Journal of Innovations in Business and Industry

aspur

Vol. 03, No. 04 (2025) 265-280, doi: 10.61552/JIBI.2025.04.006 - http://jibi.aspur.rs

CATALYSING DIGITAL TRANSFORMATION FOR SMALL-AND-MEDIUM ENTERPRISES IN HARARE, ZIMBABWE: A STUDY OF ADOPTION DRIVERS

Leo T. Mataruka [1]
Joe Muzurura
Christopher Zishiri
Cletos Garatsa
Lovemore Z. Mugambiwa,
Gladman Jekese

Received 28.05.2024.
Revised 12.07.2024.
Accepted 30.07.2024.

Keywords:

Digital technologies, Information and Communication Technology (ICT), SME, ICT adoption, Technological-Organizational-Environmental (TOE) model, Harare.

Original research

A B S T R A C T

This paper analyses the factors influencing the adoption of digital technologie and ICT among Zimbabwean SMEs, highlighting their potential for growth an innovation in the digital era. It explores the hurdles encountered by some SME in Harare, Zimbabwe, while implementing digital and ICT technologies and hov these challenges affect their survival, flexibility, and sustainability. The blend o the Technological-Organizational-Environmental paradigm and the Diffusion o Innovation theory forms the theoretical basis for this paper. Data was acquire from 132 Harare SMEs using purposive sampling, while partial least square structural equation modelling (PLS-SEM) was used to analyse the data. Th study reveals that relative advantages and top management support significantl influence ICT adoption in participating SMEs. However, no significan association was found between ICT adoption and variables such a compatibility, complexity, organisational culture, government laws, an competitive pressure. This study contributes to the current understanding of IC adoption in SMEs, providing significant insights for SMEs in Harare and beyon who are looking to develop effective strategies for embracing digital technolog and innovations. Furthermore, the findings could assist policymakers in creatin frameworks that promote the adoption of digital technology by SMEs an prospective entrepreneurs to enhance their business operations and long-ter viability.

1. INTRODUCTION AND STUDY BACKGROUND

The rapid advancement of digital technologies has significantly transformed the corporate landscape and our personal lives, propelling the digital economy forward. Embracing digitalisation has become crucial for businesses to remain competitive and avoid obsolescence (Smith et al., 2020a). The SMEs, which account for a substantial proportion of businesses globally and play a significant role in shaping the global economy, are the backbone of economic development. However, SMEs face various challenges that hinder their adoption of Information and Communication Technology (ICT) at the same rate as large enterprises (Awa, 2015; Mahuni et al., 2021; Mataruka et al., 2023; Chundu et al., 2022; Kajongwe et al., 2020; Muhammad et al., 2019). To support SMEs, policymakers should focus on improving ICT infrastructure, providing financial assistance, and developing digital skills (Sanga & Aziakpono, 2023).

[1] Corresponding author: Leo T. Mataruka
Email lmataruka@cuz.ac.zw

These support mechanisms can enable SMEs to embrace digitalisation fully and leverage their potential for growth and innovation, empowering them to contribute meaningfully to the economic development matrix for their countries (Cassetta et al., 2020; Chege & Wang, 2020; Chen et al., 2017; Jones et al., 2018; Nyoni & Bonga, 2018).

Despite their challenges, SMEs in developing countries have demonstrated remarkable resilience in their slower adoption of ICTs and implementation of e-transformation technologies (Chigusiwa et al., 2020; Chimucheka & Mandipaka, 2015; Kongolo, 2010; Tjahjono & Purbiyati 2023). They have faced various obstacles, including financial resources, research and development capabilities, and risk appetite compared to large corporations (Vakirayi, 2020). However, they continue to push forward, overcoming challenges such as high ICT-related expenses, inadequate government ICT planning, and a need for more skilled labour. This resilience underscores the critical need for support in their bid for digital transformation. Researchers have highlighted that organisations may face challenges in adopting ICT due to constraints in technical and human resources, insufficient political and economic support, and a traditional bureaucratic mindset (Agwaniru, 2023; Maalouf et al., 2023; Mataruka et al., 2023; Chundu et al., 2022; Makiwa & Steyn, 2020; Al Busaidi et al., 2019). Nonetheless, we argue that SMEs have a distinct advantage over large corporations. Their size allows them to make efficient strategic decisions (Mataruka et al., 2023), demonstrating their agility and adaptability and fostering a collaborative work environment essential for innovation and performance (Mabenge et al., 2022; Sulistyo & Ayuni, 2020).

1.1 Zimbabwe SME's Contextual Theorisation

Understanding the role of SMEs in Zimbabwe's economy is crucial. Nyathi et al. (2018) probed into the factors that define SMEs, such as employee count, capital investment, market reach, sales revenue, and infrastructure. In Zimbabwe, SMEs play a significant role, contributing substantially to the country's GDP (Makanyeza & Dzvuke, 2015; Makanyeza 2023). Thus, SMEs in Zimbabwe are not just economic entities but the backbone of the nation's development. In 2016, they contributed US$8.58 billion to Zimbabwe's GDP and employed 5.9 million individuals, a testament to their potential (FinScope, 2022; Manyanga et al., 2023; Sibanda et al., 2018). Over 70% of the taxpayer data was accounted for, and a large portion of the workforce is employed in the informal sector (FinScope, 2022; Matsongoni & Mutambara, 2021). They also play a pivotal role in the contribution and attainment of the Sustainable Development Goals (Sonntag et al., 2022) and the country's National Development Goals. Based on their contribution to the ailing economy, the Government of Zimbabwe has recognised the importance of SMEs and taken deliberate steps to support them. A Ministry of SMEs and Cooperative Development was established to nurture SMEs (Makiwa & Steyn, 2020; Chibaya et al., 2022). This support is crucial as it helps SMEs overcome productivity challenges and ensures their growth and long-term viability (FinScope, 2022; Matsongoni & Mutambara, 2021). The Government has encouraged the private sector to promote incubation hubs and implement employment regulations to support SMEs (Chibaya et al., 2022; Matsongoni & Mutambara, 2021). However, the Ministry needed to do more to effectively interact with SMEs to encourage them to leverage growth by adopting ICTs (Musabayana et al., 2023). Studies have shown that ICT adoption can be a game-changer for SMEs in Zimbabwe, unlocking their potential and contributing to economic growth (Mataruka, 2022). A recent study found that 68% of surveyed SMEs had undertaken digital transformation using mobile apps, cloud computing, and data analytics (Mwangi et al., 2023). This underscores SMEs' potential advantages by incorporating ICT into their activities (Maleka & Fatoki, 2016; Mataruka et al., 2023; Chundu et al., 2022). However, SMEs face several challenges, including limited digital literacy, inadequate infrastructure, financial constraints, and cybersecurity concerns (Vakirayi, 2020; Makiwa & Steyn, 2020). Effective digital transformation faces barriers like skills gaps and infrastructure issues (Matsongoni & Mutambara, 2021; Musabayana et al., 2023; Kajongwe et al., 2020; Alma et al., 2018). Thus, while SMEs in Zimbabwe must embrace ICT, more research is needed on the factors influencing ICT adoption in their context (Gutierrez et al., 2015). It was essential to understand the specific challenges and benefits that SMEs face when adopting digital technologies, as well as the impacts on their performance and long-term viability. The following questions are answered in the study:

- RQ1: What factors contribute to the adoption of ICT among SMEs in Zimbabwe?
- RQ2: How prevalent is digitalisation among SMEs adopted in Zimbabwe?

RQ3: This study was designed to dissect the factors influencing the adoption of digital technologies and ICTs among SMEs in Zimbabwe. The study explored the relationship between various factors, including these technologies' benefits, senior management support, compatibility, and the external environment. Additionally, the study proffered strategies that can be adopted to promote the integration of digital technologies in SMEs.

2. LITERATURE REVIEW

Digital transformation pertains to the restructuring/integration of an organisation to align its operations with technological breakthroughs in the digital domain (Widnyani et al., 2021). Putri et al. (2022) state that organisations must adopt digital transformation. This can be achieved by effectively transforming their structure and mechanisms to address and integrate multiple issues. It must be noted, however, that the digital transformation process poses various challenges and opportunities for SMEs. They should be proactive when

preparing for and navigating the digital landscape (Listiyoningsih et al., 2022). An effective strategy could involve improving SMEs' human resource skills in ICT (Wening & Santosa, 2022). To effectively address digital transformation, SMEs must embrace emerging technological changes and apply critical thinking (Amoah et al., 2023; Wening & Santosa, 2022). The advantages of implementing digital transformation in SMEs can be significantly amplified by consolidating various interconnected issues. These objectives encompass improving operational efficiency, promoting customer engagement, cultivating innovation capabilities, expanding market reach, and adapting to evolving market dynamics (Lutfi et al., 2022; Alraja et al., 2021). SMEs can optimise their potential by implementing various strategies, including cloud computing, digital marketing, e-commerce, data analytics, and enhancing digital skills (Brodny & Tutak, 2022; Trawnih et al., 2021).

