

An Integrated Model of Digital Adoption, Strategic Sourcing, Inventory Management and Procurement Excellence Driving Firm Performance

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Abstract. This empirical research of 325 industrial managers investigates the interrelationships between digital adoption, strategic sourcing, inventory management, procurement excellence and firm performance. Statistical analysis using structural equation modeling demonstrates digital adoption, strategic sourcing and inventory management positively influence firm performance directly as well as indirectly through enhancing procurement excellence. The findings theoretically enrich the research on leveraging organizational capabilities towards competitive advantage. For business practice, results signify synchronously improving technology assimilation, supply chain partnerships and material flows alongside procurement best practices allows companies to fully optimize operational and financial outcomes. Uniquely, the integrated model advances understanding of the synergistic mechanisms underlying successful strategy execution.

Keywords: digital adoption, strategic sourcing, inventory management, procurement excellence, firm performance.

1. Introduction

Firm performance is crucial in the business. Empirically, firm performance impacts business growth/success (Susanto et al., 2021; Yuniarti et al., 2022). It indicates that firm performance is vital for the growth and sustainability of businesses/companies, including companies managed by the Government of Indonesia (State Owned Enterprises), such as PT Semen Indonesia Tbk (SIG). However, in recent years, SIG has been less successful in showing its firm performance, at least from the decrease in Revenue and EBITDA values. From 2020 – 2023 (Q2), revenue (in billion rupiah) decreased successively: 36,894, 36,702, 36,379, and 17,032. EBITDA experienced more severe declines: 9,437, 8,643, 7,959 and 3,504.

This decrease is, of course, not without reason. There are at least four influencing variables: digital adoption, strategic sourcing, inventory management, and procurement excellence. Although the terms differ, several recent studies indicate that digital adoption influences firm performance (e.g., Zhou et al., 2023; Chen et al., 2023; Masoud & Basahel, 2023). Another study by Nkrumah et al. (2019) and Munyi et al. (2020) proves that strategic sourcing impacts firm performance. Then, research results from Haile and Devi (2021) and Rashid and Rahseed (2023) found that inventory management positively impacted firm performance. In addition, Mwau (2017) and Lee et al. (2024) revealed that procurement excellence affects firm performance. The results of other previous research show that procurement excellence is influenced by digital adoption (Luo et al., 2023; Jantaro & Badir, 2024), strategic sourcing (Janet & Miriam, 2023), and inventory management (Eveline et al., 2019). This empirical fact positions procurement excellence as a mediator between digital adoption, strategic sourcing, and inventory management with firm performance. However, other research shows contrasting results. For example, Singh and Chan (2022) demonstrate that green procurement influences e-procurement technology. It means green procurement as the equivalent of procurement excellence does not represent e-procurement technology, in other words, digital adoption. Apart from that, Ahmad et al.'s (2018) study revealed that social media (digital) adoption does not affect firm performance. Usai et al. (2021) also claim that adopting digital technology has a shallow positive impact on innovation performance; they suggest that decision-makers no longer consider digital technology as necessary. The research results of Kim et al. (2015) also indicated that e-procurement influences strategic sourcing; not at all. Apart from that, Mutua and Juma (2018) also claim that strategic sourcing decisions do not affect procurement performance. These inconsistent research results give rise to research gaps that trigger the priorities of practitioners and researchers, requiring clarification through scientific research, especially when viewed from the perspective of technology adoption. The presence of technology adoption variables among the complexity of strategic management variables, such as strategic sourcing, inventory management, procurement excellence, and firm performance, will provide a different power compared to previous research so that it promises novelty. Based on these critical issues, this research is aimed at investigating and revealing the influence of digital adoption, strategic sourcing, inventory management, and procurement excellence on firm performance; the impact of digital adoption, strategic sourcing, and inventory management on procurement excellence; as well as exploring the role of procurement excellence in mediating the influence of digital adoption, strategic sourcing, and inventory management on firm performance to discovering new empirical model.

2. Literature Review and Hypothesis Development

2.1. Firm Performance

Firm performance is a specific version of organizational performance, so conceptually/theoretically, it is not different. Firm performance is a profit-oriented business organization. Traditionally, organizational performance reflects an organization's ability to implement appropriate strategies to achieve organizational goals and objectives effectively (Randeree & Al-Youha, 2009; Cho & Dansereau, 2010). Organizational performance can also be interpreted as the difference between the organization's actual results and those expected (Tomal & Jones, 2015). According to Armstrong and Taylor (2023),

successful organizational performance is built on sustainable and diverse mechanisms that involve employees and managers through continuous self-development and cooperation in producing certain products and services.

