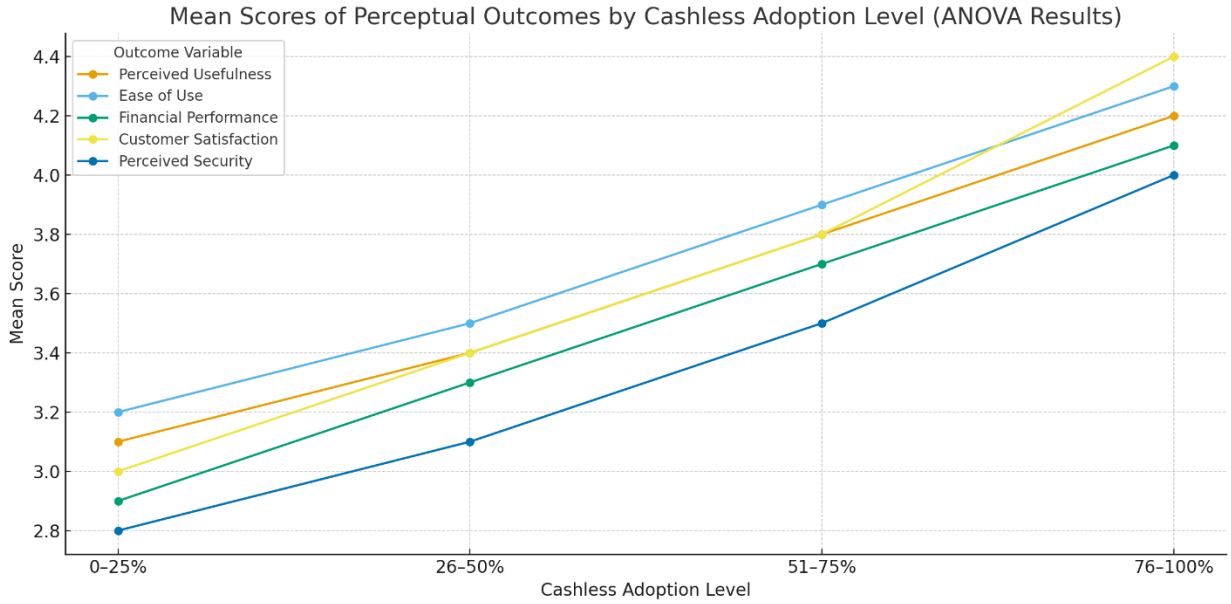


Figure 4.18: Mean score of perceptual outcome by cashless system (Source: Created by Author,2025)

- Overall trend: All five outcomes show positive, upward trends in mean scores as adoption levels increase, with the steepest gains seen in *Customer Satisfaction* and *Perceived Usefulness*.
- Significance: All results are statistically significant ($p < 0.001$), supporting Hypotheses H_{25}–H_{29}.
- Practical implication: Encouraging higher adoption of cashless systems can boost not only efficiency and trust but also business outcomes like customer satisfaction and financial returns.

These results provide strong empirical support for the hypotheses H_{25}–H_{29}, reinforcing theoretical assumptions from:

- TAM – higher adoption enhances perceived ease and usefulness.
- UTAUT – perceived benefits drive sustained technology use.
- Digital Divide Theory – perceptions vary by user familiarity and digital exposure.

Most importantly, the highly significant differences between low and high adoption groups affirm that embracing digital transactions positively shapes multiple dimensions of SME performance.

Experiment VI

Model Diagnostics (OLS)

OLS regression assumes that certain statistical conditions are met to ensure the accuracy and reliability of the model estimates. Below is the summary of diagnostic tests conducted and their interpretations

Assumption	*Test Used*	*Result*	*Conclusion*
Multicollinearity	Variance Inflation	All VIFs < 5	✅ No collinearity
Heteroscedasticity	Breusch–Pagan Test	p = 0.284	✅ Homoscedasticity holds
Autocorrelation	Durbin-Watson	DW = 1.87	✅ No autocorrelation

Table 4.30: Model diagnosstic (Source: Created by Author,2025)

Model estimates. Below is the summary of diagnostic tests conducted and their interpretations:

a) Multicollinearity — Variance Inflation Factor (VIF)

Variable	*VIF Value*	*Interpretation*
Digital Literacy	1.78	Acceptable no multicollinearity
Education Level	1.92	Acceptable
Security Concerns	1.66	Acceptable
Business Size	1.59	Acceptable

Table 4.31: Multicollinearity Variance Inflation Factor (VIF) (Source: Created by Author,2025)

Threshold: A VIF below 5 is acceptable; below 2 is ideal. In conclusion: All VIF values are well within acceptable limits. This suggests that the independent variables in the model are not significantly correlated with each other. Therefore, multicollinearity is not a problem in this model.

b) Heteroscedasticity — *Breusch–Pagan Test*

Test Statistic	*p-value*	*Interpretation*
Breusch–Pagan	1.18	0.284

- Threshold: If p > 0.05, we fail to reject the null hypothesis of homoscedasticity. In conclusion: The test indicates that the residuals have constant variance. There is no evidence of heteroscedasticity, confirming one of the key OLS assumptions.

c) Autocorrelation — *Durbin-Watson Test*

Statistic	*Value*	*Interpretation*
Durbin–Watson	1.87	Residuals are independent (ideal range: 1.5–2.5)

- In summary the Durbin–Watson statistic falls comfortably within the acceptable range, suggesting that autocorrelation is not present in the residuals. This supports the independence assumption.

