




Promoting value co-creation through digitalised supply chains in small, medium, and micro enterprises



Authors:

Portia P.S. Sifolo¹ 
 Njabulo Ndlovu¹ 
 Vincent Maduna² 

Affiliations:

¹Department of Tourism Management, Faculty of Management Sciences, Tshwane University of Technology, Pretoria, South Africa

²Directorate of Research and Innovation, Faculty of Research and Innovation, Tshwane University of Technology, Pretoria, South Africa

Corresponding author:

Njabulo Ndlovu,
 ndlovun4@tut.ac.za

Dates:

Received: 06 Nov. 2025
 Accepted: 05 Feb. 2026
 Published: 28 Apr. 2026

How to cite this article:

Sifolo, P.P.S., Ndlovu, N. & Maduna, V., 2026, 'Promoting value co-creation through digitalised supply chains in small, medium, and micro enterprises', *Journal of Transport and Supply Chain Management* 20(0), a1288. <https://doi.org/10.4102/jtscm.v20i0.1288>

Copyright:

© 2026. The Authors.
 Licensee: AOSIS.
 This work is licensed under the Creative Commons Attribution 4.0 International (CC BY 4.0) license (<https://creativecommons.org/licenses/by/4.0/>).

Read online:



Scan this QR code with your smart phone or mobile device to read online.

Background: This study analyses how digitalised supply chains affect value co-creation and performance among small, medium, and micro enterprises (SMMEs) in KwaZulu-Natal and Eastern Cape, South Africa.

Objectives: It aims to provide insights into how digital technologies enhance supply chain efficiency and support sustainable development goals through innovation and collaboration in the tourism sector. Grounded in dynamic capabilities theory, the study explores how SMMEs integrate and reconfigure resources to sustain competitive advantage in dynamic environments.

Method: A quantitative approach using regression analysis was employed to assess the relationships among supply chain digitalisation, value co-creation, and enterprise performance.

Results: Digitalised supply chains positively influence value co-creation and performance, enabling SMMEs to optimise processes, improve customer satisfaction, and achieve sustainable competitiveness.

Conclusion: The study provides strategic insights for managers and policymakers to promote digital transformation and strengthen SMME performance in the tourism value chain.

Contribution: The study links digitalised supply chains with value co-creation in SMMEs, particularly in developing economies. It highlights how digital technologies facilitates collaborative value creation through improved connectivity among supply chain actors. It also identifies the digital capabilities and relational mechanisms essential for SMMEs to realise shared value value. This integrated perspective connecting digitalisation and co-creation outcomes aligns with the Journal of Transport and Supply Chain Management's focus on innovation and value creation within resilient, digitally enabled supply chain systems.

Keywords: value co-creation; digital supply chains; supply chain networks; digitalisation; SMMEs.

Introduction

Background

Promoting value co-creation and digitalised supply chain networks among small, medium, and micro enterprises (SMMEs) is crucial for South Africa's economy, driving employment and economic growth while enhancing social and political justice (Ramsuraj 2023). Despite the high failure rate of SMEs during their first year (Mukonyo & Pooe 2025), SMMEs foster independence and offer a route to entrepreneurship for individuals in underprivileged areas, while also acting as a catalyst for innovation (Rungani & Potgieter 2018). Small, medium, and micro enterprises are essential contributors to the creation of new products and technological advancements. They play a vital role in encouraging industrial revitalisation and boosting economic development. Despite their potential, these enterprises encounter a host of hurdles ranging from limited resources and fierce competition to the ever-evolving demands of the market (Mhlongo & Daya 2023). These challenges lead to soaring unemployment rates, which in turn stifle meaningful contributions to the economy and society as a whole (Fatoki & Garwe 2010). A study conducted by MasterCard (2023) identified the top three areas for support required by SMMEs in Africa, which include training and upskilling staff (91%), digitising enterprises (88%), and access to a broader range of financial services (88%). A study focused on SMMEs in Gauteng unveiled striking insights. It highlights that these businesses face significant challenges, often leading to high failure rates and subpar performance (Mhlongo & Daya 2023). The study identifies several key factors contributing to this struggle: a deficit in entrepreneurial leadership skills, limited access to financial resources, insufficient financial education, infrastructure issues, a lack of training opportunities, technological shortcomings, and the adverse effects of crime and corruption. These obstacles paint a clear

picture of the hurdles that SMMEs must overcome to thrive in a competitive landscape. Innovation and leadership failures are mainly caused by owners and managers having a limited understanding (Ngibe & Lekhaya 2019). They often focus on short-term operational survival, which hampers creativity, exacerbated by a persistent digital adoption skills deficit among these SMME leaders. Therefore, a combination of weak leadership in innovation and inadequate digital skills reinforces one another, trapping SMMEs in the periphery of competitive circles.

