

# Enhancing global supply chain resilience in the Indonesian medical device industry: a dynamic capability perspective

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## Abstract

**Purpose** – This paper aims to understand how the global supply chain in the medical device industry embraces resilience by adopting agility approach following COVID-19.

**Design/methodology/approach** – This study adopts an interpretative approach to examine the qualitative data drawn from interviews and observation under dynamic capability theory. The data collection concerned multiple stakeholders involved in purchasing and supply management in the medical device market: manufacturing suppliers, channel partners, hospital management and end-users. The coding analysis uses an application that helps the researchers categorise the nodes and extend the existing literature.

**Findings** – The findings show that global supply chain leaders leverage the dynamic capability by centralising the business process decision to respond to the shifting demand from the local governments to the national health ministry, shaping the partnership style from the area- to the funnel-based agreement, even though it exposes a risk of product acceptability from the end-users, encouraging the distributor to convert just-in-time approach into holding safety stock to avoid penalty from missing the procurement target even and restructuring the local partners' debts to manage long-term performance.

**Originality/value** – This study extends the emerging literature in international business by underpinning dynamic capability theory.

**Keywords** Emerging markets, Foreign market entry, Supplier relationships, International business theory

**Paper type** Research paper

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## Introduction

COVID-19 has shaped the global market by augmenting the existing problems in the global supply chain. However, the mainstream supply chain literature remains concerned with lean manufacturing, a just-in-time approach and long-term supplier relationship, which may become irrelevant during the pandemic due to supply shortages and new logistics obstacles (Agyabeng-Mensah *et al.*, 2021; Kovács and Sigala, 2021). Moreover, purchasing and supply chain professionals need to redesign their agreements with more customisation and flexibility to respond to the dynamic business environment (Kovács and Sigala, 2021). Moreover, the health-care industry requires a resilient leader to bring manufacturers closer to customers and provide valuable learning opportunities beyond increasing demand (Alicke *et al.*, 2021; Alfaro-Ureña *et al.*, 2022).

The medical equipment market in emerging countries provides the best example of disruption in the global supply chain. The global supply chain in the medical device industry, such as ventilators, ultrasound scanners and patient monitors, continuously seeks to fill the massive gap with the need of end users, especially in emerging economies (The Economist, 2020). The health-care systems face an extreme shortfall of medical equipment that calls for global supply chain agility to fight the pandemic by generating a new institutional system (Jacobzone *et al.*, 2020).

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The critical question comes to what extent the future of international business will change because of the COVID-19 shock and how that will impact the practices of global enterprises (Brakman *et al.*, 2021).

The research gap in public health services during the crisis calls for further studies for better design of the global supply chain and how they deal with various barriers to the procurement system (Camboni *et al.*, 2020; Grandia and Kruyen, 2020). Ketchen *et al.* (2020) suggest the need to understand how supply chain leaders integrate their global strategy with small business capabilities by fostering resourcefulness, a rapid decision-making process, and swift methods. Hence, it is essential to address the gap between supply chain innovation and disruption literature (Yan *et al.*, 2022). Barney (2022) highlights governments' role in shaping the global supply chain by using their authority to provide special funds for the medical industry. The global supply chain models concern the composite supply chain design problem by extending models to drive agility for creating competitive advantage.

There are several studies concerning agility in the global supply chains in the health-care industry during COVID-19. However, there is a need to explore the context of the health-care supply chain that addresses the surge in medical equipment demand (Patel and Sambasivan, 2021). Recent studies attempt to minimise the medicine distribution, inventory holding and production costs through a simulation approach (Goodarzian *et al.*, 2021). Many structural flexibility elements to mitigate supply chain disruptions have been working in humanitarian research but are not well understood outside of that domain. Further research in structural flexibility is critical for supply chain agility in the health-care industry, especially when adopting a funnel business model to attract new customers (Kovács and Sigala, 2021; Abolfathi *et al.*, 2022).

This article seeks to understand how the global supply chain responds to COVID-19 by exploring the practices of the medical equipment industry at the frontline markets. This study adopts a qualitative approach to address the research question derived from the research gap we discussed in the introduction section. Table 1 presents the research gap summary. The following section is a literature review, which discusses the underpinning theory and some concepts. The analysis proceeds by presenting the data, followed by the results of qualitative analysis. Finally, we discuss the findings and conclude with suggestions for further work. Hence, the results extend the emerging literature in international business by underpinning dynamic capability theory.

## Theoretical background

This study underpins the dynamic capability theory to understand the concept of global supply chain agility. The idea of dynamic capability has emerged along with the resource-based view, which reveals the four criteria for competitive advantage (Barney, 1991) – valuable, rare, imperfectly imitable, and non-substitutable (VRIN). Hence, the dynamic capability extends the resource-based theory by highlighting how firms adapt, integrate and reconfigure the resources that shift the firms' character in responding to changing business environments (Teece and Pisano, 2003). Furthermore, firms demonstrate their dynamic capability by coordinating and redeploying their functional competencies to respond to a dynamic business environment (Teece, 2018).