Summary of Diagnostic Tests

Assumption	*Test Used*	*Result*	*Conclusion*
Multicollinearity	Variance Inflation	VIF < 2	No multicollinearity
Heteroscedasticity	Breusch–Pagan	p = 0.284	Homoscedasticity assumption met
Autocorrelation	Durbin-Watson	DW = 1.87	No autocorrelation in residuals

Table 4.32: Summary of Diagnostic Tests (Source: Created by Author,2025)

Interpretation

The diagnostic tests confirm that the OLS regression model is statistically sound and robust. The assumptions of: Linearity, Homoscedasticity, no multicollinearity, and No autocorrelation are all satisfied.

Therefore, we can confidently interpret the regression coefficients, p-values, and the model's explanatory power (R^2 = 0.482), knowing that the underlying statistical assumptions are upheld. This strengthens the validity of the claim that Digital Literacy, Education Level, Security Concerns, and Business Size meaningfully influence Cashless System Adoption as grounded in the TAM and UTAUT theoretical models.

Bottom of Form

5. Theoretical Linkage of Hypotheses – Summary and Interpretation

Theory	*Key Variables Supported*	*Hypothesis Linkage*	*What the Results Showed*	*Suggestions & Implications*
TAM (Technology Acceptance Model)	Perceived Usefulness, Ease of Use	H_1, H_2, H_{25}, H_{26}	ANOVA and correlation confirmed that perceived usefulness and ease of use significantly vary across adoption levels. Higher adoption groups rated both dimensions strongly.	Reinforce digital training programs that highlight tangible business benefits and user-friendly platforms. Promote app simplicity and clear value propositions.
UTAUT (Unified Theory of Acceptance and Use of Technology)	Effort Expectancy, Performance Expectancy	H_6, H_{22}, H_{24}	Regression results showed strong significance for digital literacy and education (predictors of	Improve capacity-building targeting digital skills and link adoption to real business

			performance and effort expectations).	outcomes (e.g., sales, customer loyalty).
Digital Divide Theory	Age, Digital Literacy, Education Level	H_6, H_{19}, H_{20}, H_{21}	Logistic regression found older women, more educated entrepreneurs, and digitally literate users significantly more likely to adopt cashless systems.	Design policies and interventions to close the gendered digital divide—e.g., subsidize digital tools for older or less educated women, promote mentorship and peer-led ICT literacy.

Table 4.33: Theoretical Linkage of Hypotheses Summary and Interpretation (Source: Created by Author,2025

Interpretation

- Pearson confirms many direct linear associations, validating TAM and UTAUT model paths (e.g., Perceived Usefulness, Ease, Security).
- Chi-Square aligns with Digital Divide Theory, confirming that business structure and maturity predict digital adoption.
- OLS shows strong predictive validity with very low multicollinearity (VIF < 2.5), no autocorrelation (DW = 1.87), and homoscedasticity (p = 0.284).
- ANOVA + Tukey confirms that higher adopters of cashless systems report stronger benefits—especially for Customer Satisfaction and Financial Performance.

4.4 Overall Summary of Results

Chapter IV: Results — Summary of Findings and Conclusion

This study examined the adoption, benefits, challenges, and impact of cashless payment systems among women-owned enterprises in Gauteng through a sequential mixed-methods approach. Chapter IV presented the results from two integrated phases: an in-depth qualitative exploration followed by quantitative validation.

Phase I – Qualitative Insights

The first phase involved semi-structured interviews with 42 women entrepreneurs from diverse sectors. Thematic analysis using NVivo software revealed seven core themes, illustrating how digital payment systems are reshaping business practices, security perceptions, and institutional engagement. These themes include:

1. Operational Efficiency – Cashless systems improved transaction speed, accuracy, and financial reconciliation.
2. Financial Oversight – Enhanced bookkeeping, audit readiness, and transparency.
3. Customer Satisfaction – Increased consumer trust and loyalty through secure digital experiences.
4. Cybersecurity Gaps – Persistent concerns around fraud, phishing, and data privacy.
5. Market Expansion – Access to broader markets through e-commerce and mobile platforms.
6. Institutional Support – Banks and fintechs play a pivotal role in enabling or hindering adoption.
7. Gendered Digital Barriers – Cultural norms, literacy gaps, and infrastructure access challenges limit female entrepreneurs' digital participation.

These themes mapped directly onto the research objectives and theoretical frameworks, including the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT), highlighting both the benefits and structural inhibitors of adoption.

