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Supplier involvement as the link between information sharing, e-procurement and small and medium enterprises performance in South Africa

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Orientation: Supplier involvement has been found to influence firm performance with information sharing and e-procurement identified as aspects that are fundamental to its efficacy. This dimension of supply chain interactions has however received little research attention – which is alarming, given how important these variables are in the success of buyer–supplier relationships.

Research purpose: The purpose of the study was to explore the role of supplier involvement in the relationship between information sharing, e-procurement and firm performance in the small and medium enterprise (SMEs) sector of South Africa – a section that needs intervention.

Motivation for the study: Supplier involvement is a dimension of business that can contribute towards increased performance of a firm. It has become a strategic imperative in the challenging SME sector of South Africa. Furthermore, information sharing and e-procurement can allow supplier involvement to be more effective. However, without empirical research, the potential for a practical contribution to the sector is not possible. Herein lies the motivation for the present study.

Research design, approach and method: This is a quantitative study, and a correlational research design was used. A sample size of 120 SMEs was acquired and data was collected through the survey method by means of simple random sampling.

Main findings: The results indicated support for the relationship between information sharing and supplier involvement and that of information sharing and e-procurement.

Practical/managerial implications: The results suggest that information sharing is key in ensuring that supplier involvement and e-procurement within the SME sector is effective.

Contribution/value-add: The study expands insight into the role of supplier involvement within the SME sector.

Keywords: supplier involvement; information-sharing; e-procurement; firm performance; small and medium enterprises; South Africa.

Introduction

Suppliers are regarded as key contributors to the growth and development of the small and medium enterprise (SME) sector. They have gradually transitioned from being perceived as contracted supportive roles to a position that identifies them as significant for the overall success of the sector. For this reason, their performance has become one of the key research areas in the field of business management and supply chain management, respectively (Liu et al. 2021; Van der Westhuizen & Ntshingila 2020).

Supplier firm performance has been found to be influenced by supplier involvement (Oh & In 2023). Supplier involvement adds value by enabling suppliers to engage with buyers and encourage collaboration which is essential for SMEs who want to succeed in the South African economy, which is regarded as a hostile business environment (Nanziri & Wamalwa 2021). However, it is important to acknowledge the importance of information sharing in terms of supplier involvement, with a view to generate value that contributes to an increase in firm performance. Information sharing stimulates collaboration and supports the supplier's aim of fulfilling its contractual obligations effectively. Similarly, the use of electronic procurement

(hereafter referred as e-procurement) towards improving supplier involvement is essential. E-procurement is a technological enabler that is reinforced by information sharing; it can strengthen supplier involvement by providing a number of benefits that come with modern procurement. The ultimate goal is to improve firm performance on the basis of effective supplier involvement championed by information sharing and e-procurement. If effected, the result can elevate the supplier as a key asset that can be leveraged by the buying firm.

However, despite this theoretical potential and the increasing attention paid to supplier efficiency, little is understood about the extent to which these supply chain interactions ultimately influence a firm's performance. Empirical studies have reported inconsistent results regarding supplier involvement (e.g. Flankegård, Granlund & Johansson 2021; Suurmond, Wynstra & Dul 2020), and limited studies have examined whether its efficacy is contingent upon digital coordination mechanisms such as information sharing and e-procurement, particularly in the context of South African SMEs. This is unsettling, especially given that performance volatility in South Africa is common (Nanziri & Wamalwa 2021) and also given that firm performance, encompassing operational and growth metrics, is emphasised as a strategic imperative.

This study therefore seeks to bridge the gap in our knowledge in this regard by aligning the concept of supplier involvement with information sharing, e-procurement and firm performance, using a complementarity theoretical lens. The study argues that information sharing and e-procurement influence firm performance primarily through the mediating mechanism of supplier involvement. In other words, the study purports that it is not the isolated effect of these relational and technological tools that matter, but how they jointly enable deeper supplier integration that drives performance. To validate this contention, three empirical objectives have been formulated to:

- Investigate the influence of information sharing and e-procurement on supplier involvement.
- Examine the mediating role of supplier involvement in the relationship between information sharing, e-procurement and firm performance.
- Analyse the relationship between supplier involvement and firm performance.

Clarifying these relationships can inform both theory and managerial practice in performance enhancement.

