Identifying the most influential criterion of selecting a 3PL provider by Large Scale apparel manufacturing and export companies in Sri Lanka

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DECLARATION OF THE CANDIDATE & SUPERVISOR

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The above candidate has carried out research for the Masters thesis under my supervision.

Name of the supervisor: Ms. Harishani Liyanage

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Signature of the supervisor: Date

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ABSTRACT

The 3PL companies plays a major role in supply chain function in most of the largescale manufacturing companies. In the global scenario, in apparel industry plays a major role in collaborating and optimizing the supply chain function in large scale companies ensuring seamless flow of the operation. However when we consider the 3PL Industry in Sri Lankan context the most of the customers that 3PL companies handle is either FMCG vertical or industrial vertical. When analyzing the data it showed a very low percentage that apparel manufacturing companies outsource their warehousing and logistics function to 3PL service provider.

Considering the facts, this report discuss about the barriers for large scale apparel manufacturing companies to outsource their warehousing function to 3PL providers. And the most influential criterion for Sri Lankan large scale apparel manufacturing and exporting company evaluate a 3PL company. To evaluate the point mentioned above I have used a questionnaire to collect data. The methodology used for the research was Identifying current organisational practices and trends in warehouse management of Large Scale apparel manufacturing and export companies in Sri Lanka. And secondly assessed the barriers of outsourcing the warehousing function. Analysed the data collected from decision makers of few reputed apparel companies in Sri Lanka. And evaluated the most influential criterion.

For this I have analysed the research outcomes from previously done researches in this regard and the data Analysis of the collected data are conducted with R Statistical Programming and Microsoft Excel.

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LIST OF ABBREVIATIONS

Abbreviation	Description
3PL	Third Party Logistics
CITIPAT	Customs-Trade Partnership Against Terrorism
DEA	Data Envelopment Analysis
ISO	International Organization for Standardization
MCDM	Multi-Criteria Decision Making
SA8000	Self Assessment: Partnership Tax Return
CAFTA	Central American Free Trade Agreement
WMS	Warehouse Management System
ERP	Enterprise Resource Planning
EDI	Electronic Data Interchange

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Chapter 01

INTRODUCTION

In recent years it has been a trend of outsourcing the logistic activities and emergence of 3PL companies catering almost all the production industry verticals in Sri Lanka. Comparatively to other manufacturing industries, apparel manufacturing companies showed a low interest in outsourcing the logistics and warehousing activities to 3PL companies in the beginning of the era. The main reason for that trend was that all the leading apparel manufacturing companies in Sri Lanka Caters to the leading fashion brands in the world and 3PL industry was not that popular in the beginning of the era. However, interestingly there is a growing trend in now days in apparel manufacturing sector in Sri Lanka to outsource the warehousing and logistic related activities to 3PL Service providers and focus on their main business of apparel manufacturing. In this literature review I have highlighted the impact to the apparel manufacturing industry in Sri Lanka due to the diffusion of apparel manufacturing from American and European continent. The definition and the and the scope of 3PL in apparel industry. And in the latter part of the literature review I have highlighted the Criterion and tools of evaluating 3PL Providers in apparel industry in Sri Lanka.

1.1 Research Gaps

In order to Understand the most influential criterion to evaluate a 3PL by large scale apparel manufacturing and exporting companies in Sri Lanka, we need to understand and rationalize the factors supporting the outsourcing of warehousing function of a apparel manufacturing company. The most influential criterion and the factors affecting the selection criterion differs from one to a another based on their perceptions and organization corporate culture. And there were no any research in the Sri Lankan context to understand the perception and the 3PL selection criterion by local apparel manufacturing and exporting companies.

1.2 Research Objectives

Objective of this research is to

Identifying current organizational practices and trends in warehouse management of Large Scale apparel manufacturing and export companies in Sri Lanka.

Assessing the barriers of Outsourcing the warehouse function to 3PL Provider by large scale apparel manufacturing and export companies in Sri Lanka.

Establishing the most influential criterion of selecting a 3PL provider by Large Scale apparel manufacturing and export companies in Sri Lanka.

1.3 Research Questions

What are the barriers in outsourcing the warehousing function to 3PL Company of Large Scale apparel manufacturing and export companies in Sri Lanka?
Most influential criterion of selecting a 3PL provider by Large Scale apparel manufacturing and export companies in Sri Lanka.