The dynamic capability approach also extends the growing literature of international business by examining how multinational enterprises achieve a competitive advantage with the three resource orchestration processes: seizing, sensing and transforming (Verbeke, 2022). In addition, the customer relationship in global market is a unique resource to promote orchestrating resources that suppliers generate by collectively making sense of customer needs through close collaboration (Andersén and Ljungkvist, 2021). Moreover, Ketchen *et al.* (2020) discuss supply chain entrepreneurial embeddedness to explain how a

**Table 1** Research gap in supply chain resilience

<i>Authors</i>	<i>Findings</i>	<i>Opportunities for future studies</i>
Ketchen and Craihead (2020)	A preposition of supply chain entrepreneurial embeddedness, which attempts to explain how a large company capitalises market in emerging markets	Future studies should explore the key elements of supply chain entrepreneurial embeddedness by examining the effective contracting between a large global company and small local partners
Agyabeng-Mensah <i>et al.</i> (2021)	Just-in-time moderates the relationship between green supply chain and business performance	Future studies need to entail business environment context and social items
Barney <i>et al.</i> (2021)	Viewing resource-based theory within the value creation framework adds clarity to the appropriation of economic value	There is an opportunity to enhance synergy between the resource-based view and other approaches by leveraging the concept of a strategic resource
Beamish and Chakravarty (2021)	Multinational enterprises play a pivotal role in the well-being of communities they operate in and in balancing stakeholder interests	Calling for empirical studies to theoretically frame the resources and capabilities that drive effective multinational enterprises
Kovács and Sigala (2021)	Structural flexibility is essential to mitigate future supply chain disruptions, but it is not well understood outside of that domain	Further research should enhance the lessons from humanitarian supply chains in public health care and industry
Abolfathi <i>et al.</i> (2022)	The customer switching costs disrupt the conventional purchasing funnel	Extended studies should examine a funnel business model to deal with new customers
Yan <i>et al.</i> (2022)	Natural uncertainty is associate with large decrease in performance but generates growth opportunities	Research needs to examine the mutual causality between innovations and disruption by bridging the supply chain innovation and disruption literatures

Source: Authors' own creation

multinational enterprise integrates the strategy with small local business capabilities in emerging countries.

### *Dynamic capability*

Dynamic capability demonstrates the ability to coordinate actions in pursuit of market opportunities or respond to threats. The capability shows how a pair of partners integrate and reconfigure resources to deal with dynamic environments (Chang *et al.*, 2015). Competitors may replicate the business model by calibrating the opportunity, but the process requires the organisation to adapt to the dynamic business model (Teece, 2018). Policymakers play a pivotal role in pooling tenders and avoiding monopsony practices among vendors (Miller and Lehoux, 2020). The incentive to form a partnership with disadvantaged partners is quite challenging for policymakers because this partnership may pose a high risk for the principles (Rosa, 2020).

Procurement partnerships require specific qualifications in several work categories by combining world-class companies with small partners with local networks (Camboni *et al.*, 2020). Furthermore, the partnership promotes safety and human rights issues, influencing the local partners' organisational culture and procurement practices (Kim and Chai, 2017; Pratono and Ratih, 2019; Etse *et al.*, 2021). On the contrary, policies for dynamic procurement capabilities place a great expectation on public services to deal with institutional entrepreneurs who seize opportunities to mobilise funding, gain support from the multilevel government and influence the legal framework (Uyara *et al.*, 2020).

Medical device and equipment purchasing demonstrates a comprehensive procurement system with a high-value contract that involves user needs, technical maintenance, training, adequate consumables and disposal (Hinrichs-Kapels *et al.*, 2022). The suppliers need to adjust for purchasing process from both spatial and temporal perspectives. Hence, the purchase funnel falls into four steps: awareness, preference, purchase and after-sale services. Filling the gap between awareness and preference for high-technology medical equipment presents a long-term commitment to the health-care system, which involves the government budget and public hospital plan (Dreger *et al.*, 2022). Hence, purchasing large-scale medical equipment demonstrates how multiple institutional logics shape the design of affordances when a hospital develops new digital technologies by billing acceptability, authority and discretion (King *et al.*, 2022).

### *The agility*

The premise of supply chain agility is the bottom-up innovation empowerment to generate value for customers and firms with a speed response (Chiang *et al.*, 2012; Denning, 2018). Patel and Sambasivan (2021) argue that agility refers to firms' quickly responding to changes, whilst flexibility effectively counters changes. Highlight three agility aggregate dimensions: customer value, partnership and operation. Customer agility is about interacting with customers to explore resource ideas; partnering agility shows how firms interact with their partners to deliver new value, whereas operational agility refers to generating and delivering value to customers (Eickstein *et al.*, 2015; Hadjilias *et al.*, 2021).

Supply chain agility presents a short-term plan to respond to market environment changes, while the long-term strategy is a fundamental structure that entails supply chain adaptability (Bidhandi and Valmohammadi, 2017; Dubey *et al.*, 2018). Along with short- and long-term strategic approaches, supply chain alignment shows how firms collaborate by sharing incentives with the stakeholders to achieve the best performance (Feizabadi *et al.*, 2021). The global supply chain adaptability involves internal manufacturing and external supplier locations in various countries to facilitate collaboration initiatives (Meixell and Gargeya, 2005; Kobeng and Longoni, 2019).

