

**A STUDY OF INLAND WATERWAYS LOGISTICS
IN SOUTHERN VIETNAM
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Abstract: The paper concentrates on analysing the general situation in logistics and supply chain management (SCM) in the South of Vietnam, especially in the business connection between Binh Duong province and Ho Chi Minh city besides other surrounding regions. In addition, it is crucial that the decisive factors including inland waterways transportation infrastructure, logistics policies, the economic environment, and professional workforce in logistics and SCM will be illustrated and considered seriously. As a consequence, it is of utmost importance that the workable solution will be proposed based on both the advantages and disadvantages of the economic and social environment in southern Vietnam.

Keywords: Logistics, Supply chain management, Southern Vietnam, Inland waterways transportation

1. Introduction

In Vietnam, there is a sophisticated system of inland waterways that play an essential role in the economical structure, especially in freight transport. According to the report conducted by the World Bank in 2019, it constitutes 20 per cent of the total commodities transported within Vietnam in comparison with 5% to 7% of the shipments delivered by the means of inland waterways in China, the United States of America and European Union (Hoang Anh Dung, 2019). Besides that, Vietnam possesses the natural advantage of inland waterways systems with 19,000 km in association with about 3,200 km of coastal waters, and it has not been operated and underestimated (Yin Lam, 2019).

Regarding the environmental pollution due to the activities relevant to logistics and supply chain in goods transport, it is unarguable that the inland waterways and coastal transportation contribute to a smaller percentage of greenhouse gases than other transportation methods (Hoang Anh Dung, 2019).

In terms of the cost of goods transportation, the enormous volume of merchandise, especially super heavy, over-dimensional and unusual freight, can be transported safely and efficiently with reasonable prices by a large quantity of cargo barges on inland waterways, particularly the involvement of many local private enterprises. As the result, the local government

in Binh Duong province considers the inland waterways system as a principal role in economic development. Tan Cang - Long Binh ICD JSC has been established since 2007 within total areas of 230 ha, there is much more incentive for local industrial areas in Dong Nai province, Tay Ninh province, and Binh Duong province to connect with the logistics systems in Ho Chi Minh city and particularly Ba Ria-Vung Tau province which has Cai Mep – Thi Vai port cluster (JSC, n.d.). The capacity of Cai Mep – Thi Vai can load the import and export products from the ultra-large cargos with a deadweight of more than 214,000 tons, and the shipments of containers from Ho Chi Minh city to Cai Mep – Thi Vai port which account for 90 per cent were transported by inland waterways vessels (Luis C. Blancas, 2014). As a consequence, it opens the main gate for a remarkable range of local products to enter the international marketplace through inland waterways systems.

Nowadays, the municipal authorities in Ho Chi Minh city and generally in other cities in Vietnam have drawled considerable attention to the role of logistics and SCM in not only the reinforcement of the competitive strength and the development of the local economy, but the improvement of the capacity in goods transportation and the optimization of the economic and social resources as well. Take Binh Duong province as an excellent example, the local administration emphasised that the substantial reduction of transportation cost by utilising the

integrated logistics process is underlying fundamentals in enhancing the competitive strength of the enterprises based on the improvement of the inland waterways transportation infrastructure (Department of Information and Communication of Binh Duong, 2018).

2. Information technology integrated into logistics and supply chain management

In order to fulfil customers demand on time, it is indispensable that figure 1 demonstrates that the logistics management process has to manage effectively and resourcefully an enormous amount of critical information ranging from the supplies to the distribution of the products (Christopher, 2011). Recently, there have been many contemporary concepts of logistics that deliberate on the complete integration of all aspects in business operation in one solution. To illustrate the trend of customer behaviour and optimise the inventory management, marketing and manufacturing procedures are no longer considered separately compared with the conventional methods of the organization administration in the past (Christopher, 2011).

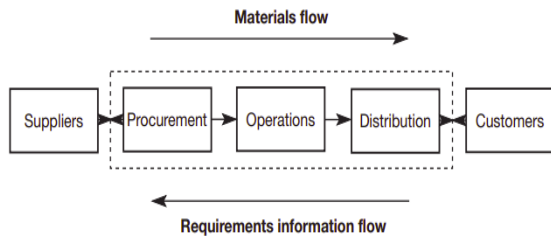


Figure 1. Logistics management process (Christopher, 2011)

There is an overwhelming number of definitions of supply chain management but all of them which have three main groups are composed of the upstream suppliers, the firm, and the downstream parties as in figure 2 (Stanley E. Fawcett, 2014). Based on the extension of the logistics companies, the model of SCM will be more complicated, and hence, the managers should implement properly the workable systems of the logistics and SCM.

