Harnessing ICT in Strategic Alliances: Pathways to Customer and Financial Performance in Manufacturing

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Abstract

This study investigates how information and communication technology (ICT) influences customer and financial performance in strategic alliances. It also examines how product type affects this relationship as firms shift from standardised to customised production. Data were collected from 104 Indonesian manufacturing companies through questionnaires. The proposed relationships were analysed using path analysis and Partial Least Squares (PLS)-based multi-group analysis. The results show that participation in strategic alliances does not directly enhance financial performance. However, the use of ICT improves coordination and connectivity among alliance partners. This leads to better customer performance, which in turn supports financial gains. The impact of ICT and strategic alliances is stronger in customised production, where firms experience more significant improvements in financial outcomes. This study highlights the importance of ICT in strategic alliances and underscores the need to consider product type when evaluating performance outcomes.

Keywords: Strategic alliance, ICT, Customer performance, Financial performance, Indonesia, mass production, customised production.

1. Introduction

Global and internet markets have increased market competition worldwide. Consequently, customers now have a wider range of options and demand better-quality products and competitive prices (Chen & Chen, 2015). The literature suggests that various marketing and production strategies can improve financial performance (Jiang *et al*., 2016; Morgan *et al*., 2019). A strategic alliance is a significant trend in which manufacturers and important suppliers consolidate their resources to achieve strategic objectives. The main goal of forming a strategic alliance is to leverage the strengths of partners to gain a competitive edge without requiring significant investment or long-term commitments (Babu *et al*., 2020; Geleilate *et al*., 2021).

A significant number of studies have investigated the effect of strategic alliances on improving a firm's performance (e.g., Alvarez and Barney (2001); Cacciolatti *et al*. (2020); Coombs *et al*. (2006); Geleilate *et al*. (2021)). However, the empirical evidence is mixed. A number of studies report a positive effect of strategic alliances on firm performance (e.g., Cacciolatti *et al*. (2020); Geleilate *et al*. (2021); Tseng and Liao

(2015)), with some showing positive effects on value creation and subsequently negative effects on value destruction (e.g., Coombs *et al.* (2006)), while others demonstrate solely negative effects (e.g., Alvarez and Barney (2001)).

The biggest barrier to the effectiveness of a strategic alliance is the absence of close communication, information sharing, integration among members, and cooperation (Winata *et al*., 2016; Yang *et al*., 2007). This relationship requires good communication and information sharing to increase integration and collaboration among members (Babu *et al*., 2020; Dhaundiyal & Coughlan, 2022). Dumont (2021) examined the main reasons for failure of alliances between several major American corporations and found that these failures were mainly attributed to a lack of communication. This led to clashes in organizational culture, redundancy in functions, and incompatibility in systems and processes. As the intranet and/or Internet can transmit information rapidly, it enables users to access information instantly and share it with other parties in business. Additionally, ICT can be developed to provide compatible systems and processes among members of the strategic alliance. It is argued that through the use of ICT, companies' alliance members will be able to enhance the benefits of alliance relationships through, for example, jointly developing products or services, finalizing contracts, assessing and developing the potential of their partners, sharing promotional plans, identifying and negotiating optimum prices, and identifying the organization's potential to enter new markets. Although previous studies have identified factors affecting strategic alliance success or failure (Dumont, 2021; Greve *et al*., 2010; Sambasivan *et al*., 2011; Siew-Phaik *et al*., 2013; van der Kamp *et al*., 2022), none of those studies tested the impact of the managerial use of ICT on strategic alliance success in developing countries.

This study contributes to the understanding of the moderating role of ICT in the relationship between strategic alliances and firm performance in manufacturing companies located in developing countries. Furthermore, this study extends the existing literature by examining whether different types of products, such as standardised and customised products, derive distinct benefits from engaging in strategic alliances.

