African Journal of Hospitality, Tourism and Leisure
ISSN: 2223-814X
2025, Vol. 14 No. 5 pp. 1088-1094

Drivers and Challenges of Tourism Small, Medium and Micro Enterprises (SMMEs) Technology Adoption

Mavis CHAMBOKO-MPOTARINGA
School of Tourism and Hospitality, University of Johannesburg, Email, mmpotaringa@uj.ac.za
Corresponding Author

Refiloe. J. LEKGAU
School of Tourism and Hospitality, University of Johannesburg, Email, rlekgau@uj.ac.za

Tembi. M. TICHAAWA
School of Tourism and Hospitality, University of Johannesburg, Email, tembit@uj.ac.za

Abstract

Digital transformation and innovation have become pivotal in enhancing the competitiveness and sustainability of the tourism sector. Small, Medium, and Micro Enterprises (SMMEs), which form the backbone of tourism destinations, particularly in South Africa, play a vital role in the sector's transformation and serve as a livelihood pillar, particularly in job creation and entrepreneurial development. Despite the increasing recognition of the need for digitalisation, many tourism SMMEs face significant barriers to effectively utilising digital technologies. As such, the study investigates the drivers for and challenges of technology adoption by SMMEs, using quantitative data gathered from tourism SMME owners through stratified, purposive and snowball sampling techniques. Descriptives and multivariate tests were performed. The study highlights the prominent digital tools adopted, as well as their benefits and challenges. Findings revealed significant differences among tourism SMMEs' perceived benefits driving technology adoption and challenges of using digital technologies by level of experience. The insights offer valuable guidance to develop targeted strategies that foster innovation, resilience and sustainable growth within the tourism industry.

Keywords: Digital transformation; technology adoption; tourism SMMES; South Africa; resilience

How to cite this article: Chamboko-Mpotaringa, M., Lekgau, R.J. & Tichaawa, T.M. (2025). Drivers and Challenges of Tourism Small, Medium and Micro Enterprises (SMMEs) Technology Adoption. African Journal of Hospitality, Tourism and Leisure, 14(5):1088-1094. DOI: https://doi.org/10.46222/ajhtl.19770720.698

Introduction

Small, medium and micro enterprises (SMMEs) make up the backbone of the tourism sector (Nyugen et al., 2021; Badoc-Gonzales et al., 2022). Indeed, the World Economic Forum (2022) reported that SMMEs constitute approximately 80% of businesses in the tourism sector. Several studies have underscored the significance of these enterprises to socioeconomic development in tourism destinations owing to their contribution to employment creation and boosting the local economy (see, for example, Badoc-Gonzales et al., 2022; Sibiya et al., 2023; Wang & Zhang, 2024). In developing countries, Nunkoo et al. (2020) argue that tourism SMMEs foster an entrepreneurial culture and contribute to poverty alleviation, echoing Rogerson's (2010) assertion of the interlinked relationship between economic growth and SMME development. In the context of South Africa, the importance of tourism SMMEs extends to the national transformation agenda, whereby these SMMEs can empower marginalised communities through their participation in the sector (Mokoena & Liambo, 2023; Harilal & Nyikana, 2016; Rogerson & Sixaba, 2021). Unfortunately, these enterprises have been widely reported to lag behind in their digital transformation, which has consequential impacts on their growth (O'Connor, 2022). The advances in the technological environment have significantly transformed the tourism industry, with scholars such as Mokoena & Liambo (2023) and O'Connor (2022) underlining increased customer experience and satisfaction, improved productivity, lower operational costs, and greater access to tourism networks as some of the prominent benefits of digital transformation. Overall, digitalisation in the tourism sector plays a crucial role in development and competitiveness of enterprises nationally and internationally (Seetanah & Fauzel, 2025), constitutes an important part of the Fourth Industrial Revolution (Holl & Rama, 2024), which is a key policy agenda in South Africa. Beyond their continued development, several studies have underscored the role of digital transformation of tourism SMEs in their sustainability and resilience (Wang & Zhang, 2023; Rastegar et al., 2025; Badoc-Gonzales et al., 2022). According to Wang & Zhang (2023), digital transformation enables tourism SMEs to continuously react and adapt their capabilities to the rapidly changing business environment.