Additionally, this situation is set against the backdrop of the efforts of the government to promote digital adoption through its well-known policy frameworks. For instance, the National Development Plan (NDP) emphasises innovation and digital adoption as important drivers enhancing SMMEs' competitiveness and sustainability (National Planning Commission 2012). The development of NDP and support structures such as Small Enterprise Finance Agency (SEFA) and Small Enterprise Development Agency (SEDA) influences the digital inclusion of financial innovation (Ndabeni-Abrahams 2024). While the NDP provides strategic direction for digital uptake among SMMEs, its practical impact is adversely affected by resource limitations. Despite all this effort, the South African SMME landscape still suffers from a lack of digital infrastructure and limited digital literacy, among other things. This shortcoming is further compounded by fragmented policy implementation and weak coordination, which somewhat constrain digital uptake (Shava & Maramura 2021). This constraint creates an opportunity for SMMEs to embrace digitalisation to be competitive. Hence, a performance improvement model to enhance value co-creation through digitalised supply chains is paramount in addressing the challenges faced by SMMEs.

Undoubtedly, digitalisation remains a critical enabler of competitiveness. Beyond this input, it can enhance survival chances for SMMEs operating in a volatile and dynamic market space. However, through digital uptake, SMMEs can respond swiftly to shifts in customer demand and supply chain disruptions, thereby making the SMMEs agile (Restrepo-Morales, Ararat-Herrera & López-Cadavid 2024). Digitalised supply chains offer a potential solution to these challenges by improving operational efficiency, reducing costs, and enhancing value co-creation (Christopher 2016). Similarly, Grunwald (2022) emphasised that attention to sustainability issues and the advancement of digitalisation motivate organisations to collaborate on sustainability issues in projects involving various stakeholders within and around global value chains. This study presents the following hypothesis.

Hypothesis

The hypotheses for this article are as follows:

- H1:** Digitalisation has a positive effect on value co-creation.
- H2:** Value co-creation has a positive effect on supply chain network performance.

H3: Digitalisation has a positive effect on supply chain network performance.

H4: Value co-creation mediates the relationship between digitalisation and supply chain network performance.

Application of the dynamic capabilities theory and innovation adoption theory

A dynamic capabilities theory (DCT) lens, combined with the innovation adoption theory, provides a powerful framework for analysing the digitalisation and innovation challenges that South African SMMEs navigate through. A combination of the SMMEs' ability to sense and seize new opportunities and behavioural factors driving the acceptance and adoption of new technologies remains critical to the sustainability of these entities.

Grounded in DCT, this study identifies digitalisation, value co-creation, and supply chain networks as crucial enablers that help SMMEs in South Africa sense and seize opportunities in unpredictable and resource-constrained environments (Teece, Pisano & Shuen 1997). For example, sensing capabilities enhance SMMEs' use of digital technologies such as digital platforms, data analytics, and information-sharing systems (Bleady, Ali & Ibrahim 2018). These tools help identify customer demand, supply chain disruptions, and market conditions. As a result, digitalisation artefacts such as social media platforms, online booking platforms, digital payment systems, and customer relationship management tools (Chamboko-Mpotaringa 2025; Mosweunyane, Rambe & Dzansi 2019) provide SMMEs with unprecedented opportunities to enhance customer visibility, which is essential for fostering value co-creation opportunities (collaborative innovation) with their clients, suppliers, and other stakeholders within increasingly digitally networked supply chains (collaborative partnerships through digital platforms) (Al-Omouh, De Lucas & Del Val 2023; Royo-Vela & Velasquez Serrano 2021; Teece 2007; Warner & Wäger 2019). By sensing opportunities, SMMEs can seize and transform these prospects into sustainable outcomes. Activating this process involves assembling limited resources, adopting collaborative digital platforms, and reconfiguring supply chain relationships. Furthermore, SMMEs can leverage their ability to seize opportunities by investing in digital technologies that promote value creation and operational integration, which are crucial for the continuous renewal of organisational routines and the expansion of network structures. However, in emerging economies like South Africa, DCT capabilities are essential for building supply chain resilience, enhancing competitiveness, and sustaining value co-creation amid institutional uncertainty and infrastructural constraints (Kraus et al. 2022; Teece, Peteraf & Leih 2016).

Whereas, drawing on innovation adoption theory, Rogers (1962), digitalisation facilitates value co-creation and strengthens SMMEs' supply chain networks. Driven by

SMMEs' perceptions of key innovation attributes, predominantly digital technologies that clearly demonstrate advantages in efficiency, coordination, and decision-making can be a game-changer towards realising their goals. Additionally, digital technologies should be compatible with existing SMMEs' routines and their contextual complexity. The theory further places emphasis on digital tools and their associated collaborative platforms that enable SMMEs to run experiments, thereby reducing uncertainty while promoting learning (Oliveira & Martins 2011; Rogers 2003). However, digitalisation enhances interactive engagement and shared learning among supply chain players, improving value co-creation and fostering more integrated, transparent, and resilient supply chain networks (Gunasekaran, Subramanian & Papadopoulos 2017; Vargo & Lusch 2008).

