

DISTRIBUTION PLANNING STRATEGY: SELECTING CHANNELS, OPTIMISING LOGISTICS ROUTES, AND TECHNOLOGICAL INNOVATION TO ACHIEVE EFFICIENCY AND EFFECTIVENESS IN DELIVERING PRODUCTS TO END CONSUMERS

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Abstract

This study examines strategic distribution planning by integrating distribution channel selection, logistics route optimization, and technological innovation to improve distribution efficiency and delivery effectiveness. The rapid growth of e-commerce, omnichannel retailing, and digital supply chains has increased the complexity of product distribution, requiring companies to develop integrated, responsive, and technology-enabled distribution systems. This study employs a library research approach through a literature review of relevant scholarly publications, particularly Scopus-indexed studies in supply chain management, logistics, distribution, e-commerce, and digital transformation. The literature was analyzed using narrative and thematic synthesis to identify conceptual relationships and research gaps. The findings indicate that distribution channel selection determines network configuration and fulfilment structures, while logistics route optimization improves transportation efficiency through better routing, scheduling, capacity utilization, and delivery coordination. Technological innovation functions as an enabling capability by enhancing connectivity, real-time visibility, data integration, and adaptive decision-making. The synthesis further demonstrates that integrating these three dimensions strengthens distribution efficiency and, in turn, improves delivery effectiveness. This study proposes an integrated conceptual framework: Distribution Channel Selection → Logistics Route Optimization → Technological Innovation → Distribution Efficiency → Delivery Effectiveness. The framework provides a theoretical foundation for future empirical research and practical guidance for developing efficient, adaptive, and customer-oriented distribution systems.

Keywords: strategic distribution planning; distribution channel selection; logistics route optimization; technological innovation; distribution efficiency; delivery effectiveness.

Introduction

The development of global trade, business digitalization, and the growth of e-commerce have transformed product distribution from operational activities to one of the

strategic functions in supply chain management. Companies are no longer only required to produce quality products, but also ensure that products are available at the location, time, quantity, and cost that suit consumer needs. In this context, *strategic distribution planning* has become increasingly important because decisions regarding distribution channel selection, logistics network design, and transportation management directly affect the cost and level of service to customers. Complexity is increasing due to the development of *omnichannel* strategies, increasing expectations for fast delivery, and the need for companies to integrate physical and digital channels. The literature shows that distribution network design and *omnichannel* integration are an important part of creating order fulfillment systems that are responsive to changes in consumer behavior (Hübner et al., 2016; Lim et al., 2018; Melacini et al., 2018). Thus, distribution is no longer seen simply as a process of moving goods, but as a strategic capability that connects a company's operations to the creation of value for consumers.

The transformation of consumption patterns is mainly seen from the growth of *e-commerce* transactions and the increasing need for *last-mile delivery* services. UNCTAD estimates that business *e-commerce* sales in 43 countries will reach around US\$27 trillion in 2022, demonstrating the large scale of economic activity that increasingly relies on digital-based distribution networks. At the same time, *last-mile logistics* is one of the most complex parts of the distribution system because it involves multiple delivery points, dispersed demand, relatively small order sizes, and consumer demands for speed and flexibility of services. Boysen et al. (2021) show that the growth of *e-commerce* generates new operational challenges in *last-mile delivery*, ranging from scheduling, shipping consolidation, to the selection of modes and locations of delivery of goods. Meanwhile, Mangiaracina et al. (2019) found that innovation in *last-mile delivery* is evolving towards the use of technology-based solutions, alternative network designs, and more efficient distribution approaches. These conditions show that the ability to integrate channel, route, and technology decisions is becoming increasingly relevant in improving distribution efficiency.