Phase II – The summary of key findings from quantitative study

Using a sample of 201 women entrepreneurs, quantitative analysis tested 29 hypotheses using statistical methods such as Pearson's correlation, Chi-square, ANOVA, and logistic and linear regression. Key findings include:

- **Positive Correlations**: Cashless adoption is strongly correlated with revenue growth ($r = 0.617^{***}$) and customer retention ($r = 0.614^{***}$).
- **OLS Regression**: Digital literacy ($\beta = 0.416^{***}$), education ($\beta = 0.372^{***}$), and business size ($\beta = 0.153^{*}$) significantly predict adoption; security concerns reduce it ($\beta = -0.287^{***}$). The model was robust ($R^2 = 0.482$, $F = 26.54^{***}$, DW = 1.87).
- **ANOVA Tests**: Significant differences in perceived usefulness, ease of use, financial performance, and customer satisfaction were found between low and high adopters.
- **Chi-Square Tests**: Age, experience, and business size were statistically associated with adoption levels ($p < 0.001$), confirming key socio-demographic influences.
- **Model Diagnostics** confirmed the reliability and validity of the regression models (VIF < 2.5, Breusch–Pagan $p = 0.284$, DW = 1.87).

The convergence of qualitative narratives and quantitative evidence provides a robust, multidimensional understanding of how cashless payment systems affect women-owned enterprises in Gauteng. The research confirms that digital transformation is both an opportunity and a challenge: while adoption enables financial growth, customer loyalty, and operational efficiency, it is constrained by literacy gaps, security fears, and infrastructural inequalities.

Key implications include:

- Digital Literacy is Fundamental: Empowering women entrepreneurs through targeted training can enhance adoption and reduce vulnerability to cyber risks.
- Security Must Be Prioritized: Trust in digital payments hinges on credible security protocols and user education.
- Institutional Ecosystems Matter: Banks, fintech providers, and government actors must collaborate to improve access, support, and equity in digital finance.
- Inclusive Policy Frameworks are essential to bridge digital divides and ensure that fintech innovation does not replicate gendered exclusions.

In summary, the results of this chapter provide empirical and conceptual foundations for designing gender-responsive digital payment ecosystems, aligned with South Africa's 4IR agenda, financial inclusion strategies, and Sustainable Development Goals (SDGs 5, 8, and 9).

CHAPTER V:
DISCUSSION OF RESULTS

This chapter provides a detailed discussion of the study's key findings in relation to the research questions introduced in Chapter I. It integrates both the quantitative results and qualitative themes presented in Chapter IV, offering a triangulated view of the data. The discussion also connects findings to the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), and the Digital Divide Theory, ensuring theoretical alignment. Each section is structured around the four primary research objectives.

5.1 Discussion on Integrated key findings on research methods and theoretical framework used

The study employed a sequential exploratory mixed-methods design, involving both qualitative and quantitative phases to investigate the adoption and impact of cashless payment systems among women-owned enterprises in Gauteng. This design allowed the triangulation of findings across methodologies and enhanced the robustness of the conclusions drawn (Creswell & Plano Clark, 2018).

- Qualitative Phase (Phase I): Semi-structured interviews were conducted with 42 women entrepreneurs from diverse sectors. Thematic analysis revealed rich insights around operational efficiency, financial control, customer satisfaction, cybersecurity concerns, and ecosystem support.
- Quantitative Phase (Phase II): A structured survey with 201 respondents provided empirical evidence through statistical analysis including Pearson correlations, Chi-square tests, ANOVA, and binary logistic regression.
- The analysis confirmed that both internal capacities (e.g., digital literacy, education, business experience) and external enablers (e.g., institutional support, perceived security, fintech access) are statistically and conceptually associated with cashless system adoption. These findings are consistent with the Technology Acceptance Model (TAM) (Davis, 1989) and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), which emphasize perceived usefulness, ease of use, and facilitating conditions as key predictors.
- The study also validates dimensions of the Digital Divide Theory (Norris, 2001), showing that women entrepreneurs from smaller businesses or with lower education and digital skills experience greater barriers to adoption. Such divides suggest structural inequalities in access to digital financial systems.

5.2 Discussion on aligned with Research Objectives

Objective 1: To Assess the Benefits of Cashless Systems

The first objective sought to examine the positive outcomes experienced by women entrepreneurs adopting cashless systems. The qualitative findings revealed strong sentiments around operational efficiency, faster transactions, reduced handling errors, and simplified bookkeeping. Participants described how digital tools improved real-time tracking of payments and reduced physical cash risks. These perceptions align with Theme 1 (Operational Efficiency) and Theme 2 (Financial Oversight & Accuracy) of the qualitative analysis.

- Quantitatively, Pearson correlation results (H_1–H_{18}) confirmed that higher adoption levels were strongly associated with customer satisfaction ($r = 0.385$, $p < 0.001$), improved revenue ($r = 0.276$, $p < 0.01$), and operational reliability. The One-Way ANOVA (H_{25}–H_{29}) indicated statistically significant differences across adoption groups for financial performance ($F = 17.72$, $p < 0.001$) and customer satisfaction ($F = 19.42$, $p < 0.001$). Tukey's HSD post-hoc test further confirmed that businesses in the high-adoption group (76–100%) reported superior outcomes.
- These findings are theoretically consistent with Davis's TAM model (1989), which posits that perceived usefulness and ease of use drive technology acceptance. Similarly, Venkatesh et al.'s UTAUT model (2003) highlights performance expectancy as a core determinant of adoption. Studies by Chingapi, & Steyn, 2021 and World Bank (2023) also affirm that digital payments promote transparency, speed, and accountability—outcomes echoed in this study. Thus, Objective 1 is strongly supported.

