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Building manufacturing operational performance through management commitment, information technology adoption, supply chain transparency and practices

Sautma Ronni Basana[a*], Ruth Srininta Tarigan[a], Mariana Ing Malelak[a], Zeplin Jiwa Husada Tarigan[a] and Saida Farhanah Sarkam[b]

[a]*School Business Management, Petra Christian University, Surabaya, Indonesia*
[b]*Faculty of Business and Management Universiti Teknologi MARA, Malaysia*

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A B S T R A C T

Transparency in the supply chain is crucial for enhancing integration, efficiency, and responsiveness, but it also carries the risk of strategic information leakage. Management commitment and the effective use of digital technology are essential to creating safe and transparent environments. This study aims to investigate the impact of management commitment on the adoption of information technology, supply chain transparency, and practices that enhance operational performance. Data collection was conducted at 221 manufacturing companies that have adopted information technology as their primary system. Testing the research instrument using SmartPLS version 4 data analysis showed a good goodness-of-fit model. The study's results indicate that management commitment has a significant influence on the adoption of information technology and supply chain practices. However, its impact on supply chain transparency is less pronounced. The resulting operational performance is not directly determined by supply chain transparency, but rather by the adoption of information technology and the implementation of effective supply chain practices. The adoption of information technology has an impact on supply chain practices through supply chain transparency. The results of this study contribute practically to company management by enabling the update of information technology and the implementation of supply chain practices and transparency, thereby facilitating continuous evaluation and control of the company system. The results of this study contribute to enriching the theory of digitalization in the manufacturing industry's supply chain.

1. Introduction

The manufacturing industry continues to exhibit rapid development in its response to the challenges of globalization and disruptive technological advances (Anastasia et al., 2024; Basana et al., 2025). The manufacturing industry strives to maintain continuous performance improvements to remain competitive (Yu & Huo, 2021). Manufacturing companies need to enhance the role of suppliers and customers in improving firm performance (Ambekar et al., 2021). Active participation of external partners in supply chain management can enhance synergy, leading to increased efficiency and effectiveness. Manufacturing companies can manage the accuracy of material procurement from suppliers, thereby maintaining production speed and product quality (Sharma & Joshi, 2023). This condition can enhance the company's operational performance, leading to on-time deliveries to customers. Manufacturing company excellence can be maintained by actively engaging external partners in maintaining process flexibility. A successful manufacturing company can effectively meet customer needs and stay informed about market developments (Herzallah et al., 2025). Manufacturing companies can effectively communicate customer demand with suppliers, thus maintaining material availability for the production process (Al-Shboul et al., 2017). Coordination is established with customers and communicated promptly to suppliers, necessitating the implementation of information technology that meets their needs (Jimenez-Jimenez et al., 2019; Hartati et al., 2024). The adopted information technology

* Corresponding author
E-mail address sautma@petra.ac.id (S. R. Basana)

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must be aligned with the company's needs to ensure data synchronization within and outside the organization (Sundram et al., 2020). The information technology established within a company is crucial for integrating functions, allowing all functions to access them in real time (Suprapto et al., 2017). The use of information technology can streamline manual processes, enabling the rapid utilization of necessary data to inform operational decisions (Soesetyo et al., 2024). Adopting information technology can increase the effectiveness of communication between departments, thereby strengthening cross-functional and cross-company coordination (Le & Ha, 2024; Hartati et al., 2024). The use of information technology enhances company efficiency in resource utilization (Patil et al., 2024). The information technology used by companies can monitor operational activities directly on the production floor in real time, allowing for quick insight into process progress. This information technology enables efficient inventory management across all functions, allowing for easy data accuracy (Siagian & Tarigan, 2021). Other inventory-related functions can predict future material needs. This also allows companies to schedule product deliveries and distribution to customers. The use of technology in operational areas can help reduce process bottlenecks, maintain consistency, and increase company productivity (Soesetyo et al., 2024). Adopting information technology requires a strong commitment from company management to ensure adequate resources and adequate funding (Sundram et al., 2020).

Management commitment is a strategic step in achieving the set goals (Opoku et al., 2025). Management involvement in monitoring operational activities can help align functions within the company (Su et al., 2013). Management consistency in providing resources can accelerate operational processes, resulting in timely product production, thus meeting predetermined delivery times (Kaliani Sundram et al., 2016). Management-defined policies can be effectively implemented within a well-organized work culture that prioritizes collaboration between functions (Le & Ha, 2024). Management commitment is a driving force in adopting information technology for integration, ensuring harmonious and sustainable supply chain transparency (Caliskan et al., 2025). Manufacturing companies face the challenge of increasing supply chain transparency to achieve optimal integration and drive improved operational performance (Shi et al., 2024; Anastasia et al., 2024; Montecchi et al., 2021). The complexity of supplier networks, global distribution coverage, and customer demands for accurate, real-time information make transparency essential (Sègbotangni et al., 2025). Transparency also plays a crucial role in strengthening trust between business partners, fostering a robust supply chain system, and enhancing a company's ability to respond effectively to market dynamics (Iranmanesh et al., 2023). The information technology leader performed worse than the industries where the transformation of strategic role predominates. The control businesses outperformed the information technology leaders in the automate information technology strategic industry in terms of business performance (Chae et al., 2018).