The challenges and opportunities for tourism SMEs to capitalise on digital technologies for innovation and growth are different compared to larger enterprises. Some of these challenges discovered in existing research centred on the lack of financial resources, limited knowledge, and the scale of the available digital infrastructure (Sibiya et al., 2023). Accordingly, this study contributes to the growing yet still limited body of research (see Nguyen et al., 2021; Holl & Rama, 2024; Wang & Zhang, 2023) by examining the adoption landscape, benefits and challenges of digital technology in South Africa's tourism SMMEs. This study, exploring digital adoption landscape, presents numerous opportunities for understanding how digital technologies can drive growth and innovation in tourism SMMEs and identifies how digital platforms are used that transform business practices and can open new markets for South African tourism businesses (see international examples in Schegg & Stangl, 2017). As such, it highlights the opportunities to leverage digital technologies to foster greater competitiveness in the tourism sector, thereby accentuating the role of digital transformation in driving tourism transformation and inclusivity. Notably, the study seeks to contribute to another emerging strand of literature on tourism SME resilience as digital transformation and adoption are able to reduce enterprise vulnerability during times of crisis as well as foster innovative processes and products to adapt and grow their operations during crisis. Therefore, understanding the digital adoption landscape, as well as the current pressing challenges can provide insight on how SMME can better develop and growth in the tourism environment, as well as elucidate how digital technologies can enhance the adaptive capacities, which can enhance their overall organisational resilience.

Literature review

The integration of digital technologies in tourism SMMEs has become increasingly vital, particularly in the wake of the previous pandemic, where digital transformation has been accelerated by many businesses' realisation that adopting digital technologies for agility and adaptability ensures survival (Thomas, 2024). Digital technologies encompass a wide range of tools and platforms, such as Information and Communication Technologies (ICTs), e-commerce systems, social media (Matikiti et al., 2018), and immersive technologies such as Augmented Reality (AR) and virtual reality (VR), and the metaverse, which help transform traditional business models to meet evolving consumer needs (Majeed et al., 2020), whereas innovation refers to the processes and outcomes associated with the introduction of new ideas, products, or services that enhance value creation. In the tourism sector, innovation can manifest through developing new digital marketing strategies, implementing advanced booking systems, or using data analytics to personalise customer experiences (Mokoena & Liambo, 2023). The tourism industry's inextricable dependence on providing quality and unique services to consumers highlights the critical importance of integrating digital technology and innovation (Thomas, 2024). The tourism industry has been considered a pioneer in the adoption and implementation of digital innovations (Samala et al., 2020), such as Central Reservation Systems (CRS) (from as early as the 1950s) and Global Distribution Systems (GDS) (in the early 1980s) (Dhaigude et al., 2016). The proliferation of digital technologies such as automation tools, project management software, data analytics, digital marketing tools, and data protection tools has transformed the business ecosystem, altering how companies compete in the marketplace. Its impact on tourism is profound as it reshapes how tourism services are perceived, consumed, and accessed (Chamboko-Mpotaringa & Tichaawa, 2021). From the customers' perspective, digital technologies facilitate seamless communication and transactions, enriching the customer journey at every touchpoint (Tsourgiannis & Valsamidis, 2019). They have revolutionised travel planning and booking, enabling consumers to make informed decisions based on real-time information and user-generated content (Narangajavana Kaosiri et al., 2019), fostering customer satisfaction and driving businesses to innovate to meet customer needs constantly (Mosweunyane et al., 2019).

On the other hand, digital platforms allow SMMEs to reach a global audience crucial for the growth and expansion of tourism SMMEs, as it broadens their customer base and creates new sources of revenue. Digital innovation enhances the personalisation of travel experiences and customer engagements, such as tailored recommendations to interactive guides (Chamboko-Mpotaringa & Tichaawa, 2023), fostering loyalty and repeat business (Febrianti et al., 2022). The ability to streamline operations and offer real-time data analytics through digital technologies ensures improved decision-making. Majeed et al. (2020) and Li et al. (2022) emphasise that real-time services cater to tourists' expectations for seamless online experiences, while the integration of big data enables SMMEs to understand better and respond to dynamic visitor demands. Echoing the same sentiments, Li et al. (2022) note that data-driven approaches enable SMMEs to optimise their offerings and improve operational efficiencies, leading to cost savings and higher profitability. The adoption of digital technologies has its own challenges for SMMEs. Many tourism SMMEs face financial constraints such as high costs of technology investments and limited access to funding and resources (Sibiya et al., 2023). Coupled with this is the uncertainty of digital innovation investments. Consequently, many tourism SMMEs avoid investing in digital innovations (Cheng et al., 2023). Tourism SMMEs often lack technical expertise due to insufficient understanding of technologies by the staff. This requires continuous training and educating staff to keep up with technological advancement, adding to the financial pressure. However, some employees may resist change as they traditionally rely on face-to-face interactions and may feel intimidated and sceptical towards adopting digital approaches. Another challenge is the inadequate infrastructure, affecting the availability and reliability of the Internet in certain business locations; for example, businesses located in rural areas may experience poor Internet connection problems, which hinders effective digital implementation. These challenges and opportunities have yet to be fully explored and investigated in the context of tourism SMMEs in the African context.