2. Literature Review and Hypotheses Development

The effects of engagement in strategic alliances are a significant topic for alliance researchers. In the strategic management literature, previous studies have investigated the relationship between strategic alliances and organizational performance (e.g., Jiang

et al. (2016); Mouri et al. (2012); Robson et al. (2019)). These studies suggest that strategic alliances for new resource complementarity (e.g., Dhaundiyal and Coughlan (2022); Mouri et al. (2012); Pangarkar and Wu (2013)) and increased firm performance may be achieved by generating synergistic capabilities. From the perspective of the Resource-Based View (RBV), such alliances are strategic mechanisms through which firms can access, combine, and leverage valuable, rare, inimitable, and non-substitutable (VRIN) resources that are otherwise unavailable internally. These potential alliances are designed with the intention of producing abnormal returns (e.g., Brooke and Oliver (2005); Keasler and Denning (2009)), which may or may not eventuate in reality. Thus, strategic alliances are well-accepted management tools designed to achieve a greater product market position by enhancing a firm's resource base and competitive advantage.

There are two primary research areas in strategic management literature that focus on strategic alliances. The first research area seeks to investigate the connection between organizational learning and innovation through strategic alliances (e.g., Babu *et al.* (2020); Enderwick (2011); Jiang and Li (2009)). Waheed *et al*. (2023) investigated the relationship between alliance learning processes and alliance success, while considering the moderating role of organizational openness culture. They found that alliance learning has a positive influence on alliance success, and the impact of openness varies depending on the level of alliance learning. The second research area is motivated by the study of team diversity, coordination, and effectiveness in organizations, and aims to improve financial performance through strategic alliances (e.g., Dhaundiyal and Coughlan (2022); Jiang *et al.* (2016); Zoogah *et al.* (2011)). While it seems logical that strategic alliances were formulated with the purpose of improving financial performance, to date, few empirical studies have examined how ICT is associated with improved customer-related performance in strategic alliances as a strategic management tool to improve an organization's financial performance. Haase and Franco (2015) discovered that SMEs internationalize via strategic alliances to improve sales and reduce costs. This is because strategic alliances enable SMEs to learn about foreign markets, cultures, and partner with suitable national firms, particularly for those with limited international experience. In this study, we propose a connection between strategic alliances and organizational performance by examining the influence of ICT on improving customer-related performance, which in turn leads to a positive financial performance of the strategic alliance.

2.1 Involvement in a strategic alliance and customer performance

Previous research indicates that strategic alliances offer various benefits to their members, including improved access to larger markets with less investment, better management of environmental uncertainty and inter-organizational dependency, reduced resource dependence, increased control over markets and brand name, and a competitive advantage (Dhaundiyal & Coughlan, 2022; Jiang & Li, 2009; Steensma & Corley, 2000; Zoogah *et al*., 2011). However, previous studies have reported contradictory results. For instance, Tehrani (2003) finds that participating in a strategic alliance allows a manufacturing company to improve product quality by gaining access to high-quality materials and parts from its suppliers, leading to higher productivity. Establishing alliances can also facilitate companies to promptly address customer demand and uphold or improve customer services. Collaborating strategically with distributors and marketing agents can assist companies in delivering superior customer services and support. Furthermore, strategic alliances can enhance partners' responsiveness to market changes, provide deeper insights into purchasing patterns, and foster improved collaboration and information-sharing throughout the supply chain (Kim *et al*., 2013; Zoogah *et al*., 2011). They can also enhance collective ordering, improve the management of supply sources, and ensure on-time delivery of required quantities (Jiang & Li, 2009). However, Winata *et al.* (2016) observed no direct relationship between engagement in a strategic alliance and customer relationships across different types of industries. Despite the mixed findings of the strategic alliance and CRP relationship in the above literature, it is argued that as organizations engage in strategic alliances, it should improve member firms' CRP. This leads to the following hypothesis:

> *H1: Engagement in a strategic alliance of a manufacturing company influences customer performance.*

2.2 Involvement in Strategic Alliance and ICT

Most studies have demonstrated that strategic alliances improve financial performance (Cacciolatti *et al*., 2020; Geleilate *et al*., 2021; Jiang & Li, 2009; Zoogah *et al*., 2011). However, these studies fail to find a direct relationship between strategic alliances and performance, arguing that a relationship exists through mediating factors (Steensma & Corley, 2000). Other researchers report no association between engagement in strategic alliances and performance (Shrader, 2001) which supporting Steensma and Corley's

assertion of omitted variables. According to Shrader (2001) it is essential for all members of a strategic alliance to share information with their trading partners and customers in real time for the alliance to operate successfully. By exchanging information and establishing strong relationships, alliance members can build trust and demonstrate their level of commitment, which ultimately affects the behavior of the alliance as a whole.

