

INVESTIGATING BARRIERS TO ICT ADOPTION AND ITS EFFECT ON SMES' SERVICE DELIVERY IN THE WESTERN CAPE, SOUTH AFRICA

ANÁLISE DOS OBSTÁCULOS À ADOÇÃO DAS TIC E DO SEU IMPACTO NA PRESTAÇÃO DE SERVIÇOS PELAS PME NA PROVÍNCIA DO CABO OCIDENTAL, ÁFRICA DO SUL

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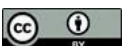
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Abstract

Small and Medium-Sized Enterprises (SMEs) play a critical role in economic development; however, their capacity to deliver efficient and competitive services increasingly depends on adopting Information and Communication Technologies (ICTs). This study investigates the barriers to ICT adoption and examines their effects on service delivery among SMEs in the Western Cape. The findings reveal four major barriers constraining ICT uptake: a lack of digitalisation, inadequate ICT infrastructure, limited automation, and broader technological adoption challenges. The lack of digitalisation was found to hinder SMEs' transition from manual to streamlined digital processes, thereby affecting operational efficiency. Inadequate ICT infrastructure, including unreliable connectivity and limited access to technological resources, further constrained effective ICT utilisation. Additionally, reliance on manual procedures led to limited automation, resulting in slower, less consistent service delivery. Technological adoption challenges, such as skills gaps, resistance to change, and financial constraints, also emerged as significant obstacles. Collectively, these barriers negatively impact SMEs' ability to enhance productivity, improve customer service, and remain competitive in a digitally evolving environment. The study

Resumo

As pequenas e médias empresas (PME) desempenham um papel fundamental no desenvolvimento económico; no entanto, a sua capacidade de prestar serviços eficientes e competitivos depende cada vez mais da adoção das tecnologias da informação e da comunicação (TIC). Este estudo investiga os obstáculos à adoção das TIC e analisa os seus efeitos na prestação de serviços entre as PME da Província do Cabo Ocidental. Os resultados revelam quatro grandes barreiras que limitam a adoção das TIC: falta de digitalização, infraestruturas de TIC inadequadas, automatização limitada e desafios mais amplos relacionados com a adoção tecnológica. Verificou-se que a falta de digitalização dificulta a transição das PME de processos manuais para processos digitais simplificados, afetando assim a eficiência operacional. As infraestruturas de TIC inadequadas, incluindo conectividade pouco fiável e acesso limitado a recursos tecnológicos, limitaram ainda mais a utilização eficaz das TIC. Além disso, a dependência de procedimentos manuais levou a uma automatização limitada, resultando numa prestação de serviços mais lenta e menos consistente. Os desafios de adoção tecnológica, tais como lacunas de competências, resistência à mudança e restrições financeiras, também se



concludes by recommending targeted digital-literacy initiatives, infrastructure improvements, increased support for automation, and structured interventions to strengthen SMEs' technological readiness for sustainable ICT integration.

Keywords: ICT Adoption. SMEs. Customer Service Delivery. Digitalisation. Infrastructure.

revelaram obstáculos significativos. Em conjunto, estas barreiras têm um impacto negativo na capacidade das PME de aumentar a produtividade, melhorar o serviço ao cliente e manter-se competitivas num ambiente em evolução digital. O estudo conclui recomendando iniciativas específicas de literacia digital, melhorias nas infraestruturas, maior apoio à automatização e intervenções estruturadas para reforçar a preparação tecnológica das PME para uma integração sustentável das TIC.

Palavras-chave: Adoção de TIC. PME. Prestação de Serviços ao Cliente. Digitalização. Infraestruturas.

1 INTRODUCTION

The advent of information technology (IT) continues to significantly transform business operations globally. Recent research shows that digital technologies, including cloud computing, artificial intelligence (AI), and digital platforms, are now central drivers of organisational change and competitiveness (Yuwono et al., 2024; Kahveci, 2025). While extant studies further highlight that IT-enabled automation and digital transformation have become essential mechanisms for improving efficiency, streamlining operations, and enhancing decision-making within small and medium-sized enterprises (SMEs) (Kallmuenzer et al., 2024).

