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Relationship between supply chain activities in Vietnamese retail business enterprises

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ABSTRACT

The objective of this paper is to assess the relationship between supply chain activities in retail businesses enterprises in Hanoi, Vietnam. The sample includes 312 retail business enterprises in Hanoi city. Using the analysis technology of PLS - SEM structure model, through Smart PLS 3.0 software, the results show that the activities of the retail supply chain in Hanoi were statistically significant where the effects were from 0.166 to 0.605 and the level of significance was 1%. Inventory does not have a statistically significant relationship with the supply chain management strategy of these retail businesses in Hanoi.

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1. Introduction

Supply chain is a system of organizations, people, activities, information and resources involved in moving products or services from suppliers to consumers. Supply chain is increasingly developing both in theory and in practice in the world. Moreover, the emergence and development of a mass of retail supermarket chains of domestic and foreign enterprises in Vietnam market in recent years has led the competition to its peak. In order to successfully compete in today's business environment with full of fluctuation, enterprises are required to engage in the business of their suppliers and customers by building their own complete supply chain. The development of a complete supply chain will create a foundation for enterprises to save unnecessary costs, improve added value of products, increase competitiveness of products compared with competitors. In addition, it also helps the domestic industry enter the global production value chain, expanding consumption markets to all corners of the world. This requires enterprises to pay great attention to the entire flow of raw materials, how to design and package products, services of suppliers, how to transport and preserve finished products and things that consumers want.

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Globalization and liberalization of international trade are posing challenges for enterprises in terms of effectively controlling and integrating the flow of goods, information and finance. To do this, enterprises must build a fast, highly adaptable and innovative supply chain to enhance their competitiveness in the market.

Since being a member of the World Trade Organization (WTO), Vietnam has been following WTO commitments and integrating deeper and deeper into the global supply chain. However, the supply chains of Vietnamese enterprises are facing problems and challenges that reduce the efficiency of chain operations. Therefore, to help enterprises maximize their potential and turn their potentials into competitive advantages and easily overcome competitors, it is necessary to have a harmonious coordination between activities inside and outside the enterprise.

In fact, in other countries, many researchers and authors have contributed a lot of good articles that have brought great value to enterprises and retail supermarket chains in their home countries. However, in Vietnam, articles and references as well as in-depth research topics on supply chain and supply chain management activities, the application suitable to the environmental conditions, legal framework, culture and characteristics in each region and in the territory of Vietnam in particular compared to the world in general, especially for retail supermarket chains in Vietnam are still limited. Providing information with more practical value and effectively applied locally and at the same time finding good business secrets for Vietnamese enterprises are of great importance. Especially in the integration period, when Vietnamese enterprises have to compete fiercely with foreign ones, such documents are very necessary.

This paper attempts to understand the relationship among supply chain activities in retail business enterprises in Hanoi, assess the level of impact among factors. The paper includes: introduction, research overview, research methodology, research results and conclusions.

2. Research overview

2.1. Concept of supply chain

The concept of supply chain has been a favored topic of many researchers and authors since the 80s and 90s of the last century (Hugos, 2003). This was a period when enterprises realized the importance of market expansion to increasing profit. Thanks to the strong development of science and technology and modes of transportation, large corporations were able to expand beyond the borders and develop quickly. From here, the problems of logistics, management, strategy, etc. due to quick expansion of scale of enterprises, appeared and were the premise for researchers to start researching on the supply chain.

When approaching supply chains, researchers have normally followed two main directions: considering the supply chain as a collection of organizations, or a complicated process or using both. The concept following the first direction considers the supply chain as a group of companies that operate and work together to complete products and services. According to Hugos (2003), supply chain management was the coordination of production, storage, location and transportation activities among organizations in the supply chain in order to bring to the market they were serving the most convenient and efficient combination.