1.4 Significance of the Research

Identifying the attitude of Sri Lankan apparel companies towards Outsourcing warehousing function to 3PL company is important because of several reasons.

1.5 Description of Data

The research will be conducted using collecting primary data from the employees of leading apparel companies in Sri Lanka. The target population will be 44.
A questionnaire will be provided to the target population to carry out the research and data will be gathered using face to face interviews, telephone conversations, e mails, Google docs and printed fill out forms.
The target population will be consist of operational level employees, management level employees, strategic level employees and training students in 3 large scale leading apparel companies in Sri Lanka. An adjusted random stratified sampling technique will be used based on employer population on selected companies used as the sampling technique when collecting data from the target population and gathered data will be analyzed and evaluated using appropriate statistical/ mathematical models to derive conclusions.

1.6 Outline of the Research

Chapter one of the research is about the introduction to the research. This further explains the reasons for carrying out the research and the importance of conducting this research. This chapter discusses about the research topic and overall structure of how the research is carried out.

Chapter two of the research includes the literature referred to by the research when carrying out the research. These literatures provide the ideas obtained from different reliable sources by the researcher to carry out the research.

Chapter 3 of the research includes details about the statistical methodology carried out during the research while chapter 4 and 5 explains about the statistical analysis and conclusions and recommendation that can be derived out of research analysis respectively.

Chapter 02

Literature Review

2.1. Impact to the Apparel Manufacturing Industry in Sri Lanka due to diffusion of Apparel Manufacturing from US and UK towards Asian countries

In the past two decades, there was a trend of many US and European apparel manufacturers moving their production operations to most of the Asian countries of the globe. One of the main reasons which supported the new trend was the attractive tax policies and the cheap labor factors which had in those Asian countries. For most of the leading apparel companies both in US and Europe this outsourcing to Asian countries trend was unavoidable, mainly due to the fact that they always wanted to regain their market share. (Teng and Jaramillo, 2005; Sauvant, 2004; Kim, 2003).

In this scenario when European and US companies finding it difficult to sustain and in the market and to face the global competition due to the high operation cost, this opportunity was capitalized by the most of the Asian countries such as China, India, Sri Lanka and Bangladesh and they are gaining their share in the global market.

However, being a low labor cost country is not a sustainable strategy in apparel manufacturing industry. This strategy will always be an order qualifier strategy. For a company to achieve order winner in the global market scenario the company should always maintain the quality of the garments and the compliance levels that the end apparel brand requires. This situation is quite challenging for apparel manufacturers in the low cost countries. Moreover, if we really consider the main challenges that the apparel manufacturing companies in Asian context face is that low infrastructure facilities and high shipping lead-times and share of information.

According to the global supply chain organization at the American Apparel Producers' Network in Atlanta, it takes approximately 21 days to get designs made and delivered from Central America; that number is 43 days if American material is used, as mandated by 2004' Central American Free Trade Agreement (CAFTA) (Kiley, 2006). In China, India, Bangladesh and Sri Lanka, that time can stretch to 90 days if fabric is available domestically and between 120 and 150 days if materials has to be imported into these countries (Kiley, 2006). Considering the lead-time it shows that proper arrangement and smooth flow of material has become an essential factor which has influenced Sri Lankan apparel manufacturing companies to outsource the warehousing and logistics related activities to 3PL Companies.

However, with the advancement of technology and the consumer needs becoming more complexed and this trend changed to a new Era. Faster the fashion comes to the market and in-season flexibility became the deciding factors for an apparel brand to attract more customers and expand the market share. With this new change, only the companies who can transform their traditional supply chain, which mainly focused on supply focus, and be a demand focus company could survive and sustain in the market.

With this change in the market, the apparel industry turned to a new trend of nearshoring the production for most of the US and European mass-market apparel brands and retailers. With this change, the global apparel industry is going through a crucial period where the consumer, channel and supply shifts along with economic volatility. One of the main factors that affect volatility is, the sift to bottom up trend. When we consider the behavior of the consumers in the past, they were spoon-fed by the several advertising campaigns conducted by apparel companies. In this new generation, consumer insights and perception is more important for product and product development process. The push model will no more work for apparel players now. Consumers has access to a larger data base and they derive their style cues from various social media and internet based platforms, peer and the reviews.