Too much transparency risks triggering product imitation practices by competitors, which can cause significant losses, especially for companies that rely on innovation as a competitive advantage (Jia et al., 2025). Management commitment plays a key role in determining the extent to which transparency can be implemented effectively without sacrificing the company's strategic advantage (Sègbotangni et al., 2025). Utilizing secure digital technology is a critical factor in ensuring that information shared within the supply chain remains protected and accessible only to authorized parties (Lopes De Sousa Jabbour et al., 2025; Le & Ha, 2024). Transparency in the supply chain has a close relationship with supply chain integration, specifically the integration between suppliers, manufacturers, and distributors in conducting business operations (Shi et al., 2024; Caliskan et al., 2025). Good transparency between partner companies enhances supply chain integration, enabling companies to expedite their response times to changes in demand (Bui, 2024). High supply chain integration will increase collaboration between business partners, enabling companies to reduce inefficiencies and increase competitiveness (Jimenez-Jimenez et al., 2019; Siagian et al., 2022). Supply chain transparency facilitates the implementation of effective supply chain practices, thereby supporting company competitiveness (Shi et al., 2024). To monitor material tracking methods and procedures from the first transportation route to the last port as the destination, supply chain transparency can offer real-time information (Al-Khatib, 2025). Utilizing digitalization in inventory, demand analysis, and real-time monitoring systems helps companies achieve optimal operational performance (Chai et al., 2025). Supply chain transparency can result in sharing information between internal functions related to resources and knowledge about core competitiveness (Jia et al., 2024).

Supply chain transparency ensures that companies do not withhold information related to their operations and products from stakeholders, but in the future, this may be related to the company's financial reports (Shi et al., 2024). Increased transparency combined with efficient supply chain practices impacts operational performance (Lopes De Sousa Jabbour et al., 2025; Patil et al., 2024). Companies experience the benefits of increased efficiency and strong business relationships, but face challenges such as an increased risk of data breaches and the inability to protect their competitive advantages (Siagian et al., 2022). The combination of management commitment, supply chain transparency, supply chain integration, and supply chain practices will directly contribute to improving the operational performance of manufacturing companies (Kitsis & Chen, 2021; Sundram et al., 2020; Bag, 2025; Yu & Huo, 2021). The novelty of this research lies in the application of supply chain management in the digital era to enhance transparency within internal and external partners of manufacturing companies in Indonesia, as well as the importance of balancing information transparency and data protection as a key challenge in achieving operational excellence. The research objectives are divided into three major parts: determining the magnitude of the influence of management commitment on supply chain transparency, supply chain integration, and supply chain practices. To determine the magnitude of the influence of supply chain transparency on supply chain integration, supply chain practice, and company operational performance. Finally, to determine the magnitude of the influence of supply chain integration and supply chain practice on company operational performance.

2. Literature Review

2.1. The relationship between the concept of management commitment and the adoption of information technology

The company's management commitment has established its long-term and short-term goals as a strategic step, in accordance with estimated changes in external conditions, which have been adjusted to internal conditions (Opokuet et al., 2025). Management can maintain the consistency of the company's system sustainability by providing adequate resources to achieve the strategic goals that have been set (Kitsis & Chen, 2021). Company management can regulate work culture to maintain employee discipline in carrying out the production process, ensuring it runs smoothly (Shahzad et al., 2024). The role of management in adopting information technology can meet the needs of all organizational levels (Sharma & Joshi, 2023). Adopting information technology is crucial for companies to carry out continuous operational activities. Manufacturing companies can leverage information technology to develop a unified system that operates efficiently (Patil et al., 2024). The use of information technology as a data input and output device enables it to be utilized jointly by all functions, thereby achieving the company's goals. Management support in the adoption of information technology is hampered by unclear communication (Soesetyo et al., 2024). This condition results in the adoption of information technology, often experiencing minor changes that are repeated repeatedly. Limited communication capabilities between management and employees can lead to delays in the adoption of information technology (Siagian & Tarigan, 2021). A strong management commitment to the adoption of information technology supports effective implementation and can help achieve the goal of forming data integration (Siagian et al., 2022).