Literature review

Theoretical grounding

Complementarity theory

The concept of 'complementarity' was initially introduced by Edgeworth (1881), who defined activities as complementary, 'if doing (more of) any one of them increases the returns to doing (more of) the others'. The concept also identifies resources as co-existing and as collectively helping to achieve performance enhancement (Man Tang et al. 2022). According to Zhao et al. (2023), the synergistic effect derived from applying practices jointly can give rise to overall performance that is more significant than the sum of outputs of each of its parts. The literature further highlights the fact that complementarity is supplementary on the one hand and inciting on the other (Liao & Li 2018). The concept of supplementarity denotes that one variable accounts for the deficiencies of the other (Deeg 2007), while it is also grounded on the logic of synergy, which advocates that the presence of one variable spurs that of another. This mutually influential relationship allows an entity to benefit from the mutually reinforcing effects (Deeg 2007).

The notion of complementarity between practices has been widely accepted in management literature (Liao, Chen & Dong 2022; Man Tang et al. 2022). In addition, the concept of supplier involvement is also sustained in the literature. Wang, Modi and Schoenherr (2021) define supplier involvement as the extent to which practices are administered together with the supplier. This collaboration echoes the complementarity theory, which advocates that activities and/or practices are complementary and tend to be applied collectively. However, research highlights the fact that supplier involvement is contingent upon information sharing in order to fulfil its goals (Hwang et al. 2019), while e-procurement is a contemporary practice that has been introduced to make the supplier's involvement more technically efficient (Mavidis & Folinas 2022). Together, these practices complement supplier involvement, which in turn influences a firm's performance. This hypothesis is in accordance with the complementarity theory, which contends that activities and/or practices are symbiotic and increase performance in unison (Man Tang et al. 2022).

Review of constructs

Information sharing

The level of success achieved in a relationship is largely moderated by sharing 'knowledge' (Kang, Wang & Cao 2024). The term 'knowledge' is often used interchangeably with the term 'information', and it is understood to relate to contexts pertaining to supply chain management. It is significant for measuring intrinsic value (Wan, Huang & Holtskog 2020). Information sharing refers to the essence of a buyer–supplier relationship and is a key requirement for developing its foundation. The concept incorporates two major aspects, namely communicating information to others and accepting information that has been transferred by the information giver (Moshood, Rotimi & Rotimi 2022). Having access to pertinent information helps one to understand what is actually happening, and how this might develop so that decisions and actions taken are right for the situation. Research, however, cautions that information sharing should be understood and examined appropriately, as the construct is characterised by diverse concepts such as information exchange, information transfer, information diffusion and

information dissemination – therefore suggesting that information sharing cannot be understood as a generic concept of giving and receiving information (Savolainen 2017). For example, Hersberger, Rioux and Cruitt (2007) argue that information exchange entails a mutual, multidirectional information exchange, while information sharing represents a single, unidirectional activity. In light of this, and with reference to the buyer–supplier relationship that forms the context of this study, this study defines information sharing according to Kembro and Naslund (2014) as, 'the inter-organisational sharing of data, information and/or knowledge in supply chains'.

Supplier involvement

Research into supplier involvement was originally initiated by the observation that Japanese automotives perform better than their Western counterparts in time-to-market and development cost in terms of supplier participation in new product development (Iansiti & Clark 1994). Subsequent research has yielded additional literature and insights on supplier involvement (e.g. Oh & In 2023). Moreover, several terms have been used in defining the concept, including integration, coordination, cooperation, collaboration and interaction (Wlazlak et al. 2018). However, involvement is the term that has emerged as dominant in the literature (e.g. Ayala et al. 2021; Suurmond et al. 2020; Wang et al. 2021). This term has been used in a number of studies to address the interface between buyers and suppliers (Flankegård et al. 2021). A further review of the literature has also brought to light the fact that there are different types of supplier involvement which authors describe differently (e.g. Cheng & Krumwiede 2017; Wieteska 2020). This classification helps to describe the degree of involvement, which is the level of responsibility assigned to the supplier and the associated risks. This study defines supplier involvement, in accordance with Wang et al. (2021), as the degree to which practices are performed together with the supplier.

E-procurement

E-procurement has become appreciated by businesses, industries and governments. It is an instrumental tool that is used to increase effectiveness and efficiency and also to improve the service quality of its adopters (Emery, Mélon & Spruk 2023). This method of procurement became recognised only following the inception of the Internet, and it is now identified as a tool that drives procurement reform by means of this e-commerce technology, including the Internet, Extensible Markup Language (XML) and, in some instances, key civic infrastructure (Vaidya & Campbell 2016). Its adoption is on the rise, despite resistance from some organisations in the past (Singh & Chan 2022). While the advantages of adopting e-procurement (e.g. increased efficiency in procurement processes, reduction in inventory costs and decreased order fulfilment time – see Bag et al. 2020; Nawi et al. 2016) have been expressed and acknowledged, scholars like Vaidya, Sajeev and Callender (2006) hold that its benefits had been exaggerated, perhaps because challenges in technology, infrastructure and legislation, resource constraints and organisational and management characteristics remain ever-present. However, a standard report by the Aberdeen Group reinforced the understanding that e-procurement was 'here to stay' and can do 'more with less' (Aberdeen 2008). Such conceptions have been criticised by the likes of Nawi et al. (2016), who argue that it is common for larger organisations to support such systems given that they are well capacitated and would benefit optimally from such systems because of their large volume of trade and numerous transactions. Thus, the significance of e-procurement is still subject to scrutiny.

