

# The Influence of Information Technology on Company Performance Through Internal and External Integration

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## Abstract

Information technology is essential for companies to make informed decisions that support internal business processes and external collaboration, thereby improving overall company performance. The research collected data from 105 manufacturing companies in East Java. The research sample was determined using judgmental sampling with respondents who were at least staff level and had become permanent company employees. Data analysis was used with SEM-PLS. Implementing information technology in manufacturing companies impacted internal and external supply chain integration. Internal supply chain integration, combined with internal data integration, is running smoothly and in real-time, which positively impacts cross-functional integration and does not directly affect company performance. External supply chain integration, in collaboration with external partners, is progressing well. The company is actively involved in developing these partnerships, which can lead to improved company performance, increased flexibility in meeting customer demands, and reduced production costs. Practical contributions to research provide insight for industry practitioners, enabling the internal cross-functional team to operate in an integrated manner and necessitating collaboration with external parties. Purchasing and marketing managers can play an active role in enhancing the involvement of external partners in improving company performance, making a theoretical contribution to enriching the development of information technology systems, and sustainable supply chains.

**Keywords:** Implementation of Information Technology, Internal Integration, External Integration, Supply Chain Integration, Firm Performance.

## 1. Introduction

A business environment where competition between companies becomes increasingly open and transparent, thereby encouraging the formation of strategic cooperation and cross-border collaboration to capitalize on market complexity and turn it into profit opportunities (Setiawan & Tarigan, 2022). The rapid advancement of information technology now means that distance is no longer a barrier for businesses to play an active role globally (Siagian et al., 2021). Competition between companies is becoming increasingly transparent, enabling cooperation and collaboration that transform complex business environments into opportunities for profit (Birasnav & Bienstock, 2019). This condition encourages companies to partner with other business actors to enter the global market and compete effectively. Companies can quickly reach markets and access suppliers by building networks in various regions (Oktapia & Tarigan, 2022).

Companies are also encouraged to establish partnerships with other business actors to enter global markets more effectively by building networks spread across various regions, allowing them to access markets and suppliers worldwide quickly. As a result, the movement of goods and capital across national borders becomes easier, and producer activities are no longer limited by geographical constraints, thus providing equal

potential for all parties to penetrate the global market. To maintain business continuity and increase competitiveness, companies must be able to adapt to global market dynamics (Siagian et al., 2022). Active involvement in the global arena encourages companies to improve their operations more efficiently and effectively. The company continues to strive to become a formidable competitor by involving all internal elements to increase productivity and performance (Daigude et al., 2021). Information technology has also become a significant requirement in efforts for innovation and continuous improvement (Caniato & Größler, 2015). However, its implementation requires a substantial investment of resources, not only in financial terms but also in terms of time to prepare the infrastructure and ensure workforce readiness (Fayezi et al., 2015; Sundram et al., 2020).

Information technology is a key component in this effort, as a reliable system can provide data quickly and in real-time (Jimenez-Jimenez et al., 2019). Companies have a fundamental need for quality technology and information to support their operations (Putra et al., 2020). Effective IT management is crucial for creating a competitive advantage and enhancing business resilience (Ju et al., 2021). Success in managing information technology depends significantly on the alignment between IT management goals and the company's vision. Therefore, resource use must be optimized to ensure IT

supports the achievement of the company's strategic goals (Vafaei-Zadeh et al., 2020).

Optimizing the use of IT not only improves operational efficiency and coordination along the supply chain but also strengthens collaboration with internal and external partners, thereby supporting overall supply chain integration and helping companies maintain a competitive position in the global market (Setiawan & Tarigan, 2022). The IT system adopted by the company enables the provision of data quickly and in real time (Yuan et al., 2022). This provides a clear picture for management to make informed decisions. Thus, procurement can establish an effective relationship with suppliers to meet material needs on time, thereby increasing the efficiency and quality of the materials obtained (Kristanti & Mranani, 2024).