Objective 2: To Analyses the Security Challenges of Cashless Systems

The findings of this study reveal that security concerns remain a fundamental barrier to the adoption of cashless systems among women entrepreneurs in Gauteng. Drawing from both qualitative and quantitative data, these concerns span across cybersecurity risks, fraud incidents, and inadequate digital literacy—particularly among small and medium-sized enterprises (SMEs) owned by women.

- Qualitative data (Theme 4) exposed recurring anxieties about system vulnerabilities such as phishing, unauthorized access to funds, and weak or absent encryption mechanisms. Many women expressed fears of account breaches and dissatisfaction with the lack of real-time fraud detection features in some mobile money or banking platforms. This resonates with GSMA (2022), which noted that women in developing regions often avoid digital financial platforms due to concerns over fraud and inadequate recourse mechanisms.
- From the quantitative perspective, regression analysis (H_{22}–H_{24}) revealed a significant negative coefficient for the predictor variable "Security Concerns" ($\beta = -0.287$, $p = 0.002$). This confirms that heightened perceptions of digital risk strongly deter women from adopting or expanding usage of cashless payment systems. These empirical insights are consistent with the Unified Theory of Acceptance and Use of Technology (UTAUT), which positions perceived risk

and trust as core moderators of behavioral intention to adopt new technologies (Venkatesh et al., 2003). Similarly, Arner et al. (2020) emphasized that for fintech to flourish among underrepresented populations, robust data protection and user assurance mechanisms must be prioritized.

- The Digital Divide Theory also finds relevance here, as digitally vulnerable users—particularly those with limited education or exposure—tend to disproportionately suffer from weak cyber hygiene and are less likely to be protected by sophisticated authentication or fraud detection systems (Bångens, & Söderberg, 2011). Women entrepreneurs in this study identified lack of training, high costs of cybersecurity tools, and limited institutional safeguards as contributing factors that widen this digital gap.
- In conclusion, the study affirms that addressing security-related barriers is critical to ensuring equitable access and sustainable uptake of cashless systems. Policymakers, fintech providers, and financial institutions must co-develop user-centric, gender-sensitive cybersecurity solutions. These may include simplified authentication, fraud insurance schemes, user education initiatives, and the integration of biometric verification, especially for low-income female entrepreneurs in high-risk sectors.

Objective 3: To examine the Effect of Cashless Systems on Financial and Customer Outcomes

The third objective aimed to examine how cashless payment systems impact financial performance and customer satisfaction among women-owned enterprises in Gauteng. Both qualitative and quantitative data provided compelling evidence of the positive effects of digital payment adoption on business performance.

- Quantitative Evidence: Pearson correlation results (H_4 H_5 H_6) demonstrated statistically significant positive relationships between cashless system adoption and two critical business outcomes: customer satisfaction ($r = 0.385$, $p < 0.001$) and revenue growth ($r = 0.276$, $p < 0.01$). These findings were further substantiated by One-Way ANOVA tests (H_{25}–H_{29}), which showed statistically significant differences in perceived usefulness ($F = 13.42$), perceived security ($F = 11.89$), and ease of use ($F = 13.08$) across the four levels of cashless adoption ($p < 0.001$ for all). Businesses that reported higher levels of digital payment adoption also reported superior financial and customer-related performance metrics.
- These quantitative findings are congruent with the results of Tam and Oliveira (2017), who found that digital transactional systems significantly improve business scalability, streamline customer experiences, and facilitate broader market access in developing economies. Moreover, Suseno, & Abbott, (2021) affirmed that digital financial inclusion fosters entrepreneurial growth by enhancing financial accuracy and customer engagement.
- *Qualitative Evidence:* Interviewees in the qualitative phase echoed these sentiments. Many described increased customer loyalty and trust due to the use of transparent and traceable payment systems. They emphasized that customers

appreciated the safety, speed, and convenience of digital transactions, which contributed to better brand perception and repeat business.

- Women entrepreneurs also shared that digital systems enhanced their financial management capabilities by automating recordkeeping and allowing real-time tracking of payments, invoices, and cash flow. Such practices were seen as improving overall business performance and enabling faster decision-making.
- *Theoretical Alignment:* These findings align strongly with key constructions in the Unified Theory of Acceptance and Use of Technology (UTAUT), particularly performance expectancy and behavioral intention. UTAUT posits that perceived usefulness (i.e., improved performance) is a primary determinant of technology acceptance. In this context, as women entrepreneurs observe tangible improvements in customer engagement and financial returns, their willingness to adopt and continue using cashless systems increases.
- In addition, the Technology Acceptance Model (TAM) underscores the importance of perceived ease of use and usefulness, both of which were quantitatively validated through high F-values in the ANOVA results. The positive link between adoption and customer satisfaction reinforces the relevance of TAM in understanding fintech usage behaviors among small businesses.