H$_1$: *Management commitment influences the adoption of information technology.*

2.2. Management commitment to supply chain transparency and practice

Company management commitment can impact effective supply chain management (Vidal et al., 2023). Management support in providing resources according to the company's needs can help achieve established goals (Opoku et al., 2025). Management involvement in company operations can provide high supply chain transparency (Shi et al., 2024). Management's commitment to implementing a transparent system can help control processes between functions within the company (Shi et al., 2024). The supply chain transparency created enables each function in the organization to understand the work processes in other functions in real-time, allowing them to anticipate sudden changes and increase resilience (Montecchi et al., 2021). Supply chain transparency within a company enables the production process to understand the availability and readiness of raw materials, as well as the quality standards provided by suppliers (Iranmanesh et al., 2023). Supply chain transparency within the company can be open, with information on the production process being reported, allowing other functions to be informed (Sègbotangni et al., 2025), thereby ensuring that information is delivered to customers quickly and accurately. Management support in maintaining information transparency in the supply chain can create a business environment based on transparency, thereby reducing financial risk (Bui, 2024). Companies can use accurate data to anticipate uncertain changes and make operational improvements as part of their supply chain practices (Su et al., 2013).

Supply chain practice refers to a set of company activities that connect suppliers and customers to enhance efficiency and effectiveness, ultimately improving company performance and achieving both short-term and long-term goals, thereby promoting sustainable supply chain practices (Shahzad et al., 2024). Supply chain practices aim to integrate all internal functions within a company, enabling coordination with external functions to generate added value for customers (Patil et al., 2024). A company's ability to implement effective supply chain practices enables solid relationships with both internal and external partners (Okeke, 2024), allowing the value chain to move in harmony and create added value. Supply chain practices can be viewed as part of an operational function that plays a crucial role in determining the efficiency and effectiveness of supply chain flows (Kitsis & Chen, 2021). Supply chain practices are a series of company activities involving external partners that are directly related to the supply chain's ability to achieve its objectives (Kaliani Sundram et al., 2016). Management's commitment to maintaining business continuity by consistently monitoring supply chain practices can maintain the stability of the company's business processes (Okeke, 2024). Management's commitment to making improvements will strengthen the quality of service provided to customers.

H$_2$: *Management commitment has an impact on supply chain transparency.*
H$_3$: *Management commitment has a significant influence on supply chain practices.*

2.3. Adoption of technology information to supply chain transparency and practice

A company's information technology can aid communication and coordination in decision-making (Ambekar et al., 2021). The information technology it creates can improve a company's operational performance through integrated and collaborative efforts between departments (Anastasia et al., 2024; Jimenez-Jimenez et al., 2019). The adoption of information technology that is formed cannot be separated from the role of management in building the supply chain transparency (Shi et al., 2024). The adoption of information technology strengthens the relationship between functions within the company, allowing collaboration to run harmoniously due to the formation of supply chain transparency (Sègbotanni et al., 2025). The openness of information between internal functions enables company departments to communicate effectively with external partners, thereby reducing the risk of uncertainty (Caliska et al., 2025). Supply chain transparency enables consumers to verify the accuracy of deliveries by leveraging the company's information technology. Adopting information technology allows companies to build supply chain transparency more quickly, resulting in faster access to information (Patil et al., 2024This also allows components in the supply chain to use the same information, thereby reducing information asymmetry and enhancing collaboration as a form of supply chain practice (Vidal et al., 2023; Chai et al., 2025).

The adoption of information technology enables companies to implement robust supply chain practices in their operational activities (Sundram et al., 2020). The use of information technology enhances inventory control as a supply chain practice, increasing resilience (Basana et al., 2025). The adoption of information technology impacts supply chain practices by creating more accurate demand forecasts. Supply chain practices can enhance operational functions by determining efficiency and effectiveness, with a strong role for information technology (Al-Shboul et al., 2017). The implementation of information technology enhances green supply chain practices by effectively communicating material needs to suppliers, thereby providing more informed responses to market and customer needs that are easier to understand (Soesetyo et al., 2024; Herzallah et al., 2025). Supply chain transparency may be impacted using digital technology to guarantee data authenticity and efficiently close the information gap between internal functional and cross-organizational sources (Chai et al., 2025; Yu & Huo, 2021).