2.1 Theoretical basis

The study combined the lens of the Diffusion of Innovations (DOI) theory (Rogers, 1962) and the Technology-Organization-Environment (TOE) (Tornatzky & Fleischer, 1990) frameworks to provide a comprehensive understanding of the elements influencing technology acceptance and diffusion in the SME sector in Harare of Zimbabwe. Combining these theories allowed a complete understanding of technology uptake. The DOI theory focuses on the diffusion process and individual-level factors influencing adoption decisions. On the other hand, the TOE framework focuses on technological, organisational and environmental components (Machado et al., 2020). Together, these theories provide a more comprehensive understanding of the context in which technology adoption occurs (Rogers, 1962; Tornatzky & Fleischer, 1990).

Substantial empirical evidence supports the efficacy of merging these ideas in the IS area. For example, Kumar et al. (2023), Mataruka et al. (2023) used the DOI theory to investigate mobile banking adoption and social media integration, respectively (Puriwat & Tripopsakul, 2021). Dube et al. (2022) used the TOE framework to investigate the adoption of digital technologies in Zimbabwean SMEs. Muhammad et al. (2019) used the TOE framework to investigate the adoption of e-commerce among Pakistani SMEs. Ahn and Ahn (2020), Chau and Deng (2021) found that technological, organisational, and environmental aspects are essential in understanding technology adoption inside businesses. The DOI theory provides a solid foundation for understanding the adoption process, while the TOE framework takes a rigorous approach to evaluating the unique contextual elements that influence technology uptake. It is worth acknowledging the inclusion of other adoption and institutional theories inside the DOI and TOE frameworks. Institutional Theory examines how external variables such as institutional constraints, norms, and legislation influence technology adoption. Li and Wang (2022) applied Institutional Theory inside the TOE framework to investigate technology adoption in SMEs. Research in the IS sector has proven that each theory has advantages and can provide valuable insights into technological adoption (Rogers, 1962; Tornatzky & Fleischer, 1990; Kumar et al., 2023; Mataruka et al., 2023; Dube et al., 2022; Muhammad et al., 2019). For example, the Innovation-Decision Process Theory, part of the DOI framework, focuses on people's steps when implementing new ideas. This theory offers insights into technology adoption's cognitive processes and decision-making mechanisms. The Technology Adoption Model (TAM) investigates the elements influencing people's adoption and use of technology, providing essential insights into user behaviour and acceptability. Consequently, combining these theories enabled this study to comprehensively analyse digitalisation adoption in Zimbabwe's SME sector.

2.2 Hypothesis Development and Conceptual Research Model

2.2.1 Technology Contextual Factors

Technological considerations significantly impact SMEs' digital transformation capabilities. Key factors influencing SMEs' adoption of new ICT include relative advantage, compatibility, complexity, security, and accessibility (AlSheibani et al., 2020; Trawnih et al., 2021; Fadeyi et al., 2022). Relative advantage is the perceived superiority of an invention over existing alternatives, which is critical in encouraging SMEs to adopt innovation (AlSheibani et al., 2020). SMEs' transformational powers in digitalisation are influenced by their view of the comparative benefits of the technology they adopt. Compatibility and integrating technology with SMEs' beliefs, experiences, and needs also strongly impact adoption (Trawnih et al., 2021). SMEs' transformative powers in digitalisation are influenced by the compatibility of the technology with their organisational values and needs. The other key factor is technology complexity, which can deter SMEs from adoption due to perceived difficulties in understanding and implementation (Fadeyi et al., 2022). Researching the relationship between complexity and SMEs' transformational skills in digitalisation would provide insights. Accessibility, conversely, ensures data protection and confidentiality while maintaining easy access, which is a crucial priority for SMEs. Data breaches, outages, and connectivity limitations may restrict adoption (Fadeyi et al., 2022). Examining the relationship between accessibility and SMEs' digitalisation skills is essential. It is apparent that these technical contextual variables significantly impact SMEs' ability to adapt through digitalisation. Analysing these attributes and SMEs' digitisation capabilities using a study hypothesis may help better understand their relationship.

Thus, the subsequent hypothesis is put forward:

Hypothesis 1: The capacity of SMEs to undergo digital transformation is affected by factors such as comparative

benefit, compatibility, intricacy, security, and accessibility.

This hypothesis offers a structure for empirical investigation, facilitating a thorough examination of the elements that influence SMEs' transformative capabilities in adopting digitalisation. Hence, the sub-hypotheses are represented by relative advantages (RA), compatibility (CM), and complexity (CO).

2.2.2 Organisational Contextual Factors

The organisational context significantly impacts ICT integration in SMEs. This research investigates critical components of the organisational setting that influence ICT adoption in SMEs, including top management support, organisational size, technical preparedness, culture, and financial/management restrictions (Alma et al., 2018; Albar & Hoque, 2019; Trawnih et al., 2021). Top management support is crucial, as studies have found a strong correlation between CEO traits like innovation, positive attitudes towards ICT, and technology adoption (Alma et al., 2018; Albar & Hoque, 2019; Trawnih et al., 2021). Organisational size also positively impacts ICT adoption, as larger SMEs rely on technology to maintain market share (AlSheibani et al., 2020). Organisational readiness, including financial resources, qualified personnel, and technological infrastructure, is critical for successful ICT implementation (Trawnih et al., 2021; Twinomurinzi & Msweli, 2019). Organisational culture also plays a substantial role, as different cultural orientations affect ICT adoption differently (Albar & Hoque, 2019). Finally, financial and management constraints heavily influence SMEs' ICT adoption, as a lack of resources can limit their ability to adopt new technologies (Jayeola et al., 2022; Thabela et al., 2019). The reviewed literature amply demonstrates that these organisational factors significantly impact SMEs' ICT adoption, and analysing their relationship can provide valuable insights in the context of SMEs in Zimbabwe. Thus, the study adopts SME digitalisation to infer ICT adoption factors (IA).

Expanding on this analysis, the subsequent research idea is put forward:

Hypothesis 2: The elements of top management support, organisational size, organisational preparedness, technological readiness, organisational culture, and financial and management restraints have a significant impact on the adoption of ICT by SMEs.

This hypothesis serves as the basis for additional empirical study, facilitating a thorough investigation of the correlation between these organisational variables and the use of ICT by SMEs. The proxy study variables are top management support (TM) and organisational culture (OC).

2.2.3 External Environmental Factors

The adoption of information and communication technologies (ICT) by small and medium-sized enterprises (SMEs) is influenced by various external factors, including the regulatory environment, competitive pressure, supplier pressure, and customer pressure (Albar & Hoque, 2019; AlSheibani et al., 2020; Thabela et al., 2019). Government laws and regulations can significantly impact SMEs' use of ICT. SMEs that align with government policies and norms are more inclined to embrace ICT, while those facing strict regulations may use it less often (Albar & Hoque, 2019). Government initiatives, such as funding programs, regulatory frameworks, and the creation of innovation hubs and digital ecosystems, can facilitate SMEs' digital transformation (Curraj, 2018). Competitive pressure also drives SMEs to adopt and integrate new technologies. In highly competitive environments, SMEs are concerned about maintaining their edge over rivals, prompting them to adopt ICT for a competitive advantage actively (AlSheibani et al., 2020). On the other hand, supplier and customer pressures also influence SMEs' ICT adoption decisions. Technology service providers and suppliers often encourage SMEs to adopt specific ICT solutions. At the same time, customer demands for enhanced services, faster response times, or upgraded digital capabilities can motivate SMEs to utilise ICT (Thabela et al., 2019). Research in the Zimbabwean context has validated the active efforts made by the Southern African government to promote technology adoption, including policies to encourage adoption, working with different societal groups, and ensuring affordable technology for entrepreneurs and small businesses (Hisrich & Soltanifar, 2021; Lose & Kapondoro, 2020; Chibaya et al., 2022). However, Musabayana et al. (2023) found that policymakers' lack of commitment can hinder the development of digital skills and attaining competitive advantage.