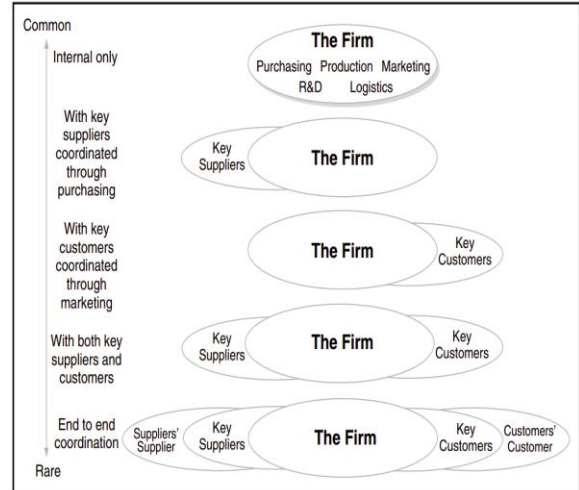


Figure 2. Models of supply chain integration (Stanley E. Fawcett, 2014)

Since the accelerated development of information technology including big data, blockchain technology, and the internet of things (IoT) has occurred recently, the realistic prospects for the integrated logistics and supply chain system can be considered for the revolutionary transformation of the conventional logistics organisations. Concerning other cutting-edge technologies in computer-aided design, computer-aid manufacturing, product lifecycle management, they also contribute to the dramatic transformation in logistics and SCM.

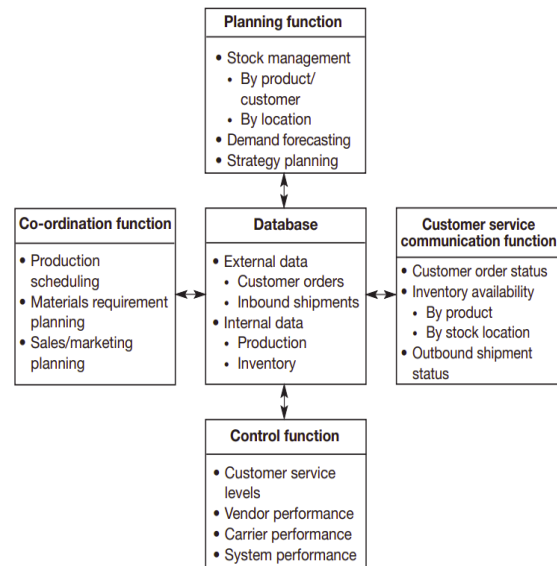


Figure 3. Application of information technology in logistics (Christopher, 2011)

It has become apparent that the internet, especially the 5th generation of the wireless network, will enable the logistics business to integrate much more data into their logistics platforms so that all business partners in the logistics systems can cooperate effectively, and hence reduce significantly the cost of logistics by optimizing the schedule of the replenishment and estimating precisely customer's forthcoming demand in real-time. As can be seen from figure 3, it is essential that the core of IT systems applied in logistics and SCM is always the online database which contains not only customer's requirements and inbound shipments but also the data of the production and the inventory management. The data centre will receive the updated information simultaneously with 4 critical functions including planning, customer service communication, coordination and control (Christopher, 2011).

3. Implementation of integrated logistics and SCM solutions in inland waterways

As discussed in the introduction, the differential advantage of the inland waterways systems with in 19,000km in Vietnam should be considered as the crucial factor in developing the modern integrated inland transportation system including road transport, inland waterways shipping, and air cargo shipments. It can be illustrated from figure 4, there would be many benefits that Vietnam has to integrate the inland waterways shipment system into inbound and

outbound logistics solutions, especially the transportation in raw materials and the distribution to warehouse and wholesalers, causing to diminish substantially the cost of the merchandise transportation (Paul R. Murphy & Knemeyer, 2018).