The concept of e-procurement is a function of the e-commerce supply chain (Taghipour, Murat & Huang 2021). It has been acknowledged as strategically significant in inter-organisational relationships and as an incentive for some e-commerce supply chain practices (Singh & Chan 2022). At the minimum, there are three different ways in which the concept can be understood by academics and practitioners. The first is to reflect on the description of e-procurement, which explains its key characteristics (Davila, Gupta & Palmer 2003). A second approach is to take note of the various technologies used to explain the concept (De Boer, Harink & Heijboer 2002). The third approach is to be cognisant of the concept 'public e-procurement', which also has different levels that exist in its development (Mohungoo, Brown & Kabanda 2020). This study defines the concept of e-procurement as the 'electronic integration' and administration of all procurement-related activities between the buyer and the supplier (Chen et al. 2021).

Firm performance

A firm's performance is highly likely to be influenced by how effectively and efficiently actions are implemented to reinforce one another. Despite financial reforms, emerging markets, developments in communication and information technology and changing customer behaviour, organisational practices affect firms' performance, and also determine performance differences within the industry. Organisations therefore need to be decisive on how these aspects of the business should be applied, because this determines their efficiency. In the literature of strategic management, firm performance is one of the most relevant constructs. However, research into the construct is not without criticism. In fact, as early as the 1990s, firm performance has been described as 'generally problematic' with 'no consistent approach, that clear definitions are lacking and that identical indicators represent alternative concepts simultaneously' (Shenhav, Shrum & Alon 1994:771). More than two decades later, the construct was once again criticised, with Hult et al. (2008) and Bouland-van Dam et al. (2021) pointing to its conceptual and measurement issues, respectively. Miller, Washburn and Glick (2013), in their turn, documented three approaches towards conceptualising performance. Firstly, the 'latent multidimensional approach' acknowledges performance in both theoretical and empirical studies. The main argument is that the different dimensions of performance are interrelated but inadequately demonstrate overall success. Secondly, the

'separate constructs approach' necessitates using the exact properties of performance when developing theory and analysing empirical results. For example, the argument may be focused on improvement, while the increase in purchases is measured as the empirical construct. Thirdly, the 'aggregate construct approach' involves using a definite composite from different performance constructs consistently. Collectively, these constructs measure overall firm performance in general but should not be regarded as correlated. This study conceptualises firm performance as a unidimensional construct and defines it as the aptitude and ability of an organisation to efficiently use the available resources to realise accomplishments coherent with the set objectives of the organisation (Nguyen & Dao 2023).

Empirical review and hypotheses development

Information sharing and E-procurement

Information sharing has been conceptualised as an independent variable in previous studies (Nabila et al. 2022). This implies that as a variable, it has the potential to influence another variable in a meaningful way. This insight is especially important for processes like e-procurement that are imposed and expedited in businesses to make them more efficient (Emery et al. 2023). E-procurement is a function that ensures that the necessary processes are performed electronically without manual intervention – the latter has been found to be costly and delaying the procurement process (Osei-Tutu et al. 2019). The correlation between information sharing and e-procurement is evident in the sense that during the procurement process, information is communicated between the buyer and the supplier (Osei-Tutu et al. 2019). However, capabilities such as the Internet and Information and Communication Technology are required to run these and to facilitate the sharing of information during the e-procurement process. In light of this, the present study therefore proposes that there is a relationship between information sharing and e-procurement. In particular, it is hypothesised that:

H1: Information sharing has a positive relationship with e-procurement in the SME sector.

Information sharing and supplier involvement

Information sharing has also been found to play a key role in supplier involvement (Zhang, Zou & Wang 2023). This insight is also propounded by Petersen, Handfield and Ragats (2003), who, drawing from 17 case studies, found that information sharing improves supplier involvement by assisting the firm in meeting its objectives and realising better outcomes. Kankam et al. (2023) further emphasise inter-organisational information processing in achieving project or goal fulfilment. However, Zhang, Wang and Gao (2017) argue that the information shared should be clear and sufficient. This is understandable, given that shared information that is meaningless and inadequate does not have value. Against this backdrop, this study therefore proposes that there is a relationship between information sharing and supplier involvement. In particular, it hypothesises that:

H2: Information sharing has a positive relationship with supplier involvement in the SME sector.