The organisation's agility helps the firm satisfy customers by minimising delivery time and boosting competitiveness across supply chain activities to foster sustainability. Firms may suffer during the agility process, where revenue decreases in the short term. However, the adaptability process allows firms to generate long-term performance (Fayezi and Zomorodi, 2015; Epinosa *et al.*, 2021). Hence, firms integrate adaptability in agility through partnership reconfiguration opportunities (Irfan *et al.*, 2020; Razaghi and Shokouhyar, 2021; Yang, 2021). The global supply chain agility process requires a market leader in the worldwide market to draw suppliers from the home country and push the local content with policy support for industrial development (van der Loos *et al.*, 2022).

Accelerating operations, scanning the business environment and adjusting operational tactics become common elements between agility and resilience strategies. Moreover, resilience capability demonstrates how firms remain to survive during a crisis by avoiding turbulence. Core players powerfully serve by reinforcing the existing institutional arrangements (Gligor *et al.*, 2019). On the contrary, peripheral players strive to improve their position and change the balance of control over resources within the field. However, their low status and limited resources hinder them from convincing others to partake in their project (Corbo *et al.*, 2016). The literature shows that the agility approach in the supply chain focuses on the manufacturing industry and rarely examines medical equipment (Kim and Chai, 2017; Humdan *et al.*, 2020).

### *Indonesian procurement system*

We conduct the study within the context of the Indonesia procurement system in which Presidential Regulation 16/2018 imposes an online mechanism to promote transparency

(Nuswantara, 2020). The policy decentralises the public procurement activities to individual ministries and local governments. The regulation requires listing the products for the government's demand in the e-catalogue under a local firm's registration. The authority to manage the e-catalogue goes to the National Agency for Public Procurement. To respond to COVID-19, the government revised the national public budget in 2022 by allocating US \$2.4bn for spending on medical devices and medicines. In 2023, the National Government focused on a general health system, which gave 168tn (Mahrofi and Yumma, 2022).

Despite Indonesia coming near the bottom of the Transparency International Corruption Perceptions Index, the establishment of e-government presents challenges to improving the transparency of the public procurement process (Choi *et al.*, 2016). For example, there is no punishment for a pharmaceutical company which won the tender but failed to fulfil the contracts (Anggriani *et al.*, 2020). The Indonesia Corruption Watch highlights that the Indonesia Ministry of Health (MOH) set 430 procurement plans to respond to the COVID-19 pandemic. The procurement activities are under the national government budget that allocates most health-care products and equipment. Among those activities, 74 plans adopt direct procurement methods in which the regulation mandates that actions with less than IDR 200m can skip the open tender process (Adjie, 2020).

The government also issued a regulation to relax the licencing requirement and encouraged the business to support the procurement of medical equipment to prevent the spread of COVID-19. For example, the MOH accelerated certification services for distribution certificates by offering a one-day-service programme for marketing authorisation. The Ministry also simplified the required document. Hence, the local distributors can submit their business registered number, a statement letter and information about the engineer for the aftersales service. The policy also highlights that importing medical devices does not require a surveyor report from the country of origin (Pratono *et al.*, 2020). The MOH Regulation 7/2020 only requires the importers to have a recommendation letter from the National Disaster Management Agency, and they could apply through the online system.

## Research method

We conducted this study in the medical equipment industry in Indonesia under the new normal policy, which provides insights into the characteristics of global supply chain players and how they identify, exploit and manage business opportunities. COVID-19 yields insight into a unique phenomenon for further inquiry that seeks common ground across global supply chain players. Qualitative data presents a rich text analysis that leads to an excellent possibility for exploring a new theoretical perspective. Furthermore, the qualitative approach helps the researcher address the main research question:

*RQ1.* How does the global supply chain respond to market turbulence by adopting the resilience strategy?

Hence, we derive the main question into four sub-questions:

*RQ1a.* How do the manufacturers respond to the buyers?

*RQ1b.* How do the manufacturers respond to the distributors?

*RQ1c.* How do the distributors respond to the users?

*RQ1d.* How do the distributors address the financial issue?

## Research participants

Table 2 presents the respondent profile. The first research participant is suppliers. We interviewed four respondents representing the two manufacturers that supply major diagnostic products. In addition, four respondents represent the medical equipment market companies that produce ultrasound, computed tomography (CT), magnetic resonance

**Table 2** Research participants

<i>Research participants</i>	<i>No. of respondents</i>	<i>Interview types</i>	<i>Average time of interview</i>
Principal companies (S)	4	Online and offline	30 min
Policymakers (G)	2	Online	27 min
Local distributors (D)	5	Online and offline	55 min
Local end users (U)	5	Online	30 min

**Source:** Authors own creation

imaging (MRI) and X-ray machines. The first company's headquarter is in Germany, and the other is in the USA. The companies have established their country representative offices in Jakarta. Their organisations are legal entities of wholly foreign ownership that have to meet some local restriction regulation, such as limiting the direct selling of their products in the public procurement system (Table 2).

The second participant is staffs who work for the Indonesian MOH, which has the authority to manage 34 hospitals. Their office is located in the capital city of Jakarta, with health services located in urban areas, such as Jakarta, Surabaya, Makassar and Denpasar. The MOH commits to delivering the health-care system by investing large-scale medical equipment to address the pandemic. The product lists are available in the e-catalogue of the Indonesia Agency for Public Procurement. The government imposes buying local products, but CT, MRI and X-ray machines are mainly from Europe and the USA.