Problem statement

The rapid advancement of digital technologies has transformed global supply chain systems, yet many SMMEs in South Africa continue to face challenges in adopting and integrating digital tools within their supply chain networks. These limitations constrain their ability to improve operational efficiency, enhance collaboration with supply chain partners, and respond to market volatility. Although digitalisation is recognised as a key enabler of competitiveness, the mechanisms through which it supports supply chain efficiency and value co-creation within SMME networks remain insufficiently explored in current research. This study, therefore, investigates how digitalisation influences supply chain networks and the extent to which it enhances value co-creation and overall performance in SMMEs. This problem statement sheds light on the challenges faced by South African SMMEs in their journey toward digital adoption. It highlights the areas of efficiency, collaboration, and competitiveness that can be enhanced through improved digital integration. The statement identifies a knowledge gap, providing a solid base for the study to focus on how to help these businesses overcome challenges and succeed in a digital world.

Aim of the study

This study aims to develop a conceptual model that examines how digitalisation of supply chains enhances value co-creation among partners and customers, and how these interactions contribute to improved enterprise performance in South African SMMEs.

Empirical literature review on determinants of value co-creation in small, medium, and micro enterprises

A literature review was conducted to identify the existing research on value co-creation and digitalised supply chains in SMMEs. Value is created when the customer has used, experienced, and developed perceptions that determine the value. Defining value co-creation is essential to ground the study. Value co-creation refers to the collaborative processes between enterprises and customers, which lead to mutual benefits and enhanced customer experiences (Romero & Molina 2009). Therefore, customer engagement is a critical

determinant of value co-creation. Engaged customers are more likely to participate in co-creation activities, providing valuable insights and feedback (Zhang et al. 2018). Studies have shown that customer engagement can be enhanced through interactive communication channels, personalised services, and community-building initiatives (Hollebeek, Srivastava & Chen 2019).

The construct of value co-creation is an emerging paradigm in the study of SMMEs. It calls for the active participation of both enterprises and customers in creating value through interactions and mutual contributions (Prahalad & Ramaswamy 2004). Value co-creation has become a prominent construct in modern service and innovation literature. However, much of the existing research tends to be primarily descriptive and focuses on normative frameworks, often depicting co-creation as inherently advantageous. This prevailing perspective has faced criticism for lacking a thorough theoretical exploration of when, how, and under what circumstances value co-creation results in superior outcomes, especially for resource-constrained firms like SMMEs (Grönroos & Voima 2013). This literature review examines empirical studies on the determinants of value co-creation in SMMEs, identifying key factors that influence this process. A survey conducted by Nenonen and Storbacka (2010) on enterprise model design and the conceptualisation of networked value co-creation revealed that the locus of value creation is no longer perceived to reside within enterprise boundaries; instead, value is considered to be co-created among various actors within the networked market (Antoldi & Cerrato 2020). In the context of SMMEs, value co-creation is crucial as it fosters customer loyalty and competitive advantage. Mathibe, Chinyamurindi and Hove-Sibanda (2023) explored value co-creation as a mediator between strategic planning and social enterprise performance in the South African context. The results revealed that an organisation's flexibility when dealing with its partners is critical to value co-creation. Understanding market orientation is positively associated with value co-creation (Narver & Slater 1990). Market-oriented enterprises are better positioned to identify co-creation opportunities and develop products and services that align with customer preferences (Jaworski & Kohli 1993). Hence, collaborative networks and partnerships with other enterprises, institutions, and communities can enhance value co-creation. These networks provide access to additional resources, knowledge, and capabilities that can support co-creation efforts (Abbate, Codini & Aquilani 2019). Empirical studies have demonstrated that strategic alliances and partnerships can lead to more innovative and effective co-creation outcomes (Babu et al. 2020).

Digital platforms facilitate value co-creation by enabling real-time communication, personalised services, and the integration of customer feedback (Sigala 2018). The adoption of technology and digital platforms plays a significant role in

enabling value co-creation. Digital tools facilitate real-time communication, data sharing, and collaborative innovation (Sigala 2018). For SMMEs, the use of social media, customer relationship management systems, and online co-creation platforms has been shown to impact value co-creation efforts positively (Hoyer et al. 2010). The empirical literature on value co-creation in SMMEs highlights several key determinants, including customer engagement, technology adoption, organisational culture, employee involvement, trust, customer knowledge, market orientation, and collaborative networks (Antoldi & Cerrato 2020). These factors collectively contribute to the effectiveness of value co-creation initiatives. Figure 1 below presents the performance improvement model for SMMEs to enhance Value Co-Creation through Digitalised Supply Chains.