Organizations can only improve their performance when their existence can be measured (Richard et al., 2009). Some methods commonly used to measure organizational performance are balanced scorecards, benchmarking, business process reengineering, and comprehensive quality management (Alzoubi & Ahmed, 2019; Tadejko, 2015). It is carried out to improve financial performance, product market performance, and shareholder returns as proxies for organizational performance (Richard et al., 2009). Departments in a company, such as operations, human resources, marketing, and strategy, are essential capital for building organizational performance (AlShehhi et al., 2021; Alzoubi et al., 2021). Organizational (firm) performance can be measured using several indicators, namely effectiveness, efficiency, operations, employee productivity, and business success (Ibarra-Cisneros, 2020; Ismail et al., 2021; Ghumiem & Alawi, 2022; Ghumiem et al., 2023). Therefore, these indicators are used as firm performance parameters in this research.

2.2. Digital Adoption and Firm Performance

Recently, digital innovation has been at the forefront of organizational transformation based on the latest digital technology. Competitive pressures in local and global markets are causing digitalization to become increasingly massive, especially in increasing efficiency, effectiveness, quality, productivity, performance, and company foreign power.

According to Wibowo et al. (2023), digital means modernization or renewal of the use of technology, often associated with the internet and information technology. For Riper (2023), digital means using a system for receiving and sending information in the form of a series of ones and zeros, which indicates the presence or absence of electronic signals or is connected to the use of computer technology, especially the internet, or displays information in numbers. Meanwhile, digitalization is the adoption and use of digital technology by organizations (Lee et al., 2020). It is a change from analog mechanical and electronic technology to digital technology (Wibowo et al., 2023).

Digital adoption, according to Rosário (quoted in Barbosa et al., 2022), is the capacity of people or organizations to effectively utilize new technology and participate in digital processes for specific goals. For Shapiro and Mandelman (2021), it results in increased automation, modifications to the labor market's structure, and better employee outcomes. According to Straub, as quoted by Skare and Soriano (2021), adopting (digital) technology reflects complex social and developmental processes that depend on individual construction.

The development of digital technology is influenced by three factors, namely: (1) digital transition, the very rapid growth of the digital product industry has an impact on the growth of analog products, which has decreased; (2) network convergence, meeting the needs of local people, (3) digital infrastructure, studying something as part of a product (Wibowo et al., 2023). In addition, digital technology adoption is also stimulated by driving factors that empirically influence adoption behavior and outcomes (de Vass et al., 2018; Fernando et al., 2018; Hänninen et al., 2018). These factors include operational, strategic, customers, suppliers or supply chain partners, competition, technology, organization, and environment (Yadegaridehkordi et al., 2018; Yang et al., 2021). In practice, aligning actual adoption activities with their drivers will provide results more aligned with the initial business objectives (Correani et al., 2020).

According to Pagani and Pardo (2017), the accessibility of digital technology has made it possible to access a variety of digital systems that control how actors in a network interact with one another, including customers and suppliers. The perceived ease of use and utility of technology can influence variations in its adoption and repercussions inside individual organizations (Kwabena et al., 2021). According to Ghobakhloo and Ching (2019), information and digital technology include indicators: (1) technological context, including perceived value, costs, and compatibility; (2) organizational contexts, such as information processing requirements, information and digital technologies knowledge

competency, and strategic road mapping for manufacturing digitalization; and (3) environmental context, including imposition by environment, and competitive pressure.

Even though the term digital adoption is relatively popular, it is still difficult to find specific research on the influence of digital adoption on firm performance. However, research with similar terms, such as digital technology adoption, digital transformation, digital capabilities, digitalization, and other things related to organizational/firm performance, is not complex to find (e.g., Zhou et al., 2023; Blichfeldt & Faullant, 2021; Usai et al., 2021; Chen et al., 2023; Masoud & Basahel, 2023; Heredia et al., 2022; Lin et al., 2022; Liu et al., 2021; Ferrer-Dávalos, 2023; Saranya & Vasanth, 2023; Salih et al., 2024). It indicates that digital adoption has the potential to influence firm performance. Therefore, the first hypothesis can be promoted as follows:

H₁: Digital adoption affects firm performance.

2.3. Strategic Sourcing and Firm Performance

Traditionally, strategic sourcing refers to managing and designing supply networks based on operational objectives and company performance (Narasimhan & Das, 1999). In its development, experts have defined strategic sourcing in various ways, according to the context. For example, as quoted by Ledlow et al. (2023), Johnson and Kaczmarek stated that strategic sourcing is a disciplined and systematic process of analyzing company expenditure by developing strategies to reduce the total cost of materials and services purchased externally. Meanwhile, Li et al. (2023) define strategic sourcing as a combination of the quantity of the source and the unit price of the goods purchased (wholesale price). Another definition states that strategic sourcing is a written agreement in which a company agrees to purchase goods from a supplier in exchange for payment transactions (Dada et al., 2007; Federgruen & Yang, 2011).