Over time, research has shown that SMEs' business operations have relied heavily on traditional methods, a tendency that has often impeded operational efficiency and constrained both business growth and cash flow (Meunier & Mickus, 2020). While SMEs are widely recognised as an important driver of economic development and growth, accounting for approximately 50% of global employment and contributing up to 40% of GDP in emerging markets, this underscores their critical role in economic performance. In South Africa, SMEs are defined under the National Small Enterprise Act: small enterprises employ up to 50 workers, and medium enterprises employ up to 250 workers, collectively forming the SME sector (Mdhluli, 2024). In 2019, Statistics South Africa reported that the formal business sector generated R10.5 trillion in turnover, of which SMEs contributed R3.8 trillion (32%), demonstrating their significant impact on the

country's overall economic performance and GDP (Statistics South Africa. 2020). Furthermore, SMEs continue to play a vital economic role by generating employment, fostering innovation, and contributing significantly to national output, with digital transformation serving as a critical catalyst for reinforcing and sustaining this ecosystem (OECD, 2026)

In recent years, however, the introduction and rapid advancement of digital technologies have substantially enhanced productivity and strengthened customer connectivity (Jeza & Lekhanya, 2022). As a result, IT adoption has become a strategic priority across all business sectors, due to its measurable contribution to operational efficiency and competitiveness in customer service delivery (Kohli & Malik, 2025). The significance of IT in enhancing customer service delivery within SME operations cannot be overstated, as digital tools play a critical role in improving business performance by reducing operational costs, enabling greater collaboration, enabling data-driven decision-making, and improving customer relationship management (Kotarba, 2018). While scholarship highlights that digital service innovation and improved service delivery are vital for sustaining SME competitiveness in a rapidly evolving marketplace (Kahveci, 2025). However, despite the positive impact of digitalisation, many SMEs still struggle to prioritise optimising customer service delivery, even though it is central to value creation, customer satisfaction, and long-term business sustainability. Emerging evidence shows that when SMEs harness automation enabled by technologies such as artificial intelligence, cloud-based systems, and digital service platforms, they can achieve significant gains in productivity, organisational performance, and customer satisfaction (Muzuva et al., 2024; Mkhize et al., 2025). Hence, this study investigates the barriers to ICT adoption that limit its capacity to enhance service delivery, thereby placing SMEs at a competitive disadvantage.

2 REVIEW LITERATURE

The essence of any business entity, including SMEs, is to provide efficient and satisfactory services to its customers. Service delivery is a foundational pillar of any organisation, as it shapes the institution's capacity to respond consistently and efficiently to the evolving needs and expectations of its clients (Metz, Ilieş & Nistor, 2020). While

extant literature emphasises that service delivery involves creating seamless, consistent, and personalised interactions across multiple touchpoints, enabling customers to receive assistance and products through the channels they prefer (Okeke, Alabi, Igwe, Ofodile & Ewim, 2024). Furthermore, the current literature highlights that service delivery is enhanced through customer-centric digital transformation, in which SMEs use digital tools, such as data analytics, mobile-friendly platforms, and inclusive interfaces, to provide timely support, improve accessibility, and tailor services to diverse customer needs (Demirel, 2022). Recent service quality research also shows that the quality-of-service delivery strongly shapes customer perceptions, organisational reputation, and overall success, making it a central determinant of customer satisfaction in modern service environments (Khan & Sohail, 2025; Nwachukwu & Nyandoro, 2026). Collectively, these extant studies agree that customer assistance encompasses a range of supportive activities before, during, and after a purchase, all aimed at maintaining customer commitment, strengthening loyalty, and enhancing perceived value in an increasingly digital and competitive marketplace (Khan & Sohail, 2025; Okeke et al., 2024; Demirel, 2022).

2.1 Barrier to effective customer service delivery in SME business operations

Among other barriers, technological constraints remain one of the most significant constraints on SMEs' ability to deliver efficient, responsive, and high-quality customer service (Sagala & Ori, 2024). In today's digital economy, service delivery increasingly depends on the effective use of ICT systems, automation tools, and integrated digital platforms (Mattioli & D'Andreamatteo, 2022; Shibambu & Ngoepe, 2025). However, many SMEs continue to struggle with several technological limitations that hinder their capacity to meet evolving customer expectations (Brink & Packmohr, 2023). Recent research shows that SMEs benefit greatly from adopting digital tools, omni-channel communication systems, and AI-enabled service platforms, yet these capabilities are often underdeveloped or absent in smaller businesses (Mattioli & D'Andreamatteo, 2022). The following barriers are highlighted: lack of digital tools/low digitalisation, poor ICT infrastructure, limited automation, and technological adoption challenges.