E-procurement and supplier involvement

The relationship between e-procurement and supplier involvement can be acknowledged in this study's adopted definition. Mavidis and Folinas (2022) add that e-procurement supports the integration and coordination with the supplier. Moreover, commitment has been identified as significant in the influence of e-procurement by Nawi et al. (2016). These authors highlight that this is especially true among SMEs. Therefore, if there is a lack of commitment, it becomes difficult for e-procurement to contribute to supplier involvement in a meaningful way. In light of this and with reference to relevant literature, this study proposes that there is a relationship between e-procurement and supplier involvement accordingly. In particular, it is hypothesised that:

H3: E-procurement has a positive relationship with supplier involvement in the SME sector.

Supplier involvement and firm performance

Firm performance is a construct that is often analysed as the final dependent variable (Raj et al. 2023; Tajvidi & Karami 2021). This approach has been adopted in this study, and the construct is hypothesised to be influenced by supplier involvement. The correlation between the constructs has been acknowledged in the literature. For example, Delgado-Verde and Diez-Vial (2024) highlight that a dedicated effort by suppliers guarantees quality improvements, while Bahemia, Squire and Cousins (2017) report supplier involvement as contributing to improvements in innovation capabilities, increased resource flexibility and a reduction in risks, respectively. However, supplier involvement has been largely acknowledged as an interconnected process (Wang et al. 2021) and an ongoing integration of resources (Lusch 2011). This implies that supplier involvement requires equal commitment from the buyer in order to influence firm performance in a significant way. Therefore, in light of this and the literature, this study proposes that there is a relationship between supplier involvement and firm performance. In particular, it hypothesises that:

H4a: Supplier involvement has a positive relationship with firm performance in the SME sector.

Information sharing, supplier involvement and firm performance

Supplier involvement is an interdisciplinary phenomenon that has been studied in the field of supply chain management (Suurmond et al. 2020; Wang et al. 2021). It is a construct that can explain the significance of information sharing, illustrating that supplier involvement can only meet its mandate of supply (e.g. manufacturing or transforming of raw materials and their delivery as finished goods) effectively through information sharing with the buyer (Mathu 2019). This implies that the value of

supplier involvement is influenced by information sharing, a notion that is further supported by Narkhede et al. (2013) as generating performance improvements for the firm. In light of this, the present study proposes that supplier involvement mediates the relationship between information sharing and firm performance. In particular, it hypothesised that:

H4b: Supplier involvement mediates the relationship between information sharing and firm performance.

E-procurement, supplier involvement and firm performance

Firms have been acknowledging the significance of information technology in terms of realising improved performance (Sánchez-Rodríguez, Martínez-Lorente & Hemsworth 2020). It is likely that this acknowledgement has also contributed to the increased study of e-procurement (Bag et al. 2020; Emery et al. 2023). In the process of working towards supplier involvement, e-procurement facilitates material cost savings and productivity – which, in turn, stimulate improvements in key performance indicators such as quality, responsiveness and risk management (Högel et al. 2018). This insight suggests that the value of e-procurement on firm performance can also be realised and appreciated in terms of the impact it has on supplier involvement. For this reason, this study therefore proposes that supplier involvement mediates the relationship between e-procurement and firm performance. In particular, it is hypothesised that:

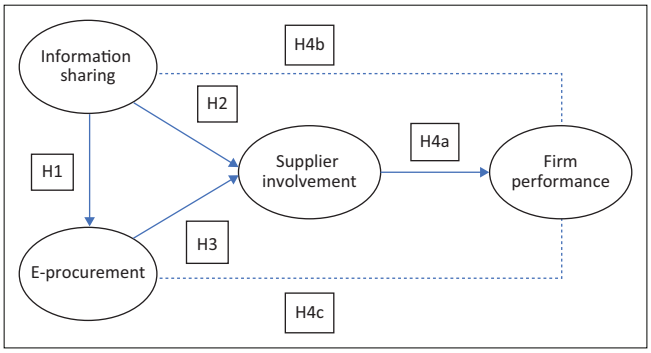
H4c: Supplier involvement mediates the relationship between e-procurement and firm performance.

Conceptual model

Drawing from the complementarity theory and insight gleaned from the relevant literature, a conceptual model for this study has been developed. The model is formative, with six hypotheses that have been developed. Information sharing and e-procurement are conceptualised to predict supplier involvement, which in turn are hypothesised to influence firm performance. Furthermore, supplier involvement is operationalised as a mediator between information sharing, e-procurement and firm performance. Figure 1 illustrates the conceptual model.