In addition to integrating the implementation and growth of long-term partnerships with suppliers, strategic sourcing comprises the identification and evaluation of possible strategic suppliers (Talluri & Narasimhan, 2004). Thus, strategic sourcing can be interpreted as managing and designing a supply network, including selection, assessment, integrated implementation, and developing long-term strategic partnerships with suppliers. In competitive market situations, strategic sourcing has emerged as a weapon of choice (Çankaya, 2020). Kaczmarek (2010) said that much effort and hard work were put into obtaining strategic resources, from opportunity assessment and spending analysis, category analysis (specifications), and market research to developing spending strategies.

Strategic sourcing includes three indicators: strategic purchasing, internal integration, information sharing, and supplier development (Chiang et al., 2012; Kocabasoglu & Suresh, 2006; Kim et al., 2015). If the company can apply these indicators properly and optimally, they can stimulate increased firm performance. Researchers also claim that strategic sourcing positively affects firm performance (Sarpong, 2018; Nkrumah et al., 2019; Park et al., 2018; Munyi et al., 2020). Thus, the second hypothesis can be formulated as follows:

H₂: Strategic sourcing affects firm performance.

2.4. Inventory Management and Firm Performance

Inventory management is crucial for small, medium, and large businesses to realize company performance. Efficient and effective inventory management can increase organizational competitiveness (Fattah et al., 2016). Conceptually, inventory management is an integrated approach to managing production flows in the supply chain to achieve and guarantee service at rational and acceptable costs (Emmett, 2015). It also represents a set of guidelines for managing and keeping an eye on inventory levels, as well as guidelines for how many orders to place, what levels to maintain, and when to restock inventory. Therefore, inventory management is concerned with monitoring the storage, inventory, and accessibility of goods to ensure sufficient inventory without oversupply. Inventory management is carried out to ensure customers have the products or services they need (Miller, 2015).

According to Mumo and Moronge (2019), inventory management practices are oriented toward developing and managing inventories of raw materials, goods in process, and finished goods so that adequate supplies are available. That way, the costs of excess or shortage of inventory will be low. Inventory management consists of several indicators, such as raw materials, work-in-progress, and ready-to-use goods (Atnafu & Balda, 2018). If implemented efficiently and effectively, it can positively impact firm performance. Scholars is also demonstrated that inventory management significantly impact firm performance (e.g., Atnafu & Balda, 2018; Simon & Chukwuemeziem, 2018; Mumo & Moronge, 2019; Haile & Devi, 2021; Rashid & Rahseed, 2023). Therefore, it can promotes third hypothesized:

H₃: Inventory management affects firm performance.

2.4. Procurement Excellence and Firm Performance

Firm performance can also be influenced by procurement excellence. Odhiambo and Theuri (2015) and Mwau (2017) proved that procurement excellence influences firm performance. Procurement is a key activity in the supply chain (Lewis & Roerich, 2009). It has an impact on the overall success of the emergency response. However, it depends on how it is managed. If managed well, it will have a significant positive impact. This condition must be distinct from the empirical fact that procurement represents a substantial proportion of total expenditure in most organizations, especially business organizations. Hence, it needs to be managed effectively.

Procurement functions exist in the internal supply chain processes framework that convert demand into actual products or services to meet needs (Caldwell et al., 2009). As a result, procurement refers to actions or procedures used to acquire products and services from a corporation. The objective is to acquire the company's products or services for the purpose of carrying out its planning, buying, shipping, receiving, inspecting, and storing activities, among other operational procedures (Masudin et al., 2021). Procurement serves three levels of users, namely internal customers, programs in response to emergencies, and ongoing programs and stock prepositions, both for internal customers and program needs. Several indicators are needed to realize procurement excellence within the company, including transparency, accountability to investors, efficiency, and effectiveness (Caldwell et al., 2009). If this condition can be created properly, it impacts on firm performance. Thus, it can formulate the fourth hypothesis:

H₄: Procurement excellence affects firm performance.

2.5. Digital Adoption and Procurement Excellence

There are hints that digital adoption influences procurement excellence, which in turn effects firm performance. The research results of Luo et al. (2023) prove that digital transformation affects procurement. Buhere and Mukanzi (2019) also found that technology adoption impacts procurement. It shows that digital adoption has the opportunity to make a positive contribution to procurement excellence. When companies make strong efforts to carry out strategic purchasing, internal integration, information sharing, and supplier development, it can encourage increased firm performance from the perspective of effectiveness, efficiency, operations, employee productivity, and business success. Accordingly, we can propose the fifth hypothesis as follows:

H₅: Digital adoption affects firm performance.