The third participant is the local distributors. The local channel partners play a pivotal role in the public procurement process because the manufacturer supplies have their products listed in the e-catalogue that must register under the name of their local partners. Two of these research participants informed that their companies belonged to a group where foreign investors owned 40% of equity. Hence, their organisations are not subject to strict requirements and limits like foreign firms.

The last participant is the end users, medical doctors designated as the managerial team at the COVID referral hospitals. We interviewed five hospital managers who work for national- and district-level hospitals. They have been working for more than 10 years at hospitals. The national government has provided financial resources to the national-level hospitals, whereas the district-level hospitals have gained support from the local governments. Therefore, the respondents play a pivotal role for maximising the use and allocating the resource at the clinical engineering departments.

### *Data collection and analysis*

Firstly, the data collection begins with the networks in which our universities collaborate with a multinational company that focuses on medical equipment. Hence, we adopt snowball sampling, which allows us to access the leading players in the global value chain through their networks, consisting of multinational companies, local distributors and hospital managers. We follow [Bartlett and Vavrus \(2017\)](#), who suggest that the interview should present the symbolic aspects of experience by asking how and why the research participants act in specific ways.

Secondly, this study gets information from the key players by adopting various approaches from informal interviews, focus group discussions and workshops. We also invite them to present in seminars. Hence, we record the activities and convert the video into verbatim transcription using the Google Docs application. Voice typing involves verbatim transcription that captures words from the audio. The transcription helps the researchers process the information, especially when dealing with accents or language barriers. Moreover, the researchers manage the transcripts viable for coding analysis.



The third step is the open coding process, in which the researchers generate categorical concepts by highlighting the text to specific nodes. The researchers read the interview transcripts and broke it up into discrete data. The converting data from transcripts into discrete data is based on four perspectives: the suppliers, distributors, buyers and end users. We analysed the interviews separately, resulting in three subsequent iterative analysis sessions to reach a consensus on emerging topics in partnership capability. This process follows [Nijaki and Worrel \(2012\)](#), who highlight the continuous discussion in identifying the contents and clustering the information into a thematic structure toward a coherent narrative.

The fourth step is axial coding, in which the researchers draw a connection between codes. In contrast to open coding, axial codes present connections between codes. Then, the researchers group the data into categories after reading over the open codes. The second step concerns grouping similar text segments following the research questions, which we call axial codes. Hence, we examined how these themes and patterns aligned with each respondents' capability and the user who expected the most valuable products. This analysis process involves the interaction of the ground researcher and a series of discussions among the research team in continuous consultation ([Shelton and Minniti, 2017](#)).

The last step presents a selective code process, which connects categories in axial into core categories. The core categories address the main research question, which falls into four sub-questions. After examining the data with identified nodes, the researchers revisited the literature review to uncover consistent themes and recognise the phenomena by understanding the meaning and sense-making of research participants. Hence, the researchers independently compared the codes to identify the selective principles. Finally, after coding all transcripts, we discussed the codes, determined sub-themes and placed the themes. The core category presents the central thesis of this article ([Table 3](#)).

## Finding

Before COVID-19, the government decentralised the health system to promote efficiency and quality. The local governments set up an annual budget for local hospitals. Supplier companies partnered with local distributors to provide medical devices for local hospitals. During COVID-19, the national government offers medical equipment for the local hospitals to respond to the pandemic by centralising the purchasing system. Hence, the decision-making process has shifted to the central government's authority. The purchasing process occurs in the headquarter offices where the MOH manages the procurement process for local hospitals.

The global supply chain leaders have shifted to Jakarta and reallocated their resources to respond to the national purchasing system. The global supply chain leaders manage their partnerships with distributors with access to the national government. The suppliers seek distributors who can handle a relationship with the local hospital managers and procurement staff from the national government who decide to buy the medical device. Hence, suppliers review the purchasing funnels in which the local partners operate: brand awareness, product preference, purchasing and after-market service:

The Ministry of Health empowers the referral hospitals to handle COVID-19 by investing valuable resources for large-scale medical equipment. G1

The new procurement mechanism imposes my headquarters to keep an eye on the procurement process at all funnel processes, from consumer awareness, preference, purchase and maintenance.

S1

Building resilience embraces a trade-off against short-term efficiency, especially when the medical equipment performance during the crisis is more excellent than during stable