2.2 Activities in the supply chain

In Hugos' opinion (2003), there were three main supply chain activities: being oneness with the goal of controlling the entire product flow from suppliers to customers; coordinating chain strategies in operations and strategies among member enterprises; maintaining customer-centric thinking to create unique goods or services that make customers satisfied. Unlike Hugos (2003), Beamon (1999) identified main activities of a typical supply chain including: Planning manufacture and distribution; Determining the level of inventory (size of raw materials, semi-finished products and inventory

location); Determining the length of the supply chain (number of members): eliminating members no longer suitable and admitting new members; Assigning customers to distribution centers: which customers should be served by which distribution centers; Delivering products to factories: which products would be produced at which factories; Managing the relationship between suppliers and customers; Identifying product differences in the manufacturing process; Determining the time the products were kept in stock.

From the above activities, Beamon (2005) divided the areas of management in supply chain activities into four main categories: Facility arrangement, Design and operation of the material flow system, Design and operation of information transfer system and Customer service. The five main areas in supply chain activities were manufacturing, inventory, location, transportation and information. These five factors are also known as design parameters or policy decisions. These five factors form models and competencies in any supply chain. When policy decisions are formulated, the supply chain always operates through day-to-day activities on regular basis.

Supply chain connection strategy is a business model based on connecting organizations to adjust decisions. Moreover, the strategic process on the system connecting suppliers/manufacturers to end customers is to gain a competitive advantage, total strength as well as work performance/efficiency. In addition, it also helps control inputs and outputs related to activities of enterprises. This model is like a structure that allows enterprises in the chain to closely connect with each other.

3. Methodology

3.1. Research sample

Total retail sales of Hanoi have increased sharply over the years. Specifically, in 2010, the total retail sales reached VND 55817.7 billion (accounting for 35.5% of total retail sales of goods and services). But by the same period of 2016, total retail sales reached VND 307745.4 billion, an increase of 551.34% compared to 2015 (accounting for 81.9% of the total retail sales of goods and services). It can be seen from this statistics that retail sales are increasing more and accounting for a large proportion in total revenue. This proves that the investment efficiency in retail business is quite high and tends to prevail. Achieving such strong growth in sales was thanks to supermarkets in general (and the general business supermarkets in particular) having appropriate development policy and strategy, constantly expanding the market. Besides, there were other factors contributed to that growth such as constantly improving product quality, diversifying service policies, reasonable prices, improving quality of retail services to better meet customer needs.

The research sample is retail business enterprises in Hanoi city. We interviewed senior managers of retail business enterprises in Hanoi such as: Directors, Deputy Directors, Sales Managers. We conducted by sending online questionnaires via email and sending directly in the period of 3 months from August to October 2019. As a result, we collected 328 questionnaires and after checking and classifying, there were 312 valid questionnaires for analysis.

3.2. Research model

Hugos (2003) supposed that Information is an important factor and influences other supply chain activities such as Inventory, Manufacturing, Location and Transportation. It is a basis for decision-making and a linkage to other supply chain activities. If this linkage is strong, other supply chain activities will be operated properly and bring success to the enterprise. The research model is given in Fig. 1. In this figure, the content of observed variables in the scales will inherit from previous studies related to the topic of this paper. The scales are as follows:

- Manufacturing scale inherits from Minh (2017).
- Inventory scale is taken from studies by Khan et al (2009) and Minh (2017).

- Location scale is developed from studies by Goswami and Mishra (2009) and Minh (2017).
- Transportation scale is designed based on the studies by Minh (2017) and Nguegan et al. (2017).
- Strategy scale is developed from the studies by Minh (2017) and Qi et al. (2009).
- Scale of Top Management Support inherits from the studies by Flynn et al. (1994), Min et al. (2007) and Youn et al. (2013).
- Information scale is built on the studies by Gawankar et al. (2017) and Wu et al. (2014).
- Collaboration scales in the supply chain is designed based on the studies by Adams et al. (2014), Ellinger (2000) and Wu et al. (2014).