In a strategic alliance in which members are interconnected, they can leverage and enhance each other's core competencies by utilizing ICT. This enables all members to effectively utilize information for the prompt delivery of goods and services to customers (Hsiao *et al.*, 2017). For example, ICT may enable business processes or transactions to be tracked across departments, companies, enterprises, and alliance boundaries. Winata *et al.* (2016) find that CRP benefits from strategic alliances through ICT, and as such, strategic alliances and the use of ICT are inseparable. Geleilate *et al.* (2021) found that integrated system capability increases organizational performance via vertical strategic alliances. In other words, an organization needs to use ICT to incorporate its alliances to improve organizational performance. This study argues that:

> *H2: A manufacturing organisation's engagement in a strategic alliance influences the use of ICT.*

2.3 ICT and customer-related performance

ICT and associated software are used to bring information from the organization to customers in relation to products, prices, sales, and market trends (Bresnahan, 2019; Shi *et al*., 2020). Consequently, firms are increasingly establishing electronic relationships with their customers. Interactive websites allow customers to find product information and subsequently process sales orders and payments. Strategic alliances may entail manufacturers developing joint product planning, advertising, storage, and distribution (Winata *et al.*, 2016).

Consequently, to create competitive markets, management creates close relationships with customers, which accelerates organizational performance. These improvements may include improvements in product quality and delivery performance. Communication networks enable organizations to access online information and share vital data that are crucial for decision-making and are essential for staying competitive in current markets. In a market with intense competition, customer preferences and demands as well as products offered by competitors can undergo sudden and unforeseen

changes. ICT helps managers monitor these changes and take appropriate action (Choe, 2008). Additionally, ICT allows for swift and efficient communication between marketing and production departments when responding to customer inquiries related to product availability, quality, and pricing. (Faber *et al*., 2004; Geleilate *et al*., 2021; Quader & Quader, 2008; Siew-Phaik *et al*., 2013). Coordination between production and marketing is also crucial for meeting customer demands and offering competitive pricing (Quader & Quader, 2008; Siew-Phaik *et al*., 2013). In a strategic alliance, the supplier and manufacturer may use their combined ICT to determine which features desired by customers can be provided in a way that increases, rather than decreases, the strategic alliance's profits. Therefore:

H3: The use of ICT influences customer-related performance.

2.4 Customer-related and financial performance

Businesses frequently allocate significant resources to marketing their products, acquiring new customers, and maintaining current customers. Nonetheless, in the worldwide e-commerce marketplace, relying solely on traditional product promotion approaches may not be sufficient for a company's survival (Jiang *et al.*, 2015). The literature suggests that to survive in such a market, businesses must enhance customer satisfaction levels, both to retain current customers and to attract new ones. The academic literature has long recognized a correlation between customer satisfaction and financial performance (Eklof *et al*., 2020; Jiang *et al*., 2016; Seiders *et al*., 2005; Williams & Naumann, 2011). Gruca and Rego (2005) suggested that high customer satisfaction accelerates cash flows resulting from repeat purchases. Recently, Eklof *et al.* (2020) found that customer satisfaction and loyalty can be considered predictors of future profitability in the service industry. Because a firm's CRP reflects customer satisfaction, a high CRP improves financial performance. Therefore:

H4: Customer-related performance influences financial performance.

Additional path, it is postulated that strategic alliances can improve financial performance by enhancing CRP, and that this effect is mediated by ICT connectivity. Therefore, ICT connectivity acts as a mediator between strategic alliances and CRP, ultimately leading to improved financial performance. However, the nature and extent of communication, collaboration, and trust varies across countries and societies. According to Hofstede (1997), Indonesian society is characterized by collectivism, where business

relationships are based on mutual trust and business transactions are driven by mutual relationships and obligations for mutual protection and loyalty. Based on existing evidence suggesting a direct correlation between strategic alliances and financial performance, it is anticipated that there will be a positive association between an Indonesian manufacturing firm's engagement in a strategic alliance and its financial performance.

