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Influence of Epidemic COVID–19 on Business Strategy, Information Technology and Supply Chain Agility to Firm Performance in Medical Device Industry

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***Abstract*---**Research related to the impact of the COVID-19 pandemic on business strategy, information technology, and supply chain agility on firm performance in the medical device industry in Indonesia. The analysis used is the Structural Equation Model (SEM) with the AMOS program. The study had 171 respondents. The findings in this study are that business strategy, information technology, and supply chain agility have a positive and significant influence on firm performance during the COVID-19 pandemic. The practical implication is that business strategies and information technology save companies and society by involving supply chain agility in securing the supply of medical devices in Indonesia. It is recommended that further research consider not only focusing on medical devices but also larger or different areas to elicit different responses. The practical implications provide direction for adopting business strategies, information technology, supply chain agility in improving firm performance.

***Keywords*---**business strategy, firm performance, information technology, supply chain agility.

Introduction

The coronavirus disease (COVID-19) pandemic has had an impact on the economies of all countries, including Indonesia. The Indonesian government imposes strict regulations on social and economic activities, such as regional traffic lockdowns, and travel restrictions. These policies effectively contain the

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spread of the virus and control the epidemic (kemenperin.go.id). However, these measures have also weighed on the economy with production and transportation activities becoming uncertain (Attaran, 2004; Sher & Lee, 2004; Teece, 2010). With the obstacles in transportation, there is attention to medical devices. Health equipment such as personal protective equipment, masks, and oxygen cylinders as well as hand sanitizers are some of the sectors that can record brilliant performance amid the onslaught of the COVID-19 pandemic. This is due to the high domestic demand for products from medical devices (kemenperin.go.id).

Medical device supply chains hit by the global pandemic are under unprecedented pressure, as sharply fluctuating demand triggers widespread shortages of medical devices. Therefore, the Ministry of Industry is determined to achieve independence in medical devices in Indonesia and to encourage this sector to become a major player and host in Indonesia (Suharto, 2013). On the other hand, the impact of COVID-19 on medical devices is related to supply chain management (Bhuniya et al., 2021). First, lead time and service level constraints. Second is the stock of goods, transportation costs, inspections, and customer satisfaction. The role of the supply chain during the COVID-19 pandemic is very important in the delivery of medical devices needed by the community. Disruptions in the supply chain can be reduced by supply chain strategies (Daneshvar et al., 2020).

Every company must have a strategy to reduce problems in the supply chain (Maemunah, 2021), to gain a competitive advantage value to get ahead of competitors. Strategy refers to a supply chain that is responsive or agile as well as efficient or lean (Firmansyah & Maemunah, 2021). Therefore a business strategy is needed to anticipate uncertainty (Maemunah & Syakbani, 2021), by increasing sustainable competitive advantage. In the conditions of the COVID-19 pandemic, intense competition, and uncertain business environment, firm performance is determined by a business strategy that is supported by the company's internal and external capabilities (Carnes & Ireland, 2013).

The application of strategy, information technology for supply chain agility is a factor considered in this study. This study emphasizes the importance of the influence of business strategy, information technology, and supply chain agility on firm performance during the COVID-19 pandemic. In a previous study, the first related research (Mollenkopf & Ozanne, 2020), described the transformative supply chain response to COVID-19. The second study (Bastani. et al., 2021), explains that strategies to increase the resilience of pharmaceutical supply chains under political-economic sanctions: the case of Iran. The third study (Bhuniya et al., 2021), describes the supply chain model with service level constraints and strategies under uncertainty. The fourth study (DeGroote, 2012), describes an empirical investigation of the impact of information technology on supply chain agility and firm performance in the U.S.

Method

This research is quantitative using primary data. Primary data was taken using a questionnaire distributed through a survey to respondents. The data describes the respondents' assessment objectively regarding the variables used in this study. Analysis of the data in this study using Structural Equation Modeling

(SEM). The data in this study are primary data taken through a questionnaire or questionnaire. The questionnaire was written using a web-based platform, namely Google Form, and distributed to respondents using e-mail. data processing to test hypotheses using AMOS software. Respondents from the study were directors, managers, and decision-makers in the medical device industry in Indonesia. The population of this study is the entire medical device industry in Indonesia. The sample in this study was 171. The appropriate sample size ranged from 30 to 500 respondents (Susanti & Nashiruddin, 2020).

Result

This study contributes to the literature related to the impact of the COVID-19 pandemic on business strategy, information technology, and supply chain agility on firm performance on medical devices in Indonesia. The results of the test using Amos, with a P-value <0.05, are significant, and if P> 0.05, it is not significant (Akter et al., 2016; Riahi-Belkaoui, 1998).