2.6. Strategic Sourcing and Procurement Excellence

There are signs that firm performance is impacted by procurement excellence as well as by digital adoption. The research results of Luo et al. (2023) prove that digital transformation affects procurement. Buhere and Mukanzi (2019) also found that technology adoption impacts procurement. It shows that digital adoption has the opportunity to make a positive contribution to procurement excellence. When companies make strong efforts to carry out strategic purchasing, internal integration, information sharing, and supplier development, it can encourage increased firm performance from the perspective

of effectiveness, efficiency, operations, employee productivity, and business success. Accordingly, we can propose the fifth hypothesis as follows:

H₆: Strategic sourcing affects firm performance.

2.7. Inventory Management and Procurement Excellence

Inventory management influences not only company performance but also procurement excellence. The study of Eveline et al. (2019) shows that inventory management significantly affects procurement excellence. It can happen because inventory management can guarantee that the company's inventory is sufficient to meet demand (Jay & Barry, 2019). Inventory management also acts as an inventory management system that can classify and record inventory accurately and be well maintained. Thus, inventory management helps balance inventory investment and customer service so companies can realize low-cost strategies (Heizer & Render, 2014). If the company implements inventory management, including raw materials, work-in-progress, and ready-to-use goods, it can have implications for procurement excellence. Thus, the seventh hypothesis can be formulated as follows:

H₇: Inventory management affects procurement excellence.

2.8. The Mediation Role of Procurement Excellence

Several studies demonstrated the strategic position of procurement excellence. Procurement excellence, besides being influenced by digital adoption (e.g., Zhou et al., 2023; Chen et al., 2023; Masoud & Basahel, 2023), strategic sourcing (Nkrumah et al., 2019; Munyi et al., 2020) and inventory management (Eveline et al., 2019), is also affects firm performance (Odhiambo & Theuri, 2015; Mwau, 2017). This condition opens opportunities for the role of procurement excellence in mediating the effect of digital adoption, strategic sourcing, and inventory management on firm performance. It means that when digital adoption, strategic sourcing, and inventory management are in good condition, they can enhance procurement excellence and improve firm performance. Thus, the hypothesis can be promoted as follows:

H₈: Digital adoption affects firm performance through procurement excellence.

H₉: Strategic sourcing affects firm performance through procurement excellence.

H₁₀: Inventory management affects firm performance through procurement excellence.

Based on the literature review and hypothesis development above, the research conceptual framework can be visualized as follows:

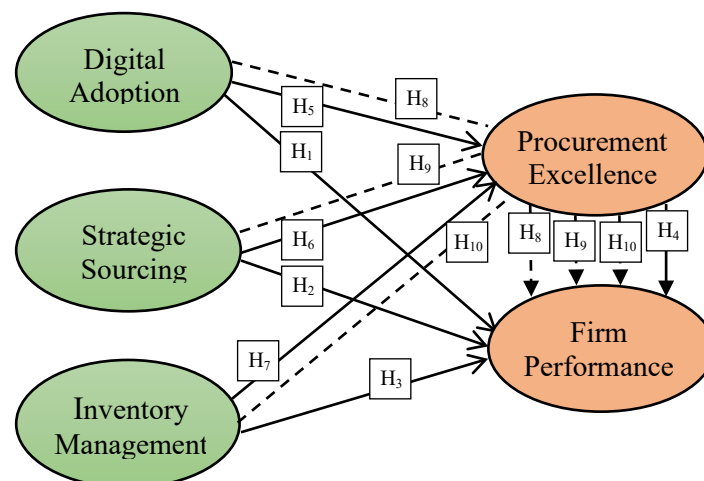


Fig.1: The Research Conceptual Framework

3. Research Methods

3.1. Participants

The population of this research is 905 managers of PT Semen Indonesia, Tbk, a holding company owned by the Indonesian government. Meanwhile, participants as sample frame are 325 managers. They were determined by accidental sampling based on their availability and willingness to fill out a complete questionnaire without receiving any compensation during the study (Widodo, 2021). Based on their willingness to fill out the questionnaire without receiving payment, they were identified and chosen via chance sampling (Widodo, 2021). As presented in Table 1, the majority of gender is male (83.38%), ages 46 – 55 years (58.46%), bachelor education (59.69%), married status (96.62%), and job experience > 21 years (49.54%).