Objective 4: To Recommend Inclusive Ecosystem Approaches for Women Entrepreneurs

The final objective sought to identify strategic, inclusive recommendations to ensure that cashless systems are safe, accessible, and effective for women entrepreneurs across Gauteng. The mixed-methods findings underscored the importance of enabling ecosystem-level support to facilitate adoption, particularly among digitally and economically marginalized segments.

- Qualitative Insights: Barriers and Need: Thematic analysis from Phase I revealed several critical structural barriers impeding adoption. Theme 6 (Barriers to Adoption) and Theme 7 (Institutional Gaps) emphasized infrastructural and socio-cultural constraints, especially in rural and township contexts. Respondents cited high transaction charges, unstable internet connectivity, and limited training opportunities as recurring limitations.
- Women entrepreneurs also expressed frustration with fragmented fintech ecosystems that lack interoperability, as well as insufficient inclusion of their voices in policy dialogues. These insights reinforce findings from GSMA (2022) and the Ojo, & Ndzendze, (2023), both of which stress that digital inclusion requires context-sensitive and gender-responsive intervention.

- Quantitative Results: Structural Inequities: The quantitative results further reinforced the qualitative patterns. Chi-Square Tests (H_{19}–H_{21}) revealed that older age groups, businesses with longer operational histories, and larger enterprises were significantly more likely to adopt cashless systems (all $p < 0.001$). These findings confirm the assumptions of the Digital Divide Theory (van Dijk, 2020), which posits that access to digital infrastructure and capabilities remains uneven across socio-demographic strata.

5.3 Discussion on Integrated recommendations and theoretical Implications

Based on the merged data from both qualitative interviews and quantitative statistical analyses, the study provides the following integrated recommendations to foster a more inclusive, secure, and efficient cashless ecosystem for women entrepreneurs in Gauteng:

- Capacity Building: Women entrepreneurs particularly those in rural areas or over the age of 45 require targeted digital literacy and cyber-hygiene training. Many participants cited lack of confidence and skill gaps in handling mobile money, PoS systems, and internet banking platforms.
- Gender-Sensitive Fintech Design: Several interviewees noted that current user interfaces are not designed with the realities of women in mind. Fintech solutions should be offered in local languages, with audio-visual tutorials and context-aware customer support that accommodate caregiving roles and non-linear schedules.
- Public–Private Partnerships: Strong collaboration is needed between banks, fintech developers, mobile network operators, and government to drive down costs, expand infrastructure, and incentivize access. Subsidies for connectivity, data, or initial onboarding fees would be especially impactful for microenterprises.
- Policy Incentives: Policymakers should create enabling environments through preferential credit scoring mechanisms for digital adopters, tax incentives for cashless integration, and regulatory sandboxes to support innovation. Reduced KYC requirements for women entrepreneurs in the informal sector may also bridge the financial inclusion gap.

5.4 Discussion on supporting Literature

- These integrated recommendations are grounded in a growing body of global and African fintech research. Arner et al. (2020) propose regulatory sandboxes and tailored digital ID systems to foster financial innovation while reducing exclusionary risk. Ojo, & Ndzendze, (2023) underscores that digital financial services can only close the gender gap if accompanied by inclusive infrastructure and regulatory coordination.

- Further, the GSMA (2022) highlights the need for gender-intentional product development and ecosystem engagement to overcome the persistent digital divide affecting women-led SMEs. Digital inclusion, therefore, must be supported by coordinated stakeholder interventions to be sustainable and equitable**.**

5.5 Discussion on theoretical Implications and framework Alignment

- The study's results validate and extend several key theoretical frameworks: Technology Acceptance Model (TAM): The significant influence of perceived usefulness ($\beta = 0.416$) and ease of use aligns strongly with Davis's TAM model. Participants who found cashless systems timesaving, transparent, and convenient were significantly more likely to adopt them.
- Unified Theory of Acceptance and Use of Technology (UTAUT): Constructs like performance expectancy and facilitating conditions were clearly observed in the regression and ANOVA outputs. For instance, digital literacy and education level significantly influenced adoption likelihood, aligning with the role of enabling conditions.
- Digital Divide Theory: Chi-square tests showed that variables such as age, years in operation, and business size predicted different adoption levels. This supports the theory's proposition that socio-demographic and structural inequalities constrain access to and benefits from technological tools.

5.6 Conclusion

This chapter synthesizes the study's empirical and conceptual insights into the adoption of cashless systems by women entrepreneurs in Gauteng. The data confirm that digital platforms positively influence operational performance and customer outcomes, but security risks, digital literacy gaps, and structural inequities remain major obstacles. A well-coordinated approach involving policy reform, ecosystem development, and grassroots support is essential to unlock the full potential of digital finance for inclusive economic development.