**Table 3** Coding analysis

<i>Open coding</i>	<i>Axial coding</i>	<i>Selective coding</i>
The revised budget of the National Government for COVID-19 (G1, G2) Highly uncertainty (G1) The top-down policy for health services at local hospitals (G2, G2). The headquarter policy (S1, S2, S3) Finding new local partners (S1, S2, S4) Setting new performance target (S1,S2,S3) Employee mobility (S3,S4) New business opportunity (S1) Review the agreement (S1, S2, S4) Area-based agreement (S3) The effective funnel-based agreement (S4) Procurement system (D1, D2, D3, D5) Political networks (D1, D2, D4) Networks with the users at the local hospitals (D3). Risk of fraud (D4) Exclusive networks (U1, S2, S4) The reversed logistics (U3) The local hospital refused the equipment (U4). Tender project fail (G1, S1, D2) Area based agreement (S1) Risk from coordination failure (S5) Sub-distribution network (D1) Local partners sub-distribution partner (D1) The funnel-based agreement has a lack of access to the bottom-up networks (D2) Risk from stiff competition (D3, D4) Downstream network capability for the excellence aftersales service (S1, S2, S3, S4) The extraordinary process to secure supplies on time (U1, U2) Expecting excellence after sales services (U2, U4, U5) Product acceptability (U1, U2, U3, U4, U5) Sharing risk with principal companies The principles organised the distributors to leverage better deals together (S1) Inventory cost (D1, D2, D3, D5) Working capital (D3, D4, D5) Excess inventory (D1, D4) Servicing warranty covers extra costs (D5)	Business opportunities from the national health ministry The headquarter policy to seize the business opportunity  National procurement system Changing supply networks Funnel-based supply chain networks Area-based supply chain networks Support from local hospitals  Competency to meet the end users' expectation Just-in-time delivery Inventory system Missing the procurement target Financial risk Unreliable suppliers  Debt refinancing Long-term financial performance In accurate forecasting	Centralising the business process to respond to the shifting demand from the local hospitals to the national health ministry  Shaping the partnership from the area-to the funnel-based agreement with risk of product acceptability  Encouraging the distributor to convert just-in-time approach into inventory system to avoid penalty from missing the procurement target even, which implies high financial risk  Restructuring local partners' debt to manage long-term performance

Source: Authors' own creation

periods. Since COVID-19, the central government of Indonesia has allocated the national budget for medical equipment to respond to the pandemic with hundreds of procurement plans. This policy posed business challenges and opportunities to the medical equipment industry, which required the suppliers to adopt agility approach by finding local partners as soon as possible. However, only a few local suppliers or distributors can meet the requirement, which involves access to the national government and considerable capital:

My country manager comes to the front-line marketing to meet the users to make sure that we commit to providing the best after-sale service. S2



My [principle] company takes over the bidding process and product presentation instead of providing full authority to the distributor. S3

There is no one-size-fits-all organisation structure. But we have no option. We need the right action quickly in response to opportunities. S4

Adopting agility depends on the disruption type, disruption effect and the company's position. Centralising the decision process demonstrates how the supply chain seeks to thrive in new circumstances, enabling firms to capitalise on the opportunity. The agility approach begins with the supply chain leaders, which respond to the government policy by centralising the decision-making process for resource allocation. The agility approaches seek to reduce the impact of the crisis by enabling all critical supply chain functions to respond opportunistically and shape the competitive environment:

I am happy to have direct interaction with the supplier companies. However, I am afraid of complicated networks following the middleman's intervention, which implies misunderstanding and inefficiency in service delivery. G1.G2.

The huge demand for medical equipment from the central government is temporary. We estimate that the demand will decrease by the next couple years. D1

*P1.* The global supply chain leaders adopt agility approach by centralising their decision-process to respond to the shifting demand from the local governments to the national health ministry.

Before the COVID-19 pandemic, the global suppliers selected local distributors and adopted an area-based agreement (Figure 1). The distributors sell the products to local public hospitals following the decentralisation policy. The local distributors managed their networks with the hospital under the local governments' authority to meet the local demands. The agreement allowed the distributors to focus on specific customer segments and improve the product population. In addition, the manufacturer companies conducted annual evaluations responding to their capability to meet the targeted sales.