Supply chain transparency within a company can optimize supply chain practices. Supply chain transparency can foster information synergy between internal and external parties, ensuring the harmonious implementation of supply chain practices (Iranmanesh et al., 2023). Supply chain transparency has a positive impact on resilience because it can identify risks in real time and maintain inventory volatility (Jia et al., 2024). Supply chain transparency can foster a solid relationship between internal company functions and can be effectively communicated to external parties, including suppliers and customers (Shi et al., 2024). A study by Al-shobul et al. (2017) emphasizes that supply chain practices require supply chain transparency to enable cross-functional internal collaboration and strong external relationships, thereby maximizing benefits. Management involvement in supply chain practices relies heavily on supply chain transparency, with a strong level of integration within and outside the organization (Kaliani Sundram et al., 2016). Adopting information technology in a company can improve operational performance by enabling efficient and effective decisions (Patil et al., 2024). Adoption of information technology such as enterprise resources planning enables companies to be integrated and transparent so that they can share information with internal and external partners to produce improved performance (Suprapto et al., 2017; Le & Ha, 2024). Information technology enhances the ability to monitor operational activities in real-time, allowing for the maintenance of a stable production process in accordance with environmental conditions (Sègbotangni et al., 2025). Supply chain transparency demonstrated by using technology that can monitor material movement in the logistics network and effectively transparently in planning and inventory can have a positive impact on supply chain resilience (Al-Khatib, 2025). The information technology used in the company has an impact on increasing the timeliness of delivery and operational flexibility (Basana et al., 2025). Fostering enduring partnerships with important suppliers, information and communication technology influences business performance when supply chain techniques are included in purchasing strategies (Ambekar et al., 2021). Integrated information technology can have an impact on firm performance in educational institutions (Hartati et al., 2024). Adopting information technology enables companies to share information with partners, reduce inventory levels, and streamline production lines, thereby enhancing operational performance (Anastasia et al., 2024). Based on the explanation above, hypotheses H_4, H_5, and H_6 can be established.

H_4: *Adoption of information technology has an impact on supply chain transparency.*
H_5: *Adoption of information technology has an impact on supply chain practices.*
H_6: *Supply chain transparency has an impact on supply chain practices.*
H_7: *Adoption of information technology has an impact on operational performance.*

2.4. Supply chain transparency and practices regarding operational performance

Supply chain transparency is crucial in modern business to maintain sustainable performance (Jia et al., 2025). Suppliers and customers can simultaneously monitor the company's process activities, thereby anticipating potential uncertainties (Iranmanesh et al., 2023). Companies can respond more quickly to customer needs related to products and timely delivery, thereby improving operational performance (Anastasia et al., 2024). Supply chain transparency can provide information to all supply chain components that have access rights, enabling them to determine the appropriate response and support better operational performance (Sègbotangni et al., 2025; Patil et al., 2024). Supply chain transparency enables internal company functions to anticipate disruptions, ensuring process stability and a positive impact on operational performance (Montecchi et al., 2021; Yu & Huo, 2021). The supply chain transparency created can lead to better collaboration with external partners (Caliskan et al., 2025), thereby improving operational performance effectiveness. Transparency for companies with internal and external partners can support the development of sustainable supply chain practices (Bui, 2024; Shahzad et al., 2024). Transparency optimizes supply chain practices in maintaining smooth business processes from suppliers to customers (Lopes De Sousa Jabbour et al., 2025). Supply chain practices can maintain a balance between material procurement activities and timely product delivery to customers as a tangible manifestation of the company's operational performance (Kaliani Sundram et al., 2016). The involvement of all components in implementing supply chain practices enhances operational performance by enabling a swift response to market demand fluctuations and customer needs, thereby maintaining stability in the face of changes (Al-Shboul et al., 2017). Consistency in management's monitoring of supply chain practices can lead to improved operational performance, reduced operational costs, and optimal inventory management (Bag, 2025). The implementation of supply chain practices can increase operational efficiency and flexibility, which has a direct impact on company performance (Shou et al., 2018). Supply chain transparency has a positive impact on sustainability performance because it has an impact on environmental performance (reduce waste and improve transactions), social performance (reduce reporting costs, reduce pollution) and economic performance (test the supply and production conditions, comprehensive access to information) (Jia et al., 2024). Based on the explanation above, the hypotheses H_7, H_8, and H_9 can be determined.

H_8: *Supply chain transparency has an impact on operational performance.*
H_9: *Supply chain practices have an impact on operational performance.*

3. Research Method

This study aims to examine the relationship between management commitment and operational performance through the adoption of information technology, supply chain transparency, and practice. In this study, structural equation modeling (using SmartPLS version 4) was employed for path modeling analysis to test the established research hypotheses. The research model's structure, along with its conceptual framework, is illustrated in Fig. 1.