The research model was controlled by the type of product: mass-standardised and customised. A mass-standardised product is a mass-produced product in which the production process is routine, and this product will be produced for a long period of time, whereas a customised product is a production system based on customer orders. This type of product is only produced once a customer has ordered it. It is expected that the effect of strategic alliances and ICT on financial performance for a standardised product will not be as strong as the alliances needed for a customised product. The reason behind this argument is that the engagement of a strategic alliance and ICT for a standardised product is a common practice in companies that produce these mass products, and the relationships between suppliers, manufacturers, and customers are based on routine and long-term contracts. Since customised products are dependent on customer preferences, taste, and demand, the product will vary in terms of design, quality, and price. Market competition intensity and fast responsiveness to customer demands require manufacturers to have strong strategic alliances to gain market share. Buffington (2011) and Ullah and Narain (2018) explained that the mass customization of products is a new market evolution in which customers are involved in product design and configuration. It has also been reported that mass customization systems require fast and accurate responses to customers in terms of time, price, and demand. These factors make it challenging for manufacturers to handle and satisfy customers.

Squire *et al.* (2009) reported that collaboration with a supplier increased customer responsiveness, not only in terms of delivery and cost, but also in terms of product quality. Smith *et al.* (2013) also reported that compared to standardised production systems, mass-customised product systems need stronger supply chain management and greater integrated customer-manufacturer communication within their relationships. Squire *et al*. (2009) and Ullah and Narain (2018) proposed that additional efforts should be put into developing techniques for collaborative modular design, interactive customer integration, integrated supply chain management, and reconfigurable manufacturing

systems. These techniques aim to achieve personalized production by enhancing the ability to meet individual customer needs. This indicates that ICT could be a key success factor for achieving these goals. Further, this argument agrees with Cai et al. (2016) who reported that IT usage enhances the relationship between the supply chain and organizational responsiveness. This study is supported by Urban, et,al (2022) who highlights how ICT supports strategic collaboration and enhances customer satisfaction in mass-customised production. Their study shows that ICT enables real-time communication between manufacturers and customers, improving responsiveness and customization accuracy. They emphasize that ICT facilitates seamless integration across the value chain—similar to strategic alliances—leading to more efficient production and higher customer satisfaction. This suggests that ICT may play a critical role in managing supply chain components efficiently, particularly in relation to customer-oriented factors. While existing studies have explored the relationship between strategic alliances, ICT integration, and customer performance, they tend to focus on either general industry contexts (Dairo et al., 2021) or specific cultural and relational dynamics (Luo, 2007). Sabioni et al. (2021) extend this by examining ICT's role in mass-customised and standardised production systems, but their study does not explicitly address the role of strategic alliances in these settings.

What remains underexplored is the combined effect of strategic alliances and ICT on customer performance across different manufacturing strategies—specifically, mass production versus customised production. No current study systematically compares how these relationships vary between production types, nor do they consider how strategic partnerships may influence ICT effectiveness in enhancing customer outcomes and firm's performance in each context.

3. Methodology

3.1 Sample Selection

This study focuses on manufacturing firms in Indonesia, a country characterised by a collectivist business culture and substantial variation in technological capabilities. As one of the largest economies in Southeast Asia, Indonesia offers a relevant context for this study. It provides an opportunity to investigate how engagement in strategic alliances and the managerial use of information and communication technology (ICT) influence organisational performance.

The sample was drawn from firms operating on Java Island, which accounts for over 75 percent of Indonesia's manufacturing activity. Firms were selected based on two main criteria. First, each firm reported annual sales between 50 and 150 billion Rupiah (appoximately US$370,000 to US$1,000,000). Second, each firm was formally registered with the Ministry of Industry, ensuring that the business was legally recognised and actively operating in the formal sector. From a sampling frame of 250 firms, simple random sampling was used to distribute structured questionnaires to business unit (BU) managers. In total, 113 responses were received, and 104 questionnaires were complete and usable. The final sample reflects a response rate of 41.6 percent.

The final sample represented a wile range of manufacturing sectors. These included food processing, textiles, garments, chemicals, automotive products, and pharmaceuticals. No single industry dominated the sample. Most sectors were evenly represented, with each accounting for approximately 3 to 7 percent of the total. This diversity not only allowed for a more balanced analysis but also helped ensure that the results were not overly influenced by any one sector.