Methodology

This study was conducted in five provinces in South Africa, owing to the diverse nature of the country in terms of economic performance, infrastructure development, culture and tourism. As such, the study focuses on Gauteng and the Western Cape owing to their dominance in the economic, infrastructure and tourism development as well as North West, Free State and Northern Cape as three underdeveloped provinces. This rationale was supported by reports from Statistics South Africa (2024), illustrating that Gauteng contributed 33% to the GDP, Western Cape 14%, North West (6%), Free State 5% and Northern Cape contributed 2% to South Africa's GDP. The selection of these five provinces enables the researchers to account for the varying development contexts of the SMMEs' operating environment. As this study investigated technology adoption by SMMEs, a quantitative research design was employed and a mixture of sampling approaches was used for this target population, which constituted formal (registered) SMMEs in South Africa. Stratified proportional sampling techniques were first used and the population was segregated geographically, according to the provincial borders and the aforementioned five provinces selected as the cases for the study. To determine the number of required responses, a database provided by the Department of Tourism was used, which showed an unequal representation of the SMMEs categories whereby accommodation has 42.2%, attractions and activities 9.7%, meetings, exhibitions and special events 4.4%, travel services (travel agencies, tour operators, and transportation) 39.3%, and food and beverage 4.3%. Thereafter, to have a sample size that is representative of the categories, a minimum sample size of n=385 was adopted, with the targeted sample size mirroring the ratio of the SMME category. Thereafter, the targeted sample size per category was divided equally amongst the five provinces (Gauteng, Western Cape, Northern Cape, Free State and North West) to ensure equal representation of the provinces to avoid over-dominance and underrepresentation of some categories or provinces (Table 1). Following, within these provinces, purposive and snowball sampling were used to ensure participation in the study.

Table 1: Summary of sample frame

SMME category	Ratio of category (in %)	Total sample size per category
Accommodation	42.2	162
Attractions and activities	9.7	38
Meetings, exhibitions and special events	4.4	17
Travel services	39.3	151
Food and beverage/restaurants	4.3	17
Total sample size		**385**

The data were collected using a fixed-response questionnaire, seeking profiles of the tourism SMMEs, digital technologies adopted and perceived benefits and challenges of technology adoption. The study operationalised a business's digital experience as the number of years the tourism SMME has actively used digital technologies. To ensure comparability among established users, the study excluded respondents with no experience (0 years) or limited experience (≤1 year) and compared firms with moderate experience (2–5 years) and high experience (≥6 years). Data were collected from April to August 2025, upon receiving ethical clearance. In total, 400 surveys were collected from the five provinces. A pre-test with 25 tourism SMME owners, who were excluded from the data used in the major study, ensured clarity, validity and relevance. The multi-item reflective scales in the questionnaire, rated on a five-point Likert scale, demonstrated acceptable internal reliability, as tested using Cronbach's Alpha: benefits ($\alpha = 0.911$) and challenges ($\alpha = 0.918$). The quantitative data collected from the questionnaires were captured and analysed using the Statistical Package for Social Sciences (SPSS) software. Given that this study is exploratory in nature, these statistics provide valuable insight into the broad theme of digital transformation in tourism SMMEs in South Africa.

Findings

Profile of the tourism SMMEs

Tourism SMMEs were evenly distributed across five South African provinces to avoid overdominance and underrepresentation, with accommodation (n=165, 41.2%) and travel services (n=155, 38.8%) dominating, mirroring the study population. Most enterprises were micro-sized (n=248, 62.0%) and had operated for more than 15 years (n=111, 27.7%) (Table 2).

Table 2: Profile of the tourism SMMEs (n=400)

Characteristic	Category	Frequency (n)	Percentage (%)
Province	Free State	80	20.0
	Gauteng	80	20.0
	North West	80	20.0
	Northern Cape	80	20.0
	Western Cape	80	20.0
Tourism subsector	Accommodation	165	41.2
	Travel services	155	38.8
	Attractions and services	40	10.0
	Meetings, exhibitions and special events	20	5.0
	Food and beverages	20	5.0
Firm size*	Micro: ≤ 10	248	62.0
	Small: 11-50	116	29.0
	Medium: 51-250	36	9.0
Years in operation	≤3 years	64	16.0
	4-6 years	81	20.3
	7-9 years	76	19.0
	10-15 years	68	17.0
	More than 15 years	111	27.7

Notes: *firm size in terms of number of employees (Micro ≤10, Small 11–50, Medium 51–250 employees)

Digital technology adoption by firm size

To determine how firm size (micro, small and medium) shapes technology adoption, the study cross-tabulated firm size with the types of digital technologies adopted by tourism SMMEs (Table 3).

Table 3: Cross-tabulation of firm size and digital technologies adopted (n=400)

Digital technologies adopted	Micro ≤ 10		Small 11-50		Medium 51-250		Total	
	n	%	n	%	n	%	n	%
Social media	205	60.3	103	30.3	32	9.4	340	100.0
Websites	199	60.3	103	31.2	28	8.5	330	100.0
Online booking systems	137	53.5	92	35.9	27	10.6	256	100.0
Digital payment systems	112	57.1	62	31.6	22	11.3	196	100.0
Inventory management systems	51	45.5	47	42.0	14	12.5	112	100.0
Immersive technologies	34	51.5	19	28.8	13	19.7	66	100.0

Notes: Counts reflect adopted (Yes) only, not adopted not shown (No)

Table 3 shows that within all digital technologies adopted, micro tourism firms reported the highest implementation percentages, accounting for 60.3% of adopters for both social media and websites, followed by digital payment systems (57.1%)

and online booking systems (53.5%). Fewer micro tourism firms have adopted immersive technologies such as 360^0, virtual reality, augmented reality and extended reality platforms (51.5%) and inventory management systems (45.5%). Medium-sized tourism firms were the least represented (less than 20%) within all the adopted digital technologies.