Besides that, not only are the warehousing, the inland ports, seaports, and other related facilities composed of the integrated logistics systems, but resources management, production and operation, packaging and assembly service, and business administration should get intimately involved as the essential factors of logistics and SCM (Paul R. Murphy & Knemeyer, 2018). The proposal of the logistics systems for the inland waterways shipping was suggested for Egypt in 2006, it will comprise two essential groups which are unmanageable (minus sign “-”) and manageable (plus sign “+”) (Islam El-Nakib, 2006).

It can be clearly seen from figure 5 that there is an enormous quantity of related factors in inland waterways logistics systems that should be considered and assessed properly. Some of them will be unstable because of the fact that not only have the advanced technologies been utilised so far, but the covid-19 pandemic influences the demand and supply in the global and local marketplace by the unpredictable ways, and hence these will bring the challenge and opportunities for the innovation in logistics and SCM systems.

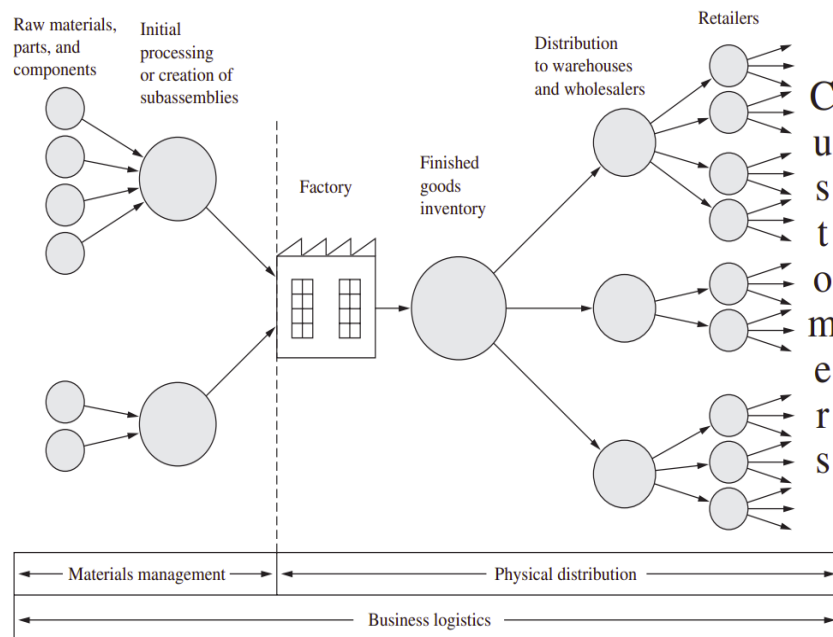


Figure 4. The management process of inbound and outbound logistics solutions (Paul R. Murphy & Knemeyer, 2018)

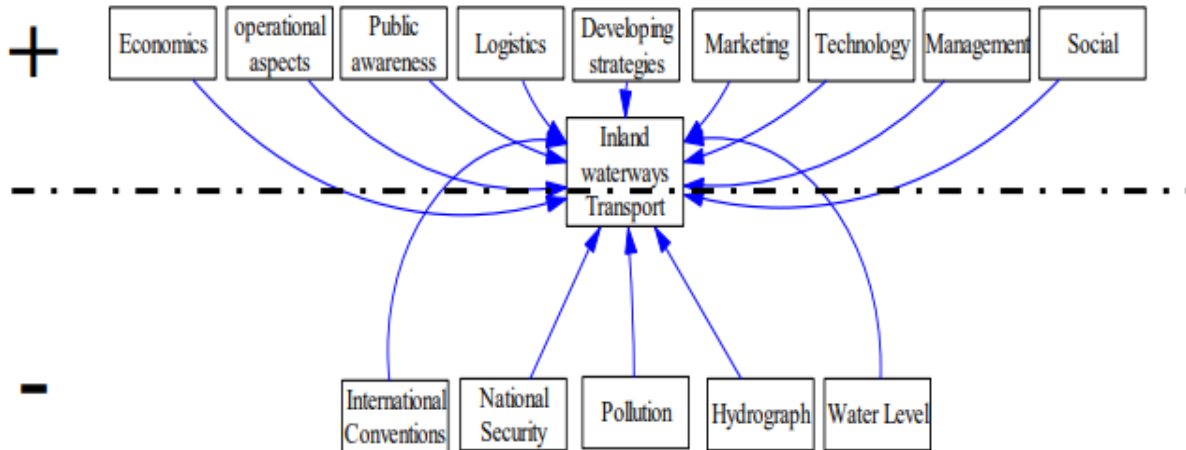


Figure 5. The innovative concept of the inland waterways logistics systems (Islam El-Nakib, 2006)

