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**FACTORS AFFECTING THE SELECTION OF THIRD-PARTY LOGISTICS SERVICE PROVIDERS IN THE EDIBLE OIL INDUSTRY OF KARACHI**

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**Abstract:**

**Purpose:** Logistics plays an important role in integrating the supply chain of industries. But given the volatility and dynamic nature of supply chain management as a field, the factors that need to be considered when choosing a 3PL can vary based on geographic location, type of industry, nature of the product and so on. Therefore, this study aims to identify which factors impact 3PL Service Provider selection the most in the edible oil industry specifically based in Karachi.

**Design:** The study describes and the theory of core competencies and how these competencies are used in the selection process of 3PL Service Providers. A survey was carried out through questionnaires to determine which competencies are best suited to choosing a 3PL Service Provider in the edible oil industry.

**Findings:** The findings showed the Selection of 3PL Provider was most significantly impacted by two of the five variables Cost of Service and Operational Performance. Financial Performance showed a weak relationship while the last two variables were proven to have little or no relationship with the independent variable.

**Originality and Value:** The study will help the supply chain professionals of the edible oil companies focus on certain factors while outsourcing their work most importantly selecting a 3PL service provider.

**Key Words:**

*Third-Party Logistics Service, Oil Industry, Selection, Karachi*

## **1. Introduction:**

Oils and fats all over the world are primarily used for food purposes but often the extracted oil and the seed itself is used as feed for livestock and as ingredients in common household products such as soaps and shampoos (Iqbal & Deshmukh, 2018). Furthermore, edible oils make up an important aspect of food spending in every household regardless of income levels and living standards and is a large and flourishing market for the industry. Major oilseed crops in Pakistan include Canola, Rapeseed/Mustard, Cotton Seed and Sunflower (Janmohammad, 2018).

On a global scale, the edible oil industry is expected to realize a Compound Annual Growth Rate (CAGR) of 5.1 % which translates to an approximate value of USD 130.3 billion by the end of 2024. Leading this growth is China, as the biggest market for edible oils, closely followed by countries such as United Arab Emirates, India and Pakistan. On the other hand, global production is dominated by South American countries including Argentina and Brazil. Both countries focus primarily on soybean and palm oil (Iqbal & Deshmukh, 2018). Even though Pakistan plays a major role in the market for edible oils, the country is still lacking in research and development activity compared to countries such as India which, therefore, lead to an excessive reliance on oil imports. In 2017, the edible oil industry of Pakistan recorded a sales volume approximately at 4 million metric tons which translates to a market size / worth of over PKR 500 billion (Iqbal & Deshmukh, 2018).

A 3PL Service Provider is a third-party logistics provider. This means that a company that is completely external to your organization is responsible for all of your logistics / transportation needs. This can include both internal as well as external movement of goods. The primary advantage of this is that since the 3PL is a specialized logistics provider, he can achieve far lower costs and much higher economies of scale than your own organization. More so because any 3PL is rarely contracted with just one company. They have many different clients across which they distribute their costs thereby giving its clients a far lower cost than if they went about doing it themselves (Robinson, 2015).

Logistics has a key role to play in integrating the many divisions and sub-divisions of the supply chain of any industry regardless of size and nature. As economies and industries grow and move to a global scale and the concept of a competitive edge is increasingly difficult to maintain, logistics has now become an important aspect where entire industries can find ways to decrease costs and improve their customer service quality at the same time (Akman & Baynal, 2014). In other words, logistics may be the biggest point of cost reduction in a businesses' value chain.

Given the volatility and dynamic nature of supply chain management as a field, the factors that need to be considered when making choice of 3PL vary between each geographic location. Therefore, this study aims to identify which factors impact 3PLSP selection the most in the edible oil industry specifically based in Karachi.