Table 1. Profile of the Research Participants

Profile	Amount	Percentage
Gender		
1. Male	271	83.38
2. Female	54	16.62
Age		
1. 10 – 25 years	0	0
2. 26 – 35 years	43	13.23
3. 36 – 45 years	92	28.31
4. 46 – 55 years	190	58.46
5. > 56 years	0	0
Education		
1. Senior High School/Equivalent	59	18.15
2. Diploma (D3)	6	1.85
3. Bachelor (S1)	194	59.69
4. Postgraduate (S2)	66	20.31
5. Doctoral (S3)	0	0
Status		
1. Married	314	96.62
2. Unmarried	11	3.38
Job Experience		
1. < 5 years	5	1.54
2. 6 – 10 years	21	6.46
3. 11 – 15 years	76	23.38
4. 16 – 20 years	62	19.08
5. > 21 years	161	49.54

3.2. Procedure and Materials

This study employs a survey method in conjunction with a quantitative approach. Five alternatives were included in the questionnaire, which used a Likert scale to collect data: never (score = 1) to always (score = 5). The questionnaire included an introduction ensuring respondent data confidentiality and agreement to use the data for articles published in international journals. Google Forms, which can be shared via email and the WhatsApp app, was used to conduct the online survey. Based on the experts' theoretical dimensions or indicators, researchers created the questionnaire. The indicators of digital adoption were strategic purchasing (SP), internal integration (II), information sharing and supplier development (ISSD) (Chiang et al., 2012; Kocabasoglu & Suresh, 2006; Kim et al., 2015). Strategic sourcing comprises technological context (TC), organizational context (OC), environmental context

(EC) (Ghobakhloo & Ching, 2019). Inventory management consists of raw materials (RM), work-in-progress (WIP), and ready-to-use goods (RTUG) (Atnafu & Balda, 2018). Procurement excellence includes transparency (Tran), accountability to investors (ATI), and efficiency and effectiveness (EE) (Caldwell, 2009). Lastly, firm performance such as effectiveness (Effe), efficiency (Effi), operations (Oper), employee productivity (EP), and business success (BS) (Ismail et al., 2021; Ghumiem & Alawi, 2022; Ghumiem et al., 2023; Ibarra-Cisneros, 2020). The digital adoption consists of nine items, such as "the company builds interactive collaboration with suppliers" and "the company actively requests the latest information from suppliers," with a corrected item-total correlation coefficient (CI-TCC) between .524 and .770 and an alpha coefficient (AC) of .907. The strategic sourcing consists of nine items, for example, "companies choose digital technology based on cost feasibility" and "companies use digital technology to map strategic patterns for manufacturing digitalization," with a CI-TCC between .377 and .762 and an AC of .846. The inventory management consists of six items, such as "recording of raw materials is carried out accurately" and "the distribution flow of raw materials from the warehouse runs smoothly," with a CI-TCC between .416 and .875 and an AC of .866. The procurement excellence consists of six items, "materials management is carried out carefully" and "raw material supply services effectively support the production process," with a CI-TCC between .373 and .824 and an AC of .800. Finally, firm performance comprises ten items, for instance, "employee work productivity can be relied on in achieving company goals" and "the company has succeeded in maintaining consistent business growth well," with a CI-TCC between .659 and .873 and an AC of .949. All items have CI-TCC of > .361, and all variables have an AC of .70; therefore, it is valid and reliable as a research instrument (Widodo, 2021), so it is suitable to be used for conducting research.

Many researchers believe that general method bias (CMB), one source of measurement error, is left unaddressed in cross-sectional survey studies employing self-report questionnaires like the one used in this work. The common method variance (CMV) generates a disparity between the reported association and the true correlation between the variables, which is measured by CMB. When considering correlation between perceived and actual values, CMV can boost the former (Spector et al., 2019; Widodo et al., 2023). As a result, CMV poses a risk to the validity and consistency of study findings. In order to regulate and reduce CMV, Fuller et al. (2016) recommend using statistical and procedural advancements. Based on this urgency, this research uses statistical mechanism are carried out using Harman's single-factor test and correlation matrix procedure (Malhotra et al. 2017; Tehseen et al., 2017). According to Harman's single-factor test, the correlation coefficient between the construct (variable) is less than .90 and the total variance extracted by one factor is 43.167%, which is less than the suggested threshold of 50%. It indicates that the study's data do not contain CMV (CMB) (Kock, 2020; Widodo et al., 2022).

3.3. Data Analysis

SEM was used to analyse the data, and it was backed up by CMB, descriptive and correlational statistics. A student's t-test was used to determine the path coefficients' significance on both the direct and indirect (mediation) levels. Reasons for using SEM include data in the form of interval, research variables not being directly measured, and being relied on to confirm the theoretical research model. Version 22 of SPSS was used for the CMB, descriptive, and correlational analyses, and Version 8.80 of LISREL was used for the SEM analysis.

4. Result

4.1. Descriptive and Correlation Analysis

Standard deviation (SD) values between .653 and 1.846 were obtained from descriptive and correlation analyses were out using SPSS. These SD values—which were fewer than the mean and were found to be in the 8.94–14.31 range—produced a unique data pattern that called for more research. Furthermore,

the correlation study presented coefficient values in the .16–.82 range. The significance of the data, which included all constructs (variables), was determined to be $p < .01$, indicating that the indicators were dependent on each other. The correlation coefficient that was found was less than .9, indicating that there were no features that would be used to characterize multicollinearity despite this mutual dependency.