IT can also provide data quickly regarding finished products in the warehouse, which is then provided to customers (Singh & Kumar, 2020). Effective implementation of IT also supports supply chain integration, and technology also speeds up coordination along a company's supply chain (Birasnav & Bienstock, 2019; Tarigan et al., 2021b; Sundram et al., 2020; Yuan et al., 2022). The use of IT facilitates communication and collaboration between internal and external partners, making the supply chain process more efficient and effective (Basana et al., 2022a; Vafaei-Zadeh et al., 2020).

Supply chain integration (SCI) refers to the internal and external integration processes established by the company, which significantly impact organizational performance by enabling more efficient operations that meet customer needs (Basana et al., 2022b). This integration also facilitates effective communication among the company, suppliers, and customers, enabling the establishment of a joint system (Vafaei-Zadeh et al., 2020). Open communication channels for companies to collaborate with suppliers to predict raw material needs and with customers to understand market demand (Okapia & Tarigan, 2022). Good coordination ensures that the process, from receiving raw materials to production and distribution, runs smoothly, reducing waiting times and potential errors, making operations more efficient. The accuracy of that, as well as the timely delivery of products to customers, improves and increases satisfaction (Willis et al., 2016). On-time delivery not only meets customer expectations but also creates trust and loyalty. Finally, this research aims to test whether the implementation of information technology influences internal and external integration to improve company performance and how the application of information technology can help companies connect various operational elements both within the company and with external parties such as suppliers and customers so that it has a positive impact on the company's efficiency, effectiveness and performance in the global market.

## 2. Literature Review

The Resource-Based View (RBV) is a grand theory of research that posits that a company's long-term competitive advantage is determined by its ability to own, manage, and utilize valuable, rare, inimitable, and non-substitutable resources, including technological resources, organizational capabilities, and relationships with partners.

### 2.1. Implementation of Information Technology

In the era of globalization marked by accelerated technological development and increasingly fierce competition, companies are required to optimize digital resources to maintain a competitive advantage. Information technology implementation involves utilizing digital technology in a company's operations (Ju et al., 2021). This technology enables companies to collect data quickly across various fields, thereby enhancing the efficiency of presentation and communication between departments (Riley et al., 2016). Data that has been processed appropriately turns into quality information, which can then be disseminated to external partners to support coordination and communication (Siagian et al., 2021). Additionally, the application of information technology enables top management to make more accurate decisions and eliminates boundaries between functions, ensuring the adequate flow of information (Pratono, 2022; Sundram et al., 2020).

Information technology encompasses the use of applications that integrate various data functions to provide information relevant to business interests (Riley et al., 2016). Applied information technology allows companies to collect and store data in databases. The data is then processed into reports required by each department, which serve as the basis for users and top management to make informed decisions. As software and hardware continue to evolve, information technology must also adapt to remain relevant. For example, the application of technology concepts can be used to collect information throughout the supply chain (Tan & Sidhu, 2022). The adoption of information technology not only increases operational efficiency and the accuracy of decision-making but is also key to dealing with market dynamics and enhancing the company's overall competitiveness (Jimenez-Jimenez et al., 2019). The organization's ability to provide data effectively supports the formation of partnerships and increases competitiveness (Vafaei-Zadeh et al., 2020). Technology supports planning and forecasting processes tailored to the company's needs, enabling all supply chain components to access information quickly. Implemented information technology through collaboration with external partners to achieve goals and optimal results (Shukor et al., 2021).

## 2.2. Internal and External Integration

Supply chain integration aligns activities and processes that occur internally within the company and externally with suppliers and customers (Birasnav & Bienstock, 2019). This concept encompasses two key aspects: the application of information technology and the exchange of information within and outside the organization (Yuan et al., 2022). Internal integration itself refers to the unification of various functions across departments within a company (Ju et al., 2021). Efforts to improve internal integration are limited to the internal scope and involve collaboration with partner companies (Basana et al., 2022a). This integration process is not related to certain ownership or domination. However, it is a collaboration that combines business processes and joint activities to support operational efficiency and effectiveness, ultimately enhancing the company's competitiveness (Tarigan et al., 2021a; Setiawan & Tarigan, 2022).