Despite the rapid development of distribution technology, companies still face problems such as high transportation costs, route inefficiencies, fragmentation of distribution channels, demand uncertainty, urban congestion, delivery failures, and difficulties in integrating information between manufacturers, distributors, logistics service providers, and end consumers. These issues become even more important in the *last mile*, when companies must balance cost efficiency with demands on speed, timeliness, flexibility, and consumer convenience (Lim et al., 2018; Boysen et al., 2021). In addition, the use of multiple channels simultaneously can increase the complexity of decisions related to inventory location, order fulfillment, shipping, and product returns (Hübner et al., 2016; Melacini et al., 2018). Therefore, it is not enough to optimize distribution simply by improving transportation routes or adding certain technologies separately. Integrated planning is needed that is able to align distribution channel

structures, logistics decisions, and the use of technology based on market characteristics and consumer needs.

Previous research has addressed various aspects of distribution from different perspectives. Hübner et al. (2016) identified the transformation of distribution networks in the context of *omnichannel grocery retailing*, especially with regard to network configuration and order fulfillment. Lim et al. (2018) developed a conceptual framework regarding *last-mile logistics* in the context of *omnichannel*, which shows the relationship between distribution structures and consumer experience. Melacini et al. (2018) show that *e-fulfilment* and *omnichannel* distribution require increasingly integrated logistics configurations. From an operational perspective, Boysen et al. (2021) map out various optimization issues in *last-mile delivery*, while Mangiaracina et al. (2019) identify innovative solutions that can improve the efficiency of *e-commerce* deliveries. On the technology side, Büyüközkan and Göçer (2018) show that *digital supply chains* are evolving through the integration of technology and data to improve connectivity, visibility, and decision-making. Frederico et al. (2020) further affirmed the importance of Industry 4.0 technology in building *Supply Chain 4.0* capabilities. The findings show that distribution channels, logistics optimization, and technological innovation have received widespread attention, but are evolving in relatively different literature streams.

Based on the previous research, there is a research gap in the form of limited studies that integrate three strategic decisions—distribution channel selection, logistics route optimization, and technological innovation—into one *strategic distribution planning* framework. Some studies focus more on channel configuration and *omnichannel fulfilment* (Hübner et al., 2016; Melacini et al., 2018), while other research groups emphasize the issue of *last-mile delivery* optimization (Mangiaracina et al., 2019; Boysen et al., 2021). The digital transformation literature, on the other hand, deals more with digitalization and supply chain capabilities than it does with explaining how technology specifically strengthens the relationship between channel decisions and distribution route optimization (Büyüközkan & Göçer, 2018; Frederico et al., 2020). This fragmentation causes the mechanisms of how channel configuration, route optimization, and technological capability together produce distribution efficiency and delivery effectiveness have not been fully explained. Therefore, a conceptual synthesis is needed that connects these three perspectives in a single distribution planning system.

This research is important because the contemporary distribution environment is increasingly characterized by dynamic demand, digitalization, *omnichannel systems*, the need for fast delivery, and the increasing complexity of *last-mile logistics*. Companies need a distribution approach that not only minimizes transportation costs, but also improves visibility, decision accuracy, capacity utilization, delivery speed, and quality of customer service. Digital technologies such as the Internet of Things (IoT), *big data analytics*, artificial intelligence, real-time tracking systems, and automation have the potential to strengthen companies' ability to plan and control supply chain activities (Büyüközkan & Göçer, 2018; Frederico et al., 2020). At the same time, the successful implementation of such

technology depends on its compatibility with the network structure and logistics process. Therefore, integrating the perspective of distribution channel–logistics route–technological innovation is important to produce a more comprehensive understanding of efficient, responsive, and consumer-oriented distribution.

Based on these problems and gaps in the literature, the study entitled "Strategic Distribution Planning for Efficient Product Delivery: Integrating Channel Selection, Logistics Route Optimization, and Technological Innovation" aims to analyze and synthesize the literature on strategic distribution planning by placing distribution channel selection, logistics route optimization, and technological innovation as three interrelated elements. In particular, the research is directed to identify the factors that determine the effectiveness of distribution channel selection, explain the contribution of route optimization to cost efficiency and delivery performance, and analyze the role of digital technology in improving visibility, coordination, and distribution decision-making capabilities. The synthesis is then used to build a conceptual framework that explains the flow of Distribution Channel Selection → Logistics Route Optimization → Technological Innovation → Distribution Efficiency → Delivery Effectiveness, so that it can provide a theoretical foundation for further research as well as a decision-making framework for companies in designing a more adaptive and end-consumer-oriented distribution system.