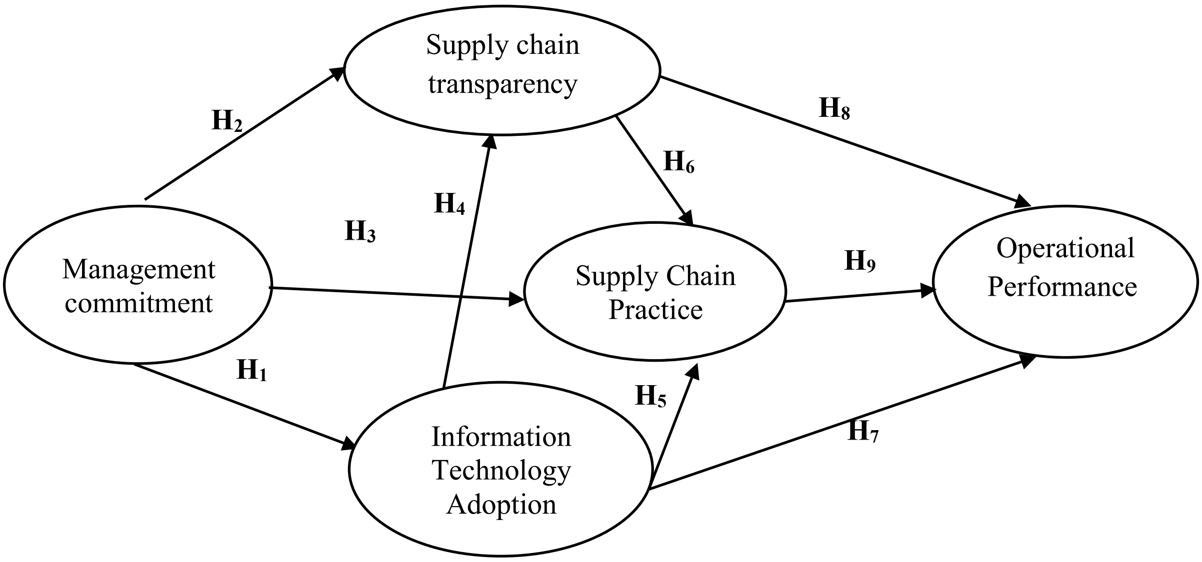

Fig. 1. Research Model

SEM analysis was employed to assess the goodness of fit of the model by testing both the outer model and the inner model, thereby utilizing a form of structural model analysis. Outer model analysis involves examining the validity and reliability of the measurement model. To achieve the stated research objectives, a research questionnaire was developed based on literature from previous studies. The measurement items for each variable were derived from previous research, with operationalizations adapted to manufacturing conditions in Indonesia. The management commitment variable represents a strategic step established by the company to achieve its goals (Opoku et al., 2025). The measurement items used to measure management commitment by adopting research Siagian et al. (2022), Soesetyo et al. (2024) are top management actively supporting innovation programs in the supply chain (MC1), management providing adequate resources (MC2), management demonstrating long-term commitment to collaboration (MC3), management consistently encouraging the use of technology (MC4) and management being directly involved in strategic decision making related to supply chain management (MC5). Information technology adoption (ITA) refers to the use of information systems by companies to integrate data across internal functions, enabling them to operate more effectively and efficiently. Measurement items used to measure information technology adoption using research Jimenez-Jimenez et al. (2019), Sundram et al. (2020) namely companies adopt information technology to simplify business processes (ITA1), companies adopt information technology to collect business data in decision making (ITA2), companies adopt information technology to analyze business data (ITA3), companies adopt information technology to communicate efficiently with partners (ITA4) and companies adopt information technology to coordinate with external partners (ITA5).

Supply chain transparency refers to the level of openness and availability of information accessible to all supply chain components, including both internal and external partners. The measurement items used to measure supply chain transparency, adopting research from Montecchi et al. (2021), Patil et al. (2024), Sègbotangni et al. (2025), and Iranmanesh et al. (2023), are: the company provides real-time supply chain information (SCT1), the company shares information with partners in the supply chain (SCT2), the company uses a digital information system to share transparent data (SCT3), and business partners can monitor delivery status directly through the system (SCT4). Supply chain practice is the most effective approach to implementing supply chain transparency within a company, facilitating connections between suppliers and customers to enhance efficiency and effectiveness, ultimately improving overall company performance. Measurement items used to measure supply chain practices by adopting research Bag (2025), Al-Shboul et al. (2017), Kaliani Sundram et al. (2016), Siagian & Tarigan (2021) are companies implementing appropriate inventory management strategies (SCP1), decision making in demand planning is based on historical data analysis (SCP2), companies actively collaborate with business partners (SCP3), the application of digital technology supports supply chain activities (SCP4), companies have a system to evaluate supply chain effectiveness periodically (SCP5) and supply chain practices adjust to demand fluctuations (SCP6).

Operational performance refers to the level of effectiveness and efficiency achieved by a company in executing operational processes to produce products or services that meet established standards and customer needs. The measurement items used to measure operational performance are based on research Anastasia et al. (2024) Sharma& Joshi (2023), Soesetyo et al. (2024) are the level of product conformity with established quality standards (OP1), the ability to meet customer demand in a timely manner (OP2), the company's success rate in delivering products on time (OP3), the company's ability to adapt to changes in market demand (OP4) and efficient management of operational costs (OP5). The questionnaire was administered to company practitioners using a Likert scale measurement, with a score of 1 indicating strong disagreement and a score of 5 representing strong agreement, thereby assessing suitability to the company's actual conditions. The questionnaire was distributed to manufacturing companies in Indonesia, particularly on the island of Java. The questionnaire distribution was obtained based on provincial areas, namely Banten Province with 7 companies (3%), Jakarta Special Region Province with 21 respondents (10%), Yogyakarta Special Region Province with 13 respondents (6%), West Java Province with 39 respondents (18%), Central Java Province with 54 respondents (24%) and East Java Province as many as 87 respondents (39%).

