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Ecosystem Exchange, Strategic Capabilities, and Firm Performance with Agility and Innovation Mediators

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ABSTRACT

Understanding the ecosystem remains a big issue, especially in coping with the affiliation challenges of the ecosystem actors. **Relied upon** open system, resource-based, and exchange theory, this study aims to depict the role of ecosystem exchange and Organizational Strategic Capabilities (OSC) and the relationship with strategic agility and service innovation in enhancing firm performance, as well as its mechanism in portraying process view of Resource-Based Theory (RBT) as the search for alignment strategy to multi-actors' challenges in the multilateral ecosystem. **This study** was conducted by using a quantitative research approach to examine sets of hypotheses. Applying five-point Likert-scale questionnaires, the primary data were collected from 196 Indonesian medical devices distributor companies. Then, the structural equation modelling was used to analyze the data. **This study found** strategic capabilities display impressively the autonomous merit of the firms and how the firms communicate through ecosystem exchange. While revealing the principle of equifinality, all roads lead to Rome, of the firms as an open system. **This study portrays** how the firms do exchange intangible resources socially and tangible resources economically and establish solid alignments with their ecosystem, hence keeping the competition away. Indonesian medical device distributor firms can achieve superior performance by fostering ecosystem exchange, developing strategic capabilities, and crucially building strategic agility. These findings offer actionable insights for industry leaders and policymakers aiming to strengthen the healthcare supply chain and advance progress toward the SDGs. The research also provides a foundation for future studies exploring the interplay of dynamic capabilities and innovation in other sectors and contexts.

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1. INTRODUCTION

One of the most essential forms of coordination that supports interfirm collaboration and contributes to organizational success is the concept of the ecosystem [1]. According to [2], an ecosystem can be understood as "An economic community supported by a foundation of interacting organizations and individuals, the organism of the business world". Building on this notion, [3] described an ecosystem as emerging when a central value

proposition needs to be realized, requiring multiple partners to interact and form a coherent alignment structure. This perspective was further refined by [4], who emphasized that such alignment is characterized as either unique or supermodular and is not governed through hierarchical control. In a similar vein, [5] viewed the ecosystem as "a community of actors, as proposed by the coevolution view, and a configuration of activities, as proposed by the structure view, where the former is anchored to the focal firm and the latter to focal innovation; both perspectives interact and reinforce each other to continuously generate innovative practices and ensure the focal firm's long-term prosperity".

The ecosystem differs fundamentally from other forms of business collaboration, such as hierarchical supply chain management or traditional strategic alliances [4]. Unlike these conventional structures, an ecosystem allows firms to establish flexible and customizable contractual relationships with each partner as a result of coordination that is based on standardized yet adaptive mechanisms. According to [3], ecosystems represent a new paradigm of interfirm cooperation, introducing innovative models for both value creation and value capture. Nevertheless, [4] argued that empirical investigations into business ecosystems remain limited. This limitation may stem from several challenges, including conceptual inconsistencies, ambiguous definitions, uncertain scope and boundaries, as well as the lack of a unified theoretical foundation [6, 7].

The previously mentioned ecosystem studies share similarities with research conducted during the 1970s, when scholars from the industrial perspective examined the external environment as a critical source of competitive advantage, primarily emphasizing product market dynamics. In contrast, studies focusing on the resource market [8–11] highlighted the significance of internal organizational elements, particularly the role of firm-specific resources, in achieving sustained success. According to [12], the development and enhancement of internal resources are essential since not all necessary resources can be readily obtained from external markets, and firms must also strengthen them to prevent imitation by competitors. Moreover, [13] emphasized that resources can be classified into several categories, including tangible assets such as financial and physical resources [14], and intangible assets such as intellectual property rights [15], along with organizational capabilities that collectively contribute to a firm's competitive advantage.

Organizational capabilities theoretically could increase the firm's competitive advantage and protect it against the threats of imitations, substitution, and dissipation from the market [16]. Additionally, [17] stated that firms need various interrelated capabilities across all of their functions so that they can generate value. Moreover, [18–20] are some scholars who suggested four factors of what they called the strategic capabilities of the firms, which are market-linking capabilities, technology capabilities, marketing capabilities, and management capabilities. Thus, [21, 22] added information technology capabilities as the fifth factor.

