A Systematized Review on Rationale and Experience to Develop Advanced Logistics Center System in Vietnam

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Abstract

Logistics is the activity of optimizing the storage, two-way transportation of resources, finance, information... from supplier to warehouse, through the production process, factories, warehouses, wholesalers, retailers and consumers. In essence, logistics are activities serving the production and circulation of goods born and associated with businesses' production for hundreds of years. Logistics is increasingly developing at a higher level, including more diversified and complex activities specialized in an independent service industry. It is a new issue of the world economy that has attracted businesses and governments' special attention from the last decades of the 20th century to the present. The research on investment in building a port logistics center is in line with the world trend of improving service quality. It creates added value for goods through the port, so most major ports focus on planning and building super large logistics centers. This article focuses on systematizes and supplements some theoretical issues about logistics and logistics centers. At the same time, they evaluated the research on models of developing logistics centers in some countries worldwide, thereby giving lessons for Vietnam.

Keywords

Logistics Center System, Vietnam, Seaport, Economy.

Introduction

Logistics is an area of activity that plays a particularly important role, indispensable in the process of production, business and social life, including from the production, circulation
and distribution of goods. At the same time, it plays a driving role in promoting the development of seaports and a marine economy based on harmony and sustainability, contributing to improving each country's socio-economic efficiency (M. Quandt, et.al., 2017). In Vietnam, along with the formation and development of the seaport system and import and export activities, logistics activities make an important contribution to the country's socio-economic development. However, the early development of logistics activities in Vietnam is still not commensurate with society's potentials, advantages, and desires (D Datta, et.al., 2020). According to some experts, Vietnamese logistics enterprises have only met half of the market's demand up to now. Even working as a hired employee in the domestic market, although Vietnam's logistics industry has had a relatively long development (N. Hoang Phuong, et.al., 2019).

However, the development of a logistics center in Vietnam still has many shortcomings and limitations compared to practical needs. According to the Vietnam Logistics report, 2018 of the Ministry of Industry and Trade (V. T. Pham, 2019) indicates that in recent years the application of artificial intelligence (AI) to the Internet of Things (IoT) and the modern tools that have affected and transformed the worldwide warehousing and distribution industry. With investment efforts in logistics infrastructure in Vietnam, different types of logistics centers with increasingly diverse sizes and services are developing. However, there are still shortcomings that need to be overcome. Vietnam has not yet built up a theoretical basis for a logistics center such as a system of criteria, classification criteria, and logistics centres development. And there is no national-level logistics center yet. Moreover, the state's role in policy-making for the development of the logistics center system is not clear. Finally, the development of logistics centres is mainly self-made; businesses' efforts and the capacity to provide logistics services are limited.

In recent years, along with the innovation process, as international trade and investment activities are expanding and more vibrant, logistics activities also began to flourish and develop rapidly. However, the actual level of logistics development is still very low (Dilip Kumar Sharma, 2010). The country currently has about 1,500 logistics enterprises, a relatively small rate compared to about 700,000 enterprises nationwide today? (Leo Willyanto Santoso, et.al.,2021). The operation of logistics enterprises is monotonous, lack connection, and high cost. This sector's contribution to the economy is not commensurate with its potential. At only about 3% of GDP, the cost accounts for 20-25% of GDP, while in some developing countries. The logistics industry contributes to GDP up to 15-20%, and logistics costs usually only account for 10 to 13% of GDP (H. P. Nguyen, 2019).
According to the plan approved in Decision 1012 / QD-TTG dated July 3, 2015, approving the planning for developing the system of logistics centers across the country to 2020, with a vision to 2030 (H. P. Nguyen, 2019). Vietnam will form and develop 18 logistics centers of class I, class II and three specialized aviation logistics centers in regions, sub-regions and economic corridors. The Southern key economic region will particularly form and develop 05 class I and II logistics centers and 01 specialized aviation logistics center. However, up to now, the implementation of the plans for the logistics center is still facing many difficulties. Major cities of the southern key economic region such as Ho Chi Minh City and Can Tho are still completing the planning project of logistics centers. Also, the current operating logistics centres' status has not been fully and comprehensively enumerated in domestic studies. Also, there is no research on developing a logistics centre system for the southern key economic region.