CHAPTER VI:
SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

6.1 Summary of the Study

This doctoral research explored the adoption, benefits, challenges, and ecosystem-level implications of cashless systems among women-owned enterprises in Gauteng, South Africa. The study employed a mixed-methods design, integrating qualitative interviews with 42 participants and survey data from 201 respondents. Findings demonstrated that cashless adoption provided benefits such as operational efficiency, enhanced customer satisfaction, and financial growth. However, adoption was hindered by security concerns, limited digital literacy, and infrastructural constraints. Quantitative analysis (including Pearson correlation, ANOVA, Chi-Square, and logistic regression) revealed significant relationships between digital literacy, business demographics, education, and cashless adoption levels. The results underscore the importance of internal capacity and ecosystem support for digital financial inclusion.

6.2 Implications of the Study

6.2.1 Theoretical Implications

This study provides significant theoretical contributions to the literature on digital finance adoption among women entrepreneurs, particularly by validating and extending the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and Digital Divide Theory.

The TAM is supported by strong empirical evidence from the study perceived usefulness and ease of use emerged as major predictors of digital adoption. Women entrepreneurs who found cashless systems convenient and helpful were significantly more likely to adopt them, affirming the foundational principles of Davis (1989). Regression results further supported the idea that perceived benefits drive behavioural intention. UTAUT was extended in this context through the inclusion of social influence and institutional support as enabling conditions. Facilitating conditions such as fintech support, training, and peer encouragement played a crucial role, confirming the relevance of Venkatesh et al. (2003). Performance expectancy and facilitating conditions emerged as core factors influencing user intention.

The study also substantiates the Digital Divide Theory (Norris, 2001) by confirming that digital adoption is unevenly distributed across demographics such as age, education level, and geographic location. Chi-Square tests showed that older, urban, and more educated women had significantly higher adoption rates. This validates structural concerns about equitable access to digital tools.

6.2.2 Practical Implications for Policymakers and Institutions

The practical implications of the study are significant for digital policy architects, financial institutions, and development actors seeking to close the digital gender gap.

- Firstly, capacity-building remains essential. The research highlights the need for structured digital literacy programs tailored for women especially older and rural entrepreneurs who may lack the foundational skills needed to engage with cashless systems.
- Secondly, inclusive design is critical. Fintech platforms should adopt multilingual interfaces, simplified user flows, and intuitive onboarding. This aligns with GSMA (2022), which emphasises that gender-intentional design enhances uptake.
- Thirdly, institutional collaboration is needed. Public–private partnerships should offer shared infrastructure, subsidised transaction fees, and open APIs to enable interoperability between platforms. Ojo, & Ndzendze, (2023) also advocates for such ecosystem cooperation as a pathway to inclusive financial systems.
- Finally, policy incentives such as preferential loans, training vouchers, and reduced digital levies can stimulate usage among women-led SMEs. These should be enshrined in national fintech inclusion frameworks.

6.2.3 Societal Implications

The findings expose how digital exclusion intersects with broader socio-economic inequalities. Women entrepreneurs from low-income and rural communities face multi-layered barriers to adoption not only lacking infrastructure but also the confidence, networks, and literacy to participate in the digital economy.

Addressing this requires more than hardware deployment. It demands a rethinking of financial citizenship through culturally relevant support systems, community-based training hubs, and mobile outreach.

When digital inclusion is achieved, it does more than increase transactional speed. It boosts women's financial autonomy, enhances household stability, and contributes to broader development outcomes such as poverty reduction and gender equality (World Bank, 2021)

6.3 Recommendations for Future Research

This study provides a robust foundation for understanding the benefits and challenges of cashless systems for women-owned businesses in Gauteng. However, several avenues remain for future inquiry to deepen, diversify, and contextualize these findings:

i. Cross-Provincial and Cross-Border Comparative Studies

Future research should explore comparative analyses across different South African provinces such as KwaZulu-Natal, Western Cape, or Limpopo to determine whether digital adoption patterns, infrastructure availability, and institutional support mechanisms differ significantly by geography. Such comparisons can reveal region-specific barriers or accelerators of fintech inclusion. Additionally, examining cross-border experiences (e.g., with Botswana, Zimbabwe, or Kenya) could offer insights into regional fintech harmonization and shared ecosystem challenges within SADC.

ii. Longitudinal Impact Assessment

While this study captures the current state of adoption and outcomes, longitudinal studies are necessary to track how sustained usage of cashless systems affects women entrepreneurs over time. This includes investigating:

- Return on Investment (ROI) from digital infrastructure
- Long-term changes in financial performance, customer retention, and business scalability
- Shifts in security awareness, digital literacy, and platform preferences Tracking these variables over multiple years will allow researchers to assess the durability and scalability of digital financial tools in women-led SMEs.

iii. Intersectional and Demographic-Focused Analyses

An intersectional approach is critical for capturing the layered nature of digital exclusion. Future researchers should disaggregate data to examine how variables such as:

- Age
- Educational background
- Business size
- Socioeconomic status
- Urban vs. rural location affect the experience and rate of adoption. Understanding these micro-level dynamics will help policymakers tailor interventions that are not only gender-sensitive but also class- and geography-sensitive.