Digitalised supply chains

In a rapidly evolving global market, enterprises face unique challenges and opportunities. Digitalisation provides tools and platforms that enable better integration, efficiency, and collaboration throughout the supply chain, fostering value co-creation that can significantly enhance competitiveness and sustainability (Grunwald 2022). There are benefits in digitalising supply chains. Transforming the supply chain through digitalisation and automation empowers companies to enhance efficiency and accelerate processes. This modern approach not only delivers valuable insights but also minimises manual errors, ultimately leading to significant reductions in total acquisition costs (Huser 2024). Embracing these innovations can revolutionise the way businesses operate, driving success in today's fast-paced market. Digitalised supply chains offer a significant competitive advantage for enterprises. For example, decision-making is made easier and faster with the use of new disruptive technologies (Big Data, Internet of Things, Artificial Intelligence, etc.); these technologies also increase operational efficiency by using continually updated data for predictive analytics (Restrepo et al. 2024). Companies can optimise their stock and supply management while increasing agility and responsiveness by relying on dependable, relevant, and real-time data flows. Hence, enterprises can integrate technologies such as the Internet of Things, big data analytics, and blockchain to enhance transparency, agility, and collaboration among supply chain participants (Ivanov & Dolgui 2021). These technologies enable SMMEs to streamline operations, improve inventory management, and respond swiftly to market changes (Christopher 2016). With digital tools, SMMEs can offer personalised services and products, thereby enhancing the customer experience. Data analytics can help understand customer preferences and tailor offerings accordingly (Romero & Molina 2009). Moreover, digital interfaces improve the ease of doing business, from ordering to delivery, thereby increasing customer loyalty and

retention. However, there are significant barriers to digitalisation. Strategic support from governments, collaborative efforts, and targeted training can enable SMMEs to fully leverage the benefits of digital supply chains, resulting in sustainable growth and increased value creation.

Research methods and design

This study employs a quantitative research survey designed to explore the intriguing effects of digitalised tourism supply chains on value co-creation within SMMEs. The approach enabled the systematic measurement and analysis of relationships between digitalisation, value co-creation, and supply chain networks. The research method employed in this study of 288 SMMEs in KwaZulu-Natal and the Eastern Cape (126 from KwaZulu-Natal and 162 from the Eastern Cape) was a cross-sectional survey and a self-administered questionnaire. The information was gathered at two significant tourism-related events that took place in Gqberha (Eastern Cape Province) and Durban (KwaZulu-Natal Province) in South Africa. In terms of size and economic activity, the two cities are the biggest in the provinces that are being examined. The 3-day events in the two cities were organised by the national and provincial governments and were intended to unite stakeholders in the tourism industry. The workshops conducted in KwaZulu-Natal (KZN) and the Eastern Cape made it possible for us to conduct a cross-sectional self-administered survey. They are frequently used in tourism studies to obtain a snapshot of current practices from a defined population at a single point in time (Castillo, Rescalvo-Martin & Karatepe 2025). This method allows for the effective collection of quantitative data to look at relationships among important variables. For our study, we focused on SMMEs that embraced digitalised supply chain practices and were eager to share their experiences through our survey. We aimed to exclude those SMMEs that had not yet ventured into digitalisation or were hesitant to engage with us. Participants took part in an engaging online survey, in which their insights were gathered through a thoughtfully designed questionnaire. The variables had different 5-point Likert scale items. Digitalisation items were never, hardly, sometimes, frequently, and always. The data were examined through the lens of inferential statistics to uncover how digitalised supply chains influence value co-creation in SMMEs. The statistical analysis employed correlation and regression analysis to investigate the relationship between digitalised supply chains and value co-creation in SMMEs. The relevant ethics committee approved the study, and all participants provided informed consent before participating in the survey. The informed consent statement was provided to all participants before they completed the survey, and they were informed of their right to withdraw from the study at any time without penalty or consequence.

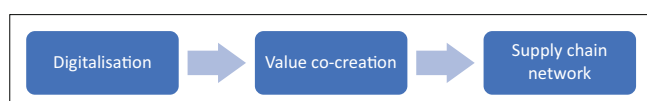


FIGURE 1: Conceptual framework.

Ethical considerations

Ethical clearance to conduct this study was obtained from the Tshwane University of Technology, Research Ethics Committee (No. REC2024=04=002 [MS]).

Results

The following section presents the descriptive and inferential statistics analysis of the study data. A 5-point Likert scale questionnaire was developed and administered, covering three primary domains: digitalisation, supply chain value co-creation, and supply chain networks. The questionnaire's reliability was confirmed through internal and external consistency checks, with Cronbach's alpha coefficients exceeding 0.7. Data were collected from a sample of 288 respondents.

Before conducting the regression analysis, all key assumptions underlying the regression analysis were assessed and met, ensuring that the model estimates are reliable. Reliability tests and validity tests were performed. All items were deemed appropriate for subsequent statistical analysis. As reflected in Table 1, all constructs recorded Cronbach's alpha values exceeding 0.7. Reliability testing evaluates the consistency of questionnaire items and the degree to which they relate to one another within a scale (Pallant 2010). According to Pallant (2010), a Cronbach's alpha above 0.7 is considered acceptable for proceeding with further statistical procedures. The results in Table 1, therefore, indicate that the study satisfactorily met the minimum threshold for internal consistency.

Correlation analysis

Table 2 showcases that the path's correlation was significant.