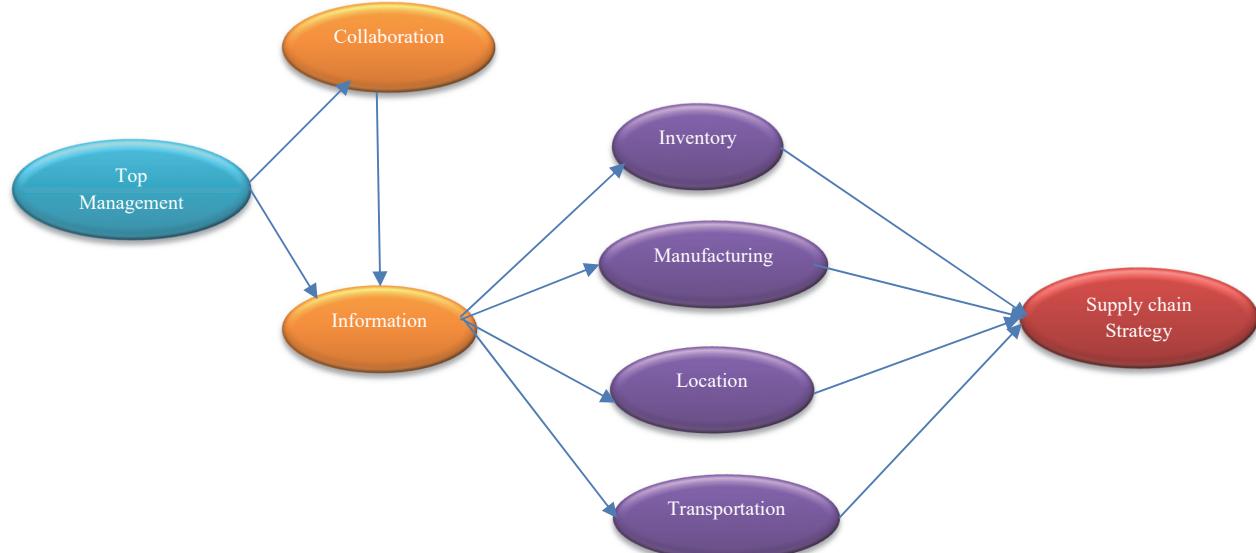


Fig. 1. The structure of the proposed method

Research hypotheses:

3.3. Analytical techniques

We used Excel software (2016) to import data from the questionnaires, after that the data was analyzed for reliability and Exploratory Factor Analysis (EFA) using SPSS 22 software, then we eliminated unsuitable and unsatisfying scales to be included in the software Smart PLS 3.0 for data analysis. In the world, PLS-SEM is considered the perfect solution for solving sample size problems to develop small-scale researches and has been carried out in many different fields (Hair et al., 2012); Ringle et al., 2012). PLS-SEM was designed and developed to reduce the pressure due to large sample sizes and the strict requirements on relationships in the model of CB-SEM method (Dijkstra, 2010; Rigdon, 2012). With only fewer observations collected, PLS-SEM can identify very complex models with high reliability. Therefore, PLS-SEM is especially useful for exploratory studies and model discoveries that do not just stop at theoretical tests (Hair et al., 2011).

Step 1: Analyzing reliability by Cronbach's Alpha coefficient and total correlation coefficient: + CA < 0.95: Cronbach's Alpha coefficient is virtual due to the phenomenon of coincident variables. The reason is that the content of questions in the same factor reflects the same problem or there is no difference in meaning. Corrected Item-Total Correlation: indicates whether the current variable contributes more or less to the overall scale; conditions must be > 0.3 (Cohen, 1988; Chin, 1998).