Literature Review

Strategic Distribution Planning

Strategic distribution planning is an integrated planning process to determine how products flow from producers to consumers through network configuration, distribution channels, logistics facilities, transportation, and proper order fulfillment mechanisms. From a *supply chain management perspective*, distribution decisions have strategic implications because they affect logistics costs, inventory levels, service speeds, flexibility, and the company's ability to respond to changing demands. The development of *e-commerce* and *omnichannel retailing* has made distribution planning increasingly complex as companies must coordinate multiple sales channels and fulfillment points simultaneously. Hübner et al. (2016) explain that channel integration in an *omnichannel environment* requires changes in the configuration of the distribution network and *fulfillment* process. Meanwhile, Melacini et al. (2018) show that the design of an *e-fulfilment* system must consider strategic and operational decisions in an integrated manner. Thus, *strategic distribution planning* can be understood as a company's ability to harmonize channel design, logistics networks, and resources to produce efficient distribution while being responsive to market needs.

Distribution Channel Selection

Distribution channel selection is related to a company's decision regarding the structure and mechanism used to deliver products to consumers, whether through direct channels, distributors, retailers, *marketplaces*, or combinations of various channels in

multichannel and *omnichannel* systems. The selection of the right channel must consider product characteristics, customer segmentation, market coverage, service costs, level of company control, and the channel's ability to provide a consistent consumer experience. In the context of *omnichannel*, the boundaries between physical and digital channels are increasingly blurred, so channel decisions need to be integrated with inventory systems, *order fulfillment*, transportation, and product returns. Hübner et al. (2016) show that distribution configuration in *omnichannel retailing* requires coordination between logistics channels and processes in order for companies to achieve a balance between efficiency and service levels. Lim et al. (2018) also assert that *last-mile fulfillment configurations* determine how the value of the service is received by consumers. Therefore, *distribution channel selection* becomes an initial foundation in distribution planning because it determines the structure of product flows and the characteristics of subsequent logistics needs.

Logistics Route Optimization

Logistics *route optimization* is the process of determining delivery routes that are able to minimize the use of resources while meeting various operational constraints and customer service levels. Route optimization is becoming increasingly important due to the increasing number of small-scale shipments, distributed demand distribution, congestion, limited vehicle capacity, and demands for delivery at certain times. In the context of *last-mile logistics*, route decisions are not only related to the shortest distance, but also consider travel time, capacity, number of delivery points, *time windows*, demand patterns, and uncertainty of operational conditions. Boysen et al. (2021) show that the development of *e-commerce* creates various new optimization problems in *last-mile delivery* that require coordination between scheduling, consolidation, transportation, and delivery locations. Mangiaracina et al. (2019) also found that transportation optimization and delivery model innovation are important mechanisms to improve *the efficiency of last-mile delivery*. Thus, *route optimization* can serve as a mechanism that converts distribution channel configurations into more efficient delivery activities.

Technological Innovation in Distribution

Technological innovation provides opportunities for companies to improve visibility, integration, prediction, automation, and quality decision-making in distribution. Technologies such as the Internet of Things (IoT), artificial intelligence (AI), big data analytics, cloud computing, GPS, real-time tracking, and transportation management systems allow companies to obtain and process distribution information more quickly. Büyüközkan and Göçer (2018) explained that the transformation towards *a digital supply chain* is characterized by increased connectivity and the ability to share information between supply chain actors. Digital technology can also support dynamic route planning when there are changes in demand, congestion, transportation disruptions, and changes in delivery priorities. Frederico et al. (2020) stated that the concept of *Supply Chain 4.0*

places Industry 4.0 technology as part of the transformation of supply chain capabilities. Thus, *technological innovation* does not only function as an automation tool, but as an *enabling capability* that can improve the quality of coordination and optimization of distribution decisions.