The study further performed a chi-square test to determine the association between firm size and digital technologies adopted.

Table 4: Analytical statistics on the association between firm size and the digital technologies adopted

Digital technologies adopted	Value	Df	Asymptotic Significance (2-sided)	Interpretation
Social media	2.800	2	0.247	There is no statistically significant association between the firm size and the implementation of social media
Websites	4.614	2	0.100	There is no statistically significant association between the firm size and the implementation of websites
Online booking systems	21.949	2	<0.001	There is a statistically significant association between the firm size and the implementation of online booking systems.
Digital payment systems	4.494	2	0.106	There is no statistically significant association between the firm size and the implementation of digital payment systems.
Inventory management systems	17.934	2	<0.001	There is a statistically significant association between the firm size and the implementation of inventory management systems.
Immersive technologies	11.452	2	0.003	There is a statistically significant association between firm size and the implementation of immersive technologies.

The Chi-square results (Table 4) show that firm size is significantly related to the use of online booking systems ($\chi^2 = 21.949$, $p < 0.001$), inventory management systems ($\chi^2 = 17.934$, $p < 0.001$), and immersive technologies ($\chi^2 = 11.452$, $p = 0.003$). However, no significant relationships were found for social media, websites, or digital payment systems.

Perceived benefits and challenges of using digital technologies

Respondents were asked to indicate their level of agreement with varied statements related to potential benefits of digital technology adoption, based on a 5-point Likert scale where 1=strongly disagree and 5=strongly agree. The results are summarised in Table 5.

Table 5: Benefits of digital technology adoption (n=400, in%)

	1 Strongly disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree	Mean ($\bar{x}$)
Allowed me to reach and engage with a wider customer base.	2.8	1.3	5.9	32.5	57.5	4.41
Increased the profits of my business.	3.8	3.5	13.4	36.0	43.3	4.12
Improved time efficiency in customer service delivery.	1.8	2.5	11.4	37.8	46.5	4.25
Improved customer satisfaction.	3.0	2.3	12.4	39.5	42.8	4.17
Reduced costs to the company.	8.0	12.5	27.2	28.0	24.3	3.48
Improved the relationships with the company's business partners.	5.8	4.8	25.9	32.8	30.8	3.78
Enabled my tourism business to remain sustainable and adaptable.	4.0	3.0	15.4	39.3	38.3	4.05
Improved overall business performance.	2.8	2.0	15.1	36.8	43.3	4.16
Made it easier to perform business tasks.	1.8	2.0	13.2	40.5	42.5	4.20
Allowed me to have better control of the business.	4.0	3.3	15.4	37.8	39.5	4.06

Table 5 shows that the highest-rated benefit was the ability to reach and engage a wider customer base (90.0%, $\bar{x} = 4.41$), followed by improved time efficiency (84.3%, $\bar{x} = 4.25$) and improved customer satisfaction (82.3%, $\bar{x} = 4.17$). Other highly rated benefits included improved overall business performance (80.1%, $\bar{x} = 4.16$) and task efficiency (83.0%, $\bar{x} = 4.20$). In contrast, fewer respondents agreed that digital technology adoption reduced company costs (52.3%, $\bar{x} = 3.48$). Although the adoption of digital technology offers many benefits, many tourism SMMEs face challenges. As a result, respondents were asked to indicate their level of agreement with varied statements related to challenges of digital technology adoption, based on a 5-point Likert scale where 1=strongly disagree and 5=strongly agree. The results are summarised in Table 6.

Table 6: Challenges of digital technology adoption (n=400, in%)

	1 Strongly disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree	Mean ($\bar{x}$)
Lack of financial resources needed to invest in digital technologies	12.3	13.3	23.4	29.5	21.5	3.35
Resistance to change from employees or stakeholders	18.3	23.5	25.1	21.3	11.8	2.85
Difficulty in choosing the right technology for the business's needs	16.8	16.8	20.4	33.5	12.5	3.08
Lack of sufficient internet infrastructure or digital connectivity	19.8	19.3	20.6	26.5	13.8	2.95
Integration challenges with existing business systems	18.0	18.3	23.9	30.8	10.0	2.97
Time constraints in learning and adopting new technologies	13.5	15.3	22.2	29.5	19.5	3.26
Privacy and security concerns regarding digital tools	16.5	13.8	24.7	28.0	17.0	3.15
Limited access to reliable customer support for digital tools	16.5	20.3	26.6	26.3	10.3	2.94
Lack of technical expertise or skills to use digital tools effectively	18.5	16.0	21.2	30.5	13.8	3.05
Inadequate digital infrastructure in my region	21.5	16.5	27.5	21.8	12.8	2.88
Lack of training services to help use digital technologies	14.5	16.3	18.7	30.5	20.0	3.25
High costs of data and training services for digital technologies	14.3	9.3	17.4	33.0	26.0	3.47
Lack of government funding or incentives to support the digital transformation of tourism SMMEs	9.0	7.3	20.2	30.0	33.5	3.72
Getting finance from the bank (loan) to pay for digital infrastructure and equipment.	13.3	10.8	27.6	26.0	22.3	3.33