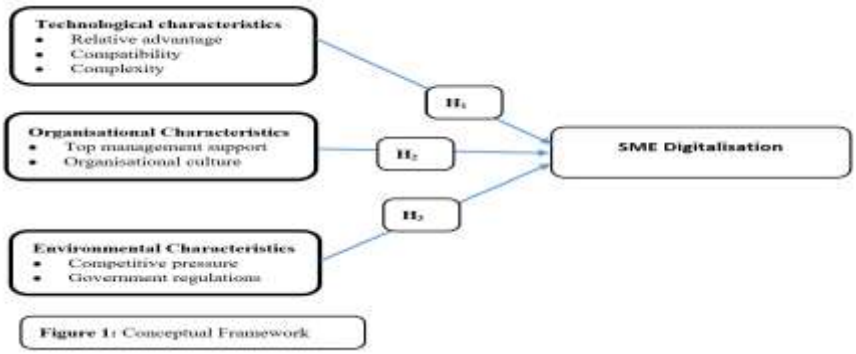

Figure 1. SME digitalization

In summary, various external factors influence SMEs' decision-making and technology adoption, including regulations, competition, suppliers, and customer demands. Understanding these factors can provide valuable insights for developing a research hypothesis on SMEs' ICT adoption.

Hypothesis 3: Regulatory, competitive, supplier and consumer pressures strongly affect SMEs' ICT adoption. Thus, the sub-hypotheses are represented by competitive pressure (CP) and government regulations (GR) factors.

Ultimately, embracing digital transformation is crucial for SMEs to maintain competitiveness and flourish in the modern digital landscape. It requires incorporating technology into all areas of an organisation, necessitating careful planning, strong leadership, and investment in digital capabilities (Figure 1). Addressing challenges and seizing opportunities can improve SMEs' operational efficiency, innovation, and market competitiveness.

3. RESEARCH METHODOLOGY

This study meticulously employs a positivist quantitative approach and a cross-sectional methodology to evaluate the implementation of digitalisation among SMEs in diverse industrial sectors in Harare, Zimbabwe (Mataruka et al., 2023; Fraccastoro et al., 2021). The research technique involved data analysis using a sample of managerial personnel from a specific group of entrepreneurial enterprises (Heubeck, 2023; Mataruka et al., 2023; Mataruka, 2022). The methodology encompassed data collection, measurement of crucial variables, structural equation analysis, and interpretation of findings (Creswell, 2021).

3.1 Sample, Data Collection, and Analytic Techniques

With a deliberate choice, the authors selected participants from SMEs in the multi-sector Zimbabwean economy's Harare District using a purposive sampling technique (Mataruka et al., 2023; Fraccastoro et al., 2021; Attor et al., 2022). This non-probability sampling approach was deemed appropriate, drawing from prior research in the field of SMEs (Mataruka et al., 2023; Fraccastoro et al., 2021). The questionnaire was developed using Google Forms and distributed through email and WhatsApp to ensure a broader reach of participants (Attor et al., 2022). The data collection occurred over four months, from November 2023 to February 2024. A pilot study was undertaken to enhance the reliability and validity of the questionnaire (Creswell, 2021). The survey was administered to a limited sample of 5 employees from non-E4IMPACT businesses in the SME category in Harare, employing purposive sampling (Mataruka et al., 2023; Mataruka, 2022). The pilot test was instrumental in improving the questionnaire by identifying errors and gathering valuable feedback from participants, demonstrating our research process's robust and reliable nature. The survey focused on numerical data, as researchers in the field of ICT place great importance on quantitative surveys that examine behaviours that are not easily observed in real-life situations (Mataruka, 2022; Curraj, 2018; Creswell, 2021). This study aimed to evaluate business performance from a management perspective, an area that has yet to be noticed in ICT-related research in Zimbabwe (Mataruka et al., 2023; Mataruka, 2022; Dzindikwa, 2021). The questionnaire gathered perceptual data that followed the TOE framework, which focuses on technology-organization-environment factors (Mataruka et al., 2023). Respondent anonymity was ensured to minimise interviewer bias (Creswell, 2021).

An effective response rate of 52.80% was attained; see Table 1 below.

Table 1: Detailed sampling size

Steps in sampling	Number	Percent (%)
Respondents reached	250	100%
Responses received (including reminders)	135	54%
Unusable responses, lack of data	3	1.20%
Final usable responses	132	52.80%

Source: *Authors' processing from SmartPLS-SEM 4.0 version*

Table 2: Demographic Characteristics of the Study Sample

Categories		Frequency	Percent (%)
Age	21-30 years	9	6.8
	31-40 years	63	47.7
	41-50 years	42	31.8
	>50 years	18	13.6
Gender	Female	30	22.7
	Male	102	77.3
	Other	3	2.3
Qualifications	Certificate	12	9.1
	Diploma	15	11.4
	Degree	75	56.8
	Masters/MBA	30	22.7
Position	Owner/Manager	81	61.4
	Business Partner	18	13.6
	Business Manager	12	9.1
	IT Manager/Professional	9	6.8
	Supervisor	12	9.1

Source: *Field data (November 2023-February 2024), retrieved from Google form*

The demographic characteristics of the sample were examined by descriptive analysis. The respondents' sentiments were evaluated using mean, standard deviation, and relative weight analysis. The relationship between independent and dependent variables was examined using PLS-SEM.

Table 2 displays the demographic characteristics of the final dataset, such as age distribution, qualifications, positions held, and the predominance of male participants.

The critical demographic data analysis shows that the participating SMEs differ in size in terms of the number of employees, the nature of the business in categories, and the number of personnel. The results reveal a fair and balanced distribution of participating companies based on the number of employees. Most companies fell within the 1 to 40 employees range, with a balanced distribution between small enterprises (1 to 5 employees) and medium-sized (6 to 40 employees) (de Bruin & Floridi, 2017). This fair representation is further enhanced by including more significant companies with more than 75 employees in the study. The sample demonstrated a significant level of expertise in IT experience, with participants having more than ten years of experience (68.2%). This is followed by those with 7 to 9 years (13.6%), 4 to 6 years (9.1%) and 1 to 3 years (9.1%). The high percentage of participants with considerable maturity and knowledge in information technology is a testament to the expertise of the surveyed group.

Regarding computer expertise, the majority of participants (45.5%) reported having an "advanced" level, followed by "basic" (34%) and "expert" (20.5%). This diversity of digital skills and capabilities among the participating companies could have implications for the design and implementation of ICT solutions and the required level of support and training. Another relevant finding was that most companies (61.4%) did not have dedicated IT professionals, which may indicate challenges in integrating and adopting ICT solutions in these organisations. Furthermore, a diverse distribution was observed in the companies' years of existence. The majority (36.4%) were relatively new, operating for 0 to 5 years, followed by those in the 6 to 10 years bracket (31.8%). There is also a significant representation of companies in the 11 to 15 years (18.2%) and more than 15 years (13.6%) brackets. This heterogeneity may reflect different maturity levels and challenges the companies faced in the ICT adoption process.

In summary, the analysis of demographic data provides a comprehensive portrait of the participating companies' profiles, highlighting their diversity in size, business sector, experience, and digital capabilities. These insights are relevant to understanding the context in which ICT adoption occurs within this business ecosystem.

3.2 Common Method Variance Test

Several measures were taken to address the potential issue of standard method variance (CMV) (Bagozzi & Yi, 1988). First, the participants were assured of the confidentiality of their responses, and they were informed that there were no right or wrong answers, which aimed to encourage honest responses and reduce response bias (Kock et al., 2021). Additionally, the participants could drop out of the survey at any time if they felt uncomfortable or did not want to continue, ensuring voluntary participation (Bagozzi & Yi, 1988). Furthermore, a post-hoc examination was conducted using a multicollinearity test employing the variance inflation factor (VIF) to evaluate the presence of CMV (Kock et al., 2021). The results showed that the VIF values were below the threshold of ten, indicating that CMV was not a significant concern in this study. Although the researchers recognised the potential for CMV, the preventative steps suggested that its effects were mitigated in this survey (Creswell, 2021).

Measurement Items and Sources

The study utilised a 41-item survey, with constructs and measurement items adopted from prior research studies (Albar & Hoque, 2019; Ghobakhloo et al., 2012; Chiu et al., 2017; Hamad et al., 2018; Stjepić et al., 2021; Adam et al., 2020; Ahn & Ahn, 2020; Trawnih et al., 2021; Oktora et al., 2020; Abdullah et al., 2018; Curraj, 2018). The survey covered technology context (11 items), organisational context (6 items), environmental context (8 items), ICT adoption intention (3 items), and digitalisation level (13 items). Detailed measurement item summaries are provided in the appendices.