3.2 Measurement Instrument

All constructs in the study were measured using multi-item scales adapted from established sorces in the literature. Some items were modified to better fit the Indonesian manufacturing context. A five-point Likert scale (1 = strongly disagree; 5 = strongly agree) was used to measure all items. Prior to the main data collection, a pilot test was conducted with 30 respondents to check whether the items were clear, reliable, and suitable for the context.

Strategic alliance engagement referred as the extent of collaboration with external partners across the value chain, including suppliers, customers, and research and development actors. This variable was adapted from Li and Atuahene-Gima (2001). Managerial use of ICT was assessed using five items adapted from Andersen (2001), capturing the degree to which digital tools were used to support inter-organisational coordination and internal operations. Customer-related performance (CRP) was operationalised using six items from Hoque and James (2000), measuring firms' responsiveness, complaint handling, delivery reliability, and market orientation. Financial performance was measured relative to competitors using three items based on Kaplan and Norton (1996), focusing on return on investment, operating income, and sales growth.

3.3 Data Analysis

The data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) with the SmartPLS software. This method was considered suitable for complex models and for studies with small to medium-sized samples (Hair et al., 2017). The analysis followed two main steps. First, the measurement model was examined. Then the structural model was assessed.

The measurement model was evaluated in terms of internal consistency, convergent validity, and discriminant validity. Composite reliability and Cronbach's alpha were used to assess internal consistency. Convergent validity was confirmed using the average variance extracted (AVE) for each construct. Discriminant validity was assessed using the Fornell–Larcker criterion and indicator cross-loadings to ensure that each construct was distinct from the others.

The structural model was assessed by estimating path coefficients, *t*-statistics, *p*-values, and confidence intervals using bootstrapping with 5,000 resamples. Additional model fit indices, including coefficients of determination (R^2), effect sizes (f^2), and predictive relevance (Q^2), were also evaluated.

In addition to testing the hypothesised relationships, an additional path was included to examine whether strategic alliance engagement (SA) directly affects financial performance (FP). This path was tested as a post hoc addition to explore whether strategic alliances could have a direct impact on financial outcomes, independent of the mediating effects of ICT and customer-related performance.

Mediation analysis was conducted to assess whether the relationship between strategic alliance engagement and financial performance was mediated through ICT use and customer-related performance. Bias-corrected bootstrapping was employed to test the significance of the indirect effects. Finally, to examine potential differences in the structural relationships based on firm context, a multi-group analysis (PLS-MGA) was performed, comparing firms with standardised versus customised production strategies.

4. Results

4.1 Measurement Model Assessment

The reliability and validity of the measurement model were assessed before estimating the structural model. As shown in Table I, all constructs demonstrated strong internal consistency. Cronbach's alpha values ranged from 0.807 (CRP) to 0.881 (ICT), while composite reliability values were between 0.800 and 0.918, exceeding the recommended

threshold of 0.70. Convergent validity was also established, with all constructs reporting average variance extracted (AVE) values above 0.50. Although two items in the CRP construct (CRP1 and CRP2) had loadings below 0.70, the overall reliability and AVE remained within acceptable levels.

Discriminant validity was evaluated using the Fornell–Larcker criterion and examination of indicator cross-loadings. All indicators loaded more highly on their respective constructs than on others, confirming adequate discriminant validity. The outer loadings, alpha values, composite reliability, and AVE for each construct are summarised in Table I.

Table I. Results of the measurement models

	Outer Loadings	Cronbach's Alpha	Composite Reliability	AVE
CRP		0.807	0.862	0.513
CRP1	0.633			
CRP2	0.628			
CRP3	0.787			
CRP4	0.768			
CRP5	0.737			
CRP6	0.728			
FP		0.631	0.800	0.573
FP1	0.790			
FP2	0.658			
FP3	0.814			
ICT		0.881	0.918	0.743
ICT1	0.949			
ICT2	0.925			
ICT3	0.589			
ICT4	0.932			
SA		0.811	0.876	0.639
SA1	0.784			
SA2	0.813			
SA3	0.860			
SA4	0.737			

4.2 Structural Model and Hypothesis Testing

The structural model was estimated using PLS-SEM with a 5,000 subsample bootstrapping procedure. The path coefficients, *t*-statistics, *p*-values, confidence intervals, and effect sizes for each hypothesised relationship are reported in Table II.