Supply chain integration reflects the unification of processes through intense cooperation between buyers and suppliers (Daigude et al., 2021). The effectiveness of this integration is a key factor for companies to make the necessary improvements to maintain their competitiveness. The company's ability to manage raw material procurement activities in collaboration with suppliers is a tangible manifestation of supply chain integration (Tarigan et al., 2021b). Through this integration, companies can communicate and coordinate with suppliers regarding raw material requirements, procurement planning for new products, and other relevant aspects (Tan & Sidhu, 2022). The company's ability to coordinate with customers, including setting the number of shipments, achieving mutual understanding of market trends, and planning distribution, is also an important part of the integration process (Siagian et al., 2021). This integration activity involving customers is known as customer integration (Shukor et al., 2021).

The company's ability to manage internal human resources in a way that allows for flexible adjustments to departmental boundaries in response to business functions is a crucial step in removing existing silos (Sundram et al., 2020). Companies can also involve human resources from suppliers and customers to foster wider integration between companies, making the cooperation process more synergistic (Siagian et al., 2022). This supply chain integration plays a vital role in improving company performance, ultimately contributing to increased competitiveness through reduced operational costs and increased effectiveness (Kristanti & Mranani, 2024). According to Sundram et al. (2020), indicators for measuring supply chain integration include active communication between companies in the supply chain, the ability of the company and its partners

to create compatible information systems, expansion of the supply chain network, and the company's participation in marketing its supply chain partners. Basana et al. (2022a) also stated that measuring supply chain integration consists of three main aspects: internal integration, upstream integration, and downstream integration.

Internal integration is a process that refers to the relationship and coordination between departments within a company, facilitating cross-functional communication, interaction, and collaboration to achieve company targets (Tarigan et al., 2021a). Integration with suppliers and customers through knowledge exchange has been proven to improve a company's operational performance (Demeter et al., 2016; Liu et al., 2018). The company also developed internal integration that encourages collaboration and synchronization between departments, making it easier to adapt to the needs of suppliers and customers (Huo et al., 2014; Demeter et al., 2016; Basana et al., 2022b). This process involves collaboration between functions to establish forecasting, scheduling, and information sharing (Jajja et al., 2018; Chaudhuri et al., 2018; Firmansyah & Siagian, 2022). Thus, internal integration involves unifying functions and processes within the company, particularly in areas such as inventory management, procurement, warehousing, transportation, demand planning, and production (Munir et al., 2020).

Collaborative decision-making to ensure the efficient flow of resources among all members of the supply chain (Demeter et al., 2016; Tarigan et al., 2020). Additionally, external integration necessitates consistent strategy adjustments in designing and implementing policies to enhance organizational performance between the company and its business partners (Jajja et al., 2018). External integration also includes unifying physical aspects and exchanging information between customers, manufacturers, and suppliers (Liu et al., 2018). Integration relationships with suppliers enhance the stability of material supply and foster partnerships between companies and suppliers (Siagian et al., 2022; Basana et al., 2022b).

## 2.3. Company Performance

Company performance is centered on the advantages it offers compared to its competitors (Siagian et al., 2022). A company's ability to obtain and manage raw materials using the right processes (Siagian et al., 2021). The increasing number of competitors in one business field makes competition increasingly difficult to face. Therefore, companies continue to strive to create added value to their products to achieve performance (Pratono, 2022). Companies compete to become consumers' first choice by prioritizing relatively low production cost efficiency while still producing products with good business value (Siagian et al., 2020). The

company's ability to manage resources efficiently, enabling it to produce products at lower costs than its competitors, is a significant attraction for consumers. Several companies enhance their performance through new product innovation and the creation of new markets, allowing the products they produce to shape consumer preferences (Firmansyah & Siagian, 2022).

Companies always consider the rate of return commensurate with the costs incurred. According to Yuan et al. (2022), company performance, as demonstrated through supply chain responsiveness, includes the ability to provide faster and more effective responses to customers, introduce and market new products more quickly, respond swiftly to market changes, and adjust competitive strategies (Abeysekara et al., 2019). Other indicators set by Siagian et al. (2022) include lower costs for customers, the ability to create high-quality products that exceed expectations, accuracy in product delivery, new product innovation, and faster production of new products compared to competitors.