The above resources and market factors could allow firms to scan the dynamic competitive landscapes, thus serving as determinants of firm performance [23]. While [24] portrayed it as the internal and external factors of the firm performance, the integration of both factors is the strategy in the era of economic uncertainty. Moreover, that strategy should be translated into business processes, activities, and routines, whereas concerning the uncertainty nowadays, [25] argued that the firm needs strategic agility as new routines and [26] mentioned about the importance of service innovation. Hence, how those external and internal factors could impact the firm performance is what the author would like to study within the Indonesian medical devices industry as the research context.

The Indonesia medical devices industry as part of the Indonesia healthcare ecosystem as referred to by [27], based upon the external and internal factors previously mentioned, should establish the alignment or re-alignment [3], with the other ecosystem actors, healthcare institutions (e.g., hospitals, clinics, health laboratories) and medical devices producers, that are considered as direct value-adding partners and partners of supply and purchase activities [4]. Such alignment or re-alignment is meant either to address the initiatives or to gain the non-generic complementarities of other actors partially or simultaneously so that the medical devices distributor firms could innovate continuously thus gain its performance. Those types of actions represent the firm's process of counteracting negative entropy and maintaining a steady state, viewing the organization as a living organism within an open system.

Regarding the external and internal resources discussed, especially from where it comes to the firm, the author applies the process view of RBT [28]. While the internal resources are accumulated, the external resources could be acquired from the market. Yet, they also stated that the acquisition cost would be higher if the resource owner has superior information and there could be resources that are non-tradeable. The concept of exchange can be used to overcome such constraints, while the resource-based perspective helps clarify the social and economic dimensions of these exchanges through the utilization of both tangible and intangible

resources. Based on these perspectives, medical device distributor firms are expected to engage in resource exchanges with other actors within the ecosystem [29].

Further, while the two processes above are simply categorized as the process of resource acquisition as one part, the process view of RBT discourse as well in another part on how the resources are developed. To portray this resource development process, the author examines how the medical devices distributor firms could strategically be agile in coping with the dynamics of the Indonesia healthcare ecosystem mentioned previously and perform its service innovatively to gain performance [30].

2. LITERATURE REVIEW

2.1. Ecosystem Exchange

Ecosystem exchange, as conceptualized by [31, 32], encompasses the collaborative engagements through which organizations mutually share knowledge, capabilities, and resources to stimulate innovation and navigate shifting market conditions. These exchanges transcend transactional interactions, they cultivate relational dynamics rooted in trust and strategic alignment. Within such exchanges, the principle of value co-creation emerges, where diverse contributions such as expertise, technological assets, and market access are integrated to yield outcomes surpassing individual firm efforts. [33] identify these synergistic and relational engagements as high-quality exchanges, characterized by their capacity to produce more impactful and customer-centric innovations that ultimately confer competitive advantage.

2.2. Ecosystem Exchange and Strategic Agility

Strategic agility defined by [34] as the organizational ability to swiftly detect and respond to emerging opportunities and threats is significantly enhanced through ecosystem exchange. These collaborative networks provide organizations with timely and diversified information flows derived from ecosystem partners, enabling rapid sense-and-respond capabilities. Firms embedded within dynamic ecosystems tend to exhibit elevated agility, as they can flexibly reorient strategies through shared insights and joint adaptation efforts. Accordingly, the following hypothesis is put forth:

H1a. Ecosystem Exchange Has Significant Effect on Strategic Agility.

2.3. Ecosystem Exchange and Service Innovation

Ecosystem exchange serves as a crucial enabler of service innovation by promoting collaborative efforts among a diverse set of partners, each contributing unique perspectives and specialized competencies. Within these networks, the convergence of ideas and resources fosters new pathways for service development and redesign. Such external leveraging of knowledge particularly in customer-oriented and technology-driven domains equips firms to create services that are more aligned with evolving market needs. [35] emphasize the role of open service innovation facilitated by ecosystem interactions, noting that co-creation involving multiple stakeholders leads to richer, more integrative outcomes. In light of this, the following hypothesis is proposed:

H1b. Ecosystem Exchange Has Significant Effect on Service Innovation.

2.4. Organizational Strategic Capabilities

OSC encompass the set of competencies and resources that enable firms to align internal processes with overarching strategic objectives, thereby securing a sustainable competitive edge. These capabilities are typically categorized into five key dimensions, namely marketing capability, market-linking capability, technology capability, management capability, and Information Technology (IT) capability.