In delivering effective customer service, Shibambu & Ngoepe (2025) argue that service delivery increasingly depends on digitalisation, which disrupts traditional approaches. However, many SMEs still lack essential digital tools, and their business equipment remains minimally digitalised, leaving them reliant on manual processes or fragmented technologies (Telukdarie et al., 2023). These limitations slow service delivery and contribute to inconsistent customer interactions and engagement (Salem et al., 2026). Metabase (2025) further highlights that without integrated digital systems, such as CRM platforms, chatbots, mobile applications, or online service portals, SMEs struggle to provide seamless, timely, and customer-centric services. Therefore, as Telukdarie et al. (2023) emphasise, the absence of integrated digital touchpoints significantly hinders the achievement of seamless and customer-focused service delivery.

ICT infrastructure has been identified as a critical enabler of effective customer service delivery and enhanced business operations (Hussain & Radulescu, 2025). While ICT infrastructure enables seamless interactions across multiple channels, including mobile, online platforms, and call centres, however, poor ICT infrastructure, such as unreliable internet connectivity, outdated hardware, and limited access to cloud-based systems, remains a major barrier to service efficiency (Khumalo & Moloi, 2025). When SMEs are unable to maintain stable systems, customers experience delays, communication breakdowns, and inconsistent service quality (Okeke et al., 2024). Consequently, inadequate ICT infrastructure weakens communication, disrupts the synchronisation of customer interactions across platforms, and undermines continuity in service delivery.

Furthermore, in delivering customer service, automating tasks without continuous human effort using machines, software, or other technologies is essential (Katragadda, 2023). This approach enables the replacement of manual systems with automated ones that improve speed, accuracy, and support for resource-limited systems among SMEs. Hollebeek et al. (2021) and Sarwar & Irshad Hashmi (2026) argue that tools such as automated messaging, AI-powered customer support systems, and workflow automation enable SMEs to provide timely, round-the-clock assistance. However, Omowole et al. (2024) highlight that many SMEs lack these technologies due to affordability constraints, skill shortages, and limited awareness of their benefits. Hollebeek et al. (2021) further maintain that the absence of automation in SMEs significantly hampers service

responsiveness and operational efficiency, particularly in firms with limited human resources.

Lastly, technology adoption refers to the process through which individuals, businesses, or organisations accept, implement, and effectively use new technologies to enhance their operations, productivity, or services (Mkhonto & Zuva, 2023). Likewise, even when digital tools are available, SMEs often struggle with adoption due to resistance to change, cost implications, limited digital skills among employees, and inadequate managerial support (Restrepo-Morales et al., 2024). Achieng & Malatji (2022) further argue that these challenges slow the implementation of digital service channels, thereby missing opportunities to enhance customer engagement. Similarly, Mbatha (2024) shows that South African SMEs face difficulties in adopting ICT for service delivery due to high costs, limited funds, and low technical skills, ultimately hindering improvements in service delivery.

2.2 The importance of digitalisation of customer service delivery

The significant impact of digital service methods is essential to customer service delivery, as this approach enhances understanding of how adopting ICT improves SMEs' service efficiency, the quality of customer interactions, and the execution of service-related tasks.

The digitalisation of SMEs' customer service delivery tools plays a foundational role in strengthening customer service by transforming traditional service practices and enabling more efficient, more accurate, and more customer-focused operations (Kohli & Malik, 2025; Khan & Sohail, 2025; Nwachukwu & Nyandoro, 2026). Equally, Shibambu & Ngoepe (2025) highlighted that without adequate digital tools, many SMEs continue to depend on manual or fragmented processes, resulting in slow service delivery and inconsistent customer experiences. While the findings of Telukdarie et al. (2023) emphasised that the integrated digital systems, such as CRM platforms, chatbots, mobile applications, and online service portals, limit their ability to provide seamless, timely, and customer-centric services. Consequently, Salem et al. (2026) underscore that multi-channel digital integration is essential for creating smooth, coherent, and responsive customer interactions.