4.2. Confirmatory Factor Analysis

Table 2 displays the Confirmatory Factor Analysis (CFA) determined measurement model. CFA results are useful for assessing the reliability and validity of measures. Hair et al. (2018) claim that factor loading values between .58 and .95 indicate that all indicators are latent variables. Only one indicator, though, was below .60, indicating comparatively strong validity. Additionally taken into consideration were the reliability indices Cronbach Alpha (CA), average variance extract (AVE), and composite reliability (CR). According to Hair et al. (2018), AVE, CA, and CR larger than .50 and .70, respectively, are acceptable values. The calculated ranges for AVE were between .589 and .808, whereas the ranges for CA and CR were between .800 and .949 and between .749 and .954, respectively. Strong dependability and appropriate convergence were demonstrated by the results.

Table 2. Result of the Measurement Model

Constructs/Variables	Indicators	Factor Loading	CR	VE	α
Digital Adoption (X_1)	SP	.82	.881	.713	.907
	II	.90			
	ISSD	.81			
Strategic Sourcing (X_2)	TC	.60	.749	.589	.846
	OC	.76			
	EC	.58			
Inventory Management (X_3)	RM	.95	.878	.708	.866
	WIP	.82			
	RTUG	.74			
Procurement Excellence (Y_1)	Tran	.69	.828	.618	.800
	ATI	.81			
	EE	.85			
Firm Performance (Y_2)	Effe	.88	.954	.808	.949
	Effi	.87			
	Oper	.86			
	EP	.93			
	BS	.95			

4.4. Goodness of Fit

Table 3 shows the goodness-of-fit (GOF) indices for the criterion measurements, showing that eight out of the eleven indices were considered good. The other three, namely chi-square, sig. Probability, and RMSEA indices did not meet the desired criteria. Hair et al. (2018) stated that the chi-square test was sensitive to large sample sizes (>200), and with 325 employees in the present research, this evaluation process and sig. probability values were deemed invalid. This model was considered legitimate, since

the other nine criteria that were examined met the appropriate standards. It means the theoretical model fits the empirical data based on the research sample.

Table 3. Goodness of Fit Statistics

Goodness of Fit Index	Cut of Value	Result	Information
Absolute fit measures			
Chi-Square	$\chi^2 < \chi^2 \text{ table}$	599.67	Poor
Sig. Probability	$P > .05$	.00000	Poor
GFI	$\geq .09$	.82	Good
RMSEA	$\leq .08$	.118	Poor
Incremental fit measures			
NFI	$> .90$	.94	Good
NNFI	$\geq .90$	.94	Good
AGFI	$\geq .90$	.95	Good
CFI	$\geq .90$	.95	Good
RFI	$\geq .90$	.93	Good
Parsimony fit measures			
Normed chi-square	$1 - 2 \text{ or } < 3$	2.07	Good
PNFI	$0 - 1$	.75	Good

4.5. Hypothesis Testing

The results from the hypothesis tests are visualized in Figures 2 and 3 and summarized in Table 4. All hypotheses, H_1 to H_{10} , were supported (significant) with t value $> t \text{ table}$ at $\alpha = .05$ and $.01$. In detail, digital adoption significantly affects firm performance ($\gamma = .14, p < .01$), strategic sourcing significantly impacts firm performance ($\gamma = .14, p < .05$), inventory management significantly influences firm performance ($\gamma = .16, p < .05$), procurement excellence significantly relationship with firm performance ($\beta = .48, p < .01$). Additionally, digital adoption impact procurement excellence ($\gamma = .21, p < .01$), strategic sourcing affects procurement excellence ($\gamma = .46, p < .01$), and inventory management influences with procurement excellence ($\gamma = .25, p < .01$). The strongest relationship between variables is procurement excellence and firm performance, followed by strategic sourcing and procurement excellence. Meanwhile, the weakest relationship is digital adoption and strategic sourcing with firm performance, followed by inventory management and firm performance. In addition, the mediation effect of digital adoption, strategic sourcing, and inventory management on firm performance through procurement excellence was also significant, with $\beta = .10, p < .01$; $\beta = .22, p < .01$; and $\beta = .12, p < .05$, respectively. Strategic sourcing has a greater mediating role than others. Meanwhile, digital adoption has the smallest mediating role compared to the others. These results are consistent with the direct relationship between strategic sourcing and procurement excellence (.46) and procurement excellence with firm performance (.48). It shows that strategic sourcing has a stronger indirect (mediation) effect than digital adoption and inventory management.