Step 2: Analyzing EFA using SPSS 22 software: (1) Factor loading: Factor loading > 0.5 + Factor Loading > 0.3 considered to reach minimum level + Factor Loading > 0.4 considered important +

Factor Loading > 0.5 considered to have practical significance. (2) KMO (Kaiser - Mayer - Olkin) coefficient is a coefficient used to consider the appropriateness of factor analysis. KMO values fall in the following range: $0.5 \leq \text{KMO} \leq 1$: that is, factor analysis is appropriate. (3) Bartlett's test is statistically significant ($\text{Sig.} < 0.5$), the observed variables have correlation with each other in the whole. (4) Rotation Sums of Squared Loadings (Cumulative%) $> 50\%$: represents the percentage of variation in observed variables (data) caused by factors. Example: Rotation Sums of Squared Loadings is 58,427%, which indicates that 58,427% of the data variation is explained by the factors generated by the model. (5) Eigenvalue coefficient > 1 : represents the variation explained by each factor, then the factor drawn have the best information summary significance.

Step 3: Analyzing the structural model and testing the research hypotheses:

Discriminant Validity: Correlation coefficient table: correlation coefficients between component concepts of a concept must be < 0.9 in order to achieve discriminant validity. Assessing the appropriateness of the research model, assessing R-square, f-square values.

4. Research results

The results of Cronbach's Alpha analysis show that all scales satisfy the analytical conditions with Cronbach's Alpha coefficient > 0.7 and total correlation coefficient > 0.3 (Cohen, 1988; Chin, 1998). EFA indicates that all factors have factor loading > 0.5 and KMO values are statistically significant with $\text{Sig.} < 0.5$. Therefore, we put data into Smart PLS 3.0 software for analysis.

The results of the general reliability analysis are as follows:

Table 1
Construct Reliability and Validity

	Cronbach's Alpha	rho A	Composite Reliability	Average Variance Extracted
Collaboration	0.910	0.910	0.910	0.627
Information	0.902	0.913	0.912	0.666
Inventory	0.838	0.841	0.838	0.634
Location	0.920	0.920	0.920	0.697
Manufacturing	0.945	0.917	0.914	0.773
Strategy	0.919	0.910	0.919	0.650
Top management support	0.912	0.933	0.932	0.775
Transportation	0.903	0.930	0.925	0.804

From Table 1 we can see that in general Cronbach's Alpha coefficients > 0.9 , such a very great number, which proves that all scales have high value and reliability. Composite Reliability coefficients are all > 0.9 , satisfying the analytical conditions according to Henseler et al. (2015). AVE coefficients are all > 0.5 , thus satisfying the conditions of general reliability for the scales. Next, we assessed the Discriminant Validity. The results are as follows:

Table 2
Discriminant Validity (Fornell-Larcker Criterion)

	Collaboration	Information	Inventory	Location	Manufacturing	Strategy	Top management support	Transportation
Collaboration	0.792							
Information	0.041	0.816						
Inventory	0.198	0.206	0.796					
Location	0.474	0.263	0.221	0.835				
Manufacturing	0.174	0.180	0.360	0.236	0.879			
Strategy	0.396	0.398	0.282	0.214	0.239	0.806		
Top management support	0.205	0.295	0.236	0.379	0.272	0.322	0.881	
Transportation	0.469	0.489	0.251	0.387	0.285	0.358	0.299	0.897

All coefficients in the diagonal are larger than the values in the table, therefore, Discriminant Validity of the scales is guaranteed. It is eligible to conduct the next analysis. $f^2 = (R^2_{\text{included}} - R^2_{\text{excluded}}) / (1 - R^2_{\text{included}})$

With R²_included and R²_excluded are the R-squared values of the endogenous variables when the corresponding exogenous variables are included in the model or excluded from the model. This means that the R² value is calculated twice by PLS, the first time with all latent exogenous variables (giving R²_included results) and the second time with exogenous variables not included in the model (giving R²_excluded values). Values f^2 of 0.02, 0.15, and 0.35 correspond to the small, medium and large effect sizes (Cohen, 1988) of exogenous variables. If the effect size is < 0.02, it is considered to have no effect. Looking at Table 3 we can see that all the effect sizes of exogenous variables are good.