## 2.4. Relationship Between Concepts

Advanced information technology plays a pivotal role in enabling seamless supply chain integration by ensuring real-time data accessibility and supporting informed, timely decisions that enhance operational efficiency (Yuan et al., 2022). It significantly contributes to the alignment and collaboration among supply chain partners by delivering accurate insights into market demand and production planning, thus promoting streamlined and coordinated processes. Moreover, companies that invest in effective IT systems tend to experience improved levels of integration across their supply chain networks (Sundram et al., 2020). The implementation of information technology in organizations is considered to have the power (Yu et al., 2021). For example, in the hotel sector, information technology has been proven to influence upstream, downstream, and internal integration (Basana et al., 2022a). The use of digital technology also provides unique value for companies in optimizing supply chain integration (Ju et al., 2021). Additionally, the application of Internet of Things (IoT) technology enables companies to enhance supply chain integration (Tan & Sidhu, 2022).

Improvements to existing technology as well as the development of new technology (Buer et al., 2021). Recent advances, including cloud computing, the Internet of Things, big data, blockchain, robotics, and artificial intelligence, have enabled the integration of previously isolated supply chain systems into intelligent and connected networks (Nayal et al., 2022). Smart manufacturing, through the application of technology in product design and assembly, can enhance internal production efficiency while meeting customer needs

through external integration (Meindl et al., 2021). New technologies also enable companies to manage large amounts of data effectively, a task that was previously challenging (Bag et al., 2021). The application of information and communication technology also increases internal and external integration. This approach involves the adoption of technologies and processes that facilitate coordination among supply chain members (Siagian et al., 2022), resulting in a seamless exchange channel for materials, information, and finished products (Sundram et al., 2020).

An integrated supply chain enables more efficient product flow and transparent operations while reducing the time between order receipt and customer delivery (Sundram et al., 2020). Information technology supports better control over supply chain integration by sharing quality information that facilitates the decision-making process (Tarigan et al., 2021a). Furthermore, the use of electronic devices to access information technology also encourages increased integration with external partners, as it allows the exchange of accurate, timely information that meets standards (Vafaei-Zadeh et al., 2020). The use of digital platforms to share information with suppliers can support the development of green digital purchasing, provide reliable and accurate data on suppliers, and guide the implementation of environmentally friendly practices in the supply chain (Birkel & Müller, 2021).

H<sub>1</sub>: Implementation of Information Technology influences Internal Supply Chain Integration

H<sub>2</sub>: Implementation of Information Technology influences External Supply Chain Integration

Supply chain integration is considered a competitive strategy in which companies strategically collaborate with partners and manage the flow of information, products, and processes within and between organizations, from upstream suppliers to downstream customers (Li & Chen, 2020). This integration aims to increase the company's value to customers by creating innovative products and processes (Tarigan, 2018). To achieve this, companies unify functions between related departments, such as suppliers, distribution, manufacturing, and customers, to strengthen long-term competitiveness (Al-Shboul et al., 2017). Internal integration refers to the extent to which a company organizes practices, resources, and procedures in a collaborative system and synchronizes and controls processes across functions to meet customer needs (Irfan & Wang, 2019). Internal integration, realized through information sharing and joint decision-making between departments, also influences external integration, particularly in exchanging information with key customers and suppliers (Munir et al., 2020; Chaudhuri et al., 2018).

H<sub>3</sub>: Internal supply chain integration influences external supply chain integration.

The use of IT enables managers to quickly adopt recovery capabilities, which have a positive impact on company performance (Riley et al., 2016). Supply chain responsiveness and information technology also strengthen company capabilities (Yuan et al., 2022). Adopting and utilizing IT is typically based on efforts to enhance supply chain operational efficiency, thereby improving overall company performance (Tarigan et al., 2021a). Performance assessment encompasses not only cost aspects but also includes other financial indicators, such as return on investment, return on assets, and sales, which continue to grow over time. A comprehensive review indicates that performance evaluation should consider all aspects, from financial to operational processes and levels throughout the supply chain (Shahbaz et al., 2018).