The correlation between digitalisation and the supply chain network was positive and moderate, with a correlation coefficient of $r = 0.3627$ ($p < 0.001$). Additionally, the correlation between the supply chain network and value co-creation was also positive and moderate, with a coefficient of $r = 0.4302$ ($p < 0.001$). There was a very strong positive correlation between digitalisation and value, indicated by a coefficient of $r = 0.8788$ ($p < 0.001$). All correlations were statistically significant.

Regression analysis

Table 3 presents the mean squares and the sum of squares divided by the respective degrees of freedom (df). That would enable the computation of F-statistic values and the subsequent testing of the significance of predictors in a model. Thus, model = $(SS/df) = 112.314829$, residual = $(SS/df) = 3.52807402$. This will enable the testing of the overall fit model.

A total of 288 observations were used in the regression analysis. The F -statistic (6, 281) = 31.83 for the regression model with 6 and 281 degrees of freedom in the residuals. This study has a higher F -statistic, which indicates that the model provides a better fit to the data. The p -value associated with the F -statistic of 0.0000 suggests that the overall model is statistically significant at conventional levels (e.g. 0.05 or 0.01). Furthermore, the overall fit model output also indicates that the independent variable can reliably predict the dependent variable, as evidenced by its smaller p -value coefficients, which indicate statistical significance.

The findings summarised in Table 4 reveal some intriguing insights about the supply chain network. With an R -squared value of 0.4047, we see that around 40.47% of the variability in our dependent variable can be explained by the independent variables in our model. The adjusted R -squared, slightly lower at 0.3920, reflects a modest adjustment for the number of predictors involved. On another note, the root-mean-square error stands at 1.8783, giving us a clear picture of the standard deviation of our residuals, or prediction errors. Delving deeper into the results showcased in the annotated output of Table 5, we find it particularly noteworthy that value co-creation emerged as a significant predictor of the supply chain network. In contrast, digitalisation does not appear to hold predictive power over this outcome. Specifically, value co-creation demonstrated a robust predictive effect on the supply chain network, with a statistically significant outcome ($\beta = 0.2724437$, $p < 0.001$). This outcome highlights the critical role that value co-creation plays in shaping supply chain dynamics.

TABLE 1: Reliability test.

Constructs	Cronbach's alpha coefficients
Digitalisation	0.8752
Value co-creation	0.8195
Supply chain network	0.7987

TABLE 2: Correlation analysis.

Variable	Digitalisation	Supply chain network
Supply chain network		
r	0.3627	-
p -value	0.0000	-
Value co-creation		
r	0.8788	0.4302
p -value	0.0000	0.0000

TABLE 3: ANOVA table.

Source	SS	df	MS
Model	673.888977	6	112.31482900
Residual	991.388801	281	3.52807402
Total	1665.277780	287	5.80236160

df , degrees of freedom; SS, Sum of squares; ANOVA, analysis of variance; MS, mean square.

TABLE 4: Overall fit model.

Variable	Value
Number of observations	288.0000
F (6, 281)	31.8300
Prob > F	0.0000
R -Squared	0.4047
Adjusted R -Squared	0.3920
Root MSE	1.8783

MSE, mean squared error.

TABLE 5: Parameter annotated output.

Supply chain network	Coefficients	Standard error	t -value	P -value	95% CIE
Digitalisation	-0.0026468	0.0459988	-0.06	0.954	-0.0931928, 0.0878992
Value co-creation	0.2724437	0.0415999	6.55	0.000	0.1905566, 0.3543308
Mediation effect of value co-creation	-0.0072009	0.0033075	-2.18	0.030	-0.0137115, -0.0006902
Constant	17.60559	0.3654252	48.18	0.000	16.88627, 18.32491

CIE, confidence interval estimate.

TABLE 6: Structural equation model.

Path	Coefficient	OIM SE	Z	P-value	95% CI
Digitalisation					
Supply chain network	-0.095	0.034	-2.830	0.005	-0.161; -0.029
Value co-creation	0.768	0.025	30.590	0.000	0.719; 0.817
Supply chain network					
Value co-creation	0.742	0.006	130.260	0.000	0.731; 0.753
Var (e. digitalisation)	6.484	0.540	-	-	5.507; 7.634
Var (e. supply chain network)	19.997	1.666	-	-	16.984; 23.545

OIM SE, observed information matrix standard error; CI, confidence interval.

TABLE 7: Significance testing of the indirect effect.

Estimates	Indirect effect	SE	z	P-value	95% CI
Delta	-0.070	0.025	-2.827	0.005	-0.119; -0.022
Sobel	-0.070	0.025	-2.828	0.005	-0.119; -0.022
Monte Carlo	-0.069	0.025	-2.829	0.005	-0.022; -0.116

SE, standard error; CI, confidence interval.

Table 6 shows that digitalisation negatively impacts the Supply Chain Network ($\beta = -0.095$, $p = 0.005$), diminishing its strength. In contrast, digitalisation positively influences Value Co-Creation ($\beta = 0.768$, $p < 0.001$), which is also significantly enhanced by the Supply Chain Network ($\beta = 0.742$, $p < 0.001$). All relationships are statistically significant.