4. Results and Discussion

The research respondents were described based on data collected through questionnaires distributed to 221 manufacturing companies. In terms of gender, 149 respondents (67%) were male and 72 (33%) were female. Regarding their positions within the company, 65 respondents (29%) held lower management roles such as staff or senior staff, 109 (49%) were in middle management positions including supervisor, superintendent, assistant manager, or manager, and 47 (21%) occupied top management roles such as general manager, plant manager, director, or owner. The departmental distribution of respondents reflects the implementation of transparent information technology systems, allowing all internal departments to access relevant data according to their specific needs. Respondents came from various departments, including accounting and finance (10%), warehouse and purchasing (10%), human resources and general affairs (15%), production and scheduling (15%), marketing (20%), and information technology (5%). In terms of work experience, 29% of respondents had between 2 to 5 years of experience, 8% had between 6 to 9 years, and 63% had more than 9 years of experience. Company size was also assessed, with 20% of respondents representing companies with 30 to 50 employees, 17% from companies with 50 to 100 employees, 11% from companies with 100 to 200 employees, and 52% from companies with more than 200 employees. The data were processed using descriptive analysis, focusing on the mean values and the goodness of fit for the research measurement items presented in Table 1.

Descriptive analysis results are presented in Table 1, which includes the mean values for each variable and corresponding measurement items. In manufacturing companies, top management commitment is a critical factor for the successful adoption of information technology systems. This commitment ensures financial support and the provision of expert personnel necessary to implement superior systems. The mean value for management commitment was 4.586, with individual item scores ranging from 4.421 to 4.697, indicating a high level of support from top management for system implementation. This support is consistently aligned with the company’s operational needs.

The adoption of information technology as an operational system yielded a mean value of 4.298, with item scores ranging from 4.149 to 4.371. This suggests that IT adoption has been effectively integrated across departments, enabling seamless access to cross-functional data. The interconnected nature of the system allows departments to share information internally and with external partners, enhancing overall communication and coordination.

Supply chain practices serve as a cornerstone for process and product innovation, aimed at achieving greater efficiency and effectiveness. These practices recorded a mean score of 4.183, with item values between 3.928 and 4.344, reflecting their positive impact on system improvement and the successful implementation of continuous improvement initiatives. Supply chain transparency achieved a mean score of 4.061, with item values ranging from 3.914 to 4.059. This transparency facilitates prompt problem identification and resolution across departments, contributing to operational agility.

Manufacturing operational performance attained a mean score of 4.245, with item values ranging from 4.122 to 4.394. This performance level indicates the company’s ability to consistently produce products that meet customer expectations.

Table 1 also presents the loading factor values used to assess the validity of the study. The lowest loading factors were 0.723 for management commitment (MC.5), 0.661 for IT adoption (ITA2), 0.575 for supply chain practice (SCP6), 0.584 for supply chain transparency (SCT4), and 0.566 for manufacturing operational performance (MOP3). Measurement items with loading factors above 0.500 are considered valid.

Additionally, Table 1 includes reliability test results for Cronbach's Alpha and composite reliability, both of which meet the minimum threshold of 0.700. Management commitment showed a Cronbach's Alpha of 0.844 and composite reliability of 0.887; IT adoption had values of 0.865 and 0.904, respectively; supply chain practice recorded 0.810 and 0.862; supply chain transparency had 0.726 and 0.829; and manufacturing operational performance achieved 0.802 and 0.862.

Table 1
The validity and reliability of the item measurement test

Item	Mean	Factor Loading	Composite reliability	Cronbach alpha	AVE
Management Commitment	4.586		0.887	0.844	0.612
MC.1	4.421	0.745			
MC.2	4.602	0.820			
MC.3	4.543	0.859			
MC.4	4.697	0.756			
MC.5	4.665	0.723			
Information Technology Adoption	4.298		0.904	0.865	0.655
ITA1	4.371	0.845			
ITA2	4.281	0.661			
ITA3	4.335	0.872			
ITA4	4.353	0.872			
ITA5	4.149	0.777			
Supply Chain Practice	4.183		0.862	0.810	0.513
SCP1	4.249	0.732			
SCP2	4.303	0.814			
SCP3	4.344	0.748			
SCP4	4.158	0.755			
SCP5	4.118	0.650			
SCP6	3.928	0.575			
Supply Chain Transparency	4.061		0.829	0.729	0.552
SCT1	3.914	0.740			
SCT2	3.973	0.804			
SCT3	4.299	0.821			
SCT4	4.059	0.584			
Manufacturing Operational Performance	4.245		0.862	0.802	0.560
MOP1	4.127	0.792			
MOP2	4.394	0.784			
MOP3	4.281	0.566			
MOP4	4.303	0.714			
MOP5	4.122	0.853			

The next stage of processing involves testing the research hypothesis to address the research objectives outlined in Fig. 2 and Table 2.