While robust ICT infrastructure is a critical component of digitalisation that empowers effective customer delivery and also enables efficient service operations (Hussain & Radulescu, 2025). Similarly, when SMEs lack stable internet connectivity, updated hardware, or cloud-based systems, service delivery becomes vulnerable to delays, communication breakdowns, and system interruptions (Idemudia et al., 2023). This outcome aligns with Khumalo & Moloji (2025), who argue that reliable infrastructure ensures continuity by synchronising customer interactions across platforms and supporting uninterrupted service provision. Thus, the quality of ICT infrastructure directly influences the reliability and efficiency of customer service delivery (Okeke et al., 2024).

Automation further enhances the value of digitalisation by reducing reliance on constant human input and supporting faster, more consistent service responses (Katragadda, 2023). While Hollebeek et al. (2021) underscore that automated messaging systems, AI-powered customer support tools, and workflow automation can significantly improve response times, minimise errors, and extend service availability beyond traditional hours. This outcome supported the findings of Omowole et al. (2024) that, despite financial constraints, limited expertise, or low awareness of their benefits, SMEs are significant for customer service delivery. Consequently, Sarwar & Irshad Hashmi (2026) emphasised that automation consistently enhances operational efficiency and elevates customer service responsiveness, particularly in resource-constrained environments.

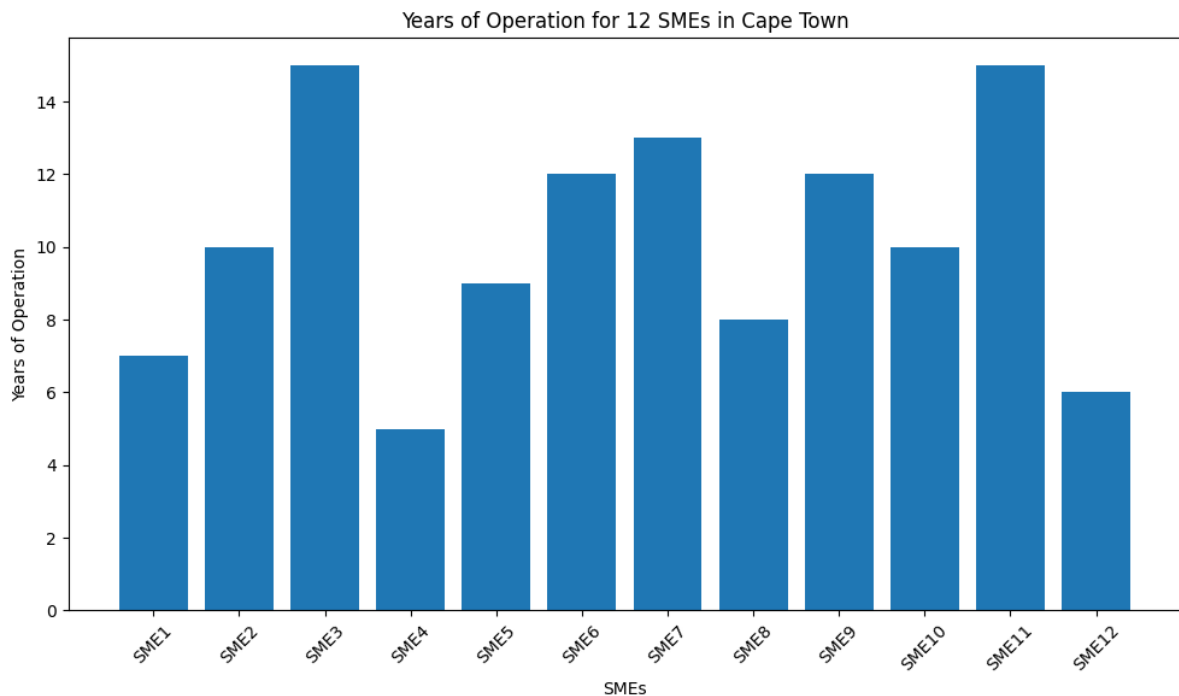
Despite the fact that many SMEs struggle to adopt technology, ICT remains essential for successful customer service delivery (Omowole et al., 2026). Restrepo-Morales et al. (2026) further highlight that the adoption of ICT not only brings organisational change and exposes staff to digital skills development but also improves the efficiency of customer service delivery while creating opportunities for enhanced customer engagement. These findings align with Mbatha (2024), who argues that ICT adoption strengthens effective customer service. Consequently, adopting digital tools enables SMEs to deliver value-adding services and significantly improve the overall customer experience.