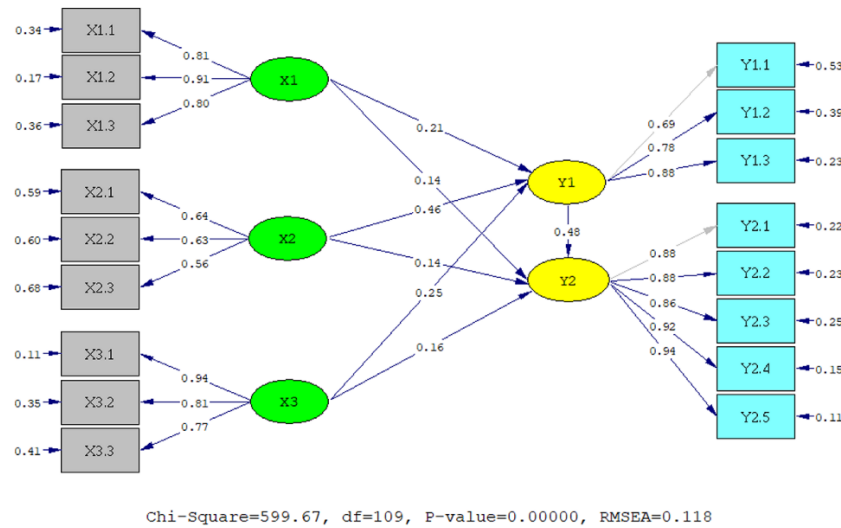


Fig.2: Standardized Structural Model

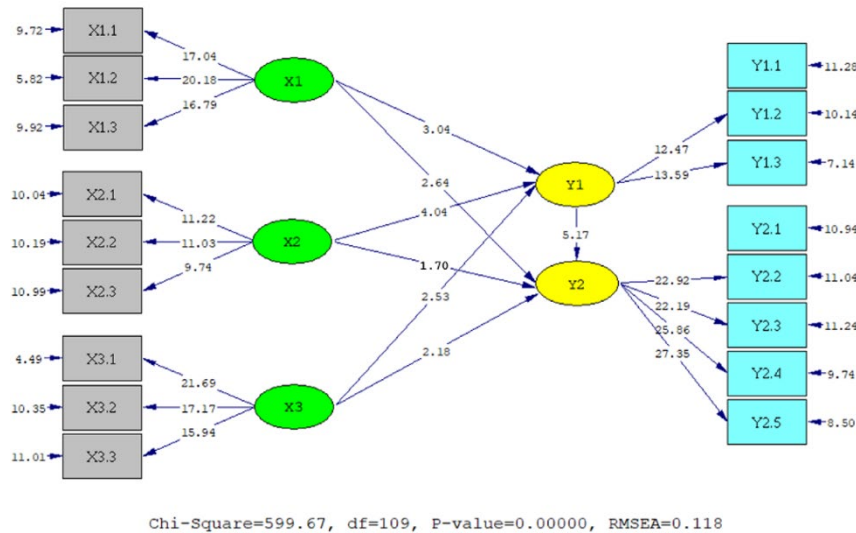


Fig.3: T-value Structural Model

Table 4. Hypothesis Testing Result

Hypothesis	γ/β	T-value	Decision
H ₁ : Digital adoption (X ₁) and firm performance (Y ₂)	.14**	2.64	Supported
H ₂ : Strategic sourcing (X ₂) and firm performance (Y ₂)	.14*	1.70	Supported
H ₃ : Inventory management (X ₃) and firm performance (Y ₂)	.16*	2.18	Supported
H ₄ : Procurement excellence (Y ₁) and firm performance (Y ₂)	.48**	5.17	Supported
H ₅ : Digital adoption (X ₁) and procurement excellence (Y ₁)	.21**	3.04	Supported
H ₆ : Strategic sourcing (X ₂) and procurement excellence (Y ₁)	.46**	4.04	Supported
H ₇ : Inventory management (X ₃) and procurement excellence (Y ₁)	.25**	2.53	Supported
H ₈ : Digital adoption (X ₁) on firm performance (Y ₂) through procurement excellence (Y ₁)	.10**	2.66	Supported
H ₉ : Strategic sourcing (X ₂) on firm performance (Y ₂) through procurement excellence (Y ₁)	.22**	3.42	Supported
H ₁₀ : Inventory management (X ₃) on firm performance (Y ₂) through procurement excellence (Y ₁)	.12*	2.26	Supported

* p < .05

** p < .01

5. Discussion

This study's results generally indicate that digital adoption, strategic sourcing, inventory management, and procurement excellence affect firm performance; digital adoption, strategic sourcing, and inventory management significantly impact procurement excellence; and digital adoption, strategic sourcing, and inventory management positively contribute to firm performance through procurement excellence.