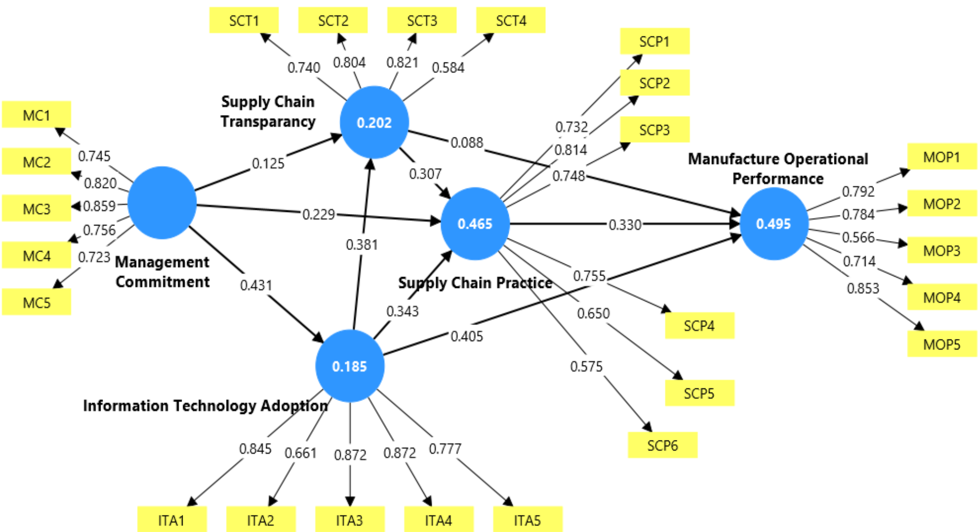

Fig. 2. Full model output of SmartPLS processing

Table 2
Hypothesis testing and path coefficient

Path Coefficient	Original sample	T statistics	P values
H1: Management Commitment → Information Technology Adoption	0.431	4.902	0.000
H2: Management Commitment → Supply Chain Transparency	0.125	1.423	0.155
H3: Management Commitment → Supply Chain Practice	0.229	2.865	0.004
H4: Information Technology Adoption → Supply Chain Transparency	0.381	3.903	0.000
H5: Information Technology Adoption → Supply Chain Practice	0.343	4.338	0.000
H6: Supply Chain Transparency → Supply Chain Practice	0.307	3.425	0.001
H7: Information Technology Adoption → Manufacture Operational Performance	0.405	4.491	0.000
H8: Supply Chain Transparency → Manufacture Operational Performance	0.088	1.041	0.298
H9: Supply Chain Practice → Manufacture Operational Performance	0.330	3.845	0.000

Based on Fig. 2 and Table 2, it is observed that for the first hypothesis, management commitment has a significant effect on information technology adoption, with a coefficient of 0.431, a p-value of 0.000 (<0.05), and a t-statistic of 4.902 (>1.96). Therefore, the hypothesis is accepted. Management commitment, as indicated by management's support in providing adequate resources to manufacturing companies, can facilitate rapid information technology adoption and enable appropriate business process changes tailored to the company's needs. The results of the study support the findings of research indicating that management commitment has an impact on information technology adoption (Shahzad et al.,2024; Sharma & Joshi, 2023; Soesetyo et al., 2024; Siagian & Tarigan, 2021; Siagian et al., 2022). The second hypothesis, management commitment influences supply chain transparency of 0.125 with a p-value of 0.155 (>0.05) and t-statistics of 1.423 (<1.96), so it is rejected. Management commitment does not significantly impact the increase in supply chain transparency. Management commitment refers to the support from management in terms of budget and human resources availability for a business process. Manufacturing companies, based on the object of research, are still inaccessible in relation to decisions that are not given transparently, but only at certain managerial levels. This condition results in several decisions that need to be maintained in the company, not being fully shared in the digital information system for transparent sharing. The third hypothesis, that management commitment influences supply chain practice, is supported by a coefficient of 0.229 with a p-value of 0.004 (<0.05) and a t-statistic of 2.865 (>1.96); therefore, the hypothesis is accepted. Management commitment, as demonstrated by providing adequate resources and consistently encouraging the use of technology, can lead to improvements in supply chain practices. The results of the study support previous research, which states that management commitment influences supply chain practice (Vidal et al., 2023; Kitsis & Chen, 2021; Kaliani Sundram et al., 2016; Patil et al., 2024).