3.3 Descriptive Statistics for Predictor Constructs

The study assessed the technical background by measuring relative advantage, compatibility, and complexity. Participants reported that technology had a significant benefit compared to other options (M=4.64, SD=0.56), was moderately compatible (M=3.841, SD=0.708), and had a low level of complexity (M=2.23, SD=0.908). The support and organisational culture evaluated the organisation's organisational context. Participants indicated corporate support from top management (M=3.89, SD=0.82) and a slightly lower level of congruence between organisational culture and technology adoption (M=3.78, SD=0.81).

An analysis was conducted on the environmental circumstances, considering the influence of competitive pressure and government regulation. Participants reported high competitive pressure, with a mean standard deviation of 0.86. They also indicated a reduced level of government controls, with a mean score of 3.11 and a standard deviation of 0.96. Overall, the study sample had a significant degree of technological and organisational context, highlighting the benefits of technology and robust backing from top management. Participants encountered substantial competitive pressure while facing reduced government controls.

3.4 Descriptive Statistics for Dependent Variables

The descriptive statistics for the dependent variables revealed a high level of ICT adoption intention among the study participants, with a mean score of 4.182 (SD = 0.828) (Hamad et al., 2018; Albar & Hoque, 2019; Ahn & Ahn, 2020). The study also examined the digitalisation

level, focusing on five factors: email usage, website usage, social media usage, e-commerce usage, and e-business usage (Chinomona & Bikissa-Macongue, 2021). The results showed a significant degree of digitalisation among the participants. Notably, social media usage had the highest mean score of 4.076 (SD = 1.020), indicating the participants' active use of social media platforms for their digitalisation initiatives (Trawnih et al., 2021; Oktora et al., 2020; Abdullah et al., 2018; Curraj, 2018). Email usage also demonstrated a notable level of ICT adoption, with a mean of 3.803 (SD = 1.240), suggesting that email communication was a significant part of the participants' digitalisation behaviours (Trawnih et al., 2021; Oktora et al., 2020; Abdullah et al., 2018; Curraj, 2018). Website usage had a mean of 3.651 (SD = 1.300), suggesting that the participants recognised the value of maintaining an online presence through websites (Trawnih et al., 2021; Oktora et al., 2020; Abdullah et al., 2018; Curraj, 2018). The usage of e-commerce had a lower mean of 3.341 (SD = 1.199), indicating that the participants engaged in online commercial activities, such as online buying and selling, but to a lesser extent compared to other digitalisation factors (Trawnih et al., 2021; Oktora et al., 2020; Abdullah et al., 2018; Curraj, 2018). The lowest mean score was for e-business usage at 2.523 (SD = 1.443), implying that the participants had relatively low adoption of more general e-business practices, such as online customer relationship management or digital supply chain management (Trawnih et al., 2021; Oktora et al., 2020; Abdullah et al., 2018; Curraj, 2018). These findings provide valuable insights into the participants' digitalisation behaviours and preferences, highlighting the prominent role of social media and email in their digital initiatives (Mataruka et al., 2023).

3.5 Model measurements

The study also assessed the reliability of the constructs using Cronbach's Alpha, and all values were above the recommended 0.7 threshold, demonstrating the internal consistency of the measures (Nunnally & Bernstein, 1994; Hair et al., 2019). Furthermore, the composite reliability values were above 0.80, further confirming the reliability of the constructs (Hair et al., 2019; Ringle et al., 2015). The study established the constructs' discriminant validity by examining the inter-construct correlations, latent variables, and the square root of the average variance extracted (AVE) values (Fornell & Larcker, 1981; Hair et al., 2019). These results provide confidence in the validity and reliability of the measurement model used in the study.

Table 4. Reliability and validity assessment for latent constructs

Constructs	Cronbach's alpha (α)	Composite reliability rho (ρA)	Composite reliability rho (ρc)	Average variance extracted (AVE)
Compatibility (CM)	0.901	0.910	0.938	0.834
Competitive Pressure (CP)	0.865	0.877	0.911	0.723
Complexity (CO)	0.771	1.353	0.835	0.633
Government Regulations (GR)	0.755	4.312	0.835	0.725
ICT Adoption Intention (IA)	0.869	0.931	0.918	0.790
Organisational Culture (OC)	0.837	0.902	0.899	0.750
Relative Advantage (RA)	0.776	0.863	0.867	0.686
Top Management (TM)	0.850	0.852	0.909	0.770
Source: Authors' processing from SmartPLS-SEM 4.0 version				

Average variant extract (AVE) values surpass 0.5, while Cronbach's Alpha (**α**) values surpass 0.7. According to Hair et al. (2019), these results imply that measuring item reliability is possible. The results of inter-construct correlations and the square root of AVEs are in Table 5.

Table 5. Correlation matrix and square root of the AVE

	CM	CP	CO	GR	IA	OC	RA	TM
CM	**0.913**							
CP	0.673	**0.850**						
CO	-0.421	-0.297	**0.795**					
GR	0.186	0.224	0.127	**0.851**				
IA	0.258	0.334	-0.19	0.204	**0.889**			
OC	0.671	0.596	-0.342	0.2	0.185	**0.866**		
RA	0.141	0.203	-0.17	-0.229	0.22	0.009	**0.828**	
TM	0.731	0.687	-0.472	0.206	0.318	0.846	0.109	**0.878**

Key: [1]AVE is an abbreviation for average variance extract. AVE in bold and italics above the diagonal and squared correlations below the diagonal. The number in bold is the square root of AVE.
Source: Authors' processing from SmartPLS-SEM 4.0 version

The findings from Table 5 suggest the existence of discriminant validity, as the square root of the AVE values for all the variables are above the corresponding correlation coefficient values of other variables (Fornell & Larcker, 1981). Additionally, all the inter-correlations are below 0.8, indicating the absence of multicollinearity (Hair et al., 2019).

The study tested various hypotheses using structural equation modelling (SEM). Tabachnick and Fidell (2013) consider the normality assumption of multivariate statistics to be the most fundamental. The test results demonstrate that all the research variables are normally distributed, as per the criterion that the skewness value is less than three and the kurtosis value is less than ten (Vincent, 2012). Further, the result does not demonstrate multicollinearity among the variables. The data were subsequently statistically analysed using SEM, which can accommodate latent variables because they are not immediately quantifiable and are not multicollinear (Hair et al., 2019). SEM is appropriate for mediation because multicollinearity analysis is almost impossible, as the conceptual framework gives a model with direct and indirect effects (mediating impact). SEM also enables testing connections between theoretical structures and their empirical indications (Hair et al., 2019).

Structural Equation Modelling-Path Analysis

The structural model was constructed to identify the path relationships among the constructs in the research model. The bootstrap method was used to test the hypotheses (Hair et al., 2019). The study tests the relationship between endogenous and exogenous variables using a path coefficient (β) and p-value. The model yields an R^2 value of 0.207, considered a weak model. However, in some contexts, an R^2 value as low as 0.10 can be considered satisfactory, such as when predicting stock returns (Hair et al., 2019). Therefore, in this study, 20.7% of the variance in ICT adoption is attributed to the seven determinants tested in the model. Figure 2 shows the path coefficients for each hypothesis.