Table 3

R - Square

	R Square	R Square Adjusted
Collaboration	0.365	0.364
Information	0.285	0.286
Inventory	0.242	0.240
Location	0.215	0.213
Manufacturing	0.232	0.230
Strategy	0.389	0.381
Transportation	0.240	0.238

All R-square coefficients are > 0.2, indicating that the variation explanatory level of the variables in the model is above average. It can be seen from the results of hypothesis testing in Fig. 2 and Table 5 that all the hypotheses are supported except for hypothesis H8. Top management support has a very strong impact on Information with effect value of 0.331 at the significance level of 1% (P-value = 0.000), which means that with top management support, information in the supply chain is better published, minimizing the information asymmetry in the supply chain of retail business enterprises in Hanoi.

Table 4

F – Square

	Collaboration	Information	Inventory	Location	Manufacturing	Strategy	Top management support	Transportation
Collaboration	0.594							
Information		0.122	0.273	0.233	0.129		0.315	
Inventory					0.212			
Location						0.136		
Manufacturing						0.342		
Strategy								
Top management support	0.576	0.322						
Transportation							0.201	

Table 5

Model fit

	Saturated Model	Estimated Model
SRMR	0.046	0.065
d_ULS	3.767	4.573
d_G	0.75	0.76
Chi-Square	798.238	839.683
NFI	0.882	0.883

At the same time, the top management support has a very high impact (0.605) on the supply chain collaboration of retail business enterprises in Hanoi, at the significance level of 1% (P-value = 0.000), thus the hypothesis H2 is supported. Collaboration makes supply chain information more perfect, reducing market failures as information asymmetry. Specifically, supply chain collaboration strongly

impacts the supply chain information with an effect size of 0.358 at significance level of 1% (P-value = 0.000), therefore, hypothesis H3 is supported.

Table 6
Results of Hypothesis Testing:

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Collaboration → Information (H3)	0.074	0.074	0.023	47.607	0.000
Information → Inventory (H4)	0.206	0.207	0.054	3.784	0.000
Information → Location (H6)	0.463	0.464	0.043	10.693	0.000
Information → Manufacturing (H5)	0.180	0.183	0.050	3.566	0.001
Information → Strategy (H12)	0.166	0.163	0.066	2.527	0.011
Information → Transportation (H7)	0.489	0.497	0.046	10.637	0.000
Inventory → Strategy (H8)	0.096	0.100	0.054	1.775	0.066
Location → Strategy (H10)	0.360	0.363	0.064	5.645	0.000
Manufacturing → Strategy (H9)	0.183	0.182	0.053	3.474	0.001
Top management support → Collaboration (H2)	0.605	0.607	0.052	11.624	0.000
Top management support → Information (H1)	-0.054	-0.055	0.030	1.812	0.000
Transportation → Strategy (H11)	0.026	0.031	0.076	3.578	0.001

The above results show that the analytical data is consistent with the research model.