Marketing capability governs strategic decisions around target market segmentation, product pricing, and promotional efforts [19]. Market-linking capability refers to a firm's proficiency in synthesizing customer and competitor data to ensure marketing activities remain responsive to fluctuating market conditions [36]. Technology capability enables organizations to remain competitive by advancing R&D activities, accelerating time-to-market for innovative offerings, and maintaining technological parity or superiority. IT capability facilitates cross-functional information exchange, allowing organizations to coordinate the innovation process and align it with market requirements [21]. Management capability, serving as the integrative force across all other dimensions, optimizes organizational structures and operations to enhance adaptability and reduce strategic uncertainty [37]. Through effective execution of core managerial functions, including human resource management, financial stewardship, and forecasting, firms are able to optimize resource allocation, enhance internal coordination, and make informed strategic choices that support long-term operational sustainability and overall organizational performance.

2.5. Organizational Strategic Capabilities and Strategic Agility

Strategic capabilities, as described by [38], represent complex configurations of skills and accumulated expertise that enable firms to coordinate operations and optimally leverage resources to sustain competitive advantage and generate economic value. Organizations with strong strategic capabilities are able to respond swiftly and cohesively to environmental changes by reconfiguring their internal processes, thereby enhancing their overall strategic agility. These capabilities also underpin efficient resource deployment and foster collaboration both within the firm and across its external network key prerequisites for agility in dynamic contexts. Capabilities rooted in resource orchestration and inter-organizational cooperation facilitate flexible and context-responsive strategic action [39]. In alignment with this theoretical grounding, we propose the following hypothesis:

H2a. Organizational Strategic Capabilities Have Significant Effect on Strategic Agility.

2.6. Organizational Strategic Capabilities and Service Innovation

Strategic capabilities can be understood as distinctive firm-level competencies that are difficult for competitors to replicate [18]. These capabilities play a crucial role in driving service innovation by equipping organizations with the processes, tools, and insights necessary for introducing novel and enhanced services. Capabilities such as market orientation and technological proficiency enable firms to interpret customer expectations and emerging technological trends more effectively, thereby fostering innovation that remains relevant and responsive to changing demand [40]. Additionally, research by [41] confirms that the depth and quality of an organization's strategic capabilities are instrumental in determining the success of its service innovation efforts. Based on this foundation, we put forward the following hypothesis:

H2b. Organizational Strategic Capabilities Have Significant Effect on Service Innovation.

2.7. Strategic Agility

Strategic agility refers to an organization's ability to continuously realign and adjust the strategic direction of its core business in response to evolving goals and changing conditions [25]. This capability not only involves developing new products and services but also innovating business models and creating novel ways to deliver value to the company. Additionally, [42] emphasized that strategic agility includes a combination of skills, traits, relationships, principles, structures, processes, and actions designed to ensure that firms remain flexible when facing new challenges.

As previously noted, strategic agility comprises three key meta-capabilities: strategic sensitivity, leadership unity, and resource fluidity [25]. Strategic sensitivity centers on a firm's ability to interpret and integrate information to drive continuous innovation and strategic enhancement [43]. Leadership unity refers to the management team's capacity to make bold decisions swiftly [25]. Meanwhile, resource fluidity describes the internal ability to rapidly redesign business systems and reallocate resources, enabling faster and less constrained responses.

2.8. Strategic Agility and Service Innovation

Service innovation involves the application of new ideas and technologies within service processes to transform and enhance existing products and services [44]. This includes improving service quality and efficiency, broadening service offerings, renewing service content, adding new elements, creating additional customer value, and ultimately strengthening the firm's competitive advantage. Agility embodies nimbleness, speed, and the capacity to pivot and generate revenue effectively [45]. Strategic agility is vital in promoting service innovation by allowing organizations to swiftly adapt to shifting market conditions and customer needs [46]. By enabling rapid repositioning of resources and capabilities in response to external changes, strategic agility fosters a culture of ongoing innovation. Based on these insights, we propose the following hypothesis:

H3a. Strategic Agility Has Significant Effect on Service Innovation.