Research methods and design

Siddiqui (2013:285) recommends 15 cases per observed variable for structural equation modelling. This was the formula adopted to extract this study's potential sample size of 240. Simple random sampling was applied when selecting participants (SMEs) from the Gauteng business registry database and local telephone directories. This technique ensured that there is an appropriate estimation of the population and guided against sampling bias (Levy & Lemeshow 2013). Eligibility required the SME to have operated for at least 3 years and employed between 10 and 200 workers. Managers of the profiled SMEs (see Table 1) were the targeted respondents. A survey using a self-administered structured questionnaire with closed-ended questions was the method for collecting data. Four items each were adopted from Green, Whitten and Inman (2012) and Chang, Tsai and Hsu (2013) to measure firm performance, information sharing and e-procurement, respectively, while supplier involvement was measured on a four-item scale adopted from Cheng and Krumwiede (2018). All items were adapted to complement the study's context and purpose and were framed in a five-point Likert scale anchored by 1 = Strongly Disagree to 5 = Strongly Agree.



H, hypothesis.
FIGURE 1: Conceptual model.

TABLE 1: Company profile data (N = 120).

Company profile	*n*	%
Number of Employees in the profiled SMEs		
10–200	22	18.3
200–249	36	30.0
250–350	31	25.8
351–2000	31	25.8
Number of years the profiled SMEs have been in operation		
3–5	45	37.5
5–10	59	49.2
≥ 11	16	13.3
Regions of the profiled SMEs		
Tshwane	49	40.8
Ekurhuleni	55	45.8
Johannesburg	16	13.3
Profiled SMEs' forms of business ownership		
Sole proprietor	8	6.7
Partnership	51	42.5
Close corporation	28	23.3
Private company	29	24.2
Public company	4	3.3
The industries of profiled SMEs		
Manufacturing	24	20.0
Trade	43	35.8
Mining	5	4.2
Electricity	7	5.8
Construction	34	28.3
Other	7	5.8
Annual turnover of profiled SMEs (in million)		
1–9	25	20.8
10–25	61	50.8
26–50	24	20.0
≥ 51	10	1.0

SME, small and medium enterprise.

Ethical considerations

Ethical clearance was granted by the Division of Research and Internalisation at Walter Sisulu University on 03 February 2025. The ethical clearance number is 06/03/06/2025/PG. Consent was requested from participants before conducting this study, and no personal and/or company details were requested throughout the survey. This ensured the anonymity of respondents.

Data analysis and results

Descriptive statistics

Of the 240 self-administered questionnaires distributed, 182 were returned (representing a response rate of 76%) with 120 questionnaires confirmed usable. These 120 usable questionnaires represented the actual sample size of the study. Key descriptive statistics indicate that of the 120 SMEs, 49% have been operating for more than five years but less than 10 years, and that 46% are operating in the Ekurhuleni Metropolitan City. Furthermore, most of the SMEs (36%) appeared to be in the trade industry, with 43% having adopted partnership as a form of business ownership. A full description of company profile data can be seen in Table 1.

Partial least squares-structural equation modelling

Although SmartPLS statistical software performs all assessments simultaneously, it is composed of two key processes, namely measurement model assessment and structural modelling (Anderson & Gerbing 1988). The results from measurement model assessment (also here referred to as scale accuracy analysis) are presented in Table 2.

Reliability

Cronbach alpha tests were run to ascertain the reliability of measurement scales. The results presented alpha coefficients that varied between 0.828 and 0.918, which signified high reliability in light of the ≥ 0.7 threshold recommended by Green and Salkind (2016). Tests for composite reliability (CR) were further performed to verify reliability (Haji-Othman & Yusuff 2022). The results revealed CR indices that ranged between 0.717 and 0.942. According to Chinomona (2011), scores greater than 0.6 are indicative of internal consistency.

Validity

Factor loadings (or standardised regression weights) were observed to determine convergent validity (Cheung et al. 2024; Sarstedt et al. 2014). Notwithstanding FP1, measurement items appeared to load strongly on their common constructs as they were greater than 0.5. This implies that items measured at least 50% of their respective constructs (see the seminal work of Anderson & Gerbing 1988). Tests for the average variance extracted (AVE) indicated that all constructs except firm performance were represented well by their measurement items, because they exhibited a variance extracted estimate that is greater than 0.5, respectively (Sarstedt et al. 2014). To further substantiate validity, discriminant validity was examined. The results are presented in Table 3.

The square root of each AVE value was determined and a higher index when compared against correlation coefficients signifies discriminant validity (Yusoff et al. 2020). The results presented in Table 3 indicate and substantiate the presence of discriminant validity.