Table II. The results of significance testing for the structural model.

	β	t-statistics	p-values	95 percent confidence intervals	f^2
H1: SA -> CRP	0.215	2.340	0.019	(0.004, 0.373)	0.051
H2: SA -> ICT	0.356	3.917	0.000	(0.134, 0.503)	0.145
H3: ICT -> CRP	0.330	3.403	0.001	(0.115, 0.496)	0.120
H4: CRP -> FP	0.642	9.618	0.000	(0.469, 0.748)	0.678
SA -> FP	0.092	1.071	0.284	(-0.078, 0.255)	0.014

From Table II, Hypothesis 1 was supported. This result suggests that firms engaged in alliances are better positioned to improve their responsiveness and customer satisfaction. Hypothesis 2 was also supported, indicating that alliance engagement significantly increases managerial ICT use. This outcome reflects the role of collaboration in encouraging digital adoption across organisational processes.

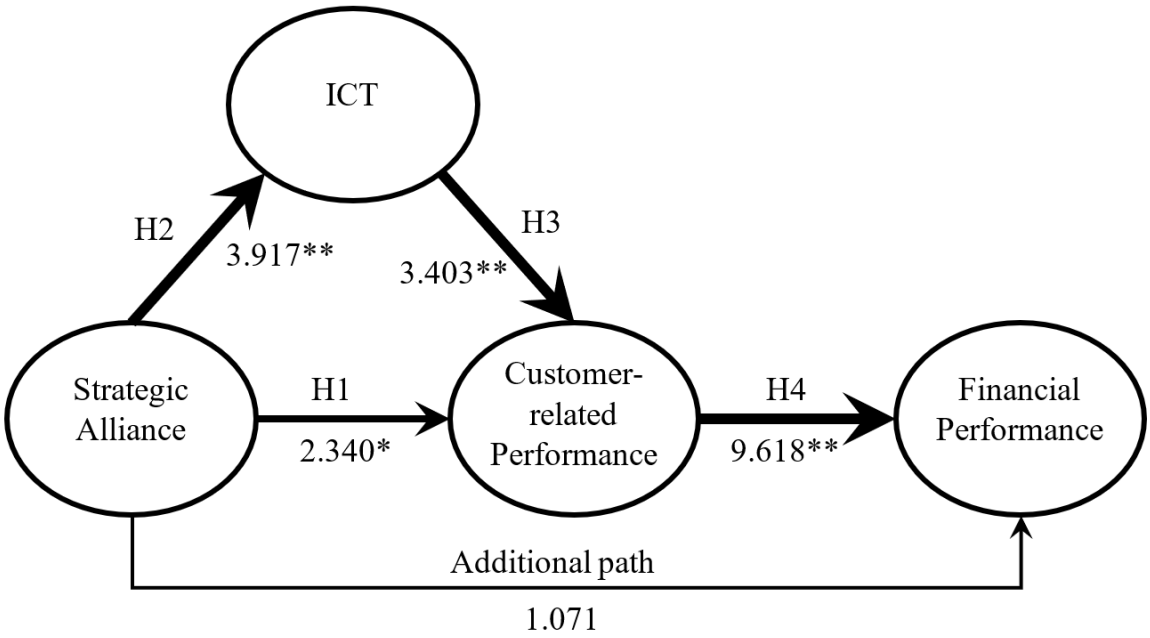
A positive relationship between ICT use and customer-related performance was found, supporting Hypothesis 3. This indicates that the use of digital tools enhances firms' ability to deliver value to customers. Hypothesis 4 was also supported, highlighting the financial benefits of maintaining a strong customer focus.

4.3 Alternative Model Specification

Although not part of the original hypothesis development, an additional path was estimated to assess whether strategic alliance engagement exerts a direct influence on financial performance. This post hoc test was undertaken in response to theoretical ambiguities surrounding this linkage and to verify whether a direct effect may exist alongside the indirect mechanisms theorised in the model.

As shown in Table II, the estimated path from strategic alliance engagement to financial performance was positive but statistically insignificant. This suggests that alliances alone do not generate superior financial outcomes unless complemented by enabling capabilities such as ICT and customer responsiveness.