Table 6 shows that the lack of government funding or incentives to support the digital transformation of tourism SMMEs (63.5% agreement, $\bar{x}= 3.72$), followed by high data costs and training services (59.0%, $\bar{x}= 3.47$), and lack of financial resources to invest in technologies (51.0%, $\bar{x}= 3.35$) were indicated as prominent challenges. Technological and infrastructural barriers, although indicated, were reported to a lesser extent, with lack of sufficient internet infrastructure or digital connectivity rated a mean score of 2.95 and resistance to change from employees or stakeholders rated a mean score of 2.85. The study further examined whether perceptions of digital technology benefits and challenges differed by level of experience. An independent samples t-test was conducted comparing tourism SMMEs with high experience (n = 170) and those with moderate experience (n = 184) in using digital technologies. Results are shown in Table 7.

Table 7: Independent t-test results comparing perceived benefits and challenges of using digital technologies by level of experience

Construct	Level of experience	Descriptives		Levene's p	Equal variance assumed?	t(df)	p-value	Cohen's d
Perceived benefits	High experience	Group size	170	0.348	Yes	4.18 (352)	<0.001	0.68
		x̄	4.28					
		σ	0.62					
	Moderate experience	Group size	184					
		x̄	3.98					
		σ	0.72					
Perceived challenges	High experience	Group size	170	0.033	No	-4.77 (341.79)	<0.001	0.90
		x̄	2.90					
		σ	0.94					
	Moderate experience	Group size	184					
		x̄	3.36					
		σ	0.85					

Notes: x̄=mean, σ=Standard deviation

Levene's test showed equal variances for perceived benefits ($p = 0.348$) but not for perceived challenges ($p = 0.033$). The results showed a statistically significant difference in perceived benefits between the two groups ($t(352) = 4.18$, $p < 0.001$). Tourism SMMEs with high digital technologies experience reported higher perceived benefits ($\bar{x} = 4.28$, $\sigma = 0.62$) than moderately experienced tourism SMMEs ($\bar{x}= 3.98$, $\sigma = 0.72$). The effect size was moderate to large ($d = 0.68$). Conversely, the results showed a statistically significant difference in perceived challenges ($t(341.79) = –4.77$, $p < 0.001$). Tourism SMMEs with moderate experience reported higher perceived challenges ($\bar{x} = 3.36$, $\sigma = 0.85$) than experienced tourism SMMEs ($\bar{x} = 2.90$, $\sigma = 0.94$). The corresponding effect size was large ($d = 0.90$).

Discussion and implications

This study aimed to investigate the drivers for and challenges of technology adoption by tourism SMMEs. The study found that the tourism SMMEs sector is dominated by micro and mature enterprises, spread in diverse geographical locations and sub-sector categories. Although the study's distribution was a balanced provincial distribution, the tourism SMMEs sector has a high concentration of service-intensive subsectors dominated by micro-tourism enterprises whose longevity reflects resilience. These findings concur with Muluh and Lekgau, (2023), who echoed that although tourism SMMEs are highly vulnerable, they have adaptive resilience, resulting in longevity. The study revealed a transparent gradient where micro-sized tourism firms lead in technology adoption, with more prominence in low-cost and easily accessible digital technologies. In contrast, advanced systems are more concentrated in larger firms, showing that technology adoption levels vary by firm size and the complexity of the digital tools, supporting the findings of Chatterjee et al. (2021). Further analysis of how firm size shapes technology adoption revealed a significant relationship between firm size and the use of online booking systems, inventory management systems and immersive technologies and no significant relationships for social media, websites, or digital payment systems, showing that firm size mainly affects the adoption of advanced, resource-demanding digital technologies. The dominance of social media and websites among micro-tourism firms reveals that marketing-oriented technologies are the easiest entry tools for digital transformation and destination sustainability, concurring with Chamboko-Mpotaringa (2024).