Distribution Efficiency

Distribution *efficiency* describes a company's ability to deliver products with optimal use of logistics resources. Efficiency can be reflected through reduced transportation costs, higher utilization of vehicle capacity, reduced distance and travel time, inventory efficiency, and reduced distribution activities that do not provide added value. This efficiency is influenced by how the company integrates channel decisions, inventory locations, *fulfillment*, and transportation. Melacini et al. (2018) show that *e-fulfillment* decisions have direct consequences on the configuration and performance of logistics systems, while Mangiaracina et al. (2019) identified various innovations that have the potential to reduce inefficiencies in *last mile* distribution. Therefore, increasing *distribution efficiency* does not solely come from reducing costs in one activity, but from the ability to optimize the entire product flow through the integration of channels, routes, and information.

Delivery Effectiveness

In contrast to efficiency, which emphasizes the use of resources, *delivery effectiveness* is related to the ability of the distribution system to meet the purpose of service to consumers. Delivery effectiveness can be represented through punctuality, order accuracy, delivery reliability, flexibility, speed, and the ability to meet customer preferences. In the *e-commerce* environment, the *quality of last-mile delivery* is an important part of the consumer experience because it is the last physical point of contact between the distribution network and customers. Lim et al. (2018) place *last-mile fulfillment* configurations as an important part of consumer value creation, while Boysen et al. (2021) point out that increasing service expectations result in a need for a more flexible and responsive delivery system. Thus, delivery effectiveness can be viewed as an output of a company's ability to combine internal efficiency with meeting consumer needs.

Research Methods

This study uses a library research approach with a literature review design to analyze and synthesize the development of knowledge about *strategic distribution planning*, especially related to distribution channel selection, logistics route optimization, technological innovation, distribution efficiency, and delivery effectiveness. This approach was chosen because it allows research to integrate various theoretical perspectives and empirical findings that were previously scattered in the literature on distribution management, logistics, *supply chain management*, *e-commerce*, and digital transformation. Literature review not only serves to summarize previous research, but also to identify

conceptual relationships, differences in findings, research gaps, and opportunities for the development of new theoretical frameworks (Snyder, 2019). This study did not use the PRISMA protocol, because the main purpose of the study was not to conduct a *systematic review* with strict screening procedures, but to conduct a conceptual synthesis of the relevant literature to explain the integration of various components in strategic distribution planning.

The source of research data is in the form of secondary data from articles from reputable scientific journals, especially publications indexed by Scopus, as well as academic literature relevant to the research focus. The literature search was conducted using a combination of keywords such as "*strategic distribution planning*," "*distribution channel selection*," "*distribution strategy*," "*logistics route optimization*," "*vehicle routing*," "*last-mile delivery*," "*technological innovation*," "*digital supply chain*," "*distribution efficiency*," "*delivery effectiveness*," "*e-commerce logistics*," and "*omnichannel distribution*." The literature is prioritized from the fields of *supply chain management*, logistics, transportation, operations, marketing, and information technology. Articles are selected based on relevance to the topic, clarity of theoretical or empirical contributions, reputation of publication sources, and their ability to explain the relationship between channel decisions, logistics optimization, technology, and distribution performance. Literature that does not have a substantive relevance to the focus of the research is excluded from the analysis process.

The analysis was carried out using a narrative and thematic synthesis approach. The first stage was to identify the main concepts, theories, variables, and findings of each selected literature. The next stage was to group the findings into five main themes, namely (1) distribution channel selection, (2) logistics route optimization, (3) technological innovation, (4) distribution efficiency, and (5) delivery effectiveness. The findings of each theme were then compared and integrated to identify patterns of relationships, consistency and differences in research results, as well as *research gaps*. The synthesis approach allows researchers to develop conceptual interpretations of various studies that have different perspectives (Snyder, 2019). The literature on *omnichannel fulfilment* and *last-mile logistics*, for example, is used to explain the linkage between channel configuration and delivery systems (Hübner et al., 2016; Lim et al., 2018; Melacini et al., 2018), while the *digital supply chain* literature is used to explain the contribution of technology to distribution integration and decision-making (Büyükožkan & Göçer, 2018; Frederico et al., 2020).