Tabel 1
Hypothesis

Hypothesis	Descriptions	Estimate	C.R.	1-Tailed P	Conclusion
H_1	Business Strategy has a positive and significant influence on Information Technology	0.217	4.470	0.000	H_1 accepted
H_2	Information Technology has a positive and significant influence on Supply Chain Agility	0.626	7.413	0.000	H_2 accepted
H_3	Supply chain agility has a positive and significant influence on Firm Performance	0.760	8.650	0.000	H_3 accepted

The first hypothesis is the influence of business strategy on information technology during the COVID-19 pandemic. The results of data processing show an estimated value of 0.217 and a p-value of 0.000 which means that the influence of the two variables in this study is positive and significant. Thus, the first hypothesis is accepted. Therefore, to improve information technology, adopting a business strategy is very necessary during the COVID-19 pandemic (Bhuniya et al., 2021), to help realize the mission and vision, help make the right decisions in the supply chain. Business strategy helps companies to be more efficient in increasing efficiency and reducing costs as well as getting ahead of competitors (Swafford et al., 2006; Harianto & Sari, 2021).

The second hypothesis is the influence of information technology on supply chain agility during the COVID-19 pandemic. The results of data processing show an estimated value of 0.626 and a p-value of 0.000, which means that the influence of the two variables in this study is positive and significant. Thus, the second hypothesis is accepted. Therefore, to improve supply chain agility, information technology helps consumers as technology users to provide information related to companies in service offerings, logistics providers. Information technology links supply chains in managing resources between producers, retailers, and consumers (White et al., 2005; Braunscheidel & Suresh, 2009).

The third hypothesis is the influence of supply chain agility on company performance during the COVID-19 pandemic. The results showed that the estimated value was 0.760 and the p-value was 0.000, which means that the third effect is positive and significant. Thus, the third hypothesis is accepted. Therefore, to improve the company's performance, supply chain agility meets the company's medical device needs during the COVID-19 pandemic, maximizes profits, ensures costs, ensures that the procurement of medical devices reaches customers without problems, quickly resolves problems, and improves performance (Li & Ye, 1999; Hendriarto, 2021; Chrisman et al., 2003).

Discussion

The COVID-19 pandemic has impacted many companies. Business strategy is needed in maintaining the company to remain competitive. Business strategy is a source of productivity and gives birth to a company's competitive advantage. A business strategy, information technology, and supply chain agility help companies to be more efficient in increasing efficiency, reducing the cost of market demand for available medical devices, creating customer satisfaction so that company performance increases. Information technology creates new ways for companies to manage supply chains and to improve the company's ability to respond to environmental changes (DeGroote, 2012). First, information technology helps supply chain agility in uncertain market conditions (Khan & Wisner, 2019). Second, information technology helps to coordinate the supply chain so that it runs according to the target. According to Permana et al. (2021), during this pandemic, the health industry also cannot escape the use of technology. Technology can be used to reduce the number of COVID-19 patients and provide broad access to the community. Information technology can reduce costs in providing access to as many technology users as possible and support governments in implementing strict regulations on social and economic activities, such as regional traffic locks and travel restrictions. Companies do not lag in adopting information technology and cooperating in service offerings, logistics providers. Information technology plays a liaison role among supply chain organizations, managing resources between producers, retailers, and consumers (Khan & Wisner, 2019). Integration of product and service offerings is also very important in the e-commerce retail environment by adopting information technology. Companies should adopt related technology information such as delivery offered on retail service platforms (Mollenkopf & Ozanne, 2020).

An agile supply chain is agile in responding to sudden changes in supply and demand (Khan & Wisner, 2019). Agile supply chains act quickly and decisively in

the face of disruptions, achieving positive business outcomes despite adverse circumstances. An agile supply chain does not have quick access to information technology and business strategies resulting in making wrong decisions. Emphasizing agile and lean logistics management will outperform competitors (Firmansyah & Maemunah, 2021; Maemunah & Syakbani, 2021). The supply chain at the company is the backbone of the economy, agility is needed to face the COVID-19 pandemic in meeting the needs of medical devices. Companies must quickly adapt and be agile in managing the supply chain of medical devices. Supply chain agility adapts quickly to rapidly changing or unexpected situations. Supply chain agility can predict all disruptions, own processes, and technology (Ivanov, 2020). Quick decision-making is the key to success. An agile supply chain can respond quickly to unexpected things and capture new opportunities regardless of uncertainty and always stay ahead of competitors (Maemunah, 2019).

Performance requires measurement to study and predict future internal and external situations to monitor circumstances and behavior relative to the goal of improving firm performance. Companies are trying to improve performance that innovates, efficiency in the organization, in achieving its goals, namely maximizing profits (DeGroote, 2012). Not only profitability is set as well as growth targets and long-term market position on firm performance but also needs to be considered such as customer satisfaction, flexibility, and productivity (Daneshvar et al., 2020). The company's financial profitability will increase the return of employee confidence, have a better production unit, and present higher quality products to its customers (Al-Matari et al., 2014).