Additionally, an alternative model was estimated to examine whether ICT has a direct effect on financial performance independent of customer-related performance. This path was also not statistically significant, indicating that the effect of ICT on financial outcomes is primarily realised through its influence on customer-related performance. These findings reinforce the validity of the proposed fully mediated model and are consistent with prior studies suggesting that ICT's financial contributions often materialise through customer-facing improvements rather than direct cost savings.



Note: * p<0.05, ** p<0.01

Figure 1: Results of the structural model

4.4 Mediation Analysis

A bias-corrected bootstrapping approach was used to assess the mediating roles of ICT and CRP in the proposed relationships. As shown in Table III, the indirect effect of strategic alliance engagement on CRP via ICT was statistically significant, confirming partial mediation.

More notably, strategic alliance engagement had a significant indirect effect on financial performance through the sequential mediators—ICT and customer-related performance. These results suggest that the performance benefits of alliances are not immediate but instead emerge through digital enablement and improved customer responsiveness.

Table III. The direct and indirect effects estimation

	Direct			Indirect			
	β	t-value	p-value	β	t-value	p-value	95 percent Confidence Interval
H1: SA -> CRP	0.215	2.340	0.019	0.118	2.730	0.006	[0.037, 0.206]
SA -> FP	0.092	1.071	0.284	0.213	3.267	0.001	[0.060, 0.324]

4.5 Multi-Group Analysis

To examine whether the structural relationships differed according to production context, a multi-group analysis (PLS-MGA) was conducted. Firms were grouped based on whether their operations involved standardised or customised production, allowing for the assessment of moderation effects.

As reported in Table IV, strategic alliance engagement significantly influenced customer-related performance among customised production firms, but the same relationship was not statistically significant for standardised production firms. Similarly, the relationship between ICT use and CRP was significant in the customised group, but not among those wigh standardised production.

These findings highlight the importance of contextual factors. The advantages of alliance participation and digital capability investment appear to be more pronounced in operational environments requiring high levels of flexibility, adaptation, and customer-specific responsiveness.

Table IV. Results from PLS-MGA

Hypothesized paths	Standardised		Customised		Comparison		
	Estimate	t-value	Estimate	t-value	Est**.** Diff.	p-value	Result
H1: SA -> CRP	0.119	0.485	0.280***	3.421	0.161	0.724	S = C
H2: SA -> ICT	0.374**	2.526	0.260*	1.808	0.114	0.257	S = C
H3: ICT -> CRP	0.216	0.815	0.405***	3.605	0.189	0.742	S = C
H4: CRP -> FP	0.758***	14.457	0.685***	6.280	0.073	0.267	S = C
SA -> FP	0.095	0.997	0.010	0.052	0.085	0.350	S = C

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

5. Discussions

The primary objective of this study was to examine the impact of ICT utilisation on both customer and financial performance within the context of strategic alliances. The findings reveal a noteworthy insight: there is no direct correlation between strategic alliances and customer performance in the Indonesian manufacturing sector. This result may be attributed to Indonesia's deeply rooted collectivist culture, where participation in strategic alliances is common and does not inherently lead to competitive advantage or improved performance. This aligns with the cultural frameworks proposed by Hofstede (1997), Koentjaraningrat (1975), and the empirical findings of Winata et al. (2016). In such environments, firms may not gain preferential access to resources or market advantages through alliances, as competitors are often engaged in similar partnerships.

More specifically, manufacturing firms in collectivist societies may struggle to leverage alliances for financial gain, as they are unlikely to secure cost advantages in procurement or command premium pricing in the market. This underscores the importance of contextualizing strategic alliance outcomes within the broader cultural and competitive landscape.

The study also supports the findings of Dhaundiyal and Coughlan (2022), who stress the critical role of effective communication in sustaining collaboration within strategic alliances. In the Indonesian context, where collectivist norms prevail, communication becomes even more vital to translating alliance participation into tangible performance outcomes. This reinforces the link between cultural dynamics and managerial practices in alliance management.

This research also extends the work of Dairo et al. (2021), who identified a positive relationship between strategic alliances, ICT integration, and customer-related performance. While their study was based on qualitative insights from industry professionals, the current research offers a more nuanced, sector-specific analysis by incorporating the variable of production type. Notably, prior studies have not differentiated the effects of strategic alliances and ICT between standardised and customised manufacturing environments.