As is illustrated in figure 5, the proposed concept of the integrated logistics solution for the inland waterways systems will be directly influenced by the economic and social conditions, the mutual effects of the government’s legal framework and private enterprises’ logistics activities, the geographical features, and other relevant issues. Particularly, the development of the waterborne transportation system depends on both the vision of centralised government and regional authorities in association with the international conventions, and it will contribute to lessening the enormous amount of environmental pollution by reducing the road traffic congestion, and decreasing the rate of noise and air pollution in relation with the truck industry (Paul R. Murphy & Knemeyer, 2018).

Intermodal and multimodal logistics solution

It is crucial that the contemporary logistics systems will be composed of intermodal and multimodal transportation. Due to the containerization in recent decades, as represented in figure 6, the intermodal application plays a dramatic role in standardizing the size of freight containers in the twenty-foot equivalent unit (TEU), and as a result, it offers the economic advantage by its convenience in handling simultaneously the standardized containers amongst ocean terminals, deep seaports, railway systems, road transport, and inland waterways (Paul R. Murphy & Knemeyer, 2018).

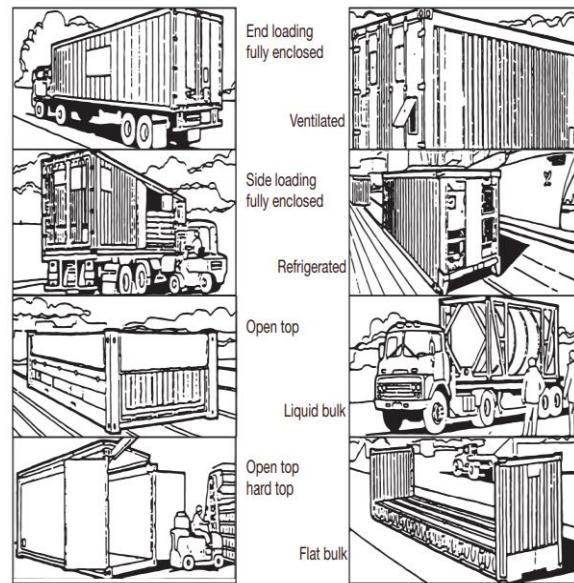


Figure 6. A wide variety of standardised containers in intermodal transportation (Paul R. Murphy & Knemeyer, 2018)



Figure 7. Centerpoint Intermodal Center (Luis C. Blancas, 2014)

An outstanding example of the implementation of intermodal logistics is that a successful enterprise is known as CenterPoint Intermodal Center (in figure 7), which was located in Ellwood (about 40 miles to the Southwest of Chicago), Illinois, the United States, and it was established by the active involvement of both governmental authorities and private businesses in the early stages of the ambitious project in 2002. In addition, by implementing the multimodal logistics system (figure 8) including roads, waterways, and air transportation in freight shipping, all parties including logistics companies and the government had beneficial consequences in 2012 (Luis C. Blancas, 2014).



Figure 8. An illustration of the multimodal logistics system (Source: <https://www.quincus.com/what-is-multimodal-logistics-how-do-you-optimize-it>)

In Vietnam, it is unarguable that the managerial responsibilities of the Ministry of Transportation

impact obviously on not only the implementation of multimodal logistics infrastructure development but the effective cooperation between provincial authorities and other government agencies as well (Luis C. Blancas, 2014). Vietnam Inland Waterways Administration, under the Ministry of Transportation, play an enormous role as the administrative agency of the inland waterways infrastructure and the logistics industry supervisor. As a result, they should stimulate a significant number of the cooperation projects in order that the private businesses are going to use the inland waterways logistics, and the managerial role of VIWA will be efficiently improved by reducing the fragmentation of their investment projects and optimizing the resources (Hoang Anh Dung, 2019).