Structural model testing

As a standard procedure, explanatory power assessment, predictive accuracy assessment and path analysis were undertaken when testing the structural model (Hair et al. 2019). The coefficient of determination (R^2) was measured to ascertain explanatory power. The results indicate that e-procurement (0.583) and supplier involvement (0.555) carry moderate explanatory power (+0.50) while firm performance (0.104) exhibits a weak one (Johannesson, Ohlson & Zhai 2024). This implies that the conceptualisation and measure of firm performance in this context need to be revised, given that it fails to represent the research model well. Figure 2 shows the structural model on which R^2 coefficients are presented.

TABLE 2: Scale accuracy analysis.

Research constructs	Cronbach's test α value	CR	AVE	Factor loadings
Information sharing				
IS1	0.828	0.887	0.664	0.705
IS2	-	-	-	0.855
IS3	-	-	-	0.892
IS4	-	-	-	0.794
E-procurement				
EP1	0.857	0.891	0.678	0.878
EP2	-	-	-	0.842
EP3	-	-	-	0.941
EP4	-	-	-	0.589
Supplier involvement				
SI1	0.918	0.942	0.803	0.876
SI2	-	-	-	0.943
SI3	-	-	-	0.881
SI4	-	-	-	0.883
Firm performance				
FP1	0.839	0.717	0.435	0.207
FP2	-	-	-	0.509
FP3	-	-	-	0.962
FP4	-	-	-	0.715

IS, information sharing; EP, E-procurement; SI, supplier involvement; FP, firm performance; CR, composite reliability; AVE, average variance extracted.

TABLE 3: Discriminant validity.

Research constructs	IS	EP	SI	FP
IS	**0.815**	-	-	-
EP	0.764	**0.823**	-	-
SI	0.744	0.551	**0.896**	-
FP	0.261	0.441	0.323	**0.659**

Bold values represent square roots of all four construct's AVE values.
IS, information sharing; EP, e-procurement; SI, supplier involvement; FP, firm performance.

The blindfolding-based cross-validated redundancy measure (Q^2) was performed to determine predictive accuracy. The results are presented in Table 4.

Firm performance exhibited a model parameter that is without predictive accuracy, while e-procurement and supplier involvement displayed medium to large predictive relevance, because they exhibited model parameters that are between 0.025 and 0.50 (Hair et al. 2019). The results indicate again that the operationalisation of firm performance in this study's context needs to be revised. Although this is yet another indication of the construct's conceptual and measurement issues (see Bouland-van Dam et al. 2021; Hult et al. 2008), e-procurement and supplier involvement are significant constructs to measure within this context and can be applied in expanding and validating the complementarity theory. Following the test for predictive accuracy, path analysis was conducted. This involved examining the direct and indirect relationships between latent constructs (Ruan et al. 2024). The results from this procedure are presented in Table 5.

T-statistics were compared against a threshold of ≥ 1.96, while *p*-value tests were run at a ≤ 0.05 significance level (i.e. 1% – 95%) to avoid false positives (Kock 2016; Winship & Zhuo 2020). Two of the direct relationships, namely H1 and H2, exhibited positive and significant correlations, while H3 and H4 were rejected. It is important to note that H3 demonstrated a statistically insignificant relationship, while H4a was positive and yet insignificant. Mediation was also tested using SmartPLS bootstrapping with 5000 samples to assess the indirect effects of information sharing and e-procurement on firm performance via supplier involvement. As shown in Table 5, the indirect effect of information sharing and e-procurement on firm performance via supplier involvement was not statistically significant (H4b: β = −0.250, p = 0.284; H4c β = −0.013, p = 0.737), indicating no mediation.

Discussion of results and implications

The results indicated that there is a positive and significant relationship between information sharing and e-procurement and likewise between information sharing and supplier involvement. These results validate the developed hypotheses and corroborate the relationships as highlighted in the literature by the likes of Osei-Tutu et al. (2019) and Mavidis and Folinas (2022). The results further suggest that information sharing is key in ensuring that e-procurement and supplier involvement within the SME sector are effective. E-procurement facilitates e-commerce and functions on the basis of information shared. Therefore, information sharing

TABLE 4: Predictive accuracy using blindfolding.