Additionally, IT has proven effective in facilitating collaborative relationships between enterprise networks, suppliers, and customers (Sundram et al., 2020). The company's ability to respond quickly to customer complaints and questions ultimately increases customer loyalty (Sundram et al., 2020). Additionally, the application of IT through a well-integrated website with business partners can expedite product delivery and enhance customer service (Vafaei-Zadeh et al., 2020).

H<sub>4</sub>: The implementation of information technology influences company performance.

The company's supply chain integration, achieved through active participation in marketing supply chain partner products, has been proven to increase competitiveness, as evidenced by higher customer loyalty and the company's ability to respond quickly to customer inquiries (Sundram et al., 2020). By implementing integration that encompasses internal, upstream, and downstream aspects, companies can adapt flexibly to enhance operational performance, for example, in the hotel sector, thereby increasing competitiveness (Basana et al., 2022b). Coordination and collaboration built through supply chain integration play an important role in driving improved business performance and strengthening the company's competitive position (Siagian et al., 2021).

The internal integration formed within the company, represented by data and enterprise applications that span multiple functions, contributes to improving operational and financial performance (Huo et al., 2014). Internal integration has a significant impact on external integration, including customer and supplier integration (Jajja et al., 2018). Strategically, intelligent supply chains adopt a digital transformation perspective by aligning supply chain goals through real-time data

flows (Benitez et al., 2022). Internal integration also plays a role in improving operational performance through stronger product differentiation (Demeter et al., 2016; Siagian et al., 2023). In manufacturing companies in India, the implementation of supply chain integration also positively impacts company performance, ultimately increasing competitiveness (Daigude et al., 2021). Integration between suppliers and customers also enables companies to develop new products more quickly than their competitors, thereby strengthening their market position (Siagian et al., 2022).

Through external integration, companies engage partners in collaborative decision-making, which contributes to improved operational performance by reducing costs (Demeter et al., 2016). Additionally, when internal integration is combined with external integration in both upstream and downstream forms, it also has a positive impact on hotel performance (Basana et al., 2022b). Customer integration, which is facilitated through digital orders and periodic interactions with key customers as part of external integration, has a positive impact on the company's economic performance (Fernández, 2022). Lastly, external integration, which involves collaboration between customers and suppliers through the sharing of information and joint decision-making, enhances agility performance in manufacturing companies (Jajja et al., 2018).

H<sub>5</sub>: Internal supply chain integration influences company performance.

H<sub>6</sub>: External supply chain integration influences company performance.

Based on the explanation above, a conceptual research framework can be established, as shown in Figure 1.

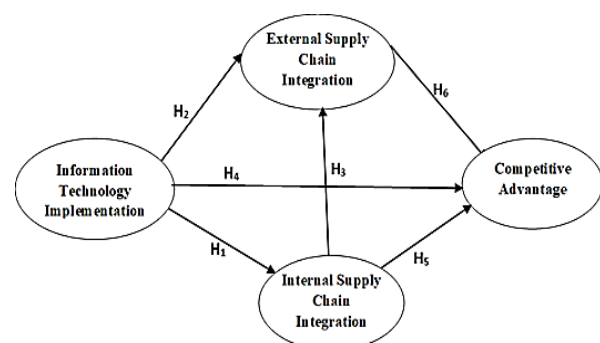


Figure 1. Research conceptual framework

### 3. Methods

This research uses a causal quantitative approach to test the cause-and-effect relationship between variables. The research population consists of manufacturing companies in East Java that have implemented cross-functional integrated information technology. The

amount of data used is calculated using an infinite population, so a minimum of 100 data points is required. The sample selection criteria included companies that had implemented information technology and were in East Java, and the respondents taken were permanent employees with work experience and held at least a staff position in the manufacturing company. The data collected comprised 105 respondents who were distributed questionnaires directly to industry practitioners, most of whom used Google Forms. The operational definition of research determines research items. The information technology implementation variable refers to the use of information technology applications that can be applied cross-functionally.