The findings of this study revealed that digital technology adoption delivers tangible operational and market benefits for tourism SMMEs, as evidenced by the overall mean values above 4.0 for benefits such as the ability to reach and engage a wider customer base, improved time efficiency, improved customer satisfaction, improved overall business performance and task efficiency. This corroborates a study by (Dayour et al., 2023), which noted that digital technologies support small and medium enterprises' operations in the tourism and hospitality industry. While the study acknowledges the benefits of digital technology adoption, notable challenges were reported, revealing that financial and institutional barriers such as a lack of government funding or incentives to support the digital transformation of tourism SMMEs, high data costs and training services and lack of financial resources to invest in technologies, remain as barriers to digital transformation in developing countries. Thus, the study results reflect the structural differences in accessing resources, training and support. These findings are similar to the findings of Mgoduka et al. (2024), who also found that SMMEs face barriers such as a lack of access to finance and digital technologies training support. Unsurprisingly, resistance to change from employees or stakeholders received a low mean score, indicating general willingness to adopt digital technologies, despite the lack of a supportive environment needed to transition from basic digital functions to more integrated and innovative applications, is associated with their understanding that technology adoption is no longer an option but a necessity (Buhalis et al., 2024).

The study showed statistically significant large differences in perceived benefits and challenges of digital technologies adoption between tourism SMMEs with different levels of digital technology use, indicating large practical differences, such as the less digitally adept tourism SMMEs experiencing more challenges in integrating digital technologies into their operations than their counterparts who are highly experienced (Williams et al., 2020). On the other hand, highly experienced tourism SMMEs enjoy more benefits of technology adoption, revealing that digital maturity shapes how tourism SMMEs perceive the benefits and challenges of technology adoption. As the level of experience increases, perceptions shift towards recognising the efficiency and adoption gains, reflecting the variations in performance expectancy and effort expectancy (Venkatesh et al., 2003). This is because, as familiarity and competence improve, digital technologies are no longer viewed as operational burdens but strategic enablers of competitiveness, resilience and sustainability, aligning with the diffusion of innovations theory, which posits that the degree of prior experience and perceived advantage influences the speed and success of innovation adoption (Dearing, 2021).

This study has both managerial and policy implications. Managerially, the study findings highlight the need for tailored interventions such as training and support initiatives focusing on digital transformation and capacity building for micro-sized, service-oriented tourism small, medium, and micro-enterprises (SMMEs) in different provinces and subsectors could help address contextual barriers, ensuring inclusive technological growth. Collaborating with universities and tech hubs can increase access to ongoing digital skills training. This can be achieved through building local capacity ecosystems that sustain hands-on, practice-based learning and reduce trial and error costs. For policymakers, recognising that digital technology adoption brings tangible operational and market benefits for tourism SMMEs underscores the importance of emphasising market and efficiency outcomes when promoting digital transformation among tourism enterprises. Furthermore, there is a need for differentiated support strategies based on firm sizes, and the need to prioritise creating an enabling environment and access to affordable advanced systems to assist micro-and small firms in bridging the digital divide, enhancing competitiveness and contributing more effectively to digital transformation and sustainable growth within South Africa's tourism sector. For policy makers and stakeholders, differentiate support not only by firm size but also by digital maturity. Tourism SMMEs with high experience levels are better positioned to leverage the core functions critical for resilience such as using digital technologies for marketing, sales and customer relationship management, whereas those that are moderately experienced, are still adapting hence face heightened challenges such as limited training, connectivity issues, lack of digital infrastructure support and financial constraints, which perpetuate digital divide across and within the tourism sector. Governments and tourism agencies should introduce tax reliefs, affordable broadband infrastructure and funding schemes to ease the financial burden of adopting digital technologies. Financial institutions could also develop low-interest technology loans tailored for SMMEs. Strengthening digital infrastructure will promote balanced participation across firms of all sizes and enhance the tourism sector's competitiveness.

Conclusion, limitations and future studies

This study sought to explore the digital adoption landscape of South African tourism SMMEs and found that the adoption of digital technologies, in terms of which digital technologies they can adopt and who can integrate advanced technologies, hinges on firm capacity. Marketing and sales-oriented tools are widespread, yet the adoption of advanced technologies such as inventory management systems and immersive technologies increases with firm sizes, evidencing a structural divide in technology adoption within the tourism SMMEs sector. The tourism SMMEs' reported benefits of digitalisation included increased customer base, profits, wider reach, time efficiency and customer satisfaction, which are market-related payoffs and crucial drivers for technology adoption. Clearly, experience matters in technology adoption, as highly experienced tourism SMMEs perceived greater benefits, whereas moderately experienced tourism SMMEs perceived higher implementation challenges. Destinations in developing countries should measure technology adoption progress threefold: by the rate of adoption, the depth of technology integration and the distribution of benefits across tourism SMMEs. Digital transformation has the potential to function as a resilience engine when implemented effectively, thereby enhancing market access and improving the productivity of SMMEs within the tourism sector. The study is not without limitations. It captures nuances at a single point in time and does not examine pathways that align skills, infrastructure and financial capacity. Future research should track a longitudinal cohort of tourism SMMEs and investigate pathways that align skill levels with infrastructure development and financial capacity.