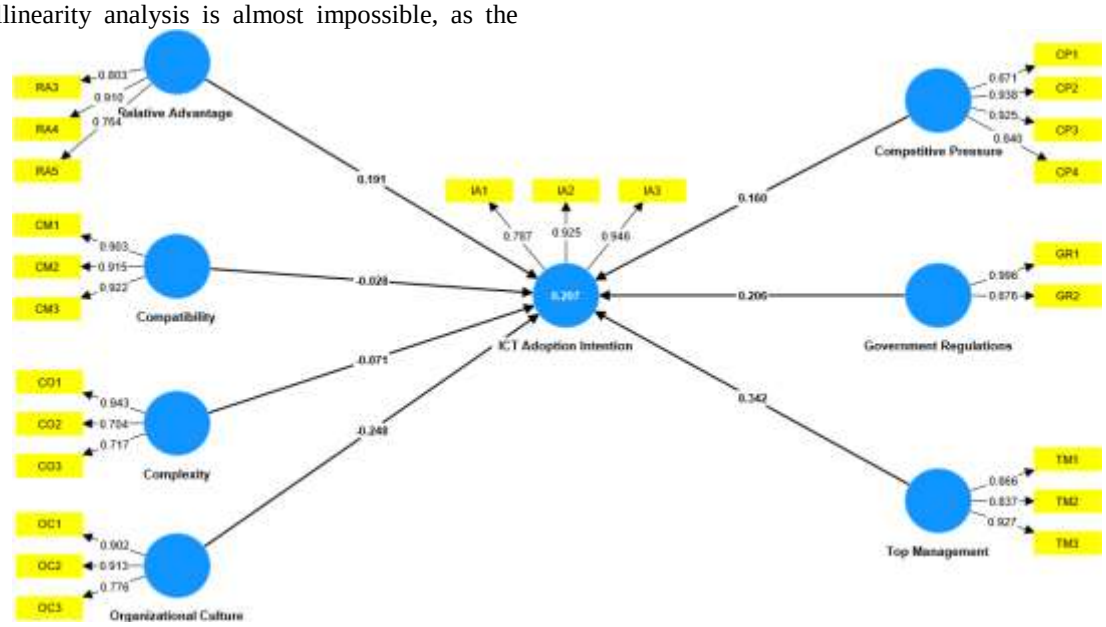

Figure 2. Path diagram of the structural model

Source: Authors' processing from SmartPLS-SEM 4.0 version

Table 6 shows Relative advantage ($H_{1.1}$) is (β=0.191, *p*=0.035). Top Management ($H_{2.1}$) is (β=0.342, *p*=0.025) had significant effects on the intention to use ICT, whereas Compatibility ($H_{1.2}$) is (β=0.028, *p*=0.793), Complexity ($H_{1.3}$) is (β=0.071, *p*=0.761), Competitive Pressure ($H_{3.1}$) is (β=0.160, *p*=0.117), Organizational Culture ($H_{2.2}$) is (β=0.248, *p*=0.176) and Government regulations ($H_{3.2}$) (β=0.260, *p*=0.290) had no significant effect on the intention to use ICT.

Table 6. ***Path coefficients and results of hypotheses testing***

Hypothesis	Path	Path Coefficient	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Decision
$H_{1.1}$	RA--> IA	0.191	0.248	0.091	2.110	0.035**	Supported
$H_{1.2}$	CM -->IA	-0.028	0.003	0.107	0.263	0.793	Not supported
$H_{1.3}$	CO--> IA	-0.071	-0.056	0.234	0.305	0.761	Not supported
$H_{2.1}$	TM --> IA	0.342	0.268	0.153	2.235	0.025**	Supported
$H_{2.2}$	OC--> IA	-0.248	-0.154	0.183	1.355	0.176	Not supported
$H_{3.1}$	CP --> IA	0.160	0.158	0.102	1.567	0.117	Not supported
$H_{3.2}$	GR--> IA	0.206	0.178	0.194	1.059	0.290	Not supported

Note that: *** p< 0.01, ** p < 0.05, * p < 0.1

Source: Authors' processing from SmartPLS-SEM 4.0 version

Therefore, $H_{1.1}$ and $H_{2.1}$ were supported, whereas $H_{1.2}$, $H_{1.3}$, $H_{2.2}$, $H_{3.1}$, and $H_{3.2}$ were not (Figure 2) and (Table 6). According to the statistical analysis conducted, only two hypotheses were supported.

4. DISCUSSION OF RESULTS

This study examined the factors affecting the extent of technology adoption and digital digitalisation in Zimbabwe. Based on the TOE framework, the factors analysed were organised into three dimensions: technological, organisational, and environmental contexts (Tornatzky & Fleischer, 1990). The main objective was to understand the factors affecting SMEs' adoption of ICT or digital technology in Zimbabwe, and the findings attempt to propose recommendations. The findings are compared to a previous research study (Zhu & Kraemer, 2005). To achieve this objective, the following specific objectives were adopted:

Objective 1: To determine the key factors affecting digital transformation by SMEs in Zimbabwe

The study found that top management support and relative advantage affect SMEs' ICT use in Zimbabwe. The study found that relative advantage affects ICT adoption more than compatibility and complexity, supporting previous studies on relative advantage and ICT adoption (Lutfi et al., 2022). Moreover, the study shows that executive-level support is necessary to boost ICT adoption. Senior executives must support SMEs' ICT adoption, especially in Zimbabwe, where owners and managers make crucial decisions. However, the study failed to establish a strong association between organisational culture and ICT adoption.

The study indicated no meaningful association between competitive forces, government rules, and the use of ICT in the environmental factor. These findings suggest that the legislative framework in Zimbabwe does not effectively support the integration of ICT by SMEs, and there is a dearth of government measures to stimulate the use of ICT (Musabayana et al., 2023; Albar & Hoque, 2019). This corresponds with recent studies that similarly found no association between the competitive landscape and the usage of ICT by SMEs (Mataruka et al., 2023). Therefore, this study emphasises the need for top-level management support and Zimbabwean SMEs' relative advantages of ICT adoption. It also underscores the need for a suitable regulatory framework and government actions to stimulate ICT adoption. Importantly, it highlights the necessity of further research to understand how industry competition affects ICT adoption in diverse environments (Muhammad et al., 2019; Albar & Hoque, 2019).

Objective 2: To establish the level or extent of digitalisation in SMEs in Zimbabwe.

The study found that most SME ICT users had adopted digital technologies. Social media is the most popular medium for SMEs (82%). Email is utilised by 76% of SMEs, followed by websites (74%), e-commerce (66%), and e-business (50%). SMEs in Zimbabwe are flexible and adaptable, mainly when led by visionary owner-managers, and they prefer digitalisation tactics for their businesses (Chundu et al., 2022). However, company size, employee count, and the lack of committed IT staff may hinder e-business technology adoption. This finding matches Zimbabwean studies by Musabayana et al. (2023), Matsongoni and Mutambara (2021), and Vakirayi (2020). The COVID-19 pandemic lockdown protocol and beyond enhanced the precedence that forced SMEs to adopt digital technologies, making them more accessible (FinScope, 2022).

Social media is the most popular medium owing to its mobile accessibility, although digitalisation depends on the organisation's needs and complexity. In the hands of innovative owner-managers, Zimbabwean SMEs are quick to adapt and flexible. According to Chundu et al. (2022), Statista (2023), they choose digitalisation techniques for their businesses. Objective 3: To provide recommendations to policy and business sectors, which are critical determinants of policy and business sectors.

The factors that drive SME digital technology adoption are essential. The determinants of the first two study objectives match the third, demonstrating that technology and organisation characteristics help SMEs adopt digital technologies. The study found no substantial effect of environmental factors on SME ICT adoption. The findings suggest that government policies and laws do not encourage SMEs to adopt and use ICT (Musabayana et al., 2023; Albar & Hoque, 2019). SMEs and the government must collaborate to create a policy framework encouraging SMEs to adopt ICT. Regular environmental scanning helps SMEs recognise external issues that can affect their business operations favourably and negatively. SME growth can be maximised by focusing on technology adoption and implementation considerations. This study's adoption of digital technology is remarkable. SMEs should explore digital technologies not covered in this study to improve their business potential (Statista, 2023; Chundu et al., 2022). To succeed in a larger business environment, evaluate and implement new technology to enter new markets and seize opportunities.

Regarding the research topic on the problems, impediments, and facilitators that policymakers and company owners should be aware of regarding Zimbabwean SMEs' ICT and digital technology use, the final objective was to make recommendations based on the initial objective. The study found that environmental factors inhibit ICT adoption. Owner-managers must lobby for government rules that encourage SMEs to adopt ICT. Collaboration among stakeholders can improve Zimbabwean SMEs' ICT integration (Mataruka et al., 2023). Small businesses should always look for possibilities and risks to be competitive. This involves government aid and rule-checking.

The study's findings have significant theoretical implications for Zimbabwean SMEs' ICT adoption research. The results contribute to well-established technology adoption models such as TAM (Davis, 1989), UTAUT (Venkatesh et al., 2003), and IDT (Rogers,

1962; Smith et al., 2020b). It also highlights the digital divide and technological inequality (Moyo et al., 2018), supporting institutional theory by emphasising government policies and industry associations (Chikwanha et al., 2017). Furthermore, the study underscores the importance of financial resources and staff skills, supporting the resource-based view (Jones & Brown, 2019). It also addresses organisational change and innovation issues (Mudavanhu et al., 2019), as well as teamwork and knowledge exchange, contributing to knowledge management literature (Fungai et al., 2020). The findings have significant implications for policymakers and stakeholders interested in SME growth (Sibanda & Ndlovu, 2019), and the theoretical conclusions help explain SME ICT uptake and inform future research.