3 METHODOLOGY

A qualitative approach underpinned this study, which collected data from 12 SMEs located in Cape Town, South Africa. Data were gathered using a questionnaire and further enriched through semi-structured interviews with SME owners and managers. All interview sessions were recorded, transcribed, and analysed using Atlas.ti software. Interviews were scheduled with consideration for participants' business operations to avoid disruptions. The study was grounded in an inductive paradigm and interpretivist methodology (Pot & Creswell, 2018), and an exploratory research design was adopted to identify emerging insights into how SMEs align digital tools, processes, and capabilities to enhance customer service delivery (Cloutier, 2024). Additionally, the qualitative approach facilitated the integration of case-study strategies to deepen contextual understanding and strengthen analytical rigour (Yin, 2018).

3.1 Sample

The sample for the current study comprised 12 SMEs operating in Cape Town, South Africa, each with 5 or more years of business experience. Several criteria informed the selection process. First, only SMEs with at least 5 years of operational history were included to ensure participants had sufficient experiential insight into customer service delivery and the integration of digital tools into their business processes. Additionally, the SMEs were required to be actively trading within the Cape Town metropolitan area to ensure contextual relevance. A total of 12 participants, one representative from each SME, were engaged in the study. These participants consisted of SME owners, managers, or key staff members directly involved in customer service operations. This structure ensured a comprehensive exploration of how SMEs utilise and align digital tools, processes, and capabilities within their business operations, as illustrated in Figure 1 below.

Figure 1*Years of operation for 12 SMEs in cape town*

3.2 Ethics approval

The University of the Western Cape (UWC) Research Ethics Committee granted ethical approval for this study. Ethical principles act as a memorandum of understanding between the researcher and the participants, protecting their rights to safety, privacy, anonymity, confidentiality, informed consent, and voluntary participation, while also ensuring fairness and the avoidance of deception. In alignment with these principles, all participants provided written informed consent before taking part in the study.

3.3 Result and discussion

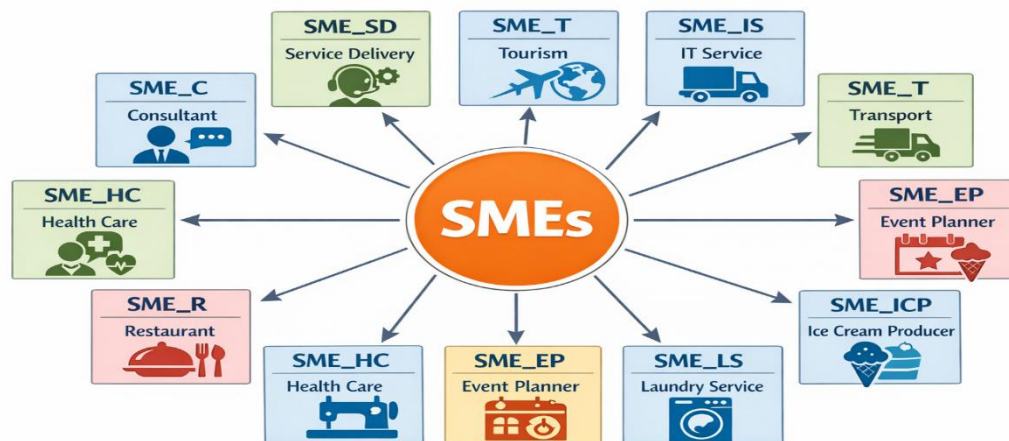
In this study, we investigate the effectiveness of information technology in shaping service delivery within SMEs, focusing on how digital tools address operational challenges and create opportunities in the South African context. The following section

presents the findings generated from the analysis of data gathered through semi-structured interviews

3.4 Code ID

While consistency in referencing is essential for maintaining clarity across the codes presented by each SME unit, the codes are specifically labelled by the type of business they are engaged in, as illustrated in Figure 2 below.

Figure 2



4 RESULTS

4.1 Lack of digital tools/low digitalisation

The study examines how limited use of digital tools and low levels of digitalisation affect customers' service delivery among SMEs. All SMEs interviewed (100%) reported that inadequate digitalisation negatively impacts their ability to deliver effective customer service.

SME_IS: As a business owner with more than 10 years of experience. I have observed that limited digitalisation directly affects our customer satisfaction and the overall quality of service delivery to them.

SME_T: The lack of digitalisation has significantly limited business opportunities and has compelled us to deliver services manually. This manual approach not only slows down operations but also increases the likelihood of errors and delays. ultimately leading to customer dissatisfaction.