Acknowledgement

The authors would like to thank the reviewers for their valuable feedback. We also acknowledge the funding received from the Department of Tourism in South Africa.

Reference

Badoc-Gonzales, B.P., Mandigma, M.B.S. & Tan, J.J. (2022). SME Resilience as a Catalyst for Tourism Destinations: A Literature Review. *Journal of Global Entrepreneurship Research, 12*(1), 23-44. https://doi.org/10.1007/s40497-022-00309-1

Buhalis, D., Efthymiou, L., Uzunboylu, N. & Thrassou, A. (2024). Charting the Progress of Technology Adoption in Tourism and Hospitality in the Era of Industry 4.0. *EuroMed Journal of Business*, *19*(1), 1–20. https://doi.org/10.1108/EMJB-11-2023-0310

Chamboko-Mpotaringa, M. & Tichaawa, T. M. (2021). Tourism Digital Marketing Tools and Views on Future Trends: A Systematic Review of Literature. *African Journal of Hospitality, Tourism and Leisure*, *10*(2), 712–726. https://doi.org/10.46222/ajhtl.19770720-128

Chamboko-Mpotaringa, M. & Tichaawa, T. M. (2023). Sustainability of Digital Marketing Strategies for Driving Consumer Behaviour in the Domestic Tourism Industry. *Studia Periegetica*. https://doi.org/10.58683/sp.570.

Chamboko-Mpotaringa, M. (2024). Revitalizing Tourism in Free State Province, South Africa: Digital Marketing Strategies for Domestic Tourism Post-COVID-19 Recovery. In P. Chihwai (Ed*.), COVID-19 Impact on Tourism Performance in Africa* (pp. 201–222). Springer Nature Singapore.

Chatterjee, S., Rana, N. P., Dwivedi, Y. K. & Baabdullah, A. M. (2021). Understanding AI Adoption in Manufacturing and Production Firms Using an Integrated TAM-TOE model. *Technological Forecasting and Social Change*, *170*, 120880. https://doi.org/10.1016/j.techfore.2021.120880

Dayour, F., Stephen, A. & Kosoe, E. A. (2023). The Boon and Bane of ICT Services to Small and Medium-Sized Tourism and Hospitality Enterprises (SMTHEs) in Northern Ghana. *Small Enterprise Research*, 30(2), 255–273. https://doi.org/10.1080/13215906.2023.2217800

Dearing, J. W. (2021). Diffusion of Innovations. In *The Oxford Handbook of Organizational Change and Innovation*. https://doi.org/10.1093/oxfordhb/9780198845973.013.23

Cheng, X., Xue, T., Yang, B. & Ma, B. (2023). A Digital Transformation Approach in Hospitality and Tourism Research. *International Journal of Contemporary Hospitality Management, 35*(8), 2944–2967. https://doi.org/10.1108/IJCHM-06-2022-0679

Dhaigude, A. S., Kapoor, R. & Ambekar, S. (2016). A Conceptual Model for Adoption of Information Communication Technology in the Travel and Tourism Industry. *Tourism Recreation Research*, *41*(1), 49–59. https://doi.org/10.1080/02508281.2015.1126919

Febrianti, M. A., Sugarindra, M., Hidayat, A. & Suyanto, M. (2022). The Impact of Digital Marketing: A Systematic Literature Review. *International Journal of Interactive Mobile Technologies (IJIM), 16*(13), 15–29. https://doi.org/10.3991/IJIM.V16I13.30609

Harilal, V. & Nyikana, S. (2019). Factors Inhibiting Large Enterprises from Establishing Sustainable Linkages with Black-Owned Tourism SMMEs in South Africa. *African Journal of Hospitality, Tourism and Leisure*, *8*(3), 1-14.

Holl, A. & Rama, R. (2024). Spatial Patterns and Drivers of SME Digitalisation. *Journal of the Knowledge Economy*, 15(2), 5625-5649. https://doi.org/10.1007/s13132-023-01257-1

Li, N., Liu, Z. & Zhang, X. (2022). A Study on the Impact of Dynamic Visitor Demand on the Digital Transformation of Enterprises—Considerations Based on the Regional Innovation Environment and the Level of Big Data. *Sustainability, 15*(1), 261. https://doi.org/10.3390/su15010261.

Majeed, S., Zhou, Z., Lu, C. & Ramkissoon, H. (2020). Online Tourism Information and Tourist Behavior: A Structural Equation Modeling Analysis Based on a Self-Administered Survey. *Frontiers in Psychology*, 11. https://doi.org/10.3389/fpsyg.2020.00599.