In detail, digital adoption positively and significantly affects firm performance. It indicates that digital adoption is an essential predictor of firm performance. The positive influence confirms that digital adoption is carried out carefully, precisely, and massively can encourage increased firm performance. For example, companies implementing strategic purchasing, internal integration, information sharing, and supplier development can help employees work effectively and productively. These findings are in line with and affirm previous research, which indicates that digital adoption has a significant effect on firm performance (e.g., Zhou et al., 2023; Chen et al., 2023; Masoud & Basahel, 2023; Ferrer-Dávalos, 2023; Saranya & Vasantha, 2023) and at the same time negates Ahmad et al.'s (2018) study that digital adoption does not impact firm performance.

This study also reveals the positive and significant influence of strategic sourcing on firm performance. This empirical evidence confirms that strategic sourcing is an essential antecedent for firm performance. The positive influence indicates a linear direction, where increases will follow improvements in strategic sourcing in firm performance. For example, a company's efficacy, efficiency, and productivity will rise when its strategic sourcing, which takes into account the organization's, technological context, and environmental context, is continuously enhanced while taking the company's internal and external circumstances into account. This finding is in line with and confirms previous studies which prove that strategic sourcing affects firm performance (e.d., Nkrumah et al., 2019; Park et al., 2018; Munyi et al., 2020) and at the same time, is an antithesis to Mutua and Juma's study (2018), which claims that strategic sourcing does not impact on procurement performance.

This study also finds that inventory management positively and significantly influences firm performance. It indicates that inventory management is a good predictor of firm performance. The positive effect indicates that improving the company's inventory management can help increase firm performance. For example, when companies are more careful and precise in managing raw materials, work-in-progress, and ready-to-use goods, this can stimulate the company's effectiveness, efficiency, operations, and productivity. These findings are consistent with and confirm the research studies that inventory management contributes to firm performance (e.g., Mumo & Moronge, 2019; Haile & Devi, 2021; Rashid & Rasheed, 2023).

The results of this study also prove that procurement excellence has a positively significant effect on firm performance. It shows that procurement excellence is an important predisposition for a firm's performance. The positive influence confirms that procurement excellence can encourage an increase in a firm's performance. As an illustration, when a company can guarantee transparency, accountability to investors, efficiency, and effectiveness in inventory management, this will stimulate employee work effectiveness, efficiency, and productivity. These empirical findings are in line with and consistent with the previous research results of Odhiambo and Theuri (2015) and Mwau (2017), which prove that procurement excellence impacts firm performance.

Additionally, the research results also prove that digital adoption, strategic sourcing, and inventory management positively impact procurement excellence. It shows that digital adoption, strategic sourcing, and inventory management are important determinants of procurement excellence. Consequently, improvements to these three can trigger and spur more perfect procurement excellence. These findings are consistent and confirm the previous study; for example, Luo et al. (2023) have proven that inventory management impacts procurement excellence, Janet and Miriam (2023) have revealed that strategic sourcing impacts procurement and Eveline et al. (2019) have found that inventory management influences procurement excellence. It also refutes the results of contradictory studies; for example, Singh and Chan (2022) demonstrate that procurement influences e-procurement technology,

Usai et al. (2021) claim that adopting digital technology has a shallow positive impact on innovation performance, and the investigation of Kim et al. (2015) which indicated that e-procurement influences strategic sourcing.

Finally, the results of this study found empirical facts that procurement excellence mediates the effect of digital adoption, strategic sourcing, and inventory management on firm performance. It not only confirms the all-in-line previous studies used as the basis for developing the research hypothesis and conceptual framework and negates the conflicting results of previous research but also has an essential difference compared to the results of previous research, primarily the empirical model produced. Under these conditions, this study promotes a novel empirical model regarding the effect of digital adoption, strategic sourcing, and inventory management on firm performance mediated by procurement excellence. It provides a helpful empirical contribution by examining how digital adoption, strategic sourcing, inventory management and procurement excellence function together to impact firm performance. However, the novelty and value addition are not sufficiently highlighted upfront. Revising the framing and conclusions to emphasize the distinct implications revealed specifically for business leaders would elevate the perceived contribution for the audience.

6. Conclusion

The quantitative evidence reveals digital adoption, strategic sourcing and inventory management combined with procurement excellence positively impact firm results. This promotes a comprehensive perspective for managers on concurrently nurturing information systems, supplier relationships and inventory control while championing transparency, accountability and efficiency in procurement. Holistically embedding these practices allows them to synergistically reinforce rather than conflict. The multi-factor approach further guards against reliance on singular isolated technical investments or partnerships. By empirically demonstrating the interdependencies, this research provides practical pathways and priorities for systematically strengthening performances. Further studies can build upon these conclusions across contexts. Collectively the model offers an integrated lens for practitioners to drive sustained excellence. However, this research has several limitations. For example, only accommodating theoretical dimensions/indicators from several experts in the literature, only using a quantitative approach, and only focusing on a single data source (managers). Therefore, similar research in the future needs to consider different dimensions/indicators, use a mixed approach (quantitative and qualitative), and involve more complete research data sources, such as leaders or subordinates.

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