

Limitations of Just-in-Time Inventory in Inbound Logistics and The Importance of Right KPIs and Suppliers for Fast-Food Chain

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Abstract

Taylor (2017) was more inclined towards the limitation of JIT inventory in the form of a tight supply chain. Organizations that use a JIT inventory system cannot change their strategy immediately, considering the economic forces. For instance, if a local bakery has an order of 60 cupcakes that have to be delivered in 3 days; is told to deliver the order in the next one hour. The local bakery would not be able to meet the demand as the order is not only huge but there is a high chance that the bakery would not be able to meet the quality that the customer was promised by the bakery. These elaborate pieces of literature highlighting the effectiveness of the JIT in case of efficient implementation in the business is the motivation of the researcher for this study which focuses on the fast-food chain which is a highly competitive business sector. This study aims to provide elaborated details on the boundaries of Just in Time inventory in the inbound logistics for emphasizing the significance of the use of the right KPIs and suppliers in the fast-food chains. where the primary qualitative research approach has been implemented, through the nature of the interpretivism research approach as well as the indicative research approach.

Keywords: *Just in time Inventory (JIT), Key Performance Indicator (KPI), Inbound Logistics, Food Chain.*

Introduction

Technological development has increased the high level of competition at local and the international level. To overcome this competition by serving the customers quality product at a fast pace, businesses like the fast-food chains have been adopting new methods such as the use of Just in Time (JIT) inventory for the provision of quality food to their customers (De Steur et al., 2016). Jakhar, Rathore and Mangla (2018) stated that businesses can get this competitive advantage through constant production of the product through the elimination of non-value-added activities. The reduction of the inventory and defects and ensuring the timely delivery to the customers through the implementation of the JIT system is also a significant method of getting a competitive advantage over the competitors (Al-Janabi, 2020).

According to Hipólito et al. (2020), the JIT which allows businesses to manufacture and buy material in a specified quantity with decent quality at the time of need at a suitable price has been the most recent approach for businesses like fast food supply chains. However, the implementation of the method has been showing varying results according to the use of the KPIs the business utilises and the suppliers that are approached for the fast-paced delivery of the products (Lai and Cheng, 2016).

Research Problem

In recent times, increasing numbers of businesses are adopting the JIT system for various functions such as the purchasing, operation and selling of products to get a competitive advantage (Agyabeng-Mensah et al., 2020; Taghipour, Hoang and Cao, 2020). However, Hristov and Chirico (2019) stated that the variation in the business and the appropriate use of KPIs are found to be significant methods of ensuring the gain of competitive advantage in business. Whereas, Kanyana, Ngana and Voonc (2016) argued that the implementation of the JIT is not only responsible for the provision of the competitive advantage to the company as keeping the track of the performance of the system plays a significant role in the companies' development.

Research Aim and Objectives

This study aims to provide elaborated details on the limitations of Just in Time inventory in the inbound logistics for emphasizing the significance of the use of the right KPIs and suppliers in the fast-food chains.

- To comprehend the role of the Just in Time inventory the inbound logistics
- To assess the significance of the rights KPIs and Suppliers for the fast-food logistics operations.

- To analyse the limitations of Just in time Inventory in the inbound logistics of fast-food chains in the UK.
- To recommend mitigating methods to better implement Just in time Inventory for the inbound logistics

Research Questions

For providing elaborate details about these limitations, this research answers the following questions:

- What is the role of the Just in Time inventory in inbound logistics?
- How are the appropriate KPIs and Suppliers significant for the fast-food chains?
- What are the limitations of Just in time Inventory in the inbound logistics of UK fast-food chains?

The Rationale of the Study

Nugroho et al. (2020), developed an understanding of the implementation of the Total JIT and the firm's financial performance and discovered that the total JIT was backward to the inbound logistics and positively impacted the performance of the firm. Furthermore, the study of Phan et al. (2019) focuses on the cost for the suppliers in case of implementation of JIT manufacturing along with the JIT purchasing routine. The results of this study highlighted that the integration of operation between the buyers and the sellers led to a positive purchase relationship between the purchasers and their suppliers.

Research Significance

While formulating this research it was observed that there is a significant lack of literature relevant to the use of JIT in the inventory management specific to the fast-food chain businesses through the appropriate adoption of the KPIs and the suitable management of suppliers for attaining competitive advantage. Therefore, the following study can be significantly considered one of the initial studies that investigate this in the fast-food sector. According to Phan et al. (2019), there is an increased level of competition in the fast-food industry and the businesses are required to utilise modern management and supply methods such as JIT for the provision of quality service. The study due to its emphasis on the implementation of the JIT inventory in the fast-food chains holds great significance to these businesses.