The indicators set for the implementation of information technology adopted in research, as noted by Jimenez-Jimenez et al. (2019), are that the information produced is accurate (IT1), reliable (IT2), timely (IT3), and complete (IT4). Internal supply chain integration enables the company to integrate various parts seamlessly, facilitating easy coordination. Indicators used to measure internal supply chain integration, as adopted by Basana et al. (2022a), include internal data integration is going well (ISCI1), real-time data integration within the company (ISCI2), and cross-functional coordination is effective (ISCI3). Cross-functional data integration is accurate (ISCI4). External supply chain integration refers to a company's ability to establish collaboration with external partners. The indicators used in this research to measure external supply chain integration are adoption Yu et al. (2021) that the exchange of information with external partners is running well (ESCI1), the ordering system with external partners is running well (ESCI2), external partner participation is high (ESCI3), collaboration with external partners is going well (ESCI4). The company is actively involved in the development of external partners (ESCI5). The dependent variable for company performance is the achievements the company achieves within a specific period. The resulting company performance is measured by adopting measurement items determined by Siagian et al. (2020), which include increasing company sales (FP1), reducing production costs for the company (FP2), enhancing customer satisfaction provided by the company (FP3), and increasing company flexibility in meeting customer requests (FP4).

Primary data was collected directly from the source through questionnaires. The questionnaire was created using Google Forms and distributed online via links shared on various social media such as Line, WhatsApp, Instagram, and others. Respondents choose answers corresponding to each statement provided, provided they meet the specified sample criteria. The measurement scale used is a Likert scale. The collected data was then analyzed using the Partial Least Squares

(PLS) method, an analysis technique connecting several independent and dependent variables. Model evaluation is carried out by assessing the suitability of latent variables using external model criteria (outer model) and internal model (inner model).

#### 4. Result

Of the respondents, 55.2% were male (58 respondents), and 44.8% were female (47 respondents). The profile of respondent's characteristic on structure organization at the level of Owner at four respondents (4%), Top management as a director at 7% (7 respondents), Manager at 10% (11 respondents), Supervisor at 38% (40 respondents), Senior staff at 20% (21 respondents) and staff at 22% (21 respondents), which is shown in Table 1.

**Table 1.** Characteristics of respondents by position

Department	Amount	Percentage
Owner	4	4%
Board of Director	7	7%
Manager	11	10%
Supervisor	40	38%
Senior Staff	21	20%
Staff	22	21%
Total number	105	100%

The profile of respondents based on length of work and having been a permanent employee at the company is found in Table 2.

**Table 2.** Characteristics of respondents based on the length of work

Length of work	Amount	Percentage
1 to 3 Years	13	12%
3 To 5 Years	12	11%
5 to 7 Years	10	10%
7 To 10 Years	18	17%
= 10 years	52	50%
Total number	105	100%

The profile of respondents based on the characteristics of the department working in the company is found in Table 3.

**Table 3.** Characteristics of respondents by department

Department	Amount	Percentage
Accounting/Finance	15	14%
Marketing/Sales	35	33%
Operations/Production	25	24%
Purchasing/Export-Import	6	6%
Engineering	6	6%
Logistic	8	8%
Planning Production Inventory Control	8	8%
Information Technology	2	2%
Total number	105	100%

Testing the outer model to test validity and reliability. The outer loading for the validity test is above



0.500. The reliability test, as indicated by composite reliability values greater than 0.700, is presented in Table 4.

Table 4 shows that all measurement items have met the validity test with a loading factor above 0.500 and the reliability test with a value above 0.700. The Q square of inner model goodness of fit of the research model was obtained using internal supply chain integration of 0.309; external supply chain integration is 0.214, and firm performance is 0.286. The predictive value of the model is determined by the Q square value  $Q^2 = 1 -$