Furthermore, this study builds upon the contributions of Sabioni et al. (2021), who explored the role of ICT in strategic partnerships among small entrepreneurial firms. Additionally, it extends the findings of Luo (2007) and Winata et al. (2016), who reported

an indirect relationship between strategic alliances and customer-related performance mediated by managerial use of ICT. By integrating these perspectives, the study offers a more comprehensive understanding of how ICT functions as a strategic enabler within alliances, particularly in culturally complex and operationally diverse settings.

This study also offers a novel contribution by highlighting how ICT mediates the complex relationship between strategic alliances and financial performance. While previous studies (e.g., Alvarez & Barney, 2001; Faems *et al*., 2010) confirm the indirect nature of this relationship, the findings suggest that ICT adds a crucial layer of strategic value. This supports a more multifaceted understanding of how alliance outcomes depend not only on structural arrangements but also on enabling technologies.

Importantly, these conclusions must be viewed through the lens of production types. For firms engaged in standardised production, only the paths from alliance engagement to ICT usage, and from customer performance to financial performance, were significant. This implies that although alliances stimulate ICT usage, this does not necessarily lead to improved customer performance in routine production environments—likely due to the relatively low technological demands. In contrast, for customised production, strategic alliances significantly enhance financial performance through ICT and improved customer responsiveness. This implies that such alliances demand sophisticated ICT infrastructure to support dynamic coordination across suppliers and customers, enabling greater responsiveness and differentiation.

This study contributes to the strategic management literature by deepening our understanding of how ICT moderates the relationship between strategic alliances and firm performance, particularly within manufacturing firms in developing countries. Drawing on the Resource-Based View (RBV) theory, the research positions ICT not merely as a supporting tool, but as a strategic resource that enhances a firm's ability to access, integrate, and leverage external capabilities through alliances. According to RBV, firms achieve competitive advantage by possessing and deploying resources that are valuable, rare, inimitable, and non-substitutable (VRIN). In this context, ICT capabilities—such as digital infrastructure, data analytics, and integration systems—serve as critical enablers that allow firms to more effectively coordinate and exploit the resources acquired through strategic partnerships.

The findings also raise important theoretical implications for collectivist contexts. While strategic alliance engagement is often assumed to be beneficial, the results form

this study suggest that without effective ICT integration, the benefits may remain unrealised. This nuance echoes Luo (2007) and Ariño (2003) assertions that in alliance-oriented cultures, relationship quality, strategic alignment, and long-term collaboration matter more than the mere existence of an alliance.

The results further demonstrate that ICT usage enables real-time information flow, enhances customer performance, and ultimately drives financial performance. Strategic alliances should thus prioritise developing sophisticated ICT capabilities to deliver timely, high-quality, and customer-oriented solutions. This is particularly critical for customised production firms, where responsiveness and customer value creation are essential.

Finally, while this study offers valuable insights, it is not without limitations. The findings are specific to the manufacturing sector and may not generalise to service industries. Additionally, this study does not distinguish between vertical and horizontal alliances, which could influence how strategic relationships translate into performance across different operational settings.

6. Conclusion

This study contributes to the existing literature by extending the foundational work of Lou (2007) Dairo et al. (2021), Winata (2106) , and Sabioni et al. (2021) on the interplay between strategic alliances, ICT, and customer performance. While previous research has established the positive influence of ICT-enabled strategic alliances on customer-related outcomes, this study introduces production type (standardised vs. customised) as a critical moderating factor. The findings reveal that the relationship between strategic alliances, ICT, and customer performance is significantly stronger in customised production environments than in standardised ones. This suggests that the benefits of ICT and strategic collaboration are more pronounced when firms operate in contexts that demand flexibility, responsiveness, and tailored customer engagement. By incorporating production strategy into the analysis, this study offers a contingency-based perspective, emphasizing that the effectiveness of ICT and alliances is not uniform but context-dependent. These insights provide both theoretical enrichment and practical guidance for firms seeking to align their digital and strategic initiatives with their operational models.

Disclosure statement

There is no conflict of interest in this study.

Author's contributions to this study is equal.

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