Therefore, with its advantages and many opportunities for socio-economic development, the southern key economic region requires a complete and complete logistics ecosystem. The completion of policies and laws on logistics services, improvement of logistics infrastructure, full package logistics services, transparent and dynamic logistics service supply market. Furthermore, the quality of human resources in logistics is also a prerequisite for developing the logistics industry. In particular, the development of the logistics center system plays a key role in creating added value for goods, connectivity, multimodal transport, reducing logistics costs and is the basic foundation to promote the development of the logistics industry. This article presents reviews of publications related to the construction and development of a modern logistics center from there as a basis for the development of the system of logistics centers in the southern key economic region of Vietnam. The next section is the theoretical basis of the logistics center; The experiences in developing and building logistics centers are described in section 3; the possibility and prospects for developing a logistics center in the South of Vietnam are shown in section 4.

The Theoretical Basis for the Logistics Center

Logistics originated from professional activity in the military with the meaning of logistics. The term logistics has been applied to all economic fields, is spread between countries and between continents, and thus there are addition and development of semantics. By the end of the 20th century, logistics was recognized as a major economic function, an effective tool to bring success to businesses both in the manufacturing and service sectors. The world economy trend is globalization with the absolute advantage of making the world economy develop more dynamically and steadily. Globalization makes the trade of countries and regions of the world thrive and will naturally lead to new demands for transportation,
warehousing and other support services. This new trend leads to the inevitable development of logistics. Therefore, research on logistics is an essential and important requirement to improve businesses' competitiveness and business efficiency in different industries (P. T.-W. Lee, et.al., 2019). From there, improving the efficiency of the entire national economy and competitiveness among countries. So far, although there are many terms used for the concept of the logistics centre, there is not too much difference in interpretation, of which the most used terms are: logistics centers, logistics and distribution center, freight village, distribution center, logistics park, a logistics node, distripark,..... Like the concept of logistics, the logistics centre concept has also changed and developed with the advent and development of the term supply chain management (H. P. Nguyen, 2019).

According to İsmail et al. (2015), a logistics center is a form of output point structure of the supply chain, including stages such as warehousing, distribution and value-added service provision, storage and storage. According to Kaynak et al. (2014), the logistics center is a combined hub of different modes of transport, functions almost like a terminal of multimodal transport, is a key element of the multimodal transport chain, is a transport point structure where transport activities take place between different modes of transport. Rimienė and Grundey (2007) argued that the logistics center is a connection point in the logistics network system that plays an important role in supporting freight movement, stock keeping, handling goods, collecting shipping goods, creating SKU (Stock keeping unit), handling shipments. They emphasized the difference between logistics centers and warehouses is that logistics centers are very limited to storing, not even having inventory (D.S. Hooda, et.al., 2014). The logistics center has the main function of serving the movement of goods and other activities related to the circulation of goods. The term logistics center is used with many different names in different parts of the world (Jalil, N. A. et.al., 2019). However, the most widely recognized and relatively complete definition of the logistics center is that of the European Association of Logistics Centers Euro platforms (V. Yavas, et.al., 2020). Accordingly, the logistics center is an area to carry out activities related to transport, logistics and domestic and international distribution of goods, performed by many different actors. These subjects can be the owners of the goods or the tenants using the logistics center's facilities and equipment such as warehouses, offices, loading and unloading areas.... The logistics center should have and be equipped with equipment for the centre's operations and services that relate to different modes of transport such as rail, motorway, sea, river and air. There are many studies, documents and reports written about logistics centers that are widely used in scientific research, training and practical application in countries around the world, including Vietnam.
Experiences in Developing Logistics Centers

In the study of Logistics centers in the new industrial era: A proposed framework for logistics center 4.0 by Yavas and Ozkan-Ozen (2020) focused research on the transformation of logistics centers in industrial revolution 4.0 and pointed out important criteria for logistics centers in the industrial revolution 4.0. The approach used is to examine the linkages with traditional logistics centres’ activities and propose a framework for new logistics centers. This study presents twelve criteria for logistics center 4.0 - logistics center 4.0, which is derived from logistics centres' four main activities, namely handling management, information management, transport management, and warehouse management. To identify these twelve criteria, the author made a comprehensive review of the available studies and held a focus group discussion with ten members from different disciplines and scholars to narrow the criteria and define them for logistics center 4.0. In the proposal framework, these criteria are linked to the four traditional criteria and are accepted as the operational criteria at the logistics center mentioned above (S. Winkelhaus, et.al., 2020), as shown in figure 1.