Hypotheses

H₁: Clustering of Suppliers has a significant relationship with the inbound logistics

H₂: Buyer-Supplier Proximity has a significant relationship with the inbound logistics

H₃: Conventional Strategies has a significant relationship with the inbound logistics

Literature Review

Numerous companies across the globe, especially in the field of manufacturing are starting to opt for Just-In-Time (JIT) as it helps them in reducing costs and improving efficiency (Chalupová, 2018). However, at the same time, it is imperative to note that for assessing the importance of the right KPIs and suppliers for organisations. In this part of the study, the literature available on the topic is reviewed, in light of the research objectives. The chapter has discussed the theory of JIT and its role in inbound logistics, the significance of using the right KPIs and right suppliers for fast food chains, the limitations of JIT and ways to mitigate them.

The concept of Just-in-time inventory originates from the increasing necessity of reducing waste and warehousing costs (Lyu, 2020). In recent times, substantial investments have been made by firms to incorporate the techniques of industry 4.0 and computer-operated warehousing to reduce the capital costs of operations. However, issues of product obsolescence, inefficient predictive analysis, fluctuating customer demands, and increasing cost of real estate have been pushing the companies towards the idea of the complete elimination of warehouses (Fettermann, 2018). Otherwise, the food business faces the risk of great losses if it does not constantly monitor the right indexes of delivery timings, prediction of peak customer demands, and availability of raw materials in the JIT-based inventory (Columbus, 2019). Furthermore, the selection of the right suppliers upstream is also an important step in ensuring the efficient performance of the inbound logistics of fast-food businesses, because inefficiencies and lags in the upstream could cause deterioration of the downstream supply chains (Mohamed, 2017).

According to Muchaendepi et al. (2019), JIT inventory has numerous benefits that if utilized in the right way, can bring success to the organisation. One of the benefits is that it helps in having improved cash flow. However, Taylor (2017) stated that a major issue with JIT is that it can give price shocks to the organisation. In simple words, when an organisation makes use of the JIT system, the organisation does not have the luxury of waiting around for the best prices on goods. At this point, Rachlin (2019) was of the view that using a JIT system requires organizations to assess every aspect carefully.

Inbound logistics, as per Mtar and Smondel (2019), is focused on the transportation and storage of incoming goods. Further assert that there is a need to comprehend; at this point, Minner (2019) demonstrates in his work that JIT plays a significant role in inbound logistics. According to Falsafi, Marchiori and Fornasiero (2018), successful transportation is only

possible for organizations if they can better serve their JIT customers, regarding their transportation needs.

For any organisation, choosing the right type of KPIs is extremely important as it helps the organisation in getting a balanced assessment of its financial position; especially in fast-food chains. However, Baker, Croucher and Rushton (2017) were of the view that apart from using the right KPIs; the right suppliers must be used for the fast-food chains because these are the people who decide if the organisation would attain success or failure. Angelos (2017) stated in his work that sourcing ingredients are seen as one of the top priorities for fast-food chains. The right food suppliers must be chosen as they would have to guarantee the quality, safety and value of the food that would be offered to the consumer.

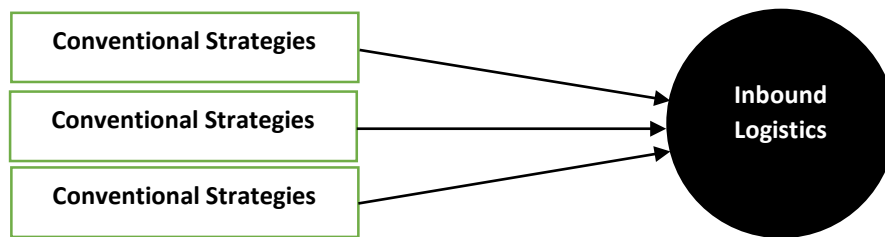
Concerning inbound logistics, it is imperative to note that there are certain limitations of the JIT inventory system (Whiteing, 2017). Any organisation that is looking to have JIT as part of their operations, must consider the limitations that are part of the JIT inventory. One of the limitations of JIT inventory in inbound logistics is the lack of flexibility. Chalupová (2018) stated in his work that if an organisation is met with a new demand that is asking for specific products in bulk; it can cause a major problem for the organisation. According to HK (2020), many businesses have to face such issues which eventually lead to the loss of a new client for them.

The requirement of the JIT systems is consistency in the logistics and the proficient handling of the equipment. To reduce the limitation of the JIT in the logistics of its inbound nature, the participants of this system need to have an increased level of flexibility and adaptability for accounting for the required coordination with the firm (Cheng, 2011b). Danese, Romano and Bortolotti (2012) similarly stated that the implementation of conventional methods entails the complex reconsideration of the sourcing decision along with the inventory management and storing of the supplied products.