### **1.1 Significance of the Study**

There are many reasons that encourage a company to outsource "in-house" processes to a 3PLSP which may include reduction in costs, focus on core activities only, improving customer focus and thereby service level, integrating elements of the supply chain, improve conflict resolution and avoidance as well as share information related to goals and objective among others that are facing the same issue and challenges (Wambua, 2017)

This study seeks to expand knowledge on the selection process and criteria for 3PLSP in the edible oil industry based in Karachi by addressing the gaps in Pakistan based research on this particular field. The study will investigate the impact of four variables namely (1) Cost of Service, (2) Reputation, (3) Operational Performance, (4) Financial Performance, and (5) Long-Term Relationship Orientation. Findings from this study are hoped to help both organization as well as the 3PL suppliers. The procurement department of the edible oil industry will be better informed as to the current market practices in the industry. In other words, not only will this study help 3PL service providers determine which element of their service is most likely to make or break a deal with the customer. Customers will know which service element is most likely to determine future good performance.

## **2. Literature Review**

Outsourcing is a broad term used to describe the phenomenon of removing a particular process from your internal value chain and establishing it as an external process with clear inputs and outputs. It is not always clear which element will be outsourced and therefore has a complex structure (Vaxevanou & Konstantopoulos, 2014).

The subcontracting of logistic functions to Third-party Logistics Service Providers (3PLSP) is a narrower field within outsourcing which has become an excellent opportunity for organizations and companies that mention the increased efficiency in operations, improved flexibility, improved levels of service and increased focus on core business activities as the primary gains and benefits that can be obtained (Windle, 1999).

Furthermore, this field is subject to interpretation. Primarily because studies have shown that most 3PL research is realistic evocative in nature and generally lacks a theoretical foundation

(Selviardis & Spring, 2007). Therefore, there are many varying interpretations and definitions of 3PL have evolved (Holldorsson & Skjott-Larsen, 2004). These interpretations can be studied in multiple perspectives which vary in scope, timeframe and nature of the relationship (Rahman & Selen, 2010). For example, one definition states that the “functions performed by the 3PL providers can encompass the entire logistics process or selected activities within the process” (Lieb, Millen, & van Wassenhove, 1993). Another definition more on the narrow side of the spectrum states that “the shipper and the logistics provider see themselves as long term partners” (Bagchi & Virum, 1996). Another, more simple interpretation is that the supplier or manufacturer works on its own “core competency” and lets an outside (third-party) firm handle the processes in which it has “core competencies” (Windle, 1999). For the purpose of this study, the interpretation presented by Lieb *et al.* has been adopted as it is easier to understand and apply because it maintains a broader view of the subject.

As mentioned earlier, one of the forces or theories that drives the concept of outsourcing and subsequently 3PL is the theory of Core Competencies (Vaxevanou & Konstantopoulos, 2014). This theory has been defined in some literature as the combined knowledge that an business has especially with regards to the techniques and methods used in coalescing diverse industrious skills and the combination of various dissimilar technologies (Prahalad & Hamel, 1990). According to this theory, the main factor that determines the success of any agreement between any two parties is the analysis of the vendor’s core capabilities (Vaxevanou & Konstantopoulos, 2014). In another piece of research which scrutinized the stages of preparation, relationship maintenance and reconsideration, the conclusion reached was that the Core Competencies Theory is one of the two methods that is a better illustrator of what elements and factors of any outsourcing process can bring success (Gottschalk & Solli-Saether, 2005).