4.1 Managerial Implications

Small and medium enterprises (SMEs) in Zimbabwe are leveraging information and communication technology (ICT) to bolster their expansion capabilities and enhance their competitiveness within the market (Maduku et al., 2016). To address persistent financial constraints, SMEs must prioritise accessing diverse financial assistance through grants, loans, and government funding schemes. Investments in ICT infrastructure, software, and training can significantly improve SMEs' technological capabilities and market competitiveness. However, many SMEs in Zimbabwe face a critical challenge related to inadequate ICT-related competencies, which hinder effective ICT adoption rates. Key stakeholders can address this challenge through targeted training and skills development initiatives.

For example, improving ICT infrastructure and connectivity requires close coordination and partnerships with the government, industry players, and telecommunications providers. Effective change management strategies, strong support from top management, and collaboration among subject matter experts are also crucial for successful ICT adoption by SMEs. Assessing and enhancing ICT infrastructure and systems is paramount for maintaining a competitive edge. By strategically leveraging ICT, diversifying financial sources, and addressing competency gaps through collaborative training, SMEs in Zimbabwe can unlock new avenues for growth, innovation, and market leadership.

4.2 Policy Implications

Policymakers should focus on infrastructure, financial support, and skills development to encourage Zimbabwean SMEs to utilise ICT for digitalisation. Improving the nation's ICT infrastructure and connectivity, such as expanding broadband networks, maintaining electrical supply, and lowering internet rates, would help SMEs access digital technology. Financial challenges associated with ICT adoption must also be addressed. Policymakers should provide SMEs with low-interest loans, grants, venture capital, and technological innovation funds to support their digital transformation. SME owners and staff must also improve their technical skills through research, training, workshops, and mentorship from educational institutions, business associations, and government agencies. In addition, SME collaboration and knowledge sharing are essential. Industry clusters and business associations can help SMEs share best practices and learn from one another. Digital transformation resources and guidance can also come from larger organisations or technology suppliers. Considering helpful regulatory actions like evaluating and revising ICT adoption legislation is crucial. Tax incentives or subsidies for SMEs investing in digital technologies might also help. Thus, ICT adoption benefits and support packages must be promoted, and government agencies, industry groups, and technology suppliers must spread awareness and encourage SMEs to digitise for national competitiveness.

5. CONCLUSION

Policymakers should improve ICT infrastructure, provide financial support, and develop skills to encourage Zimbabwean SMEs to utilise specific digital technologies such as cloud computing, data analytics, and e-commerce. Expanding broadband networks, maintaining electrical supply, and lowering internet rates can enhance SMEs' access to these technologies. Policymakers should also address financial challenges by offering SMEs low-interest loans, grants, venture capital, and technological innovation funds. Moreover, SME owners and staff must improve their technical skills through research, training, workshops, and mentorship from educational institutions, business associations, and government agencies. SME collaboration and knowledge sharing are not just beneficial. They are essential. Industry clusters and business associations are crucial in helping SMEs share best practices. Digital transformation resources and guidance can also come from larger organisations or technology suppliers, fostering a sense of community and shared goals. Regulatory actions, such as evaluating and revising ICT adoption legislation and providing tax incentives or subsidies for SMEs investing in digital technologies, are crucial in supporting digitalisation. These actions provide a regulatory framework and financial support, giving SMEs the confidence to invest in digital technologies. Government agencies, industry groups, and technology suppliers must spread awareness and encourage SMEs to digitise to promote national competitiveness.

Acknowledgement

Researchers thank the Faculty of Graduate Studies, Research and Innovation, Catholic University of Zimbabwe, for supporting library services.

Funding

This research did not receive an external funding-specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflicts of Interest
The authors had no financial or personal relationship(s) that may have inappropriately influenced them in writing this article. The authors declare no conflict of interest.

Author Contributions
Researchers carried out the same tasks concerning the study. Specific areas were background concept and theoretical frame (Mataruka, Mugambiwa), updating and editing original background (Mataruka, Muzurura), Literature updating (Mataruka, Muzurura, Zishiri, Jekese, Garatsa); Methodology (Mataruka, Mugambiwa), data management (Mugambiwa), and data analysis (Mataruka, Mugambiwa), discussion of results (Mataruka, Muzurura, Zishiri, Garatsa), final editing, submission and correspondence (Mataruka).

Publisher's Note
All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organisation, the publisher, the editors, or the reviewers.

Ethical considerations
The article followed all ethical standards appropriate for this kind of research.

Disclaimer
All authors have read and agreed to the published version of the manuscript.

References:

Abdullah, A., Thomas, B., Murphy, L., & Plant, E. (2018). Investigating the benefits and barriers of e-business adoption activities in Yemeni SMEs. *Strategic Change*, *27*(3), 195–208.

Adam, I. O., Alhassan, M. D., & Afriyie, Y. (2020). What drives global B2C E-commerce? An analysis of the effect of ICT access, human resource development, and regulatory environment. *Technology Analysis & Strategic Management*, *32*(7), 835-850.

Agwaniru, A. (2023). *ICT as a Strategy for Sustainable Small and Medium Enterprises in Nigeria* (Doctoral dissertation, California Baptist University).

Ahn, B., & Ahn, H. (2020). Factors affecting intention to adopt cloud-based ERP from a comprehensive approach. *Sustainability*, *12*(16), 6426.

Al Busaidi, N. S., Bhuiyan, A. B., & Zulkifli, N. (2019). The critical review on the adoption of ICTs in the small and medium enterprises (SMEs) in the developing countries. *International Journal of Small and Medium Enterprises*, *2*(2), 33-40.

AlBar, A.M. & Hoque, M.R. (2019). Factors affecting cloud ERP adoption in Saudi Arabia: an empirical study. *Information Development*, Vol. 35 No. 1, pp. 150-164.

Alma, B., Coskun, E., & Ozsahin, M. (2018). A framework proposal for examining the effect of ICT adoption level on innovativeness in SMEs.

Alraja, M. N., Hussein, M. A., & Ahmed, H. M. S. (2021). What affects the digitalisation process in developing economies? An evidence from SMEs sector in Oman. *Bulletin of Electrical Engineering and Informatics*, *10*(1), 441-448.

Alsheibani, S., Messom, C., Cheung, Y., & Alhosni, M. (2020). Artificial Intelligence beyond the Hype: Exploring the Organisation Adoption Factors.

Attor, C., Jibril, A. B., & Chovancová, M. (2022). Does brand personality mediate the link between social media usage and customer buying decisions on telecommunication's products and services? Evidence from Ghana. *Innovative Marketing*.

Autio, E. (2017). Digitalisation, ecosystems, entrepreneurship and policy. *Perspectives into topical issues is society and ways to support political decision making. Government's analysis, research and assessment activities policy brief*, *20*, 2017.

Awa, H. O., et al. (2015). Factors influencing the adoption of information technology in small and medium enterprises in Nigeria. *International Journal of Scientific and Research Publications*, 5(11), 2250-3153.

Bagozzi, R. P., &Yi, Y. (1988).On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, **16**(1), 74–94. DOI: 10.1007/BF02723327

Brodny, J., & Tutak, M. (2022). Digitalisation of small and medium-sized enterprises and economic growth: evidence for the EU-27 countries. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(2), 67.

Cassetta, E., Monarca, U., Dileo, I., Di Berardino, C., & Pini, M. (2020). The relationship between digital technologies and internationalisation. Evidence from Italian SMEs. *Industry and Innovation*, *27*(4), 311-339.

Chau, N. T., & Deng, H. (2021). Conceptualisation for mobile commerce adoption in SMEs: a perspective of developing countries. *International Journal of Business Information Systems*, *38*(4), 449-488.

Chege, S. M., & Wang, D. (2020). Information technology innovation and its impact on job creation by SMEs in developing countries: an analysis of the literature review. *Technology Analysis and Strategic Management*, **32**(3), 256–271.DOI:10.1080/09537325.2019.1651263

Chen, J., Zhu, Z., & Zhang, Y. (2017). A study of factors influencing disruptive innovation in Chinese SMEs. *Asian Journal of Technology Innovation*, **25**(1), 140–157. DOI: 10.1080/19761597.2017.1302552

Chibaya, O., Tukuta, M., & Manuere, F. (2022). The role of business incubation in the development of SMEs in Zimbabwe.

Chigusiwa, L., Mhlanga, O., & Gwangwava, E. N. (2020). The Role of SMEs in Zimbabwe: A Literature Review. *Journal of Economics and Sustainable Development*, 11(10), 1-9.