2.9. Strategic Agility and Firm Performance

Organizations that exhibit strategic agility can continuously adjust and realign their strategic direction in response to a dynamic environment [25]. Research by [47] underscores the critical role of strategic agility in helping organizations anticipate and react to changes, thereby achieving better alignment with market demands and enhancing overall performance. Moreover, strategically agile firms excel at reallocating and optimizing resources to meet strategic goals, ensuring efficient and effective resource use. Dynamic capabilities, which arise from strategic agility, enable firms to reconfigure their resource base in order to achieve superior performance [48]. By adopting a strategic agility approach, organizations can cultivate resource configurations that

support sustained performance improvements and adaptability in complex, competitive markets. Consequently, we propose the following hypothesis:

H3b. Strategic Agility Has Significant Effect on Firm Performance.

2.10. Service Innovation

Service innovation refers to the integration of new ideas and technologies into service delivery processes to transform and improve existing products and services. This includes enhancing service quality and efficiency, expanding the range of services offered, refreshing service content, adding new service components, creating additional customer value, and ultimately strengthening the firm's competitive position.

[49] highlighted the varied viewpoints among scholars regarding the dimensions of service innovation. For instance, [50] identified four key dimensions, including service output, the competitiveness of the service provider, the technology used by the provider, and the competitiveness of the customer [51]. In contrast, another perspective identifies several dimensions of service innovation, including the innovation concept, customer interaction interface, service delivery mechanisms, and the choice of technology.

2.11. Service Innovation and Firm Performance

[52] emphasize that the core purpose of service innovation is to generate profit by developing new services or enhancing existing ones and integrating these improvements into current operations. [53] observed that organizations that successfully implement service innovation strategies often experience higher customer satisfaction, which is closely linked to improved over all business performance. Additionally, firms that leverage service innovation can build a strong reputation, fostering customer loyalty and supporting sustained long-term success [54]. In summary, service innovation plays a crucial role in boosting organizational performance by opening new pathways for competitive advantage and differentiation in the marketplace. Based on these insights, we propose the following hypothesis:

H4. Service Innovation Has Significant Effect on Firm Performance.

3. RESEARCH METHODOLOGY

All proposed hypotheses in this study can be put together into a research model seen in Figure 1. This model essentially demonstrates the extent to which ecosystem exchange and OSC indirectly affect firm performance through two interrelated variables, namely strategic agility and service innovation.

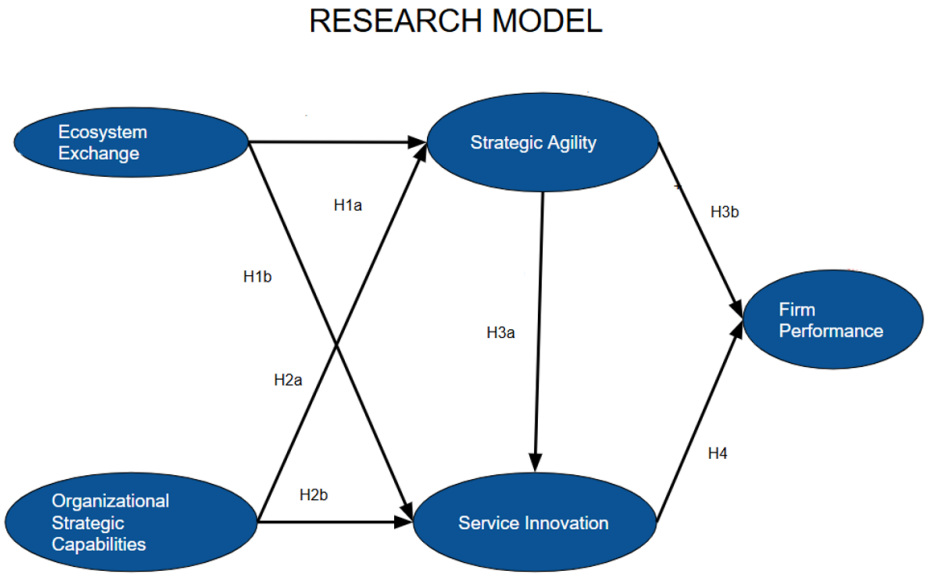

Figure 1. Research Model

This study utilized a quantitative research design to test the hypotheses outlined earlier. The research relied on primary data collected through questionnaires employing a five-point Likert scale. These questionnaires measured each variable under investigation and were adapted from previous studies, with modifications

made to suit the specific context of this research. Specifically, the questionnaire for ecosystem exchange was adapted from [3], OSC from [21], strategic agility from [55], [45], [56], service innovation from [30], [57], [58].