Discussion

The criteria used to test whether the Supply Chain Network had a mediation effect were Delta, Sobel, and Monte Carlo tests, and the three indirect effects were measured and tested. Table 7 outlines the effect indicated by Delta and Sobel was the same (indirect effect of -0.070), while for Monte Carlo, it was slightly lower (-0.069). Thus, a partial indirect but significant effect was observed from all three criteria, and the effect was negative, thus concluding that the Supply Chain Network has a partial significant effect between Digitalisation and Value Co-Creation.

The findings lend strong support to the research by Ivanov and Dolgui (2021), which highlighted that value co-creation plays a crucial role in boosting the efficiency of SMMEs. This process not only enhances operational effectiveness but also fosters essential synergies that are vital for business success. Additionally, this setup will further enhance information flow and expedite business-client interactions. The digitalisation variable did not have a predictive effect on the supply chain network. The relationship was not statistically significant ($\beta = -0.0026468$; $p = 0.954$). The results paint a different picture compared to the insights shared by Sigala (2018), who emphasises that digitalisation plays a pivotal role in enhancing supply chain networks through collaborative efforts among stakeholders. This collaboration not only enriches the exchange of real-time information but also streamlines communication across a variety of digital platforms. In diving deeper into this relationship, regression analysis was utilised to examine the hypothesis that value co-creation acts as a mediator between digitalisation and supply chain networks. The findings are compelling, revealing a statistically significant mediating effect of value co-creation on this relationship, showcased by an impressive

F -statistic value of 31.83. This outcome holds strong statistical relevance, with a p -value of 0.030 at a 95% confidence level, indicating that value co-creation truly enhances the synergy between digitalisation and supply chain networks.

Conclusion

The research reveals that value co-creation significantly boosts the effectiveness of supply chain networks, essential for strong business performance. In contrast, digitalisation showed little predictive impact on these networks. Instead, its predictive effect emerged only when the mediation effect of value co-creation was considered. This study shines a spotlight on the critical role of value co-creation in energising the supply chain networks of SMMEs. Its findings bring a fresh perspective on how value co-creation can boost business efficiency through the power of digitalisation. What is fascinating is the way the mediated test deepens our understanding of when and how value co-creation can transform supply chain networks, ultimately driving better business outcomes. Merely having digital solutions in place is not enough; these systems must be tailored to cater to the diverse needs of various stakeholders. This is why ongoing engagement with stakeholders is essential for SMMEs. By integrating cutting-edge digital technologies, tourism SMMEs can significantly enhance value co-creation. This enhancement leads to greater transparency, improved operational efficiency, and stronger collaboration throughout the supply chain. Moreover, this digital transformation does more than just boost business competitiveness; it aligns tourism practices with global sustainability goals. By minimising resource waste, promoting responsible production and consumption, and fostering inclusive economic opportunities, SMMEs can carve out a path that truly benefits all stakeholders involved.

Acknowledgements

The authors thank Willie Chinyamurindi, head of the department (HoD), Department of Business Management, University of Fort Hare, Alice, South Africa.

Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

CRedit authorship contribution

Portia P.S. Sifolo: Conceptualisation, Data curation, Investigation, Methodology, Supervision, Validation, Writing – review & editing. Njabulo Ndlovu: Formal analysis, Methodology, Visualisation, Writing – original draft, Writing – review & editing. Vincent Maduna: Formal analysis, Software, Validation. All authors reviewed the article, contributed to the discussion of results, approved the final version for submission and publication, and take responsibility for the integrity of its findings.

Funding information

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Data availability

The data that support the findings of this study are available from the corresponding author, Njabulo Ndlovu, upon reasonable request.

Disclaimer

The views and opinions expressed in this article are those of the authors and are the product of professional research. It does not necessarily reflect the official policy or position of any affiliated institution, funder, agency, or that of the publisher. The authors are responsible for this article's results, findings, and content.