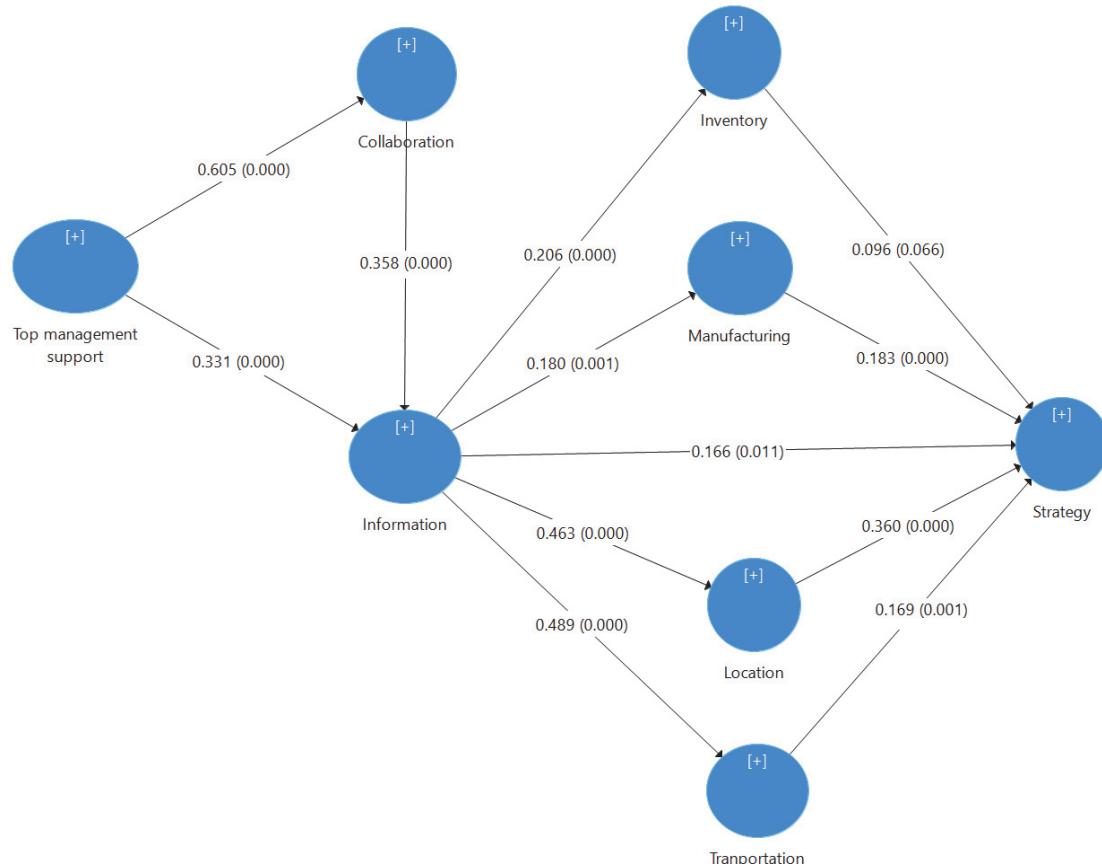


Fig. 2. Bootstrap output

All hypotheses H4, H5, H6, H7 are supported at the significance level of 1% (P-value < 0.01) with corresponding effect sizes of 0.206, 0.180, 0.463 and 0.489, which means that supply chain information is of great importance. Without sufficient information, supply chain activities will be affected, namely: If the information on supply and demand is incorrect, the inventory capacity will be insufficient or excessive; if insufficient, it will not be able to supply all customers, causing reduction in revenue, if excessive, it will increase the cost of inventory, storage, and capital backlog, resulting in reduction in the operational efficiency of the enterprise. Similarly, if the information is incorrect, the production plan will be negatively affected. For example, information on the target consumption will lead to production plans, fuel procurement, labor arrangement, etc. so if this information is asymmetric too much, it will cause the plant to operate without optimizing capacity, unreasonable labor arrangement or even creating a high rate of defective products, affecting product quality and operational efficiency of enterprises. Therefore, the information in the supply chain of all industries in general and the retail business in particular is an activity (factor) of great importance affecting the linkage and efficiency of the supply chain and business performance of the enterprise. On the other hand, information also has an impact on the supply chain strategy, though at a medium level with an effect size of 0.166 at the significance level of 5% (P-value = 0.011), like this the hypothesis H12 is supported. The factors of production, location, transportation all positively affect the supply chain strategy with the corresponding effect size of 0.183, 0.360 and 0.169 at the significance level of 1% (P-value < 0.01), this means that production activities, production capacity, material procurement plan are factors that directly affect the development of supply chain strategy. Similarly, the location of production and business activities of each enterprise has certain geographical characteristics, characteristics of market, customers and suppliers, so the location factor is a factor influencing pretty much the development and implementation of supply chain strategy. Finally, transportation capacity and transportation convenience also have positive impacts on supply chain strategy. For the retail business enterprises in Hanoi, it may be due to the fact that Hanoi is a “crowded land” so the inventory is always limited, therefore, in the context of this study, the inventory factor has no linkage to the development and implementation of supply chain strategy in retail business enterprises in Hanoi, and thus the hypothesis H8 is rejected.