![Figure 1 A proposed framework for logistics center 4.0 (V. Yavas, et.al., 2020)](image_url)

Alexander et al. (2019) pointed out the main factors in making decisions about the structure of logistics center distribution based on the theoretical review of 7 authors from 1984-2011. These include the level of demand, level of service, characteristics of goods, logistics costs, labour and land availability, accessibility, objective factors. The authors also pointed out the correlation relationship, interaction effects between 7 main factors. The correlation interaction between the main factors in deciding the distribution of logistics centers based on the study of previous theories of the author's group. New relationships and other factors are likely to exist, but identifying them is beyond this group of authors' research difficulty.
It can be seen that the service level compared to logistics costs is the main correlation affecting the choice of logistics center distribution structure. Service requests are influenced by commodity characteristics and the level of demand. Logistics costs are affected in many different ways by commodity factors, service level, and demand level. Inventory costs are sensitive to packaging and stock value density; the shipping cost meets the absolute demand level and the customer's space model (V. T. Pham, 2019). Naturally, the higher the required service level, the higher the cost of shipping. On the supply side of the service market, logistics costs are determined by the available labour and land and transport options. Accessibility influences the availability of labour by exerting inter-regional pressures in the labour market. The identified objective factors are related to accessibility, labour and land, and will also directly affect logistics costs. However, this study has not yet assessed two-way relationships, denoting an elastic need for services or costs, respectively. Besides, the study has not pointed out the balance between factors when choosing the plan of distribution of logistics centers (R. Krzysztofik, et.al., 2019).

Research on Evaluation of Logistics Center by Multi-Criteria Approach by Ismail Onden et al. (2018) has combined research on multi-criteria modelling, fuzzy analysis, time and space analysis to assess the suitability of logistics centres in the study area. Seven criteria outlined in the study are the distance of logistics centers to expressways, railways, airports, seaports, and the handling capacity of ports, volume of international trade through the centre and total population. Through sensitivity analysis, it has helped to show the suitability of each criterion.

The study on a large logistics center in Piedmont Atlantic Megaregion by Laetitia et al. (2018) presented the term "logistics sprawl" - the spread of logistics, i.e. the spatial concentration of logistics centers and distribution centers in urban areas and considering the concentration of logistics activities in the megaregion. The author also points to a study by the Equal Employment Opportunity Commission (D. F. Wood, et. al., 2012). They looked at the impact logistics centers have on labour markets, identifying modern retail distribution centers that typically have very large areas and requires substantial investment in modern cargo handling technology. Mega distribution centers (J.-P. Rodrigue, 2011) have promoted the development of warehouse service businesses. From 1998 to 2005, the number of distribution centers with more than 100 employees doubled compared to smaller establishments. Another important feature mentioned by the author is the flexibility of logistics centers. Also, green logistics strategies or consolidation between retailers and manufacturers can affect the number of warehouses, their location, and the logistics centre's internal characteristics. The ability to connect traffic between logistics centers in the region
Research on the spread of logistics in North America: methodological issues and a case study in Toronto by Clarence et al. (2018) also present the concept of "logistics sprawl". - the spread of logistics, this concept has been mentioned in the previous Dablanc studies (C. Woudsma, et., al., 2016). In this study, the author has verified previous studies in North America and yielded contrasting results between selected regions. The Atlanta and Los Angeles area went through strong logistics development from 1998 to 2008, while the Seattle area did not. An additional case study was conducted in Toronto to broaden knowledge of widespread logistics and logistics-related issues in North America. Special attention is paid to the methods of analyzing the spatial model of logistics operations in North America. Research shows that warehouses and distribution centers tend to move out of urban areas to suburban areas with advantages such as low land prices and better accessibility to highways. However, the negative consequences of this spread are more trucks have to move, emissions and traffic congestion also increase. This can also cause concerns among city managers. Also, the study presents changes in the classification of logistics infrastructures concerning warehouses and the location of logistics facilities (F. Tricoire, et al., 2017).