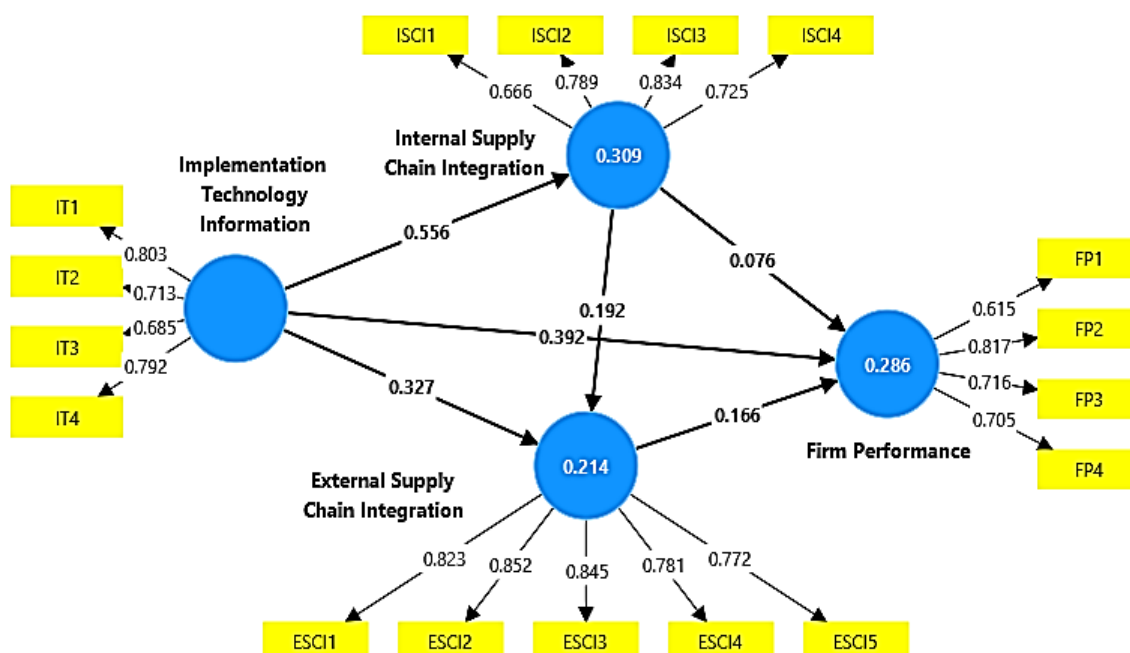
$[(1 - r_1^2) \times (1 - r_2^2) \times (1 - r_3^2)]$  is  $Q^2 = 1 - [(1 - 0.309) \times (1 - 0.214) \times (1 - 0.286)] = 0.6122$ . This indicates that 61.22% of the changes brought about by the implementation of information technology can impact both internal and external supply chain integration and firm performance.

## 5. Discussion

The test path coefficient of the inner model values is seen in Figure 2 and Table 5.

**Table 4.** Goodness of fit outer model

Item Measurement	Loading Factor	Composite Reliability	Cronbach Alpha	AVE
Implementation of information technology		0.747	0.740	0.562
The resulting information is accurate (IT1)	0.803			
The resulting information is reliable (IT2)	0.713			
Information generated in a timely manner (IT3)	0.685			
The resulting information is complete (IT4)	0.792			
Internal Supply chain integration		0.753	0.747	0.572
Internal data integration is running well (ISCI1)	0.666			
Real-time data integration in the company (ISCI2)	0.789			
Cross-functional coordination goes well (ISCI3)	0.834			
Cross-functional data integration is accurate (ISCI4)	0.725			
External Supply chain integration		0.875	0.873	0.664
Information exchange with partners is going well (ESCI1)	0.823			
Partner ordering system is running well (ESCI2)	0.852			
High external partner participation (ESCI3)	0.845			
Collaboration with external partners is going well (ESCI4)	0.781			
The company is actively involved in partner development (ESCI5)	0.772			
Firm Performance		0.720	0.718	0.514
Increase in company sales (FP1)	0.615			
Reduction of production costs in the company (FP2)	0.817			
Increased customer satisfaction provided by the company (FP3)	0.716			
Company flexibility to meet customer demands (FP4)	0.705			