SME_LS: The lack of digitalisation in my laundry business affects my business growth. as customers are not receiving real-time updates. online payment options. and timely service delivery. which has reduced customer satisfaction.

Following participants' feedback, clear evidence emerged indicating a lack of online presence in the customer service delivery of these SMEs. This finding corresponds with the study by Salem et al. (2026), which identified substantial gaps in SMEs' adoption of modern digital tools for customer service. The absence of digitalisation not only undermines the effectiveness of customer engagement but also hampers customer satisfaction and slows service delivery processes. Participants in this study emphasised that having an active online presence significantly enhances the efficiency and quality of services provided to customers.

4.2 Poor ICT infrastructure

The study demonstrated that deficient ICT infrastructure constitutes a profound structural impediment that markedly compromises the efficiency and responsiveness of service delivery. Participants unanimously underscored that systemic shortcomings, ranging from erratic internet connectivity and obsolete or inadequate hardware to recurrent power interruptions, restricted access to contemporary software solutions, and the absence of digitalised customer service platforms, collectively diminish operational effectiveness and obstruct the seamless provision of services

SME_ICP: "In my business operations, poor connectivity and outdated hardware have made it difficult for us to respond promptly to our esteemed customers, resulting in frustration and dissatisfaction."

SME_C: "During a critical Zoom meeting with a client, I experienced significant disruption caused by inadequate ICT infrastructure and unstable internet connectivity. Such deficiencies in ICT systems not only impede seamless

communication but also fundamentally undermine the quality and reliability of customer service delivery.”

SME_SD: “Power interruptions resulting from load-shedding in South Africa significantly disrupted my service delivery. particularly in my capacity as a software engineer. where our team was responsible for assisting users with critical tasks such as updating or installing system patches; however. these activities could not proceed due to the power outage.”

Given the participants' findings. it is clear that inadequate ICT infrastructure significantly hampers SME service delivery. ultimately resulting in heightened customer dissatisfaction. These findings align with those of Okeke et al. (2024) and Khumalo & Moloji (2025). who emphasise that deficient ICT infrastructure not only diminishes the quality-of-service delivery but also adversely undermines organisational reputation and erodes customers' trust. Although inadequate ICT infrastructure. manifesting in poor internet connectivity. recurrent power interruptions. and limited access to effective digital platforms. significantly impedes the efficiency of service delivery. it also has far-reaching implications for the organisation's overall brand image and the perceived quality of its products and services. These insights underscore the critical importance of investing in robust ICT infrastructure to ensure the seamless operation of SME business activities.

4.3 Limited automation

The study demonstrated that limited automation. as evidenced by the persistent reliance on manual operational processes. constitutes a significant structural impediment that substantially undermines the efficiency and responsiveness of service delivery. Participants further affirmed that the inadequate automation of business operations critically hinders the effective and timely delivery of customer service.

SME_HC: “I can attest that limited automation remains heavily dependent on traditional. manual methods that adversely affect service delivery. For example. the absence of automated service systems has significantly constrained our ability to access comprehensive and up-to-date customer information.”

SME_T: “We operate in a digital era. and the lack of automated operations significantly hinders effective service delivery. For example. in the tourism sector. where business transactions are increasingly conducted virtually. limited automation undermines the efficiency and quality of client service.”

SME_EP: From experience, limited automation significantly impedes our business operations and undermines the level of service satisfaction we are able to provide to clients

While the participants' feedback revealed that the consequences of limited automation encompassed a continued reliance on manual record-keeping and data entry, paper-based invoicing, manually driven customer service processes, labour-intensive inventory management, non-automated marketing activities, and minimal utilisation of human-resource automation. This finding aligns with Hollebeek et al. (2021), who demonstrated that without the automation of service delivery in AI-enabled operations, service processes become increasingly inefficient and remain prone to recurrent errors. When business operations are conducted manually, the resulting inefficiencies significantly undermine the effectiveness and efficiency of service delivery. Consequently, this leads to diminished customer satisfaction, an increase in customer complaints, a decline in customer loyalty, and ultimately reduced customer retention. Therefore, it is imperative to automate customer-delivery processes within SMEs to enhance operational efficiency and increase customer satisfaction.