6.4 Conclusion

This doctoral study affirms that cashless payment systems hold transformative potential for enhancing the sustainability, growth, and competitiveness of women-owned enterprises in Gauteng. Both the qualitative and quantitative phases demonstrated that digital financial tools, when appropriately supported, improve operational efficiency, customer satisfaction, and access to broader markets. Women entrepreneurs who successfully adopted cashless platforms reported gains in transactional speed, record-keeping accuracy, and financial transparency aligning with global evidence that fintech can accelerate inclusion and business resilience (FinMark Trust., 2022; World Bank (2021).

However, the findings also illuminate deep-rooted structural and perceptual barriers that inhibit widespread adoption. These include limited digital literacy, high data and transaction costs, inadequate infrastructure in peri-urban and rural areas, and a lack of institutional support tailored to the realities of women entrepreneurs. The presence of these barriers reinforces existing gender and digital divides, underscoring that technology alone is insufficient equitable access and ecosystem support are critical.

This research therefore advocates for a comprehensive ecosystem approach that integrates inclusive digital platform design, targeted institutional capacity building, and gender-sensitive policy reform. Cashless systems must be contextualised to address the diverse needs, geographies, and capabilities of women entrepreneurs. Only through such a multi-level strategy can cashless adoption contribute to broader national goals, including women's economic empowerment, inclusive finance, and the realisation of South Africa's Vision 2030 and Sustainable Development Goals (SDGs 5, 8, and 9).

6.5 Personal Reflection

Engaging in this doctoral journey has been an intellectually demanding and personally enriching experience. From the early stages of conceptualising the research to the intricate process of fieldwork and data analysis, I have encountered and overcome challenges that have refined my academic, analytical, and leadership abilities.

Conducting in-depth interviews with women entrepreneurs in Gauteng was particularly transformative. Their narratives of perseverance amidst financial, social, and technological barriers deeply resonated with me as a fellow African woman engaged in entrepreneurial innovation. These women are not merely users of technology they are builders of economies, nurturers of communities, and catalysts of social change. Yet, their realities often go unrecognised in digital finance discourses. Capturing their voices from township tailors to tech-savvy urban business owners gave the research authenticity and humanity.

Equally, the quantitative component of the study tested my rigour in statistical analysis. Navigating complex tests such as Chi-square, ANOVA, and logistic regression honed my ability to translate numerical insights into meaningful interpretations. This dual-method approach also strengthened my confidence in mixed-method research and the power of data triangulation in uncovering nuanced realities.

Importantly, this research journey heightened my awareness of systemic inequalities embedded within fintech systems, public policies, and entrepreneurial ecosystems. It reinforced my belief that true innovation is inclusive, and that digital transformation must be purposefully directed toward bridging not widening societal gaps.

On a professional level, this study has enriched my ability to design evidence-based policy recommendations, engage stakeholders across sectors, and advocate effectively for gender-transformative development. It has also deepened my commitment to future scholarship, especially in the areas of digital inclusion, women's entrepreneurship, and sustainable development.

Personally, this work was a call to action reminder that academic research is not merely a theoretical exercise but a platform for social justice and policy impact. I remain resolute in using this knowledge to shape interventions, influence decision-making, and support underrepresented women entrepreneurs to thrive in the digital economy.

APPENDIX A
SURVEY COVER LETTER

To Whom It May Concern:

Dear Participant,

Re: Survey on Digital Financial Inclusion and Cashless Systems Among Women Entrepreneurs in Gauteng

We are conducting a study to assess the adoption and impact of cashless systems among women entrepreneurs in Gauteng. This research aims to identify key challenges and opportunities in using digital financial services to support business growth.

Your participation in this survey is invaluable. By sharing your experiences and perspectives, you will contribute to a deeper understanding of how digital financial tools impact women-led businesses and help shape recommendations for improving financial inclusion.

Confidentiality and Voluntary Participation

Participation in this survey is entirely voluntary. You are under no obligation to complete the survey, and you may withdraw at any stage without providing a reason. All responses will be treated with the utmost confidentiality and used solely for academic research purposes. No personally identifiable information will be collected, ensuring your privacy and anonymity.

By proceeding with the survey, you acknowledge that you have read and understood the purpose of this study and consent to participate. If you have any questions or require further clarification, please do not hesitate to contact the research team.

Thank you for your time and valuable insights. Your contribution will help us gain a better understanding of the role of cashless systems in women-owned businesses and how digital financial services can be enhanced to support entrepreneurial growth.

Sincerely,
Lynette Magasa

Institution:
Contact #: 0824998830

APPENDIX B
INTERVIEW GUIDE

SURVEY ON DIGITAL FINANCIAL INCLUSION AND CASHLESS SYSTEMS AMONG WOMEN ENTREPRENEURS IN GAUTENG

Introduction: This study aims to assess the adoption and impact of cashless systems among women entrepreneurs in Gauteng. Your responses will help identify key challenges and opportunities in using digital financial services for business growth.

Voluntary Participation: Your participation is entirely voluntary, and you may withdraw at any stage without providing a reason. Your responses will be treated with the utmost confidentiality and used solely for academic research purposes.

By proceeding, you acknowledge that you have read and understood the purpose of the study and consent to participate.