**Figure 2.** Test results path coefficient

**Table 5.** Hypothesis test and original sample results

Hypothesis Testing	Original Sample (O)	T Statistics	P Values
Implementation Technology Information → Internal Supply Chain Integration (H1)	0.556	7.296	0.000
Implementation Technology Information → External Supply Chain Integration (H2)	0.327	2.980	0.003
Internal Supply Chain Integration → External Supply Chain Integration (H3)	0.192	1.762	0.089
Implementation Technology Information → Firm Performance (H4)	0.392	3.606	0.000
Internal Supply Chain Integration → Firm Performance (H5)	0.076	0.634	0.526
External Supply Chain Integration → Firm Performance (H6)	0.166	1.663	0.097

Testing the first hypothesis (H1) yielded a p-value of 0.556, which corresponds to a t-statistic of 7.296, exceeding the critical t-statistic of 1.96. The p-value is below 0.050. These results suggest that the implementation of information technology has a significant impact on internal supply chain integration in manufacturing companies. The information produced is accurate and timely, as a result of effective information technology implementation, which enhances internal supply chain integration, allowing for seamless internal data integration and real-time data sharing within the company. The use of information technology in companies can make them cross-functionally integrated, allowing them to utilize a single database that facilitates effective coordination and collaboration. The results of testing the second hypothesis (H2) were found to be 0.327 with a t-statistic of 2.980, which is above 1.96. The results indicate that implementing IT has a significant impact on external supply chain integration in manufacturing companies. The implementation of information technology in companies provides conditions for improving the exchange of information with external partners, and collaboration with them runs smoothly.

The third hypothesis (H3), which compared internal supply chain integration to external supply chain integration, yielded a p-value of 0.192, corresponding to a t-statistic of 1.762, which exceeds the t-statistic of 1.65 at a significance level of 0.1. Internal supply chain integration with reliable and complete information can increase high external partner participation, as it facilitates effective external supply chain integration. Testing the fourth hypothesis (H4), with a value of 0.392 and a t-statistic of 3.606, which is above 1.96. The implementation of information technology that ensures accurate

and complete data can facilitate timely decision-making, thereby increasing customer satisfaction and enhancing the company's flexibility in meeting customer requests.

The fifth hypothesis has a t-statistic value of 0.634 (<1.65). This condition suggests that the internal supply chain integration of manufacturing companies does not have a direct influence on firm performance. The sixth hypothesis (H6), with a t-statistic value of 0.166, exceeds the t-statistic of 1.65. This indicates that external supply chain integration with an ordering system for external partners is functioning effectively, collaboration with external partners is progressing smoothly, and the company is actively engaged in developing external partnerships, which can ultimately enhance firm performance. The information technology developed by the company is capable of producing both internal and external supply chain integration. Manufacturing companies that actively develop external partners and collaborate can achieve firm performance. Companies can increase their flexibility in meeting customer requests and reduce production costs.

## 6. Conclusions

In the manufacturing industry, the use of information technology has become necessary to increase efficiency and effectiveness amidst increasingly fierce competition and increasingly short-term demands. Companies must be able to maintain system integration so that they remain agile and accurate in decision-making and can adapt to external dynamics. The research results show that the application of information technology in the manufacturing sector contributes significantly to increasing internal and external supply chain integration. The company's ability to utilize information technology for fast communication and transactions enables more effective joint decision-making. Implementing information technology also directly improves company performance by providing accurate, complete, and real-time data. Furthermore, the application of information technology in manufacturing companies has been proven to improve company performance by increasing sales, reducing production costs, enhancing customer satisfaction, and increasing company flexibility in meeting customer requests. Flexibility in product development and production processes enables companies to maintain a strong competitive edge. The research provides a practical contribution for company managers to always maintain the role and function of information technology properly by updating the infrastructure. Practical contribution for key users in each department to be able to build collaboration between cross-functional and external partners on an ongoing basis. The theoretical contribution of the research is to



enrich modern management in the development of information technology systems and sustainable supply chains.

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