The final stage of the research was carried out through conceptual synthesis, which is integrating the results of thematic analysis into a conceptual framework for *strategic distribution planning*. The synthesis is directed to explain how distribution channel selection shapes logistics needs and configurations, how route optimization improves the efficiency of product movement, and how technological innovation supports information integration and distribution decision-making. Furthermore, the three components are analyzed for their relationship with increasing *distribution efficiency* and *delivery*

effectiveness. Based on this process, the research develops the conceptual flow of Distribution Channel Selection → Logistics Route Optimization → Technological Innovation → Distribution Efficiency → Delivery Effectiveness. This framework is used as a basis for discussing how the integration of structural, operational, and technological decisions can result in a more efficient, adaptive, and customer-oriented distribution system.

Results and Discussion

Results

The results of the literature synthesis show that *distribution channel selection* is the main foundation in strategic distribution planning, as it determines the structure of product flow from the company to the end consumer. The development of *e-commerce* and *omnichannel retailing* has transformed traditional distribution patterns into more complex networks involving physical stores, distributors, *marketplaces*, *fulfilment centers*, and direct-to-consumer channels. Hübner et al. (2016) show that the transformation towards *omnichannel* requires companies to integrate decisions related to inventory location, order fulfillment processes, and last-mile distribution. Similar findings were put forward by Melacini et al. (2018), who showed that *e-fulfilment* design cannot be separated from distribution network configuration because channel characteristics determine logistics needs and service levels. Meanwhile, Lim et al. (2018) show that the design of *last-mile logistics* models needs to consider consumer preferences and service characteristics. Based on this synthesis, the selection of appropriate channels allows companies to increase market coverage, order fulfillment flexibility, and responsiveness to consumer needs.

The second result shows that logistics route optimization is an important operational mechanism that connects channel configuration with distribution efficiency. The growth of digital transactions results in an increase in the frequency of deliveries with smaller order sizes and more dispersed destinations, increasing the complexity of *vehicle routing*, scheduling, and shipping consolidation. Boysen et al. (2021) identified various operational issues in *last-mile delivery*, including route determination, vehicle usage, scheduling, delivery locations, and coordination between various delivery alternatives. Mangiaracina et al. (2019) show that transportation optimization, order consolidation, the use of pick-up points, and various *last-mile delivery* innovations can be a source of increased efficiency in *business-to-consumer e-commerce*. These findings show that route optimization not only aims to obtain the shortest travel distance, but also optimizes time, vehicle capacity, transportation costs, number of deliveries, and customer service level.

The third result shows that technological innovation plays a supporting role in strengthening coordination and decision-making in the distribution system. The literature on *digital supply chains* shows a shift from manual process-based supply chain management to networks that are increasingly connected through data and digital technology. Büyüközkan and Göçer (2018) explain that supply chain digitalization

improves connectivity, integration, visibility, and the ability to share information between sectors. Meanwhile, Frederico et al. (2020) stated that *Supply Chain 4.0* integrates Industry 4.0 technology with supply chain processes to improve organizational capabilities in dealing with dynamic business environments. In the context of distribution, the use of IoT, GPS, *real-time tracking*, *big data analytics*, AI, and transportation management systems allows companies to obtain information on vehicle positions, travel conditions, changes in demand, and delivery status more quickly. Thus, technology has the potential to transform distribution optimization from a static approach to a more dynamic and data-driven approach.