## 2.1 Research Framework

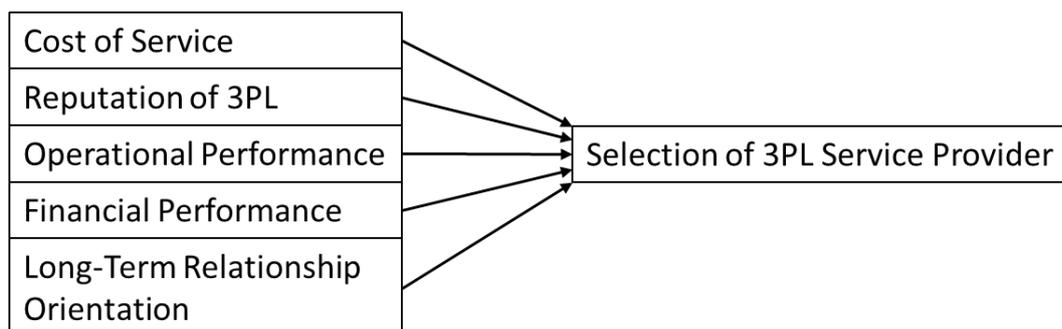


Figure 2. 1: Research Framework Model

The research framework above has been adapted from the framework presented by Binh et. Al in their his Vietnam based research (Binh, 2016).

## **2.2 Hypotheses**

H1: There is a significant impact of cost of service on 3PL selection.

H2: There is a significant impact of reputation of the 3PL on 3PL selection.

H3: There is a significant impact of operational performance on 3PL selection.

H4: There is a significant impact of operational performance on 3PL selection.

H5: There is a significant impact of long-term relationship orientation on 3PL selection.

## **3. Research Methodology**

This study is based on a quantitative approach with an explanatory strategy in order to understand exactly the current situation in the edible oil industry of Karachi. Furthermore, the study is mono-method in that the data collected is purely quantitative in nature by using closed-ended questionnaires for primary data collection. Articles, journals, books and other reliable sources on the internet have been used to collect secondary data.

### **3.1 Target Population**

The target population includes employees working in the supply chain, procurement, or logistics department of companies within the edible oil industry based in Karachi. The respondents have experience dealing with 3PL service providers and therefore are aware of the important factors that need to be considered when selecting a specific 3PL service provider.

### **3.2 Sample Size/ Technique**

The population size has been estimated to include 120 individuals that are employed in the above-mentioned departments within the edible oil industry of Karachi. This estimation is based on information provided by three companies operating within the concerned industry based in Karachi. Based on this population size, using a confidence level of 95% and a Margin of Error of 5%, the sample size used for this study is 120.

The sampling technique used in this study is non-probability convenience sampling. The primary differentiator from probability sampling is that the sample is selected based on the subjective judgment of the researcher, rather than random selection. Therefore, respondents were selected at random from the professionals working in the industry as and when possible.

### 3.3 Procedure of Data Collection

The primary data collection of this research has been conducted on professionals working in the supply chain, procurement or logistics departments in companies within the edible oil industry of Karachi. For this purpose, questionnaires were both digitally and physically distributed to these professionals both directly as well as through a contact person within that organization. A short description was included with the questionnaire in order to provide a brief introduction to the purpose of this study to enable more accurate responses.

### 3.4 Statistical Analysis

Analysis of the data gathered through the questionnaires was conducted through SPSS (Statistical Package for Social Sciences) Software. the variables were defined and then the data was entered after which multiple statistical techniques were applied in order to test the hypothesis. This includes **regression analysis, correlation and reliability tests** (through Cronbach Alpha).

## 4. Results and Findings

Data gathered in this study is from professionals working in the supply chain, procurement or logistics departments of companies operating within the edible oil industry of Karachi.

### 4.1 Validation of the Model

Validation of the framework model can be seen in the reliability statistics in Table 2, below. The value for Cronbach’s Alpha is at .854 or 85.4% which is an acceptable level. Shows that the questionnaire used for the study is reliable and accurately measures the variables

*Table Error! No text of specified style in document..1: Reliability Case Processing Summary*

		N	%
Cases	Valid	120	100.0
	Excluded <sup>a</sup>	0	0.0
	Total	120	100.0

a. Listwise deletion based on all variables in the procedure.