SECTION 1: DEMOGRAPHIC INFORMATION

1. **Which sector does your business belong to?**
   __ Agriculture
   __ Retail
   __ Services
   __ Manufacturing
   __ Technology
   Other (Please specify): CONSULTANCY

2. **What is your highest level of education?**
   __ No formal education
   __ Primary School
   __ Secondary School
   __ Tertiary Education (Diploma, Degree)
   __ **Postgraduate Education (Master's, PhD)**

3. **What is your age?**
   __ 18-24
   __ 25-34
   __ 35-44
   __ **45-54**
   __ 55 and above

4. **How many years has your business been in operation?**
   __ Less than 1 year
   __ 1-3 years
   __ 4-6 years
   __ 7-10 years
   __ More than 10 years

5. **What is the size of your business (number of employees)?**
   __ Micro (1-10 employees)
   __ **Small (11-50 employees)**
   __ Medium (51-250 employees)

6. **What percentage of your business transactions are cashless?**
   __ 0-25%
   __ 26-50%
   __ 51-75%
   __ **76-100%**

SECTION 2: PERCEIVED USEFULNESS & EASE OF USE (Based on TAM Model)

7. **Using cashless payment systems enhances my business productivity.**
   __ Strongly agree
   __ **Agree**
   __ Neutral
   __ Disagree
   __ Strongly disagree

8. **Cashless payment systems are easy to use for my business operations.**
   __ Strongly agree
   __ **Agree**
   __ Neutral
   __ Disagree
   __ Strongly disagree

9. **Learning to operate cashless payment systems is straightforward.**
   __ Strongly agree
   __ **Agree**
   __ Neutral
   __ Disagree
   __ Strongly disagree

10. **Cashless payment systems improve transaction accuracy and record-keeping.**
    __ **Strongly agree**
    __ Agree
    __ Neutral
    __ Disagree
    __ Strongly disagree

SECTION 3: PERCEIVED SECURITY (Based on Perceived Security Scale)

11. **I trust the security of cashless payment systems.**
    __ Strongly agree
    __ **Agree**

__ Neutral
__ Disagree
__ Strongly disagree

12. **Cashless payments protect my business from fraud better than cash transactions.**
__ Strongly agree
__ Agree
__ Neutral
__ Disagree
__ Strongly disagree

13. **I feel confident that my customers' payment information is safe when using cashless transactions.**
__ Strongly agree
__ Agree
__ Neutral
__ Disagree
__ Strongly disagree

14. **I am aware of cybersecurity measures needed to protect my business from digital fraud.**
__ Strongly agree
__ Agree
__ Neutral
__ Disagree
__ Strongly disagree

SECTION 4: FINANCIAL PERFORMANCE & CUSTOMER SATISFACTION

- **Customer satisfaction has increased after adopting cashless payments.**
__ Strongly agree
__ Agree
__ Neutral
__ Disagree
__ Strongly disagree

- **The adoption of cashless payments has helped me retain more customers.**
__ Strongly agree
__ Agree
__ Neutral
__ Disagree
__ Strongly disagree

- **Offering cashless payment options has made my business more competitive.**
__ Strongly agree
__ Agree

__ Neutral
__ Disagree
__ Strongly disagree

- **Cashless transactions have reduced operational costs for my business.**
__ Strongly agree
__ Agree
__ Neutral
__ Disagree
__ Strongly disagree

- **Government policies have supported the adoption of cashless systems in my business.**
__ Strongly agree
__ Agree
__ Neutral
__ Disagree
__ Strongly disagree

- **What challenges do you face in adopting cashless payment systems?** (Select all that apply)
__ High transaction fees
__ Cybersecurity concerns
__ Lack of training
__ Customer resistance
__ Poor internet connectivity
__ Other (Please specify): _____

SECTION 5: IMPROVEMENTS & RECOMMENDATIONS

21. **Which support measures would help in better adoption of cashless systems?** (Select all that apply)
__ Lower transaction fees
__ Better cybersecurity tools
__ Government incentives
__ Improved network access
__ More training and awareness

22. **Would you be interested in a follow-up interview?**
__ Yes
__ No

Thank You for Your Participation!

SCHEDULED INTERVIEW QUESTIONS

1. How has adopting cashless payment systems affected your business operations?

No major or visible impact

2. What benefits have you experienced from using cashless transactions?

Accurate record-keeping

3. What security challenges have you encountered while using cashless systems?

None

4. How do you manage cybersecurity risks in your business?

Ensuring a secure internet connection all the time

5. Have cashless systems improved your financial performance? How?

Not really

6. What factors influenced your decision to adopt cashless payments?

Safety and security, and accurate transaction records

7. What role do financial institutions play in supporting digital transactions?

None

8. What challenges do you face in accessing digital payment infrastructure?

None

9. What policy changes or government initiatives could support digital adoption?

Regulate transaction charges from financial institutions

10. What improvements would you suggest to make cashless systems more efficient for women entrepreneurs?

Access to the internet and low transaction charges

This will help you to identify common codes, followed by themes for in-depth understanding of the benefits and challenges.

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