4.4 Technological adoption challenges

The challenges associated with technology adoption include persistent skills gaps and widespread resistance to change among SMEs, manifested in limited digital literacy, inadequate technical expertise, fears of job loss, a preference for traditional methods, and apprehension about making mistakes. The SMEs that participated in this study emphasised that resistance to change and limited digital literacy are key factors hindering the adoption of digitalisation.

SME_T: I believe that numerous challenges continue to impede the adoption of digitalisation. For example, when we attempted to digitalise our accounting operations, the initiative was met with resistance from some accounting staff due to their limited digital competencies.

SME_EP: "As an entrepreneur striving to grow my business, I encountered considerable difficulty in adopting certain forms of digitalisation, such as developing a functional website. The process required technical skills and

resources that were not readily available to me. making the transition to digital platforms more challenging than anticipated.”

SME_T: Although I am fully aware of the transformative impact that ICT can have on business performance. the ongoing cost of maintaining reliable data subscriptions. coupled with concerns about cybercrime. has discouraged me from fully committing to digital technologies. These financial and security-related constraints create hesitation. making the adoption and sustained use of ICT tools more challenging than anticipated.

In light of the participants' insights. it became evident that several factors continue to impede the adoption of digitalisation within their businesses. These include persistent skills gaps. varying degrees of resistance to organisational change. and the significant cost implications associated with acquiring. implementing. and maintaining digital technologies. This is consistent with the findings of Restrepo-Morales et al. (2024). who established that resistance to change. cost implications. and insufficient skills and competencies significantly hinder the adoption of ICT among SMEs. Collectively. these barriers create an environment in which digital transformation is perceived as complex. disruptive. and financially burdensome. Therefore. it is essential to educate SMEs on the importance of adopting ICT. despite prevailing resistance and the financial constraints associated with digital transformation

4.5 The discussion

The ability to deliver effective customer service. resulting in meaningful transformation and heightened customer satisfaction. largely depends on the strategic use of ICT (Nwachukwu & Nyandoro. 2026). Without ICT-enabled systems. it becomes increasingly difficult for businesses to offer timely. accurate. and high-quality service experiences. Drawing on participants in SMEs. the study emphasised that a lack of digitalisation or slow digitalisation hinders effective customer service delivery. The absence of digitalisation within SMEs' business operations significantly undermines their capacity to provide convenient. high-quality. and satisfying services to clients (Brink & Packmohr. 2023). The insights from this study further substantiate the findings of Shibambu and Ngoepe (2025). who emphasised that the lack of digital tools in SME service delivery impedes the effective transformation of customers' service experiences.

Collectively, these perspectives reinforce the argument advanced by Salem et al. (2026), who affirm that the integration of digitalisation into SMEs' service delivery processes is essential for achieving smoother, more efficient, and more responsive customer service outcomes.

Adequate ICT infrastructure plays a foundational role in strengthening the quality, efficiency, and reliability of service delivery within organisations. When ICT systems are weak or underdeveloped, it becomes increasingly difficult to deliver high-speed services, support real-time communication and customer engagement, and maintain consistency and reliability in service processes (Hussain & Radulescu, 2025). The findings of this study echo those of Okeke et al. (2024), who argued that inadequate ICT systems significantly impede effective customer interaction and engagement within SMEs' operational environments. Similarly, Idemudia et al. (2023) emphasised that the establishment of robust ICT infrastructure is essential for enhancing SMEs' operational capabilities, thereby enabling them to deliver efficient, timely, and high-quality services. Collectively, these perspectives highlight that without well-developed ICT systems, SMEs struggle to meet evolving customer expectations and sustain competitive service delivery.

Automation of ICT equipment is vital to strengthening SMEs' business operations and service delivery, as it replaces traditional manual methods that constrain operational efficiency. In contexts where automation is limited, Hollebeek et al. (2021) and Sarwar and Irshad Hashmi (2026) note that service processes are more prone to delays, high error rates, and fragmented workflows. Omowole et al. (2024) similarly emphasise that although financial constraints pose challenges, the long-term benefits of digitalisation justify the investment. Complementing this view, Katragadda (2023) argues that automating SME operations, particularly through AI-enabled systems, significantly enhances operational efficiency and improves the quality and responsiveness of service delivery. Hence, these studies affirm that adopting automation is essential for SMEs seeking to modernise their operations and deliver consistent, high-quality services.