*Table Error! No text of specified style in document..2: Reliability Statistics*

Cronbach’s Alpha	N of Items
.854	16

### 4.2 Hypothesis Testing

The hypothesis testing was conducted using correlation and regression analysis methods. The correlation statistics in Table 3 below show that there is a significant relationship between the dependent variable (Selection of 3PL Provider) and the two independent variables of Cost of Service and Operational Performance. Secondly, the table shows that there is a less than significant relationship between Selection of 3PL Provider and Financial Performance. Lastly, it can be seen that there is an insignificant relationship between Selection of 3PL Provider and the two independent variables of Reputation of 3PL and Long-Term Relationship Orientation.

*Table Error! No text of specified style in document..3: Correlation Results*

		Selection of 3PL Provider	Cost of Service	Reputation of 3PL	Operational Performance	Financial Performance	Long-Term Relationship
Selection of 3PL Provider.	Pearson Correlation	1	.535**	.151	.565**	.396**	.159
	Sig. (2-tailed)		.000	.183	.000	.000	.158
	N	80	80	80	80	80	80
Cost of Service	Pearson Correlation	.535**	1	.366**	.431**	.348**	.331**
	Sig. (2-tailed)	.000		.001	.000	.002	.003
	N	80	80	80	80	80	80
Reputation of 3PL	Pearson Correlation	.151	.366**	1	.524**	.356**	.614**
	Sig. (2-tailed)	.183	.001		.000	.001	.000
	N	80	80	80	80	80	80
Operational Performance	Pearson Correlation	.565**	.431**	.524**	1	.576**	.566**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	80	80	80	80	80	80
Financial Performance	Pearson Correlation	.396**	.348**	.356**	.576**	1	.479**
	Sig. (2-tailed)	.000	.002	.001	.000		.000
	N	80	80	80	80	80	80
Long-Term Relationship	Pearson Correlation	.159	.331**	.614**	.566**	.479**	1
	Sig. (2-tailed)	.158	.003	.000	.000	.000	
	N	80	80	80	80	80	80

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Furthermore, regression analysis helps calculate the impact on dependent variable of independent variables. The variations occurred in dependent variables due to all the independent variables is explained by regression. The purpose of this study is to importance of

the factors that impact the selection of 3PL service providers. Regression analysis authenticates the impact on dependent variable i.e. selection of 3PL service providers of independent variables i.e. cost of service, reputation, operational performance, financial performance, and long-term relationship.

Multiple Regression is used in the study as it shows multiple impact on dependent variable of all the independent variables. Table 4.4 below, shows  $R^2$  of .507. in other words, this means that 50.7% of the variance in the dependent variable can be explained by changes in the independent variable. As the value of R-Square is more than 50% that means it is a better model fit and has more variance of independent variables on dependent variable. Adjusted R-Squared represents the R-Square of only those variables whose addition in the model is significant. Table below shows an adjusted  $R^2$  of 0.474 in other words, this means that 47.4% of the variance in the dependent variable can be explained by significant changes in the independent variables. The only difference between  $R^2$  and adjusted  $R^2$  is only 0.033 i.e. 3.3%.

#### **4.3 Discussion**

The five independent variables studied in this study are Cost of Service, Operational Performance, Reputation, Financial Performance and Long Term Relationship. According to the results all the independent variables are correlated with each other and with dependent variable “Selection of 3PL service providers” as well. Highest correlation of an independent variable with the dependent variable is Cost of Service i.e. 0.535 which means the relationship between Cost of Service and Selection of 3PL Service Provider is more positively correlated.

While selecting a 3PL service provider, brands should keep a check on the cost of service of the service provider to achieve competitive advantage and economy of scale.

Giants in every industry in every market know the importance of focusing on their product development and on their expertise so they outsource rest of the important procedure which are needed to have additional attention and are as important as other procedures. This argument is supported by different research papers published internationally and are also mentioned in the above reviewed literature that explains the importance of different factors while selecting a 3PL service provider. Giants in edible oil industry of Karachi such as Dalda Foods, APAG, Meezan Oils, Habib Oil Mills & IFFCO Pakistan also outsource their logistics to a 3PL service provider by keeping these variables important while taking the decision.