Chikwanha, A. B., & Mupemhi, S. (2018). ICT adoption and participation in e-commerce by SMEs in Zimbabwe: An analysis of challenges. *The Journal of Developing Areas*, 52(1), 135-146-

Chikwanha, A. B., Mupemhi, S., & Mbohwa, C. (2017). Adoption of information and communication technology (ICT) in Zimbabwean small to medium enterprises (SMEs): Analysing the influence of facilitating factors. *Journal of Economics and Behavioural Studies*, 9(5), 214-223.

Chimucheka, T., & Mandipaka, F. I. (2015). Factors influencing the adoption of information and communication technologies (ICTs) by small and medium enterprises (SMEs) in Zimbabwe: A case of Bulawayo SMEs. Journal of Emerging Trends in Computing and Information Sciences, 6(5), 267-277.

Chinomona, E., & Bikissa-Macongue, M. B. (2021). The drivers of customer collaboration in e-business: a case of food retailers in southern Gauteng. *Journal of Contemporary Management*, *18*(1), 433-454.

Chiu, C. Y., Chen, S., & Chen, C. L. (2017). An integrated perspective of TOE framework and innovation diffusion in broadband mobile applications adoption by enterprises. *International Journal of Management, Economics and Social Sciences (IJMESS)*, *6*(1), 14-39.

Chundu, M., Chigombe, P., & Mucheri, T. (2022). Extent of Social Media Marketing Use by MSMEs in the Construction Industry in Harare. Case Study of CIFOZ and SMEA Members. *American Journal of Industrial and Business Management*, *12*(7), 1185-1203.

Creswell, J. W. (2021). *A concise introduction to mixed methods research*. SAGE publications.

Curraj, E. (2018). Business digitalisation of SMEs in Albania: Innovative approaches and their impact on performance.

de Bruin, A. M., & Floridi, L. (2017). Factors influencing the adoption of information and communication technologies by micro and small enterprises in Cape Town. *The Electronic Journal of Information Systems in Developing Countries*, 80(1), 1-19.

Dube, B., Chikobvu, D., & Manatsa, B. (2022). The Role of Innovation and Digital Technology in Enhancing SMEs Competitiveness: The Case of Zimbabwe. *International Journal of Innovation, Creativity*, and Change, 17(4), 57-74.

Dzindikwa, E. (2021). An Evaluation of the perceived benefits of electronic business adoption in the Zimbabwean service sector. *Economics, commerce and trade management: an International Journal (ECTIJ)*, *3*(4).

Fadeyi, O. A., Ariyawardana, A., & Aziz, A. A. (2022). Factors influencing technology adoption among smallholder farmers: a systematic review in Africa.

FinScope, S. (2022). FinScope MSME Survey Zimbabwe 2022.

Fraccastoro, S., Gabrielsson, M., & Pullins, E. B. (2021). The integrated use of social media, digital, and traditional communication tools in the B2B sales process of international SMEs. *International Business Review*, *30*(4), 101776.

Fungai, D., Mbohwa, C., & Chikwanha, A. (2020). Adoption of information and communication technology by small and medium enterprises in Zimbabwe: A review of opportunities and challenges. *Journal of Innovation and Entrepreneurship*, 9(1), 1-18.

Ghobakhloo, M., Hong, T. S., Sabouri, M. S., & Zulkifli, N. (2012). Strategies for successful information technology adoption in small and medium-sized enterprises. *Information*, *3*(1), 36-67.

Gutierrez, A., et al. (2015). Factors influencing the adoption of information and communication technologies: An empirical study in the banking sector of Panama. *Journal of Information Systems and Technology Management*, 12(2), 221-240.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2-24.

Hamad, H., Elbeltagi, I., & El-Gohary, H. (2018). An empirical investigation of business-to-business e-commerce adoption and its impact on SMEs competitive advantage: The case of Egyptian manufacturing SMEs. *Strategic Change*, *27*(3), 209–229.

Heubeck, T. (2023). Managerial capabilities as facilitators of digital transformation? Dynamic managerial capabilities as antecedents to digital business model transformation and firm performance. *Digital Business*, *3*(1), 100053.

Hisrich, R. D., & Soltanifar, M. (2021). Unleashing the creativity of entrepreneurs with digital technologies. *Digital Entrepreneurship: Impact on Business and Society*, 23-49.

Jayeola, O., Sidek, S., Rahman, A. A., Bali Mahomed, A. S., & Jimina, H. (2022). Is Top Management Support Relevant in the Implementation and Post-implementation Phases of Cloud ERP in SMEs? Evidence from Malaysia. *SCMS Journal of Indian Management*, *19*(4).

Amoah, J., Jibril, A. B., Odei, M. A., Bankuoru Egala, S., Dziwornu, R., & Kwarteng, K. (2023). Deficit of digital orientation among service-based firms in an emerging economy: a resource-based view. *Cogent Business & Management*, *10*(1), 2152891. DOI: 10.1080/23311975.2022.2152891

Jones, A., & Brown, S. (2019). Barriers to ICT adoption in developing country SMEs: Evidence from Ethiopia. *International Journal of Information Management*, pp. 44, 35–43.

Jones, O., Macpherson, A., & Thorpe, R. (2018). Small Business Performance in a Recession: The Role of Management and Entrepreneurial Orientation. *Entrepreneurship Theory and Practice*, 42(1), 4–24.

Kajongwe C, Chinyena E, Mugutso R, Mambo R. Social Media and Marketing Performance of Small and Medium Enterprises (SMEs) in Harare Metropolitan Province, Zimbabwe. Journal of African Interdisciplinary Studies. 2020; 4(4):66-77.

Kock, F., Berbekova, A., & Assaf, A. G. (2021). Understanding and managing the threat of common method bias: Detection, prevention and control. *Tourism Management*, *86*, 104330.

Kongolo, M. (2010). Factors hindering information technology adoption in small and medium enterprises in developing countries: A comparative study. *Journal of Systems and Information Technology*, 12(2), 104–129.

Kumar, P., Chauhan, S., Kumar, S., & Gupta, P. (2023). A meta-analysis of satisfaction in mobile banking: a contextual examination. *International Journal of Bank Marketing*.

Listiyoningsih, S., Hidayati, D., & Winarti, Y. (2022). Teacher Strategies for Facing Digital Transformation. Scientific *Journal of the Educational Profession*, 7(2b), 655–662. DOI: 10.29303/jipp.v7i2b.389

Lutfi, A., Alsyouf, A., Almaiah, M. A., Alrawad, M., Abdo, A. A. K., Al-Khasawneh, A. L., & Saad, M. (2022). Factors influencing the adoption of big data analytics in the digital transformation era: Case study of Jordanian SMEs. *Sustainability*, *14*(3), 1802.

Maalouf, J., Miklian, J., & Hoelscher, K. (2023). Business Survival Strategies in a Polycrisis: SME Experiences from Beirut, Lebanon. *Business Horizons*.

Mabenge, B. K., Ngorora-Madzimure, G. P. K., & Makanyeza, C. (2022). Dimensions of innovation and their effects on the performance of small and medium enterprises: The moderating role of firm's age and size. *Journal of Small Business & Entrepreneurship*, *34*(6), 684-708.

Machado, M. C., Vivaldini, M., & de Oliveira, O. J. (2020). Production and supply-chain as the basis for SMEs' environmental management development: A systematic literature review—Journal *of Cleaner Production*, *273*, 123141.

Maduku, D. K., et al. (2016). Factors influencing the adoption of information and communication technology by small and medium enterprises in Zimbabwe. *Journal of Economics and Behavioural Studies*, 8(6), 1-10.

Mahuni, T., Mhlanga, O., & Gwangwava, E. N. (2021). Challenges Faced by Small and Medium Enterprises (SMEs) in Zimbabwe: *A Literature Review. Journal of Economics and Sustainable Development*, 12(4), 1-9.

Makanyeza, C., & Dzvuke, G. (2015). The influence of innovation on the performance of small and medium enterprises in Zimbabwe. *Journal of African Business*, **16**(1–2), 198–214. DOI: 10.1080/15228916.2015.1061406

Makanyeza, C., Mabenge, B. K., & Kuda Ngorora-Madzimure, G. P. (2023). Factors influencing small and medium enterprises innovativeness: Evidence from manufacturing companies in Harare, Zimbabwe. *Global Business and Organizational Excellence*, *42*(3), 10-23. DOI: 10.1002/joe.22180

Makiwa, P. J., & Steyn, A. A. R. (2020). A framework for stimulating adoption of ICT in SMEs in developing countries: The case of Zimbabwe.

Maleka, M., & Fatoki, O. (2016). Factors influencing the adoption of information and communication technology by South African SMEs. *Journal of Economics and Behavioural Studies*, 8(4), 87-99.