Primary data were gathered from 196 top managers, each representing an Indonesian medical devices distribution company. Data collection employed purposive sampling, where questionnaires were electronically distributed to 1,587 medical device distributor companies across Indonesia, yielding a response rate of 12.35%. Although this response rate is relatively low, the participating companies represent five out of six major Indonesian islands. Notably, half of the respondents are based in Jakarta, Indonesia's largest city. Most companies employ either 10-30 employees (34.7%) or more than 50 employees (33.2%). The majority have been in business for between less than 5 years and up to 15 years (66.3%). Regarding respondents' roles, most are directors (28.8%) or product managers (21.4%). Over half (53.6%) have worked in the Indonesian medical device industry for 11 to 20 years. The majority of respondents (57.7%) are aged between 25 and 45 years, with 60.7% male and 67.9% holding a bachelor's degree.

Data analysis was conducted using Structural Equation Modeling (SEM), a technique that assesses relationships among latent constructs while minimizing model error [59], [60]. SEM also offers the advantage of enabling researchers to develop, refine, and extend theoretical models, including second- and third-order factors, thereby deepening understanding of complex relationships that may not be evident at the first-order level [61]. Such multilevel modeling provides richer explanatory power by capturing latent structures that are otherwise overlooked in simpler analytical approaches. Moreover, this capability allows scholars to validate the internal coherence of theoretical constructs while simultaneously testing their nomological relationships within a unified framework.

This study employed Covariance-Based SEM (CB-SEM) because it uses a maximum likelihood estimation method aimed at minimizing the discrepancy between observed and estimated covariance matrices, rather than maximizing explained variance [59], [60]. The primary objective was to validate established theories and test hypotheses involving relationships among latent variables within a complex theoretical framework. CB-SEM allows simultaneous analysis of multiple latent and observed variables and provides statistical rigor by requiring data and model assumptions, such as multivariate normality, to be met [62]. However, it may face challenges with smaller sample sizes or when data violates assumptions like normality [63].

4. RESULTS AND DISCUSSION

The measurement models for all constructs, Ecosystem Exchange (EcoExc), OSC, Strategic Agility (StrAgil), Service Innovation (ServInno), and Firm Performance (FPerform), demonstrated strong psychometric properties. All standardized loading factors exceeded the 0.50 threshold, Composite Reliability (CR) values were above 0.70, and Variance Extracted (VE) was above 0.50, indicating convergent validity and internal consistency [64]. These results confirm that the measurement model is robust and suitable for subsequent structural analysis.

The structural model fit indices indicate an acceptable fit: RMSEA = 0.08, GFI = 0.87, IFI = 0.80, and normed chi-square = 2.4. While GFI and IFI are marginally below the ideal 0.90 threshold, they remain within the acceptable range for complex models with multiple constructs [65]. The model thus provides a reliable basis for hypothesis testing and interpretation.

4.1. Direct Effects

- **EcoExc → Strategic Agility (StrAgil):**

  The direct effect of ecosystem exchange on strategic agility is positive and significant ($\beta = 0.15, t = 3.54$). This finding highlights that organizations actively engaging in knowledge and partner exchanges within their ecosystem are better positioned to develop agility in their strategic decision-making and resource allocation [66]. This aligns with recent findings by [67], which underscore the importance of ecosystem collaboration for dynamic capability development.

- **EcoExc → Service Innovation (ServInno):**

  The direct effect is positive and significant ($\beta = 0.09, t = 2.07$), suggesting that ecosystem exchange fosters service innovation. This supports the argument that external knowledge flows and partnerships stimulate creative service solutions [68].

- **OSC → Strategic Agility (StrAgil):**

  The effect is very strong and significant ($\beta = 0.87, t = 18.96$), indicating that robust internal capabilities (marketing, technological, managerial, etc.) are critical for developing organizational agility. This is consistent with the Resource-Based View (RBV) and recent empirical studies [69].