The fourth result shows a conceptual pattern that the integration of channel selection, route optimization, and technological innovation contributes to distribution efficiency which further supports delivery effectiveness. The analyzed literature shows that channel decisions determine network structure and *fulfilment* needs (Hübner et al., 2016; Melacini et al., 2018), while route optimization determines how products are routed through those networks with more efficient use of resources (Mangiaracina et al., 2019; Boysen et al., 2021). Technology then provides visibility and information capabilities that can support the coordination and quality of distribution decisions (Büyüközkan & Göçer, 2018; Frederico et al., 2020). The integration of these three aspects resulted in a conceptual synthesis in the form of Distribution Channel Selection → Logistics Route Optimization → Technological Innovation → Distribution Efficiency → Delivery Effectiveness. These findings show that delivery effectiveness is not only determined by a single distribution activity, but by the company's ability to integrate strategic, operational, and technological decisions.

Discussion

The research findings reinforce the argument that *strategic distribution planning* needs to be understood as an integrated decision system, rather than as a set of stand-alone logistics decisions. Channel selection is an initial strategic decision because it determines where products are stored, how orders are received and processed, and through what mechanisms products are delivered to customers. In an *omnichannel* environment, for example, consumers can buy online but pick up products in-store, buy through stores for home delivery, or use *direct delivery* systems. These kinds of configurations have different logistical consequences for inventory location, order consolidation, transportation, and last-mile management (Hübner et al., 2016; Melacini et al., 2018). Therefore, *distribution channel selection* should not be viewed solely from a marketing perspective, but placed as part of the supply chain architecture that determines the logistics needs and complexity of the company.

Furthermore, the relationship between distribution channel selection and logistics route optimization shows the importance of alignment between strategic and operational decisions. The more diverse the channels a company uses, the more complex the structure of the point of origin, destination, frequency, and delivery time becomes. This complexity

increases the need for route optimization that is able to accommodate vehicle capacity, *time windows*, delivery density, regional characteristics, and demand variations. Boysen et al. (2021) show that various innovations in the concept of *last-mile delivery* result in increasingly diverse optimization problems, while Mangiaracina et al. (2019) show that *last-mile* efficiency solutions can involve changes in organization, technology, and process design. This means that the success of an *omnichannel* or *multichannel* strategy relies heavily on the ability of the logistics system to translate channel configurations into efficient distribution routes and schedules. Thus, *route optimization* serves as an operational bridge between channel design and distribution performance realization.

The role of technological innovation further expands the company's capabilities from just optimization to *data-driven and adaptive distribution planning*. Digital technology allows information regarding demand, inventory, vehicles, customer locations, travel conditions, and order status to be connected in a single information ecosystem. In the perspective of *digital supply chain*, the value of technology does not only come from the automation of activities, but from increased visibility and coordination capabilities across functions and organizations (Büyükoğkan & Göçer, 2018). Frederico et al. (2020) also emphasized supply chain transformation through the integration of technology and organizational capabilities in the concept of *Supply Chain 4.0*. Within the framework of this research, technology can be positioned as an enabling capability that strengthens route optimization through data analytics and *real-time* information. For example, actual information about congestion, new demand, vehicle delays, or changes in customer schedules allows the system to make more responsive distribution decision adjustments.

The next findings show that distribution efficiency is an important mechanism that links the integration of distribution strategies with delivery effectiveness. Efficiency in this context is not limited to cost reduction, but also includes vehicle utilization, travel time, order consolidation, facility utilization, and more optimal inventory management. Mangiaracina et al. (2019) show that *last-mile delivery* innovations are geared towards addressing inefficiencies that arise due to *e-commerce* delivery fragmentation, while Melacini et al. (2018) show that *e-fulfilment* configurations produce different consequences for logistics processes and performance. However, internal efficiency needs to be combined with service orientation because cost reductions that sacrifice timeliness or flexibility can reduce the value that customers receive. Therefore, companies need to achieve a balance between cost efficiency and service effectiveness, so that resource optimization still results in fast, precise, reliable, and consumer preference delivery (Lim et al., 2018).