Manyanga, W., Kanyepe, J., Chikazhe, L., & Manyanga, T. (2023). The effect of debt financing on the financial performance of SMEs in Zimbabwe. *Cogent Social Sciences*, *9*(2), 2282724.

Mataruka, L. T. (2022). Information Systems Resources, Competitive Advantage, and Zimbabwe's Firm Performance: An Integration of the Resource-Based View and the Dynamic Capabilities View of the Firm.

Mataruka, L., Muzurura, J., and Mapokotera, C., (2023). Enhancing small and medium enterprises' performance through social media integration: Embedding the diffusion of innovation theory in the technology-organisation-environment framework. *International Journal of Multidisciplinary Research and Growth Evaluation.* 4(5), 625-646. DOI: 10.54660/IJMRGE.2023.4.5.625-646

Matsongoni, H., & Mutambara, E. (2021). Challenges faced by the informal small to medium enterprises-a case study of the manufacturing sector in Zimbabwe. *International Journal of Entrepreneurship*, pp. *25*, 1–17.

Moyo, P., & Tengeh, R. (2021). Digital design and technology and market outreach in rural Zimbabwe. *EUREKA: Social and Humanities, (3)*, 3-14.

Moyo, S., Chikwanha, A. B., & Mbohwa, C. (2018). Barriers to the adoption of information and communication technology (ICT) by SMEs in the construction industry in Zimbabwe. *Journal of Construction in Developing Countries*, 23(2), 73-94.

Mudavanhu, F., Mbohwa, C., & Thobakgale, T. (2019). Challenges and opportunities for information and communication technology adoption by Zimbabwean small to medium enterprises: A case of selected SMEs in Harare. *Journal of Industrial Engineering International*, 15(1), 1-21.

Muhammad, I., Ahmad, N., & Kamarudin, N. Y. (2019). Digital Technology Adoption among Small and Medium Enterprises in Malaysia: A Conceptual Framework. *International Journal of Business and Society*, 20(3), 1134-1147.

Musabayana, G. T., Mutambara, E., & Ngwenya, T. (2023). Establishment of a Zimbabwe National SME sector: a major priority to enhance the national economy's performance. *Journal of Innovation and Entrepreneurship*, *12*(1), 65.

Mwangi, N. K., Njiraini, R. N., & Waweru, M. K. (2023). The Impact of Digital Transformation on Small and Medium-Sized Enterprises (SMEs) in Kenya. *International Journal of Entrepreneurship, Innovation, and Business Strategies*, *2*(1), 1-8.

Nyathi, K. A., Nyoni, T., Nyoni, M., & Bonga, W. G. (2018). The role of accounting information in the success of small & medium enterprises (SMEs) in Zimbabwe: A case of Harare. *Journal of Business and Management (DRJ-JBM)*, *1*(1), 01-15.

Nyoni, T., & Bonga, W. G. (2018). Anatomy of the small & medium enterprises (SMEs) critical success factors (CSFs) in Zimbabwe: Introducing the 3E model. *Dynamic Research Journals' Journal of Business & Management (DRJ-JBM)*, *1*(2), 01-18.

Oktora, K., Lolita, S. P., Ismail, V. Y., Novesar, M. R., & Bon, A. T. (2020). E-commerce adoption level in SMEs since pandemic COVID-19 case in Bogor, Indonesia. In *Proceedings of the International Conference on Industrial Engineering and Operations Management* (Vol. 59, pp. 1836-1847).

Puriwat, W., & Tripopsakul, S. (2021). Explaining social media adoption for a business purpose: An application of the UTAUT model. *Sustainability*, *13*(4), 2082.

Putri, OA, Hariyanti, S., & Kediri, I. (2022). Article Review: Digital Transformation in Business and Management. *Proceedings of Islamic Economics, Business, and Philanthropy*, 1(1), 135–166.

Sanga, B., & Aziakpono, M. (2023). FinTech and SMEs financing: A systematic literature review and bibliometric analysis. *Digital Business*, 100067.

Sibanda, K., Hove-Sibanda, P., & Shava, H. (2018). The impact of SME access to finance and performance on exporting behaviour at the firm level: A case of furniture manufacturing SMEs in Zimbabwe. *Acta Commercii*, **18**(1). DOI: 10.4102/ac.v18i1.554

Sibanda, S., & Ndlovu, T. (2019). Factors influencing the adoption of information and communication technology by small and medium enterprises in Zimbabwe. *Journal of African Business*, 20(1), 83-99.

Smith, A., Ray, A., & Heeks, R. (2020a). Digital Entrepreneurship in Developing Countries: A Systematic Review and Research Agenda. *Information Technology for Development*, 26(3), 469–504.

Smith, M., Chikwanha, A. B., & Mbohwa, C. (2020b). The role of financial resources in the adoption of information and communication technology in Zimbabwean small and medium enterprises. *Journal of Small Business & Entrepreneurship*, 32(4), 335-354.

Sonntag, R., Lewis, G. J., & Raszkowski, A. (2022). The Importance of implementing SDGs by small and medium size enterprises: Evidence from Germany and Poland. *Sustainability*, *14*(24), 16950.

Statista. (2023) Global social networks ranked by number of users, 2023, https://www.statista.com/statistics/272014/glo

Stjepić, A. M., Pejić Bach, M., & Bosilj Vukšić, V. (2021). Exploring risks in the adoption of business intelligence in SMEs using the TOE framework. *Journal of Risk and Financial Management*, *14*(2), 58.

Sulistyo, H., & Ayuni, S. (2020). Competitive advantages of SMEs: The roles of innovation capability, entrepreneurial orientation, and social capital. *Contaduría y administración*, *65*(1).

Thabela, M., et al. (2019). Factors affecting the adoption of information and communication technology (ICT) in small and medium enterprises (SMEs) in South Africa. *South African Journal of Business Management*, 50(1), a2264.

Thabela, T., Kabanda, S., Chigona, W., & Villo, Z. (2019, August). Challenges of using ICTs for SMEs in rural areas. In *Proceedings of digital innovation and transformation conference: digital skills* (pp. 16-25).

Tjahjono, M. C., & Purbiyati, Y. S. (2023). The effect of dynamic capabilities on organisation resilience with the mediation of digital transformation: a comparison. *International Journal of Economics, Business and Accounting Research (IJEBAR)*, *7*(4).

Tornatzky, L.G.; Fleischer, M.; Chakrabarti, A.K. *Processes of Technological Innovation*; Lexington Books: Lexington, MA, USA, 1990.

Trawnih, A., Yaseen, H., Al-Adwan, A. S., Alsoud, R., & Jaber, O. A. (2021). Factors influencing social media adoption among SMEs during the Covid-19 crisis. *Journal of Management Information and Decision Sciences*, *24*(6), 1–18.

Twinomurinzi, H., & Msweli, N. T. (2019). Digital Natives Still Need Intentional Digital Skills in the 4IR: Comparing the General and ICT Self-Efficacy of South African Youth.

Vakirayi, T. (2020). *Investigating the factors affecting the development of digital innovations in Zimbabwe's SMEs* (Master's thesis, Faculty of Commerce).

Wening, MH, & Santosa, AB (2022). School principal leadership strategies in facing the digital era 4.0. Jmksp (*Journal of Educational Management, Leadership and Supervision*), 5(1), 56–64.

Widnyani, NM, Astitiani, NLPS, & Putri, BCL (2021). Implementation of digital transformation in SMEs during the COVID-19 pandemic in Denpasar city. *Scientific Journal of Management and Business*, 6(1), 79–87. DOI: 10.38043/jimb.v6i1.3093

Leo Mataruka
Catholic University of Zimbabwe, Zimbabwe
lmataruka@cuz.ac.zw
ORCID: 0000-0001-6589-7216

Joe Muzurura
Midlands State University, Zimbabwe
jmuzurura@staff.msu.ac.zw
ORCID: 0000-0001-9774-0598

Christopher Zishiri
Midlands State University, Zimbabwe
zishiric@staff.msu.ac.zw
ORCID: 0000-0003-1959-2563

Cletos Garatsa
Catholic University of Zimbabwe, Zimbabwe
cgaratsa@cuz.ac.zw
ORCID: 0000-0001-6492-8041

Lovemore Mugambiwa
Catholic University of Zimbabwe Zimbabwe
lzmugambiwa@gmail.com

Gladman Jekese
Midlands State University, Zimbabwe
jekeseg@staff.msu.ac.zw
ORCID: 0009-0002-8777-7420