References

- Abbate, T., Codini, A.P. & Aquilani, B., 2019, 'Knowledge co-creation in open innovation digital platforms: Processes, tools and services', *Journal of Business & Industrial Marketing* 34(7), 1434–1447. <https://doi.org/10.1108/JBIM-09-2018-0276>
- Al-Omouh, K.S., De Lucas, A., & Del Val, M.T., 2023, 'The role of e-supply chain collaboration in collaborative innovation and value co-creation', *Journal of Business Research* 158, 113647. <https://doi.org/10.1016/j.jbusres.2023.113647>
- Antoldi, F. & Cerrato, D., 2020, 'Trust, control, and value creation in strategic networks of SMEs', *Sustainability* 12(5), 1873. <https://doi.org/10.3390/su12051873>
- Babu, M.M., Dey, B.L., Rahman, M., Roy, S.K., Alwi, S.F.S. & Kamal, M.M., 2020, 'Value co-creation through social innovation: A study of sustainable strategic alliance in telecommunication and financial services sectors in Bangladesh', *Industrial Marketing Management* 89, 13–27. <https://doi.org/10.1016/j.indmarman.2020.06.003>
- Bleady, A., Ali, A.H. & Ibrahim, S.B., 2018, 'Dynamic capabilities theory: Pinning down a shifting concept', *Academy of Accounting and Financial Studies Journal* 22(2), 1–16.
- Castillo, A., Rescalvo-Martin, E. & Karatepe, O.M., 2025, 'How is common method bias addressed using partial least squares structural equation modeling in hospitality and tourism research?', *Tourism Review* 81(1), 1–25. <https://doi.org/10.1108/TR-07-2025-0762>
- Chamboko-Mpotaringa, M., 2025, 'Tourism marketers' perceptions on digital marketing adoption: Extending the technology acceptance model', *African Journal of Hospitality, Tourism and Leisure* 14(2), 301–308. <https://doi.org/10.46222/ajhtl.19770720.610>
- Christopher, M., 2016, *Logistics & supply chain management*, 5th edn., Pearson Education Limited, Harlow, UK.
- Fatoki, O. & Garwe, D., 2010, 'Obstacles to the growth of new SMEs in South Africa: A principal component analysis approach', *African Journal of Business Management* 4(5), 729–738. <https://doi.org/10.5897/AJBOM09.529>
- Grönroos, C. & Voima, P., 2013, 'Critical service logic: Making sense of value creation and co-creation', *Journal of the Academy of Marketing Science* 41(2), 133–150. <https://doi.org/10.1007/s11747-012-0308-3>
- Grunwald, G., 2022, 'Sustainability co-creation in digitalised global value chains', *Strategic Change* 31(1), 19–29. <https://doi.org/10.1002/jsc.2477>
- Gunasekaran, A., Subramanian, N. & Papadopoulos, T., 2017, 'Information technology for competitive advantage in small and medium enterprises: A review', *International Journal of Production Research* 55(21), 6374–6394. <https://doi.org/10.1080/00207543.2017.1325152>
- Hollebeek, L.D., Srivastava, R.K. & Chen, T., 2019, 'SD logic-informed customer engagement: Integrative framework, revised fundamental propositions, and application to CRM', *Journal of the Academy of Marketing Science* 47, 161–185. <https://doi.org/10.1007/s11747-016-0494-5>
- Hoyer, W.D., Chandy, R., Dorotic, M., Krafft, M. & Singh, S.S., 2010, 'Consumer cocreation in new product development', *Journal of Service Research* 13(3), 283–296. <https://doi.org/10.1177/1094670510375604>
- Huser, P., 2024, *What are the advantages and challenges of digitalisation in the supply chain?*, viewed 30 July 2024, from <https://www.manutan.com/blog/en/digital/what-are-the-advantages-and-challenges-of-digitalisation-in-the-supply-chain>.
- Ivanov, D. & Dolgui, A., 2021, 'A digital supply chain twin for managing the disruption risks and resilience in the era of Industry 4.0', *Production Planning & Control* 32(9), 775–788. <https://doi.org/10.1080/09537287.2020.1768450>
- Jaworski, B.J. & Kohli, A.K., 1993, 'Market orientation: Antecedents and consequences', *Journal of Marketing* 57(3), 53–70. <https://doi.org/10.1177/002224299305700304>
- Kraus, S., Durst, S., Ferreira, J.J.M. & Veiga, P.M., 2022, 'Digital transformation in business and management research: An overview of the current status quo', *International Journal of Information Management* 63, 102466. <https://doi.org/10.1016/j.ijinfomgt.2021.102466>
- Mastercard, 2023, *Mastercard SME Confidence Index: 80% of SMEs in South Africa project similar or increased revenue in 2023*, viewed 02 February 2024, from <https://africa-business.net/mastercard-sme-confidence-index-80-of-smes-in-south-africa-project-similar-or-increased-revenue-in-2023/>.
- Mathibe, M.S., Chinyamurindi, W.T. & Hove-Sibanda, P., 2023, 'Value co-creation as a mediator between strategic planning and social enterprise performance', *Social Enterprise Journal* 19(1), 23–39. <https://doi.org/10.1108/SEJ-08-2021-0062>
- Mhlongo, T. & Daya, P., 2023, 'Challenges faced by small, medium and micro enterprises in Gauteng: A case for entrepreneurial leadership as an essential tool for success', *The Southern African Journal of Entrepreneurship and Small Enterprise Management* 15(1), 591.