The fourth hypothesis, regarding the impact of information technology adoption on supply chain transparency, yields a p-value of 0.004 (<0.05) and a t-statistic of 2.865 (>1.96); the hypothesis is accepted. The results of the study support previous research, which states that information technology adoption, which is formed from the company's ability to adopt information technology to simplify business processes and analyze business data, affects supply chain transparency, resulting in the provision of real-time supply chain information and information sharing with partners in the supply chain. The results of the study support previous research, which states that management commitment affects supply chain transparency (Shi et al., 2024; Sègbotangni et al., 2025; Caliskan et al., 2025; Patil et al., 2024). The fifth hypothesis, that information technology adoption affects supply chain practice, is 0.343 with a p-value of 0.000 (<0.05) and a t-statistic of 4.338 (>1.96); therefore, the hypothesis is accepted. The adoption of information technology in companies enables them to simplify business processes and communicate efficiently with partners, ultimately improving supply chain practices through the implementation of appropriate inventory management strategies and informed decision-making in adequate planning. The results of the study support previous research, which states that information technology adoption on supply chain practice (Vidal et al., 2023; Sundram et al., 2020; Basana et al., 2025; Al-Shboul et al., 2017; Ambekar et al., 2021). The sixth hypothesis, that supply chain transparency affects supply chain practice, yields a coefficient of 0.307 with a p-value of 0.001 (<0.05) and a t-statistic of 3.425 (>1.96); therefore, the hypothesis is accepted. Supply chain transparency, which occurs when companies can share information with partners in the supply chain and utilize digital information systems to exchange transparent data, can lead to improvements in supply chain practices. The research results support previous studies, which indicate that the supply chain transparency affects supply chain practices (Iranmanesh et al., 2023; Al-shobul et al., 2018; Basana et al., 2025; Anastasia et al., 2024).

The seventh hypothesis, that information technology adoption affects manufacturing operational performance, is accepted. The p-value of 0.000 (<0.05) and t-statistics of 4.491 (>1.96) support this conclusion. Information technology adoption simplifies business processes, facilitates data collection for decision-making, and enables data analysis have a positive impact on manufacturing operational performance by increasing product conformity and the ability to meet customer demand in a timely manner. The results of the study support previous research, which states that the adoption of information technology affects manufacturing operational performance (Patil et al., 2024; Basana et al., 2025; Anastasia et al., 2024; Yu & Huo, 2021). The eighth hypothesis, that supply chain transparency affects manufacturing operational performance, has a p-value of 0.298 (>0.05) and a t-statistic of 1.041 (<1.96), indicating that the hypothesis is rejected. The company's ability to foster openness with suppliers is limited by its inability to directly provide practical benefits; however, it can develop supply chain practices that lead to operational improvements. The ninth final hypothesis, that supply chain practice affects manufacturing operational performance, is accepted with a p-value of 0.000 (<0.05) and a t-statistic of 3.845 (>1.96). Supply chain practices, as described by the implementation of an appropriate inventory management strategy, active collaboration with business partners, and the application of digital technology in supply chain activities, have an impact on improving manufacturing operational performance. This enables efficient operational cost management and enhances the company's ability to adapt to changes in market demand. The results of the study support previous research, which states that the supply chain practices affect manufacturing operational performance (Kaliani Sundram et al., 2016; Al-Shboul et al., 2017; Bag, 202; Shou et al., 2018). The research makes it possible to update information technology and adopt supply chain practices and transparency, the study's findings practically aid in company management by enabling ongoing system evaluation and control. The findings of this study enhance the theory of digitalization in the supply chain of the manufacturing sector.

5. Conclusions

This study highlights the significance of management commitment and information technology adoption in developing effective supply chain practices to enhance manufacturing operational performance in the Indonesian manufacturing industry. Based on the analysis and discussion, it was found that management commitment plays a role in encouraging the adoption of information technology and the implementation of supply chain practices; however, it does not directly affect supply chain transparency. Strong management support can provide adequate resources and consistently encourage the use of technology, thereby increasing information technology adoption by simplifying business processes and facilitating accurate data analysis in decision-making. The adoption of information technology plays a crucial role in enhancing supply chain transparency and refining supply chain practices. Supply chain transparency, where companies provide real-time supply chain information and share transparent data for access by other functions, improves operational performance by increasing the level of product conformity to high-quality standards and ensuring on-time product delivery. Supply chain practices are proven to mediate the effect of technology on operational performance. Supply chain transparency does not have a direct effect on operational performance. This indicates that transparency plays a supporting role, strengthening coordination between partners, but the real impact on performance only emerges through the implementation of efficient supply chain practices. Thus, the research results confirm that the combination of management commitment, the adoption of information technology, and the implementation of supply chain practices is a crucial foundation for enhancing manufacturing operational performance in the digital era.

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