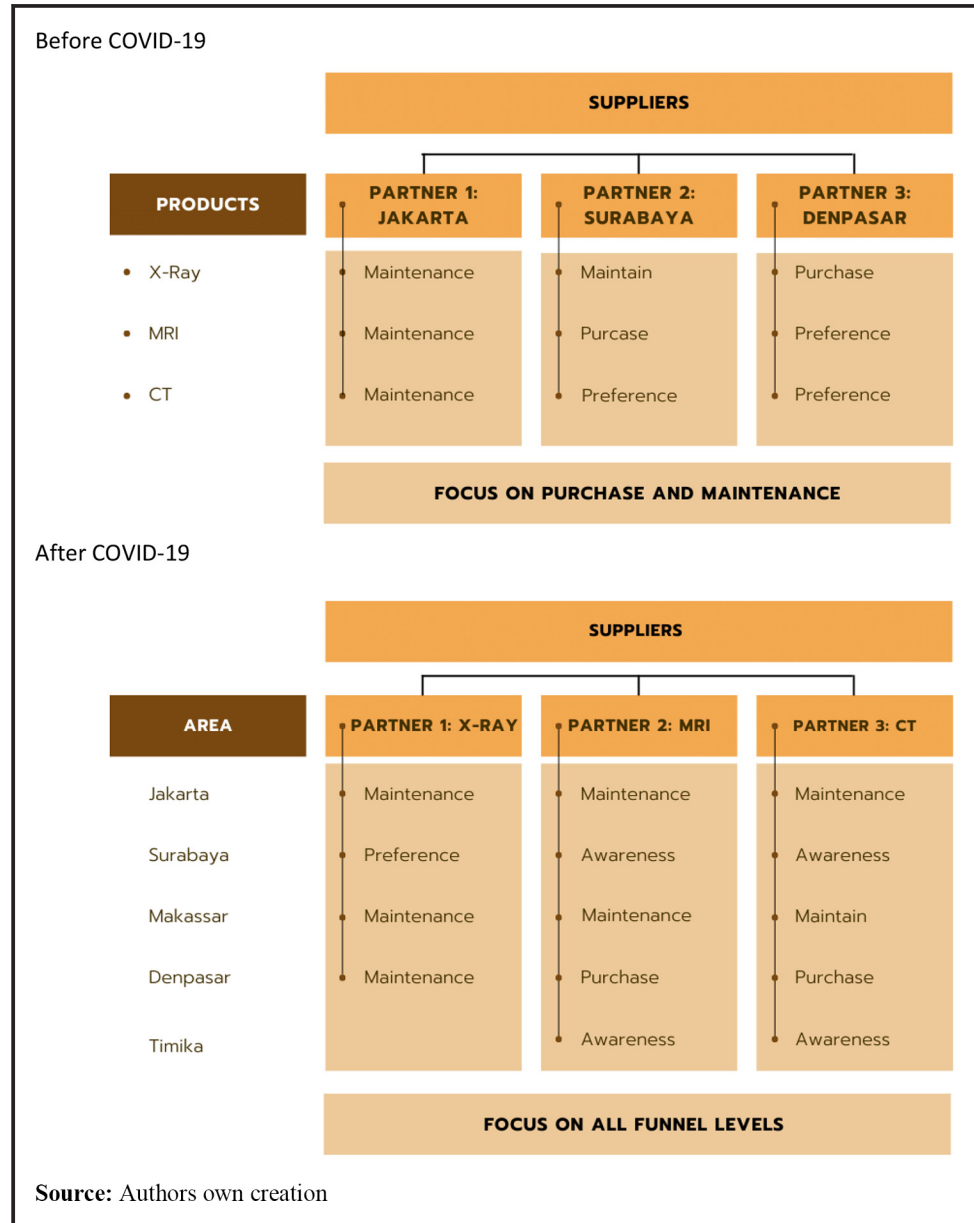
The suppliers respond to the demand from the national government by establishing a partnership with local companies that have the capability to compete at the bidding. Most of the local companies with such capability stay in the capital city of Jakarta. They focus on maintaining networks with decision makers at the local government but lack access to the end users at the local hospitals. Hence, the suppliers establish a funnel-based agreement, allowing the local companies to work in the entire area with a specific product (Figure 1).

Local companies recognised the opportunity and began to ask for a licence to sell the products. However, only some of the local companies are legitimate. Some appeared to take advantage to earn short-term profit without any long-term commitment to establishing valuable networks. They attempted to gain a bargaining position by claiming the networks with some authorities. They also convinced the suppliers that their networks allow them to influence the policy, such as banning the products from the supplier company that does not approve their proposal:

The funnel-based agreement demonstrates an effective network at the top-down public procurement with the national budget. However, my key partners lack networks with the users at the local hospitals. S1

The funnel-based partnership poses a high risk of fraud following the exclusive networks, presented an enhanced risk from a corruption perspective. The local distributors allocate valuable resources to manage the relationship with policymakers to exploit their access power on the national budget. D1

**Figure 1** Funnel-based supply chain partnership before and after COVID-19



The centralising decision-making process provides opportunities for some local distributors who rely on the politically exposed persons. Other local companies attempt to convince the users that some potential suppliers exist, but time constraints mean that the fast-track procedures will not work. U2

P2. The global supply chain leaders adopt agility approach by reshaping their partnership style from the area- to the funnel-based agreement, even though it poses a risk of product acceptability from the end users.

Before the pandemic, the medical device industry optimised the inventory system to respond to the procurement system by leveraging offshore sourcing and just-in-time processes to reduce costs. As a result, the companies grew risk averse with their global manufacture by producing the equipment following the predictable order from the frontline

marketing to meet on-time delivery. Therefore, the inventory strategy implies the working capital to meet on-time delivery requirements.

The top-down procurement of medical equipment to respond to the rising demand from the local hospitals posed a complicated issue due to the need for more capacity from the local users to manage the resource. Although the national government offers medical devices to enhance the quality of health services at local hospitals, more resources to provide support systems for imaging utilisation in the local hospitals are needed to address the pandemic (Figure 1). The lack of a support system creates health service inefficiency, which implies cost inefficiency:

The regulation stated that sub-distributor is prohibited. A company that wins the tender shall fulfil the contract and not subcontract its project. Without a solid network with local hospitals, the manufacturer challenges suppliers to convince the end-users to accept the product. S1

The distributors are not quite confident to allocate more valuable resources for the network development with the users at the local hospital. Moreover, they may not know how or do not care to provide after-sales services effectively. S2

The second issue is risk acceptance, which comes from the product safety standard applicable to medical devices, primarily to address the COVID-19 pandemic. Risk acceptance becomes apparent for the particular hazards that come from the pandemic. The local hospitals need resources to manage the equipment. However, the local hospitals need more capability to deal with the risk and tend to refuse the project. Hence, procurement projects should understand hospital management and user needs, as experience indicates that users adopt ineffective controls that they feel are overly restrictive.