According to the study by Cheng (2007a), the JIT wisdom suggested that the inbound suppliers should be located close to the firm which helps the firm reduce the functional cost of the logistics and also get an increased opportunity of attaining quality products from the suppliers.

The firms according to Zhang et al., (2019) can reduce the limitation of the JIT system through the formation of clusters of suppliers. This according to Reid (2016) allows the businesses to gather the required products in real-time. The method of clustering the suppliers reduces the dependency of the business on a single supplier and permits a more effective approach to the implementation of a JIT system.

Research Model



Literature Gap

While reviewing the literature review, it has been observed that there are various studies (such as Chalupová, 2018; Mtar and Smondel, 2019) available in the area of JIT inventory. However, Mtar and Smondel (2019) cite in their work that using the JIT inventory system would mean that organizations would become restricted in meeting the demands of customers. In such cases, the use of the right KPIs and suppliers also becomes extremely significant. However, the information available related to the fast-food chain is limited, as the researcher observed. This study has focused on fulfilling the literature gap of assessing the limitation of JIT inventory in the inbound logistics in light of highlighting the importance of the right KPIs and suppliers for the fast-food chain.

Research Methodology

Research Philosophy

The present work investigates the limitations of just-in-time inventory management in fast-food chain businesses, and it assesses the importance of the correct selection of key performance indicators and suppliers to ensure efficient operations of the supply lines. To gain a holistic perspective, the research is based on real case studies on different food outlets employing the JIT approach. Due to the subjective and qualitative proportion of the study, interpretivism philosophy has been employed throughout the investigation and data collection. It allows for the flexibility on the side of the researcher to interpret the subjective information and combine it with the objective data collected from the monitoring of some KPIs in food chains.

Research Approach

In the research analysis, several research approaches have been noted which have an aim to pursue the research goal and align the research goal into effective achievement. There are several approaches including the inductive research approach, deductive and abductive. This study consists of the analysis of subtle aspects in the implementation of just-in-time inventory management in fast-food chains. It involves a qualitative examination of the case studies of

limitations in the field concerning the existing theoretical models and literature available on the subject. Therefore, inductive reasoning has been employed in the investigation to decipher hidden patterns and conclude new findings that add knowledge to the existing literature.

Research Design

Research designs can be mainly categorized into two distinct classifications i.e., quantitative and qualitative. According to Bloomfield and Fisher (2019), the quantitative design process of the collection and analysis of the numerical data is utilized in the identification of the patterns. Whereas, qualitative research involves the careful collection and analysis of the non-numerical data derived from texts, descriptive essays, articles, and documentaries to develop a comprehensive understanding of the subject (Williams, 2019). As the current research involves real-time data collection through interviews of business owners, evaluation of customer feedback and subjective analysis of the variables involved in fast-food chain inventory management, therefore, qualitative design has been employed to provide breadth and flexibility in the process.

Data Collection Method

There are two kinds of data collection methods that have been observed which include primary and secondary. In this research, the researcher has selected the primary data collection method. This study requires careful investigation of the limitations of JIT in the inbound logistics of food chains, therefore, primary data collection methods involving interviews, surveys, and monitoring of parameters are utilized in the research.

Data Analysis

The researcher has used the SPSS in order to analyze the collected data and the sample size for this study was 120 participants. The responses of all the participants have been analyzed via SPSS.

Ethical Considerations

Battiste (2016) highlights that research ethics is one of the prominent elements of research as it enables the researcher for following the responsibility of society while involving other participants. Furthermore, extracting data in an unbiased way and authenticating the information sources is one of the necessary steps to undertake to validate the reliability of the project. Additionally, the ethical consideration of formal research also emphasizes recognizing the work of other authors that the investigator has included in the studies. It also highlights the importance of any copyrights and intellectual property rights (Bell et al. 2018).

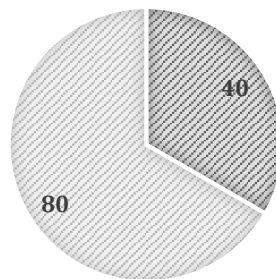
Research Limitations

The research limitations are such characteristics of study design or methodology that influenced the interpretation of the results, formulation of a theory or the application of the results. These are the inherent constraints present in the methodology of the findings. They also include the changes in variables associated with changes in your study theme with time (Brutus, 2013)

Data Analysis

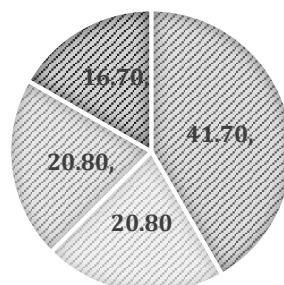
Gender

■ Female ■ Male ■ ■



Age Group

■ 18 -24 ■ 25 - 31 ■ 32 - 38 ■ More than 45



Out of total 120 respondents, eighty were male and 40 were female. As far as age group is concerned, more than 40% respondents were in the age group of 18 to 24 years, while 16% of the respondents were in the age group of more than 45 years.