4. Discussion of the feasible solutions and the further studies and for the development of inland waterways logistics systems

There is an overwhelming number of reasons which influence considerably the effectiveness of integrated inland waterways transportation system. Six determining factors that have a significant effect on the accomplishment of merchandise shipments through the inland waterways constitute the administration of the inland waterways ports, industrial areas and commercial businesses, cargo loading and unloading, asset inventory, in-stream overhauling, a convenient place for the periodic maintenance of inland waterways vessels, an ideal location for cargo fleets (Islam El-Nakib, 2006).

In addition, according to the report sponsored by the World Bank in 2014, the difficulties in inland waterways can be grouped by three complex divisions including the development of transportation infrastructure, the optimization of freight operations, and policy issued by many governmental agencies (Luis C. Blancas, 2014).

To optimise the annual budget for logistics and SCM through inland waterways, the first effective solution is that inland container depots should be located near inland water ports, and seaports, and as a result, there is the incentive for logistics enterprises to not only decrease their operational cost of using their truck fleets during rush hours but also encourage them to transport the commodity through inland waterways systems (Luis C. Blancas, 2014). Since 2014, there have been many inland container depots that were connected to inland waterways ports and seaports were invested and built in the focal economic zones in the South of Vietnam as figure 8.



Figure 9. Tan Cang – Cai Mep international terminal and its logistics network
 Source: Domestic Services - Tan Cang – Cai Mep International Terminal (tcit.com.vn)

The second workable solution is that the promotion of mutual cooperation and supports between inland clearance depots in Vietnam Logistics Business Association will not only increase the competitive strengths of the regional logistics system but also improve the freight operation services.

To foster the implementation of inland waterways shipping, the inland waterways sector development policies issued by relevant administrative agencies which are considered as a long-term solution should be based on market understanding and appraisal activities.

Regardless of the mentioned solutions, many aspects of integrated logistics and SCM should be considered and analysed in the ongoing researches, as follows:

- The productive balance of private and public businesses in logistics systems;
- Environmental issues in the operation of waterways traffic routes;
- The estimation of demand and supply based on the global, regional, local marketplaces;

- Well-qualified laborforce educated by academic institutes based on the practical demand;
- The effective coordination between three groups including administrative agencies, logistics enterprises, and universities in the promotion of integrated logistics solutions.

5. Conclusions

As can be analysed in the paper, it is essential to consider how to implement the advanced technologies in logistics and SCM in order that municipal governments can enhance their regional competitive strengths in the new circumstance caused by the Covid-19 outbreak. Since 2019, the detrimental impact of the covid-19 pandemic has affected not only regional economic and social development but also the process of logistics and SCM.

With regard to human resources in logistics and SMC, it is imperative that national, provincial, and local authorities should provide the adequate incentive to foster higher education institutes in opening the undergraduate and graduate majors in relation to logistics, SCM, and relevant occupations such as inland waterways captains, marine engineers, and

customs officers, logistics professionals and as a result, they will satisfy the urgent demand of professional workforce for thousands of logistics enterprises in Vietnam.

In conclusion, the integrated logistics and SCM will be confronted with an overwhelming number of challenges in association with opportunities in the next decades, and hence Vietnam should tackle the ongoing problems and seize the reasonable chances to develop innovative methods and invest more inland ports (figure 10 and 11) for an effective integrated logistics systems associated with the comparative advantages of inland waterways transport.



Figure 10. SP-ITC International container terminal on Soai Rap river (Source: Screenshot from Google Maps)

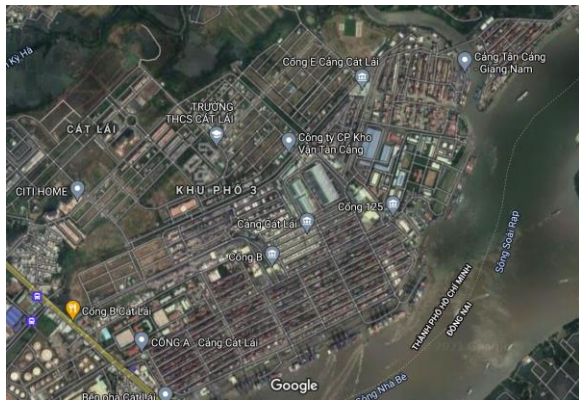


Figure 11. Cat Lai port on Nha Be river (Source: Screenshot from Google Maps)

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