Some supply chain players have a narrow view of resilience to make sure short-term operation during crisis. Disrupted shipment delays may become a concern, but all supply chain functions attempt to restore their influential role to achieve performance. The resilience approach fosters the supply chain players to seize market opportunities with the MOH's policy. The resilience approaches also encourage the local distributor offer greater reliability by differentiating their service. However, each supply chain function persistently underinvest in resilience for efficiency reason:

I believe that a good relationship with end users provides an opportunity for after-sales services with a bountiful source of income, but it needs a bountiful resource to the business activities. D1

Building networking with end-users seems to be a necessary evil. Unfortunately, it looks like a needless expense. D2

P3. The global supply chain leaders enhance their resilience by encouraging the distributor to convert the just-in-time approach into an inventory system to avoid a penalty for missing the procurement target, which implies high financial risk.

The supply chain restores its function by backing the resilience at various funnel levels, from finance to customer service. The financial function seeks to maintain the right amount of absorptive capacity in the form of extra cash, inventory and extra functionality, which may be inefficient in the short-term. Before the virus emerged as a severe economic threat, the distributors demonstrated their capability for the just-in-time inventory system of medical equipment products. The predictable procurement process began with selecting product requirements, specifications and financing approaches. Hence, COVID-19 exposed the weaknesses, especially the supply chain's lack of resilience and agility capability.

The local distributor companies seek to develop storage systems to avoid a supply shortage. The approach may allow the distributors to deliver the products timely, but it is a high risk because the medical equipment is costly and only a few local hospitals can afford it. Once the company fails during competitive bidding, it is crucial to find another buyer.

Some competitor companies may not accept when they fail the bidding and invite legal advisors to rebid the contracts. The logistics and finance department bears risk when the procurement system concerns the extraordinary process of securing supplies on time:

For the fiscal year of 2019, the procurement process occurred between July and August. We had to have sent the order to the manufacturer by October to ensure that the product would meet the customer by the end of 2019. D1

Recently, the government has centralised all bids for medical equipment to respond to COVID-19. Hence, the schedule does not follow the previous pattern anymore. However, the bidding is still in progress during the last day of October, and the customers expect to receive the equipment in December 2021. Otherwise, the supplier will get a penalty. D2

My company now is suffering from stiff competition. Last year, our products took the lead in the market share. We were overconfident in winning the competition due to our strong customer relationship. This year, the competitors attempted to do anything to win the competition, such as a black campaign and destroying the good reputation of my company. S1

We would like to continue the partnership contract with our local partner, who bears a huge debt. Now, we expect the company to maintain a good reputation. S2

P4. The global supply leaders enhance their resilience by restructure local partners' debt to manage long-term performance.

## Discussion

### *Theoretical contribution*

This study explores how a global value chain deals with COVID-19 in Indonesia by underpinning the dynamic capability theory. During the pandemic, companies have to deal with changeable, unpredictable and improbable business environments to respond to the demand for medical devices from the national government. Because the regulation requires the multinational companies to find the local distributor, who then should become the registered suppliers for the public procurement, the dynamic capability demonstrates the agility strategy by centralising the resource.

The previous studies argue that agility approaches in the supply chain help companies to achieve sustainable competitive advantage (Nijaki and Worrel, 2012; Etse *et al.*, 2021; Kobeng and Longoni, 2019). This finding shows that global supply chain agility during COVID-19 raises challenging issues, such as product acceptability, political abuse, financial risk, fragile networks and uncertain long-term performance. The agility approach strengthens the core players' bargaining position with local distributors and end users. Hence, a trust-based decision-making process could be more effective with competitors (Pratono, 2021). As a result, firms suffer during the agility process, where revenue decreases in the short term. However, the adaptability process allows firms to generate long-term performance (Epinosa *et al.*, 2021). Hence, firms integrate adaptability into agility by exploring partnership reconfiguration opportunities (Yang, 2021).

Secondly, this study extends the idea of dynamic capability by highlighting the agility approach to responding to the COVID-19 pandemic through continuously adapting, integrating and reconfiguring the resources (Teece, 2018). The case study indicates that the supplier company adapted the partnership agreement and reconfigured the sharing value, followed by the integration strategy for long-term performance. However, once the company introduces a solution, another challenging issue arises and calls for dynamic capability to redeploy the functional competencies toward a dynamic business environment. For example, centralising approach in the business process to respond to the shifting demand calls for solid support from local distributors. The findings extend the previous study, which discusses how a funnel business model helps firms to attract new customers (Abolfathi *et al.*, 2022).

As a global supply chain leader, the multinational manufacturer attempts to find solid support from local distributors as peripheral players by changing the partnership style from the area- to the funnel-based agreement. However, the peripheral players have established networks with local end demand. Hence, changing the partners poses a risk to end users' product acceptability. The findings support the previous study, which argues that peripheral players strive to enhance their bargaining position by convincing others to participate in their project (Corbo *et al.*, 2016). On the contrary, the core players' initiative to maintain partnerships with local peripheral players, overwhelmed with too many required resources and high financial risk implies a long-term performance.