Matikiti, R., Mpinganjira, M. & Roberts-Lombard, M. (2018). Application of the Technology Acceptance Model and the Technology–Organisation–Environment Model to Examine Social Media Marketing Use in the South African Tourism Industry. *South African Journal of Information Management*, *20*(1), 1-12. https://doi.org/10.4102/sajim.v20i1.790

Mgoduka, S., Kaseeram, I. & Heeralal, S. (2024). An Investigation on The Extent of Usage and Challenges Faced by Tourism SMEs Concerning E-Marketing: Empowering Co-creation of Value. *E-Bangi Journal of Social Science and Humanities*, *21*(2). https://doi.org/10.17576/ebangi.2024.2102.39

Mokoena, S.L. & Liambo, T.F. (2023). The Sustainability of Township Tourism SMMEs. *International Journal of Research in Business and Social Science*, *12*(1), 341-349. https://doi.org/10.20525/ijrbs.v12i1.2302

Muluh, N. & Lekgau, R. J. (2023). Static or Dynamic Tourism SMME's Resilience? Adaptive Strategies of Formal and Informal Enterprises to Multiple Crises. *African Journal of Hospitality, Tourism and Leisure*, *12*(4). https://doi.org/10.46222/ajhtl.19770720.435

Narangajavana Kaosiri, Y., Callarisa Fiol, L. J., Moliner Tena, M. Á., Rodríguez Artola, R. M. & Sánchez García, J. (2019). User-generated Content Sources in Social Media: A New Approach to Explore Tourist Satisfaction. *Journal of Travel Research, 58*(2), 253–265. https://doi.org/10.1177/0047287517746014.

Nguyen, V. K., Natoli, R. & Divisekera, S. (2021). Innovation and Productivity in Tourism Small and Medium Enterprises: A Longitudinal Study. *Tourism Management Perspectives*, *38*, 100804. https://doi.org/10.1016/j.tmp.2021.100804

Nunkoo, R., Teeroovengadum, V., Seetanah, B., Sannasee, R. V. & Pooloo, A. (2020). Determinants of Tourism Small and Medium Enterprises Financial Performance. Development Southern Africa, *37*(5), 809–824. https://doi.org/10.1080/0376835X.2020.1808948

O'Connor, P. (2023). Small-and Medium-Sized Tourism Enterprises and Smart Tourism: Tourism Agenda 2030 Perspective Article. *Tourism Review*, *78*(2), 339-343. DOI 10.1108/TR-09-2022-0431

Rastegar, R., Seyfi, S. & Shahi, T. (2023). Tourism SMEs' Resilience Strategies Amidst the COVID-19 Crisis: The Story of Survival. *Tourism Recreation Research*, *50*(2), 428–434. https://doi.org/10.1080/02508281.2023.2233073

Rogerson, C.M. (2010). Local Economic Development in South Africa: Strategic Challenges. *Development Southern Africa 27*(4), 481–95. https://doi.org/10.1080/0376835X.2010.508580

Rogerson, C.M. & Sixaba, Z. (2021). Transformation in South African Tourism: A Geographical Perspective on the Eastern Cape. *African Journal of Hospitality, Tourism and Leisure*, *10*(5),1610- 1629. https://doi.org/10.46222/ajhtl.19770720-182

Schegg, R. & Stangl, B. (2017). *Information and Communication Technologies in Tourism.* In Proceedings of the International Conference in Rome, Italy, 26-27 January. Springer.

Seetanah, B. & Fauzel, S. (2025). The Moderating Role of Digitalisation in the Tourism-Growth Nexus: Evidence from Small Island Economies. *Journal of Policy Research in Tourism, Leisure and Events*, *17*(2), 317-337. https://doi.org/10.1080/19407963.2023.2201888

Sibiya, A., Van der Westhuizen, J., & Sibiya, B. (2023). Challenges Experienced by SMMEs and Interventions by the South African National and Provincial Government: A Literature Review. *African Journal of Inter/Multidisciplinary Studies*, *5*(1), 1–1

Thomas, G. (2024). Challenges and Trends of Digital Innovation in the Tourism Sector: Contemporary Literature Review. *Open Journal of Business and Management*, *12*(01), 179–190. https://doi.org/10.4236/ojbm.2024.121013

Tsourgiannis, L. & Valsamidis, S. (2019). Digital Marketing in Tourism: Why Greek Tourists Use Digital Marketing Applications like Airbnb. *International Journal of Culture, Tourism and Hospitality Research*, *13*(4), 473-486. https://doi.org/10.1108/IJCTHR-03-2019-0043

Venkatesh, V., Morris, M. G., Davis, G. B. & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly: Management Information Systems*, *27*(3). https://doi.org/10.2307/30036540

Wang, S. & Zhang, H. (2025). Promoting Sustainable Development Goals Through Generative Artificial Intelligence in the Digital Supply Chain: Insights from Chinese Tourism SMEs. *Sustainable Development*, *33*(1), 1231-1248. https://doi.org/10.1002/sd.3152

Williams, C., You, J. J. & Joshua, K. (2020). Small-business Resilience in a Remote Tourist Destination: Exploring Close Relationship Capabilities on the Island of St Helena. *Journal of Sustainable Tourism*, *28*(7), 937–955. https://doi.org/10.1080/09669582.2020.1712409