- Mosweunyane, L., Rambe, P. & Dzansi, D., 2019, 'Use of social media in Free State tourism SMMEs to widen business networks for competitiveness', *South African Journal of Economic and Management Sciences* 22(1), a2780. <https://doi.org/10.4102/sajems.v22i1.2780>
- Mukonyo, A. & Pooe, D., 2025, 'Embedding SMEs in supply chains: Key considerations for business incubators', *Acta Commercii-Independent Research Journal in the Management Sciences* 25(1), 1445.
- Narver, J.C. & Slater, S.F., 1990, 'The effect of a market orientation on business profitability', *Journal of Marketing* 54(4), 20–35. <https://doi.org/10.1177/002224299005400403>.
- National Planning Commission, 2012, *National Development Plan 2030: Our future – Make it work*, The Presidency, Republic of South Africa.
- Ndabeni-Abrahams, S.T., 2024, 'Determinants of a digital work system for financing SMMEs in South Africa', Master's thesis, University of the Witwatersrand, Johannesburg.
- Nenonen, S. & Storbacka, K., 2010, 'Enterprise model design: Conceptualising networked value co-creation', *International Journal of Quality and Service Sciences* 2(1), 43–59.
- Ngibe, M. & Lekhanya, L.M., 2019, 'Innovative leadership in South African manufacturing small and medium enterprises within KwaZulu-Natal', *Journal of Contemporary Management* 16(2), 300–330.
- Oliveira, T. & Martins, M.F., 2011, 'Literature review of information technology adoption models at firm level', *The Electronic Journal Information Systems Evaluation* 14(1), 110–121. <https://doi.org/10.1016/j.ijinfomgt.2008.05.005>
- Pallant, J., 2010, *SPSS Survival Manual: A step-by-step guide to data analysis using SPSS for Windows*, 4th edn., Open University Press, Maidenhead, UK.
- Prahalad, C.K. & Ramaswamy, V., 2004, 'Co-creation experiences: The next practice in value creation', *Journal of Interactive Marketing* 18(3), 5–14. <https://doi.org/10.1002/dir.20015>
- Ramsuraj, T., 2023, 'Assessing the role of the entrepreneurship industry and SMEs in economic growth in South Africa', *International Journal of Research in Enterprise and Social Science* (2147-4478) 12(7), 283–291.
- Restrepo-Morales, J.A., Ararat-Herrera, J.A. & López-Cadavid, D.A., 2024, 'Breaking the digitalization barrier for SMEs: A fuzzy logic approach to overcoming challenges in business transformation', *Journal of Innovation and Entrepreneurship* 13, 84. <https://doi.org/10.1186/s13731024-00429-w>
- Rogers, E.M., 1962, *Diffusion of innovations*, Free Press of Glencoe, Glencoe, IL.
- Rogers, E.M., 2003, *Diffusion of innovations*, 5th edn., Free Press, New York, NY.
- Romero, D. & Molina, A., 2009, 'Value co-creation and co-innovation: Linking networked organisations and customer communities', in *Leveraging knowledge for innovation in collaborative networks: 10th IFIP WG 5.5 Working Conference on Virtual Enterprises, PRO-VE 2009*, Thessaloniki, Greece, October 7–9, 2009, Proceedings 10, pp. 401–412, Springer Berlin Heidelberg.
- Royo-Vela, M. & Velasquez Serrano, M., 2021, 'Value co-creation process and measurement in 4.0 SMEs: An exploratory research in a B2B marketing innovation context', *Administrative Sciences* 11(1), 20. <https://doi.org/10.3390/admsci11010020>
- Rungani, E. & Potgieter, M., 2018, 'The impact of financial support on the success of small, medium and micro enterprises in the Eastern Cape province', *Acta Commercii – Independent Research Journal in the Management Sciences* 18(1), 1–12.
- Shava, E. & Maramura, T.C., 2021, 'National Development Plan as an entrepreneurial mechanism for rural economic development in South Africa', *Journal of Economics and Behavioral Studies* 9(2(J)), 15–26. [https://doi.org/10.22610/jebs.v9i2\(J\).1664](https://doi.org/10.22610/jebs.v9i2(J).1664)
- Sigala, M., 2018, 'New technologies in tourism: From multi-disciplinary to anti-disciplinary advances and trajectories', *Tourism Management Perspectives* 25, 151–155.
- Teece, D.J., 2007, 'Explicating dynamic capabilities: The nature and micro foundations of (sustainable) enterprise performance', *Strategic Management Journal* 28(13), 1319–1350. <https://doi.org/10.1002/smj.640>
- Teece, D.J., Peteraf, M. & Leih, S., 2016, 'Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy', *California Management Review* 58(4), 13–35. <https://doi.org/10.1525/cmr.2016.58.4.13>
- Teece, D.J., Pisano, G. & Shuen, A., 1997, 'Dynamic capabilities and strategic management', *Strategic Management Journal* 18(7), 509–533.
- Vargo, S.L. & Lusch, R.F., 2008, 'Service-dominant logic: Continuing the evolution', *Journal of the Academy of Marketing Science* 36(1), 1–10. <https://doi.org/10.1007/s11747-007-0069-6>
- Warner, M. & Wäger, P., 2019, 'Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal', *Long Range Planning* 52(3), 326–349. <https://doi.org/10.1016/j.lrp.2018.12.001>
- Zhang, T., Lu, C., Torres, E. & Chen, P.J., 2018, 'Engaging customers in value co-creation or co-destruction online', *Journal of Services Marketing* 32(1), 57–69.