Overall, the synthesis of this research results in the perspective that distribution excellence arises through sequential capability development, i.e. when the right channel decisions provide appropriate distribution configurations, route optimization transforms those configurations into efficient product movements, and technological innovations improve information quality and decision adaptability. These three components further strengthen *distribution efficiency* and enable companies to achieve *delivery effectiveness*.

This perspective expands on previous literature that tended to discuss *omnichannel distribution*, *last-mile optimization*, and *digital supply chains* in different research streams (Hübner et al., 2016; Büyüközkan & Göçer, 2018; Melacini et al., 2018; Boysen et al., 2021). Thus, the conceptual contribution of the research lies in the integration of Distribution Channel Selection → Logistics Route Optimization → Technological Innovation → Distribution Efficiency → Delivery Effectiveness as a *framework for Strategic Distribution Planning*. The framework can be the basis for future empirical research to test the direct relationships, mediation, and interactions between variables in the context of different industries, e-commerce, retail, manufacturing, and logistics service providers.

Conclusions and Suggestions

Conclusion

Based on the results of the *literature review*, this study concludes that strategic distribution planning is an integrated approach that connects strategic, operational, and technological decisions to improve the efficiency and effectiveness of product delivery to end consumers. *Distribution channel selection* is the initial foundation because it determines the network structure, order fulfillment patterns, inventory points, and characteristics of logistics activities. Furthermore, *logistics route optimization* plays a role in translating the channel configuration into a more efficient delivery process through route management, time, vehicle capacity, order consolidation, and transportation resources. Meanwhile, *technological innovation* functions as an *enabling capability* that increases visibility, connectivity, information integration, and decision-making capabilities faster and more adaptively.

The synthesis of the literature also shows that distribution success is not enough to be achieved through the optimization of one component separately. The integration between distribution channel selection, logistics route optimization, and technological innovation is needed to produce *distribution efficiency*, which is reflected in reduced costs, travel time, more optimal capacity utilization, and increased productivity of distribution activities. This efficiency further becomes the basis for the creation of *delivery effectiveness* in the form of punctuality, reliability, flexibility, speed, and the ability to meet consumer needs. Thus, this research produces a conceptual framework for Distribution Channel Selection → Logistics Route Optimization → Technological Innovation → Distribution Efficiency → Delivery Effectiveness as an integrative perspective in explaining the mechanism of creating distribution performance.

Theoretically, this study contributes by integrating the literature on *omnichannel distribution*, *last-mile logistics*, transportation optimization, and *digital supply chains* that previously tended to develop separately. The resulting framework places distribution as a process of developing capabilities sequentially, starting from channel configuration, optimization of logistics activities, utilization of technology, creation of efficiency, to achievement of delivery effectiveness. In practical terms, the framework shows that

companies need to view technology investment and logistics optimization as part of an integrated distribution strategy, not as a stand-alone operational solution.

Suggestions

The next research is recommended to conduct empirical testing of the resulting conceptual framework using quantitative approaches such as *Structural Equation Modeling* (SEM-PLS/CB-SEM) to test the relationship between *distribution channel selection*, *logistics route optimization*, *technological innovation*, *distribution efficiency*, and *delivery effectiveness*. The research can also develop a model by including moderation variables such as *environmental uncertainty*, *supply chain complexity*, *demand volatility*, or *digital readiness*. Comparative studies between the manufacturing, retail, e-commerce, MSMEs, and logistics service providers sectors as well as cross-border research are also needed to find out whether the relationships between variables differ based on industry characteristics and distribution environments.

From a practical perspective, companies are advised to develop distribution strategies based on integrated and data-driven distribution planning by aligning channel design, transportation decisions, and technology investments. The use of AI, IoT, GPS, *big data analytics*, *real-time tracking*, and *transportation management systems* needs to be directed not only at automation, but also at improving decision quality, visibility, and distribution adaptability. With this approach, the company is expected to be able to build a more efficient, responsive, flexible, and consumer-oriented distribution system, while strengthening the competitiveness of the supply chain in the face of the development of e-commerce, omnichannel, and digital transformation.

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