5. Conclusions and recommendations

There are three important links in collaborated activities including: Synchronization of logistics activities, Information sharing and Incentive mechanism. This collaboration relationship plays a particularly important role, it creates favorable conditions for units in the same enterprise or among enterprises in the same chain to easily exchange and connect with each other. Therefore, it is important to understand how these factors affect supply chain efficiency. Factors affecting supply chain efficiency include all solutions and interventions to improve supply chain efficiency, namely: Basic elements of logistics activities synchronization which contribute to reducing fluctuations, gaps, inventory costs and better meeting customer needs and desires, thereby improving customer service; Collaboration and sharing information which aim to link information among related parties, help the cooperation in compliance with international information sharing rules, and at the same time, the parties can resolve issues in the easiest way; and Incentive mechanism which helps facilitate benefit distribution and risk distribution in order to promote the development of independent factors, bringing the overall value to the entire supply chain.

Firstly, synchronization of logistics means proposal and implementation of initiatives to create or improve the value of purchasing, consuming and distributing products and services in the market. This collaboration attempts to create many products in the market to meet and understand the needs and desires of customers; good implementation of management of inventories, facilities and transportation

among the parties will contribute to lowering inventory costs, diversifying products, eliminating outdated goods, minimizing unexpected cases such as errors or delays affecting supply chain efficiency. The basic activities in collaboration among the parties in order to create and provide practical value to customers is a big challenge for enterprises. Grimm et al. (2014) proposed three areas that are closely related to each other to ensure the synchronization of logistics activities, specifically: customer identification; recognition of customer value and development of a process creating value for customers. If an enterprise can identify customers it needs to target, brings value to the customers and designs a comprehensive customer value chain architecture model, then such enterprise has created a competitive advantage according to customer perception. Synchronization of logistics activities is a difficult problem for Vietnamese enterprises in the current period.

Secondly, it is necessary to collaborate and share information to create accurate, timely and necessary information flows for decision-making. Parties often have different information, but these flows of information are not shared, so complete and comprehensive information is very essential in the supply chain. For example, retailers understand customer needs better than manufacturers. In contrast, manufacturers understand the products better than retailers. Therefore, the exchange between manufacturers and retailers through orders from time to time will help minimize the risk of information insufficiency or gaps, and finish the products in the best way, making the customer satisfied. Nowadays, thanks to the development of science - technology, enterprises can apply IT services like the Internet. Participants in the supply chain state that they do not want to share both formal and informal information, especially sensitive information such as financial data or market volatility with each other and with suppliers. Therefore, limited information flow will get in the way of channel relationships and affect supply chain activities. Only about 15% of big retailers such as Big C, CoopMart, Vinmart, Tran Anh, etc. and local distributors often exchange information two-way with each other about issues arising in the market and together make appropriate, necessary and timely adjustments to help minimize obstacles in the supply chain of enterprises. The situation of limited information sharing activities in many retailers in Hanoi will cause many difficulties, making it difficult for enterprises to keep pace with changes in the market, especially changes in shopping behavior of customers. Business owners believe that failure to share information will lead to the fact that small changes in consumer product demand at the input of the supply chain are interpreted increasingly misleading and inflated when such information reaches the enterprises deep in the supply chain. Enterprises taking on different positions in the supply chain have to face specific situations related to market demand and this is the reason breaking the cooperation relationship among supply chain parties. They deal with problems in many ways, but first of all, a shortage of goods will be created, then, it leads to an oversupply of products by suppliers or retailers, affecting the performance of enterprises. Therefore, effective information exchange plays a very important part in maintaining the long-term relationship of retail enterprises (buyers) to achieve high performance in business activities.

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