Correlation Analysis

In this research the relationship between the conventional strategies with the buyer-supplier proximity is insignificant and clustering with the supplier is significant. correlation of Buyer supplier proximity with conventional strategies is insignificant. The clustering of suppliers has a significant correlation with both variables. in the case of the dependent variable, it has been noted that it has a significant relationship with all three independent variables since their p-value is less than 0.05.

Correlation between Variables

		Conventional _Ststrategies	Buyer_Suppl ier_Proximit y	Clustering_of _Ssuppliers
Conventional_Strategie s	Pearson Correlation	1	.081	-.075
	Sig. (2-tailed)		.379	.415
	N	120	120	120
Buyer_Supplier_Proxi mity	Pearson Correlation	.081	1	-.009
	Sig. (2-tailed)	.379		.925
	N	120	120	120
Clustering_of_Supplier s	Pearson Correlation	-.075	-.009	1
	Sig. (2-tailed)	.415	.925	
	N	120	120	120
Inbound_Logistics	Pearson Correlation	.020	-.100	-.001
	Sig. (2-tailed)	.832	.276	.993
	N	120	120	120

Correlation Between Independent and Dependent Variable

		Inbound_Logistics
Conventional_Strategies	Pearson Correlation	.020
	Sig. (2-tailed)	.832
	N	120
Buyer_Supplier_Proximity	Pearson Correlation	-.100
	Sig. (2-tailed)	.276
	N	120
Clustering_of_Suppliers	Pearson Correlation	-.001
	Sig. (2-tailed)	.993
	N	120
Inbound_Logistics	Pearson Correlation	1
	Sig. (2-tailed)	
	N	120

Conventional strategies have a significant correlation with the Inbound logistics having the 0.020 p-values. Buyer supplier proximity has a significant correlation with the inbound logistic having the -.100 p-value. Clustering of suppliers has a significant correlation with the inbound logistics having the -.001 p-value

Regression Analysis

Here all the variables have been entered in the model. the Dependent Variable was Inbound logistics whereas the independent variables were clustering of suppliers, Buyer supplier proximity and the conventional strategies.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.104 ^a	.011	-.015	1.50551

a. Predictors: (Constant), Clustering of Suppliers, Buyer Supplier Proximity, Conventional Strategies

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	t
		B	Std. Error	Beta	
1	(Constant)	3.010	.494		6.096
	Conventional_Strategies	.030	.099	.028	.300
	Buyer_Supplier_Proximity	-.105	.095	-.102	-1.105
	Clustering_of_Suppliers	.000	.101	.000	.004

Coefficients ^a			Sig.
Model			
1	(Constant)		.000
	Conventional_Strategies		.764
	Buyer_Supplier_Proximity		.271
	Clustering_of_Suppliers		.997

a. Dependent Variable: Inbound_Logistics

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.871	3	.957	.422	.737 ^b
	Residual	262.920	116	2.267		
	Total	265.792	119			

a. Dependent Variable: Inbound_Logistics

b. Predictors: (Constant), Clustering_of_Suppliers, Buyer_Supplier_Proximity, Conventional_Strategies

The Model has indicated that the p-value is greater than 0.05 thus variables have no significant relationship with each other.

Results of Hypotheses

HYPOTHESES	P-VALUE	RESULT
Clustering of Suppliers has a significant relationship with the inbound logistics	0.02	Accepted
Buyer-Supplier Proximity has a significant relationship with the inbound logistics	-.100	Accepted
Conventional Strategies has a significant relationship with the inbound logistics	-.001	Accepted

Conclusion and Recommendation

The aim of this research was to explore the relationship in between the factors as well as the inbound logistic. and it has been noted that clustering of Suppliers has a significant relationship with the inbound logistics, buyer-Supplier Proximity has a significant relationship with the inbound logistics and the conventional strategies have a significant relationship with the inbound logistics. It has been concluded that the material supply of JIT in the inbound logistics reduces the total waste of the inventory in addition to the transport cost. this research concluded that this particular system can provide benefits and challenges for organizations; in some cases, making them regret their decision of using JIT. The future researchers are concluded that in the case of this research some of the drawbacks have not been catered which are recommended to be explored in a factual manner.

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