Thirdly, this article extends the previous literature, which argues that dynamic capability involves effective coordination to redeploy the competencies to respond to a dynamic business environment. These findings confirm the previous study, which argues that partnership capability demonstrates a strong commitment among the stakeholders based on shared goals toward a specific mission (Bohari *et al.*, 2020). The results indicate that the capabilities of the health-care system to anticipate supply and configure demand come from interactions of procurement offices and networking activities with suppliers and distributors who attempt to shape purchasing methods.

Last, COVID-19 poses a high risk to the public procurement system by bringing the complicated supply network. In addition, changing partnership networks to respond to the pandemic makes procurement vulnerable with the risk of failure to delay the emergency distribution. Therefore, the players need to prepare various scenarios of logistic issues by enhancing their inventory capability, which implies a high-cost economy. These results extend the discussion on procurement risk in which allocating more resources for the inventory in uncertainty is costly (Hong *et al.*, 2018).

### ***Managerial implication***

Firstly, the COVID-19 pandemic has changed the business environment, allowing suppliers to find another alternative, funnel-based agreement. This type of agreement stimulates the supplier companies to centralise their resources and local business partners to establish a new network with the government staff at the national government as a new buyer. The results encourage the global business leader in medical devices to mitigate the risk of supply chain agility. As a result, they need much more capacity than before and begin to renegotiate the terms of a supply contract to anticipate future demand.

The funnel-based agreement poses potential problems for the users because of a lack of access to the bottom-up networks. Furthermore, dynamic partnerships lack trust-based relationships, posing possible mismatches between supply and demand. Therefore, executives must develop a contingency plan for a short-term collaboration to respond and acknowledge that the frontline divisions should manage their agile services network. Hence, local companies need to allocate resources to build trust with customers to fulfil the demand for after-market service.

Secondly, this study shows that global supply chain agility in responding to COVID-19 calls for an integrated process that involves a dynamic partnership capability with stakeholders from the central government, manufacturers, distributors and users at the local hospitals. Hence, the medical equipment industry requires local suppliers to get involved with a long-term commitment, such as providing after-sales services. As a result, the supply chain for after-sales services should achieve opportunities following the new medical devices at the local hospitals.

Combining good information and prediction techniques allows the supply chain players to explore a unique opportunity to achieve the most efficient process by optimising the big data revolution (Gallego *et al.*, 2020). In addition, the valuation process of the procurement

office is an essential capability to leverage the vendors' commitment to specific purchasing parameters as professional intermediaries (Miller and Lehoux, 2020).

Last, the inventory strategy attempted to meet the demand and supply variations at the equilibrium level by rendering them sub-optimal during the initial COVID-19 pandemic. The distributors kept the upstream industry, the principal and manufacturer, on short notice to produce the ordered equipment. The manufacturers also set a specific time to ensure that customers receive the products on time. Even when the procurement system is still on, the distributors should order particular products to meet the on-time delivery requirement. Hence, the supplier companies accelerate supply chain transparency with scenario planning of the overall supply base.

### ***Research limitation and future studies***

This study focuses on the relationship between a multinational corporation and local distributors. The data collection involves some key players in the medical equipment market, which enable the researchers to explore respondents' stories with vibrant information to address the research questions. The in-depth interview allows the researcher to address the social desirability bias in which the research participants replied to the question. However, the information seems insufficient to generate a population-level conclusion, which then calls for further studies to create a hypothesis for the broader population. Theoretical generalisation pertains to the processes and the context where the individual and organisation decide by comparing qualitative evidence to the existing theories. For example, the following studies should examine whether other industries face a risk of product acceptance when shaping the partnership model area- to funnel-based approaches by involving local distributors in various industries.

Secondly, the authors conducted this study in the Indonesian context, where the government plays a pivotal role in consumer preference for high-technology medical equipment with a long-term commitment to the health-care system. Hence, supply chain leaders manage the frontline market by partnering with local distributors, which is expected to enhance their contribution to the global value chain. Future studies should explore various public policies that generate different industrial transformation levels. Medical technology adoption in other countries presents unique phenomenon in which public policy determines the distribution of large-scale medical equipment to ensure nationwide supply. The question for future studies is to what extent public policy can build commitment to establishing a health system by adopting large-scale medical equipment. Should they rely on the global market because of the local industry's lack of sufficient scale or develop medical equipment to meet the national demand?

### **Conclusion**

This article presents how the global supply chain in the medical device industry embraces resilience by adopting agility approach following COVID-19. Drawing on qualitative evidence on the medical equipment industry in Indonesia, this article illustrates how procurement in health care has brought dynamic partnerships to the global supply chain. This study observes a dynamic relationship between suppliers and local distributors to respond to the government policy that addresses COVID-19. The results show how the supply chain leaders adjust the agreement with the local distributors, which should have the capability to approach the decision makers in the national government and build a long-term relationship with local hospitals.

This study identifies the resilience strategy by adopting a funnel-based agreement that allows the suppliers to attain a long-term performance by monitoring the distributors in conducting product awareness, consumer preference, purchase and after-sales service. This study interprets research findings under the light of the dynamic capability theory. We identify that once a supply chain leader provides a solution to address the problem in the supply chain, another problem will arise, and the rest players need to adjust their strategy.



We conclude that dynamic capability presents at both organisation and industrial levels by involving the international supply chain players. Overall, this article extends the emerging literature on dynamic capability theory by exposing how the global supply chain players set up agility and resilience approaches.

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