- **OSC → Service Innovation (ServInno):**

  The effect is positive but not significant ($\beta = 0.41, t = 1.76$), suggesting that while OSC is a necessary foundation, it may not directly translate into service innovation without mediating factors such as agility or external stimuli.

- **StrAgil → Service Innovation (ServInno):**

  The effect is positive but not statistically significant ($\beta = 0.45, t = 1.86$). While strategic agility is theoretically linked to innovation, the data suggests that other factors may moderate or mediate this relationship, echoing findings by [70] that agility alone is insufficient for innovation without supportive culture or leadership.

- **StrAgil → Firm Performance (FPerform):**

  The effect is positive and significant ($\beta = 0.34, t = 2.83$), confirming that agile organizations outperform less agile peers. This is supported by empirical evidence from recent studies [71].

- **ServInno → Firm Performance (FPerform):**

  The effect is positive and significant ($\beta = 0.43, t = 3.48$), reinforcing the central role of service innovation in driving organizational performance. This is in line with contemporary literature emphasizing innovation as a key determinant of competitive advantage [72].

4.2. Indirect Effects: Mediation by Strategic Agility and Service Innovation

- **EcoExc → StrAgil → ServInno → FPerform:**

  The indirect effect is positive but not significant ($\beta = 0.03, t = 1.49$), indicating that while ecosystem exchange can influence performance through agility and innovation, the pathway is not robust enough in this context. This suggests the need for stronger integration or alignment mechanisms within the ecosystem.

- **EcoExc → StrAgil → FPerform:**

  The indirect effect is positive and significant ($\beta = 0.05, t = 2.20$), showing that strategic agility is a key mediator in translating ecosystem exchange into performance gains. This supports the argument that agility is a critical capability for leveraging external resources [67].

- **EcoExc → ServInno → FPerform:**

  The effect is positive but not significant ($\beta = 0.04, t = 1.79$), suggesting that ecosystem exchange alone is insufficient to drive performance via innovation unless accompanied by other supporting factors.

- **OSC StrAgil ServInno → FPerform:**

  The effect is positive but not significant ($\beta = 0.17, t = 1.63$), indicating that the sequential mediation path is not strong enough to be conclusive.

- **OSC → StrAgil → FPerform:**

  The effect is positive and significant ($\beta = 0.30, t = 2.80$), highlighting that strategic agility is the primary channel through which organizational capabilities enhance performance.

- **OSC → ServInno → FPerform:**

  The effect is positive but not significant ($\beta = 0.18, t = 1.60$), again underscoring the limited direct pathway from capabilities to performance through innovation.

- **StrAgil → ServInno → FPerform:**

  The effect is positive but not significant ($\beta = 0.19, t = 1.66$), suggesting that the impact of agility on performance is more direct than mediated through innovation.

Table 1. Structural Analysis of Research Model

Research Hypothesis	**Coefficient**	**t-value / Z value***	**Significance**	**Conclusion**
		H1		
H1a: EcoExc → StrAgil	0.15	3.54	Positive; significant	Supported
H1b: EcoExc → ServInno	0.09	2.07	Positive; significant	Supported
		H2		
H2a: OSC → StrAgil	0.87	18.96	Positive; significant	Supported
H2b: OSC → ServInno	0.41	1.76	Positive; not significant	Not Supported
		H3		
H3a: StrAgil → ServInno	0.45	1.86	Positive; not significant	Not Supported
H3b: StrAgil → FPerform	0.34	2.83	Positive; significant	Supported
		H4		
H4: ServInno → FPerform	0.43	3.48	Positive; significant	Supported
		H5		
H5a: EcoExc → StrAgil → ServInno → FPerform	0.03	1.49	Positive; not significant	Not Supported
H5b: EcoExc → StrAgil → FPerform	0.05	2.20	Positive; significant	Supported
H5c: EcoExc → ServInno → FPerform	0.04	1.79	Positive; not significant	Not Supported
		H6		
H6a: OSC → StrAgil → ServInno → FPerform	0.17	1.63	Positive; not significant	Not Supported
H6b: OSC → StrAgil → FPerform	0.30	2.80	Positive; significant	Supported
H6c: OSC → ServInno → FPerform	0.18	1.60	Positive; not significant	Not Supported
		H7		
H7: StrAgil → ServInno → FPerform	0.19	1.66	Positive; not significant	Not Supported
Notes: * t-value $\geq$ 1.96 [64]: significant; *Sobel test* Z-value $\geq$ 1.96: significant [64]				
Chi-Square = 115.36; df = 49; p-value = 0.00000				
RMSEA ($\leq$ 0.08) = 0.08; GFI (0.80 $\leq$ GFI $<$ 0.90) = 0.87; ECVI = M: 0.89; S: 0.80; I: 2.05				
IFI (0.80 $\leq$ IFI $<$ 0.90) = 0.80				
Normed Chi-Square ($\leq$ 3.0) = 2.4; AIC = M: 173.36; S: 156.00; I: 451.55				