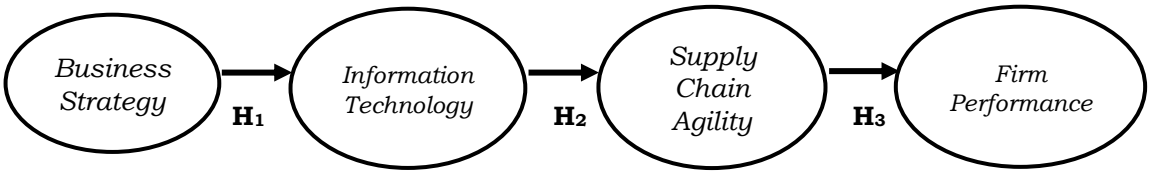

Figure 1. Conceptual framework and hypotheses for the study

Hypothesis development

H1: Is there any influence of business strategy on information technology during the COVID-19?

Strategy is unique and valuable in all actions (Porter, 2011). The nature of an efficient supply chain strategy is based on the elimination of additional activities, utilizing advanced and developing information technology, and minimizing the amount of inventory (Qrunfleh & Tarafdar, 2014), business strategies increase the level of efficiency, provide better supply chain performance. The company applies information technology related to the supply chain and adopts a business strategy to strengthen the acceleration of communication and data management (Cheung et al., 2018), to overcome all the needs of medical devices during the COVID-19 pandemic, reduce costs and time and be efficient. Information technology and

strategic planning interact with suppliers to maximize profits (Singh et al., 2020), this is to reduce costs, predict procurement to get to customers.

H2: Is there any influence of information technology on supply chain agility during COVID-19?

Effective relationships with suppliers and customers enable the entire supply chain and market needs to run smoothly applying information technology (Ivanov, 2020; Rajaguru & Matanda, 2019). Supply chain agility collaborates with information technology in company safety during the COVID-19 pandemic so that continues to exist to improve firm performance (Mollenkopf, 2020; Ivanov, 2020). Information technology improves supply chain agility in response and decision making (DeGroote, 2012). Information technology helps companies in changing the environment both internally and externally and take appropriate action (Prajogo & Olhager, 2012). Information technology makes it easier for consumers in terms of price, quality, and purchasing patterns in Medical devices. Companies adopt supply chain and information technology to deal with the COVID-19 pandemic quickly, precisely, accurately, efficiently cost as well as profitable.

Information technology plays an important role in companies by saving supply chains in managing information related to market changes (DeGroote, 2012). Information technology improves the quality of information about market changes that are communicated in the supply chain thereby increasing firm performance. Supply chain agility is the company's ability to respond to volatile markets, faster and more effectively to market uncertainty (Prajogo & Olhager, 2012), supply chains can be a source of competitive advantage for companies (Maemunah, 2021).

H3: Is there any effect of supply chain agility on firm performance during the COVID-19 period?

Companies adapt to the uncertain external environment during the COVID-19 pandemic to survive and try to meet market needs (Ivanov, 2020). An agile supply chain (DeGroote, 2012; Rajaguru & Matanda, 2019), has quick access to information, information technology, and business strategies to make the right decisions to quickly improve firm performance. Supply chain agility adapts dynamically and agilely in the conditions of the COVID-19 pandemic, reacting swiftly to meet the needs of medical devices (Ivanov, 2020). Supply chain agility collaborating with information technology in company safety during the COVID-19 pandemic continues to exist in its business to improve firm performance. The business strategy saves the company being more cost-efficient and faster in solving problems and making decisions (Bhuniya et al., 2021; Bastani et al., 2021; Kohlberger et al., 2012), companies involving supply chain agility in improving sustainable firm performance (Ivanov, 2020; Khaksar et al., 2016). Companies build stronger supplier relationships with customers in responding more quickly to problems and improving company performance (Sukati et al., 2012). supply chain agility to improve firm performance (Khaksar et al., 2016).

Conclusion

Supply chain agility capabilities that are supported by business strategies, information technology to survive in an unclear environment due to the COVID-19 pandemic can improve firm performance. The coordination of business strategy and information technology, as well as supply chain agility, is the company's commitment to maintaining the stock of medical devices to consumers without any problems. The company minimizes lead time constraints, optimal service always has medical equipment in stock, minimizes transportation costs, and guarantees customer satisfaction. Firm performance is obtained as expected, namely profits for the company and providing satisfaction to customers. Supply chain agility integrates information technology and business strategies to create innovative management, cost efficiency in improving firm performance during the COVID-19 pandemic.

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