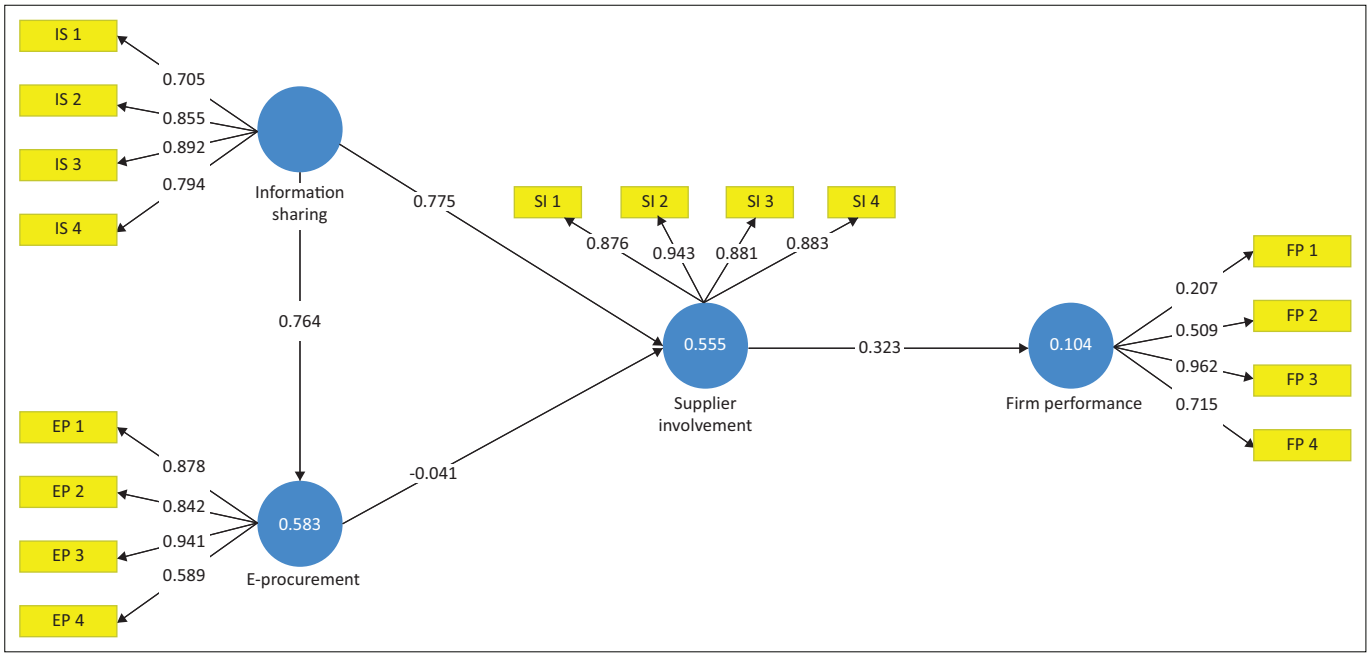
Research constructs	SSO	SSE	Q^2 (= 1–SSE/SSO)
IS	480.000	480.000	-
EP	480.000	322.208	0.329
SI	480.000	271.651	0.434
FP	480.000	486.550	-0.014

IS, information sharing; EP, e-procurement; SI, supplier involvement; FP, firm performance; SSO, sum of squares of observations; SSE, sum of squared errors.

TABLE 5: Path analysis results.

Proposed hypothesis relationship	Hypothesis	Beta co-efficient (B)	T statistics	P	Rejected/ supported
IS → EP	H1	0.764	21.598	0.000	Supported
IS → SI	H2	0.775	9.467	0.000	Supported
EP → SI	H3	-0.041	0.400	0.689	Rejected
SI → FP	H4a	0.323	1.099	0.272	Rejected
IS → SI → FP	H4b	-0.250	1.071	0.284	Rejected
EP → SI → FP	H4c	-0.013	0.336	0.737	Rejected

IS, information sharing; EP, E-procurement; SI, supplier involvement; FP, firm performance.



IS, information sharing; EP, E-procurement; SI, supplier involvement; FP, firm performance.

FIGURE 2: Structural model.

is fundamental to the success of e-procurement. The inter-organisational sharing of data, information and/or knowledge between SMEs will expedite the value in e-procurement (e.g. a reduction in inventory costs and/or decreased order fulfilment time) and support it in enabling modern business processes that are seamless and automated. In the same vein, supplier involvement is influenced by information sharing. As supplier involvement implies a collective effort with the buyer, information sharing is salient; the results highlight that its influence is positive and significant, similar to those of Petersen et al. (2003). This level of correlation is especially important given the role of supplier involvement in building a constructive relationship with the buyer. Supplier involvement must therefore be effected by sound information sharing, which ultimately stimulates growth and resilience within the SME sector.

The results, however, also suggest that the proposed relationship between e-procurement and supplier involvement is rejected. For the most part, a direct and positive correlation between the constructs has not been documented in empirical studies. For example, Mavidis and Folinas (2022) and Nawi et al. (2016) found that information sharing and commitment are key mediators that require further study. It is, however, important to note that their influence has been identified as statistically insignificant. This suggests that mediation should certainly be considered in the relationship between e-procurement and supplier involvement, as also indicated in the literature. This study, however, recommends that supplier involvement is effected in a way that is cognisant of the pragmatic benefits (e.g. facilitating e-commerce) that e-procurement provides.