The countries that have successfully developed the logistics center system attach great importance in determining the position and scale of logistics centres' development. These countries all choose logistics centres near important national and international traffic hubs and close to major economic-trade centres (M. Özmen, et. al., 2020). The logistics centres of the Netherlands, the GVZ Bremen logistics center of Germany and Singapore are all located in very convenient locations, close to the ports, facilitating maximum time and freight costs between regions. Logistics centers are built with a large land fund to serve many goods and aim to be the international logistics center. The Netherlands port logistics centre Rotterdam is a cluster of 3 centres, of which Eemhaven Distripark has an area of 65 hectares, Maasvlakte Distripark is 125 hectares, and Botlek Distripark is 104 hectares. GVZ Bremen logistics centre in Germany covers an area of about 496 hectares (M. Magnan, et. al., 2020).

Construction and development of logistics center is a type of investment requiring large capital, long payback period, high risks that mainly bring benefits to the economy and trade of a city, a region economy, that country. Therefore, it is necessary to have a specific policy mechanism to attract investment, maximize resources, and promote logistics centres' development. Most successful developed countries apply credit support policies and
attractive tax policies to attract logistics centers and customers to operate in logistics centers (I. Mell, 2016). Since 2001, the Government of Singapore has also studied to formulate and apply preferential policies. This is especially a competitive tax mechanism to attract investors and businesses to build and operate the logistics centers of this island nation. Most Japanese logistics centers are built in FAZ commercial areas, so they enjoy many investment and commercial development incentives that have attracted many businesses to exploit and use logistics services and create a large and stable source of customers for Japanese logistics centers (S. Yi, et. al., 2015).

The model chosen by many successful logistics centers is the public-private model. The public government will contribute to capital or play the role of managing land and infrastructure. At the same time, the investor will also contribute to capital and act as a logistics center operator. In many cases, the investors of the logistics centers in these countries are the center's main customers. Rotterdam's Dutch port operates as a model for private companies to lease land and infrastructure, facilitating the policy regime (M. Janjevic, et. al., 2019). These companies are responsible for labour management as well as investment in logistics services. A private company completely operates the business and operation of logistics center GVZ Bremen of Germany. This private enterprise manages and operates the logistics center GVZ Bremen very effectively. The main business model that successful logistics centers apply is providing diversified services, high quality, competitive costs, and customer needs (L. C. Nguyen, et.al., 2017).

Thus, the research abroad that the author research has presented many criteria to develop logistics centers in many aspects, such as criteria for center planning, criteria for development. The development of logistics centers and the term logistics sprawl opens up a problem that countries also consider developing logistics centers to develop a logistics center system within the region, national and regional links. These will be valuable bases to study the rationale, apply in building a set of criteria for the development of logistics centers and propose solutions to develop a system of logistics centers for the key economic region of the South.

**Opportunities to Develop a Key Logistics Center in Vietnam**

Vietnam has a particularly important position in international freight transportation in Southeast Asia and the Asia Pacific. In particular, the southern region of Vietnam. This is the only region currently fully converging the conditions and advantages to develop industry and services to be at the forefront of its industrialization and modernization. This is also a region with special advantages for the development of high-tech industries,
electronics, informatics, oil and gas industries and petrochemical products; develop high-class services, tourism services, telecommunications services, finance and banking; research, apply and deploy science and technology, train highly qualified human resources (L. N. Q. Vo, et. al., 2020).

The southern key economic region has formed a network of satellite towns developed around Ho Chi Minh City, linked by traffic routes, highways, ring roads and other infrastructure. This is also the largest key industrial region in the country, forming and linking a network of concentrated industrial zones and developing key and basic industries such as oil and gas exploitation and processing, steel rolling, electrical energy, information technology, basic chemicals, fertilizers and materials... as the foundation for the industrialization of the region and the country. Especially in Ho Chi Minh City, Thu Duc City will be formed in the future, which is expected to be the nucleus to promote Ho Chi Minh City's economy (H. P. Nguyen, 2020). It is the region with the highest technology application rate, the highest level of training and scientific research in the country, with a new urban area and an international financial center. As the gateway to the east of Ho Chi Minh City, Thu Duc city has many inherent advantages in transport infrastructure directly connected with the Southeastern provinces such as Dong Nai, Binh Duong, Ba Ria - Vung Tau. Moreover, it is well connected with synchronous traffic infrastructure such as Ben Thanh - Suoi Tien metro line, Long Thanh - Dau Giay expressway, arterial traffic routes such as Highway 51, Hanoi Highway, Pham Van Dong street.