Finally, ICT adoption is crucial for SMEs because it enables smoother workflows and enhances overall productivity, an aspect that is often overlooked in smaller enterprises. In contrast, the absence of ICT adoption, commonly linked to skills gaps, resistance to change, and financial constraints, significantly impedes the progression of

service delivery. According to Achieng and Malatji (2022), these challenges limit SMEs' ability to digitalise their operations, largely due to the restricted resources needed to acquire and maintain digital technologies. This insight aligns with Mbatha's (2024) findings, which emphasise that digitalisation substantially improves service delivery efficiency within SMEs. Therefore, despite the obstacles, it remains essential for SMEs to prioritise the adoption of ICT in their operations, as this enhances performance, supports modern business demands, and strengthens long-term competitiveness.

4.6 Summary

Drawing on Figure 3, which illustrates the key barriers to ICT adoption shaping SMEs' service delivery, it becomes evident that several constraints continue to undermine digital transformation efforts. These barriers collectively hinder SMEs' ability to deliver efficient, reliable, and customer-centred services, as outlined below:

Figure 3



Source: Authors' compilation

5 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Results from participants across the 12 SMEs in this study revealed several barriers to ICT adoption that continue to hinder the transformation of service delivery aimed at improving customer satisfaction. Participants highlighted that the lack of digitalisation or a slow online presence negatively affects the efficiency and responsiveness of SME operations. Similarly, poor ICT infrastructure was reported to obstruct the delivery of high-quality services, limiting SMEs' ability to meet customer expectations effectively.

The insight also underscored the barriers hindering ICT adoption and their broader implications for service delivery among SMEs. Participants reported that limited automation forces them to rely heavily on manual labour to execute routine tasks. This dependence not only slows operations but also disrupts the smooth, efficient flow of daily business activities.

Moreover, the participants explained that the absence of meaningful ICT integration, exacerbated by skills gaps, fear of organisational change, and the financial burden associated with technological investment, continues to impede the effective implementation of systems that could enhance service delivery. Collectively, these factors restrict SMEs from optimising their processes and fully leveraging the potential benefits of digital transformation.

Although these findings align with previous studies on SMEs, they also underscore the urgent need for strategic interventions to address the persistent barriers that impede smooth, efficient, and reliable service delivery. While information technology has demonstrated a profound and transformative influence on SMEs' operational performance, challenges arising from limited digitalisation, inadequate ICT infrastructure, minimal automation, and broader technological adoption gaps continue to constrain their growth and competitiveness. These constraints, however, are not insurmountable; with targeted policies, capacity-building initiatives, and sustained investment in technological resources, such barriers can be comprehensively mitigated

5.2 Limitation

This study examines the barriers to ICT adoption and their effects on SMEs' service delivery in the Western Cape, aiming to address the existing information gap in this area. However, because the research involved a relatively small sample, the findings may not fully reflect the varied experiences and challenges of SMEs across the region. Therefore, further studies across additional areas in the Western Cape are needed to determine whether other contextual or sector-specific factors influence the relationship between ICT adoption and service delivery. Broadening the scope of future research will strengthen the generalisability of the results and deepen understanding of the factors shaping ICT's role in SMEs' operational performance. Finally, conducting mixed-methods research using both qualitative and quantitative methods will give a fuller understanding of ICT adoption challenges.

5.3 Recommendation

In this study, the lack of digitalisation emerged as a significant barrier negatively influencing service delivery among SMEs. To enhance ICT adoption, it is therefore crucial to strengthen digitalisation efforts through targeted capacity-building programmes and digital-literacy initiatives that equip SME owners and employees with essential technological competencies.

Inadequate ICT infrastructure was also highlighted as a major constraint affecting the efficiency of SMEs' operational processes. Accordingly, the study recommends the improvement of ICT infrastructure through expanded network connectivity and increased access to affordable technological resources.

Furthermore, the findings revealed that many SMEs still rely heavily on manual procedures, resulting in limited automation and reduced operational efficiency. To address this, the study advocates for increased automation through the adoption of scalable, low-cost technological tools supported by accessible funding mechanisms.

Additionally, the study emphasises the need to overcome broader technological adoption challenges by providing continuous skills development, structured

change-management support, and financial incentives that build confidence, reduce resistance, and lower the cost burden associated with ICT integration.

AUTHORS' CONTRIBUTION

The authors participated fully throughout the research until the final version was approved.

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Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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