The mediating role of supplier involvement in the relationship between information sharing, e-procurement and firm performance was found to be insignificant. This result implies that supplier involvement cannot be expected to improve the relationship between information sharing, e-procurement and firm performance in a meaningful way. It is likely that this function has not been acknowledged and accepted as vital in the interface between information sharing, e-procurement and firm performance within the SME sector. The result further contradicts prior assumptions such as those of Högel et al. (2018) and Mathu (2019) and suggests the need for context-sensitive strategies in SME ecosystems.

Supplier involvement was, however, found to have a positive yet insignificant influence on firm performance. This result contrasts with studies such as that of Bahemia et al. (2017) who found significant performance outcomes in this regard. One explanation could be the informal structure of many SMEs, which may weaken the performance benefits of supplier involvement.

Conclusion

Three objectives were tested in the present study. Firstly, the study sought to investigate the influence of information sharing and e-procurement on supplier involvement. Following path analysis, the results indicated that information sharing has a positive and significant relationship with supplier involvement, while the influence of e-procurement was found to be statistically insignificant. Supplier involvement must therefore be empowered with information sharing, which cultivates collaboration that is characterised by the sharing of knowledge-based assets. These are essential for suppliers to excel in their role of delivering quality goods and/or services. Small and medium enterprises should further realise that e-procurement cannot influence supplier involvement in a meaningful way. Perhaps a phased approach of e-procurement integration supported by capacity building and managerial training would improve its impact.

Secondly, the objective of the present study was to evaluate the mediating role of supplier involvement in the relationship between information sharing, e-procurement and firm performance. The results indicated that the mediation of supplier involvement is insignificant. Therefore, the construct cannot be adopted as a mediator between information sharing, e-procurement and firm performance. According to the theory of complementarity, it is incompatible as it fails to demonstrate the strengths that exist in the independent variables. Small and medium enterprises are therefore advised that supplier involvement should not be effected with the expectation that it will improve the relationship between information sharing, e-procurement and firm performance.

Thirdly, the objective was to determine the influence of supplier involvement on firm performance. The results indicated that supplier involvement has a positive, yet insignificant, influence on firm performance. What SMEs should take from this is to recognise that supplier involvement is, in essence, a joint process (Wang et al. 2021) and entails a continued integration of resources (Lusch 2011). Without this collective effort, supplier involvement may be ineffective and unable to influence supplier firm performance in a significant way.

This study provides critical insights into the constructs under study, even though the results revealed partial support for the proposed framework: information sharing remains a robust enabler of supplier-driven effectiveness, even if the downstream impact on performance is not guaranteed. The findings invite further exploration of contextual variables (e.g. firm size, technological readiness or commitment levels) that may condition the strength of supplier involvement and the link it plays between information sharing, e-procurement and firm performance.

Limitations and future studies

This study is not without limitations. Firstly, while e-procurement exhibited an acceptable level of predictive

accuracy, the results indicated that it fails to influence supplier involvement in a positive and significant way. This may be because of a lack of maturity in e-procurement adoption among SMEs or underlying contextual factors not captured in the model. Secondly, supplier involvement was measured uniformly without accounting for potential variations in the sector or buyer–supplier relationship duration, which may have influenced the study's outcomes. Thirdly, the cross-sectional research design limits the ability to infer causality between constructs. Longitudinal research could provide stronger evidence of the directionality of the relationships. Fourthly, although a 50% response rate is considered acceptable in SME surveys, it may still pose a risk of non-response bias, where firms that did not participate might differ significantly from those who did. Fifthly, the study relied solely on perceptual data from a single respondent per firm, which could introduce common method bias. Future studies could employ multi-respondent or objective performance data to improve accuracy.

This study further recommends that future studies should test the relationship between e-procurement and supplier involvement with mediation, such as information sharing or commitment, as highlighted by Mavidis and Folinas (2022) and Nawi et al. (2016). Given that supplier involvement appears to exhibit no mediating effect and that it demonstrates a positive yet insignificant relationship with firm performance, contextual variables should be considered in future studies. Mediation or moderation may be introduced with a longitudinal study to further ascertain the direct effect of supplier involvement on firm performance over time.

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The author reported that they received funding from the Walter Sisulu University that may be affected by the research reported in the enclosed publication. They have disclosed those interests fully and have in place an approved plan for managing any potential conflicts.

Author's contribution

T.M.M. is the sole author of this research article.

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Data availability

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