Source: Author (2024), [64]

Table 1 presents the structural hypothesis testing results and shows that only some of the proposed relationships in the research model are empirically supported. Strategic agility demonstrates a clear positive and significant influence on firm performance as indicated in hypothesis H3b. This means that firms with stronger ability to sense changes in their environment and adjust their strategies efficiently tend to achieve better

performance outcomes [73]. Likewise, service innovation is shown to significantly enhance firm performance as stated in hypothesis H4. This suggests that the development or improvement of service offerings contributes meaningfully to strengthening competitive advantage and organizational results. In addition to these direct effects, the table also indicates that ecosystem exchange and OSC exert an indirect influence on performance through strategic agility as reflected in hypotheses H5b and H6b. This provides evidence that strategic agility serves as an essential channel through which both external collaboration and internal resource strength translate into improved organizational outcomes [74]. On the other hand, some relationships such as the influence of strategic agility on service innovation as well as multiple sequential mediation paths do not show statistical significance and are therefore not supported in this empirical context [75]. These findings suggest that service innovation needs more than agility, such as stronger relational or organizational support.

5. MANAGERIAL IMPLICATIONS

The managerial implications of this study highlight the importance of developing dynamic capabilities, particularly strategic agility and innovation capacity, to maintain competitiveness in rapidly changing environments. Firms should strengthen cross-industry and cross-sector collaborations to accelerate knowledge exchange and resource acquisition, while also leveraging data analytics and digital platforms to anticipate market shifts and respond proactively. For policymakers, enabling public-private partnerships, innovation hubs, and knowledge-sharing networks can support a more resilient and innovative healthcare supply chain. Additionally, adaptive regulatory frameworks and streamlined approval processes will help firms respond more effectively to technological advancements and shifting health system needs, while government programs that enhance digital and strategic capabilities among medical device distributors can improve efficiency, transparency, and preparedness across the healthcare value chain.

6. CONCLUSION

This research examined how Indonesian medical device distributor firms leverage ecosystem exchange and OSC to improve firm performance within a dynamic healthcare environment. By integrating RBV, exchange theory, ecosystem theory, and open systems theory, the study analyzed how firms align and re-align relationships with healthcare institutions and producers. The empirical findings demonstrate both direct and indirect effects of ecosystem exchange and OSC on performance, with strategic agility and service innovation functioning as key mediators.

The results highlight that ecosystem exchange and OSC play a crucial role in fostering strategic agility, which in turn significantly enhances firm performance. While service innovation also contributes positively to performance, its development is influenced more by external collaboration than internal capabilities alone. This suggests that firms must not only build strong internal resources but also actively participate in knowledge and resource sharing within the healthcare ecosystem to sustain competitiveness and innovation.

Practically, the study provides insights for industry leaders and policymakers to strengthen the healthcare supply chain by fostering collaboration, developing dynamic capabilities, and accelerating digital transformation. These efforts support greater resilience and adaptability in the healthcare sector and align with broader Sustainable Development Goals (SDGs), particularly SDGs 3 on health system strengthening and SDGs 17 on multi-stakeholder partnerships. Future research is encouraged to expand this model to other industries or regions, incorporate longitudinal analysis, and explore moderating factors such as organizational culture and digital maturity.

7. DECLARATIONS

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7.2. Author Contributions

Conceptualization: OJ; Methodology: BW; Software: RD; Validation: JB and RD; Formal Analysis: BW and OJ; Investigation: JB; Resources: RD; Data Curation: BW; Writing Original Draft Preparation: OJ and JB; Writing Review and Editing: BW and OJ; Visualization: RD; All authors, JB, BW, RD, and OJ have read and agreed to the published version of the manuscript.

7.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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7.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

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