Cost of service, financial performance, and operational performance are the independent variables that have high correlation with dependent variable which means these factors are more significant while selecting a 3PL service provider as compared to the rest of the two

independent variables i.e. reputation and long term relationship having low correlation with the dependent variable resulting with less importance while selecting a 3PL service provider.

Focusing on the impact of independent variables on dependent variable is that three of the independent variables i.e. cost of service, operational performance and financial performance are significant whereas the rest of the two independent variables i.e. reputation and long term relationship have less significance or are insignificant. That also concludes that these 3 factors impact on the service of the edible oil brands as they are their logistics partner.

## **5. Conclusion**

The research covers all the research objectives and research questions by determining the factors impacting the selection of a 3PL service provider. The purpose of this study is to measure the importance of the factors impacting the selection of 3PL service providers. The model was designed by gathering secondary data from articles, journals, papers, reliable internet sources etc. by reviewing their literature and summarizing it.

To collect primary data a questionnaire of 16 questions based on Likert scale with reference to all the independent variables and dependent variable was designed. In the mean time being confirmed the existing theories of different researchers about outsourcing, 3PL service providers and importance of the factors affecting their selection.

All the factors selected in this study as independent variables had their importance but the three factors that were significant were Cost of Service, Operational Performance and Financial Performance whereas the rest of the two had less significance. However, other factors are also as important as these three factors but their significance vary according to the market and industry. The reason why this study is being conducted is because brands nowadays are focusing more on what they are expert in, more product development and outsourcing the rest of the departments to other service providers who have expertise in that particular field as it saves time, money and results in better quality.

### **5.1 Implications**

In edible oil industry of Karachi, while selecting any 3PL service provider the three factors that must be kept under observation as they have a huge impact service being provided and service being profitable to company. Cost of service defines the price the company has to pay for the core service, terms of payment and how much do the service provider charges to handle goods while moving and storing. Operational Performance defines quality of service being provided by the provider, how much technologically advanced is that service provider and most

importantly the timely delivery of service provider as timely delivery is the basic rule of logistics. Last important factor is financial performance of the service provider which is based on flexibility in billing and payment which means credit terms, secondly net working capital i.e. what is the worth of the business of service provider, how much can that service provider hold the payment, what is the maximum quantity of order the service provider accepts and deliver on time and lastly financial stability that is more or less the same thing that service provider is financially stable or not. Can the service provider fulfill the cost of order before the payment is done?

## **5.2 Limitations**

Referring limitations in a study are important for the successor of the study so that he/she could be aware of what has been done, what steps needs to be taken to get over those limitations.

## **5.3 Recommendations**

The study will help the supply chain professionals of the edible oil companies focus on certain factors while outsourcing their work most importantly selecting a 3PL service provider. To get the most out of a service provider, supply chain professionals working in the company should first study the history of the service provider, secondly should negotiate with service provider to cut the cost as it is the most important factor of selecting the service provider. Other than that, should keep at least three different service providers in the list, keeping multiple suppliers for anything breaks the monopoly and gives power to the brand rather than the service provider. Thirdly, the edible oil company should check the portfolio of clients of the service provider to confirm its operational performance and financial performance. Size of the fleet also impacts the operational performance of the service provider.

The biggest limitation that was faced during this research was that in the edible oil industry of Karachi professionals focus less on outsourcing and have less experience dealing with 3PL service providers. Professionals working in bigger organization have implemented this process whereas organizations that are more centralized, are working on a smaller scale have not implemented this process of outsourcing their work to the service providers. Secondly, this research had to be conducted in shorter span of time. Time span was big limit to this study. Lastly, some of the big players of the industry are based out of Karachi so the successors should research out of Karachi as well to widen the scope of the study.

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