Most importantly, in the current period, multinational corporations’ global supply chains are moving gradually from China to Vietnam. Therefore, the southern key economic region is an impossible choice with a relatively complete logistics infrastructure system. Including No.5 port cluster with a group of Cai Mep - Thi Vai ports serving import and export goods to direct routes between Vietnam - North America, Vietnam - Europe; HCMC port cluster in service of import and export goods on the intra-Asian route; No.6 port cluster with the expectation of meeting goods in transit to Cambodia; Long Thanh international airport is formed in the future with the expectation of becoming an aviation logistics center of regional stature (X. P. Nguyen, et al., 2019).

In December 2015, CBRE published a report on Logistics Centers in the Asia-Pacific region through 2030 (H. P. Nguyen, et.al., 2020). To publish this latest report, CBRE has developed a new rating model that ranks logistics centers in the region based on key factors: infrastructure development, market demand and business environment. Based on CBRE's model, in addition to 8 logistics centers in the Asia-Pacific region ranked as global hubs, including Hong Kong, Guangzhou, Shanghai, Shenzhen, Tianjin, Tokyo, Osaka-Kobe and
Singapore will continue to dominate until 2030. Emerging logistics centers such as Chengdu, Fuzhou, Hangzhou, and Ningbo of China; Delhi, Mumbai of India; Busan of Korea; and Vietnam's Ho Chi Minh City is also becoming increasingly important (H. P. Nguyen, 2020).

Thus, the Southern key economic region is essential to form a sustainable logistics ecosystem with a clear logistics policy system, completing and developing logistics infrastructure, integrating full-package logistics services, dynamic and transparent logistics service delivery market with highly qualified logistics human resources. In particular, the logistics center plays a major role in creating added value for goods. It is an important node in the supply chain network by connecting different modes of transport. Infrastructure systems and information technology platforms, along with diversified and package logistics services, reduce logistics costs and are a key factor for the sustainable development of Vietnam's logistics industry.

Conclusion

The success of the logistics centers of some European and Asian countries cannot help but consider effective policies for the development of the logistics industry, economic-trade development policies, and a very successful policy to take advantage of geo-economic position. Governments of these countries have very early priority policies to support the development of the national logistics industry. The logistics industries in these countries are very developed globally, diverse in many industries, with logistics infrastructure, mainly the world's leading developed transportation and information technology infrastructure. The developed logistics infrastructure has contributed to logistics operations in general, and logistics services in particular in these countries are very efficient, low cost, and can effectively manage global supply chains and logistics flows. The developed logistics industry and modern logistics infrastructure are some of the main reasons determining logistics centres' success in these countries. Many countries with developed logistics centers have a very developed trade-economy thanks to the construction and application of successful economic-trade policies. The large scale economy combines diversified commercial activities that create logistics activities, thereby boosting the need for a modern logistics center.

As a developing country, Vietnam should learn selectively and apply valuable lessons and experiences to develop seaport logistics centers at major Vietnamese ports. Ports are in the strategy of building and developing into national or international gateway ports. Therefore, there are calculations from the beginning to develop the asynchronous port system, by the
conditions of the development level of Vietnam, and bringing about optimal results in many aspects for Vietnam in the short, medium and long term. With the ability to meet the trend of "one-stop shopping" and the "just-in-time" philosophy in production activities, logistics centers are increasingly developing and becoming an important link in the development of the country's logistics industry and presenting the theoretical basis and experience in developing logistics center systems of countries, building the development criteria of logistics centers and logistics center systems. The wave with the determination of factors affecting the development of the logistics center system is the basis for the strategic planning of the development of Vietnam's logistics centers in key economic regions of the country and the region. In the future, the assessment of operational status and proposing solutions to develop logistics center systems and applying to the Southern key economic region contributes significantly to enhancing competitive advantages and developing the logistics industry is the next research direction.

References