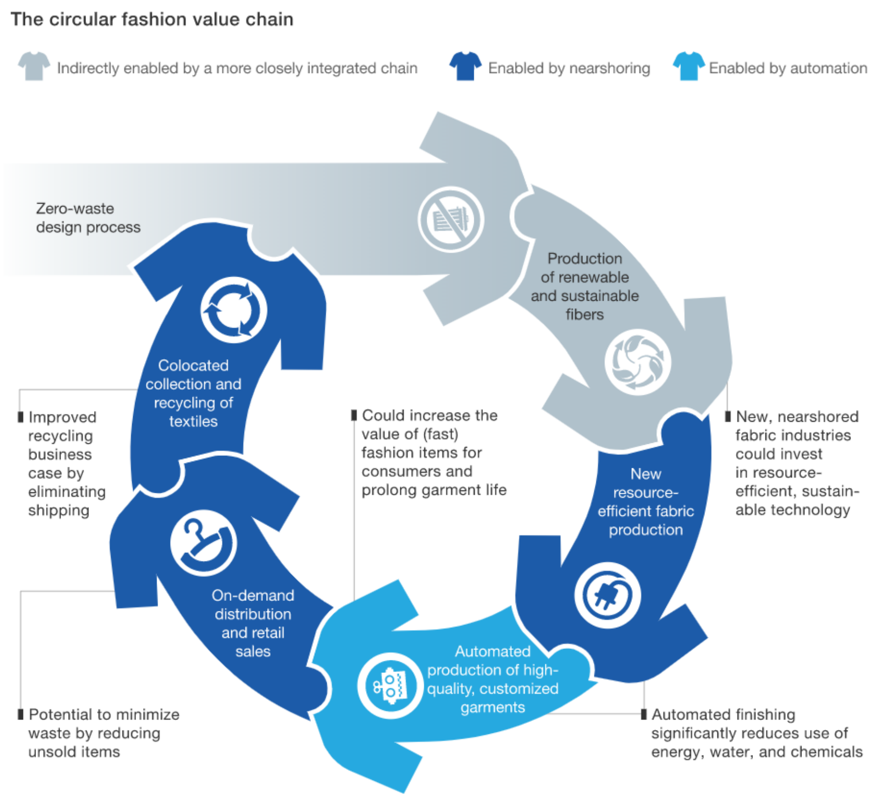
Even though his new trend is hitting the apparel industry massively, some of the traditional fast fashion companies have not been able to move their business model from “push” to “pull” model, which is the process that involves the product development, testing, and manufacturing happens based on the customer demand. Because of this, even traditional multi label brands tend to put pressure on the brands to increase customer responsiveness.

Additionally, one other main factor for affecting the sales volatility is that, the faction market is affected by emergence of new business models and online shopping plat forms. In here thy create more convenience to the end customers allowing them to access a wide array of products. The brick and mortar model will no more sustain in the fashion market. As a result of this migration to e-commerce the companies are more likely to have a agile supply chain rather than the traditional method. With this shift I the supply chain the companies more like to move to Short product development calendars, sourcing of small batch sizes, and nearshoring etc. another emerging trend which is capturing the next level is ultra-fast-fashion. The companies are facing a challenge to shorten the apparel calendar to adopt to the new change.

With these massive changes happening in the apparel industry the problem which comes to our mind is that are leading fashion brand going to practice nearshoring?

When we analyze the new trend, we can summarize the change as below.

Stock filling up at stores, warehouses and frequently marking down is widespread in today’s apparel industry. According to statistics, nearly 3% of the unsold apparel is liquidate annually. And customers are more concerned and vigilant on the environmental impact from the traditional apparel manufacturing modes. According to scholars sustainability factor will be a highly likely key purchasing factor for mass market apparel consumers in near future. In summery "circular fashion choice" can be named as the winning strategy in near future in apparel industry. For a apparel manufacturing company achieve success in the business they should follow the three factors balance cost, compliance and capacity while adopting the nearshoring, automation and sustainability flavor to their sourcing, decision making and production models.



Considering the massive changes that are happening in the apparel industry in the global context, we can find that this has become a eye opener for most of the apparel manufacturing and exporting companies in Asian continent to focus more on liner production, focusing more on pull demand fast fashion reducing the lead-time. And that is how and why working conditions and the production processes in Sri Lankan supply factories should be in high standards before the arrival of ethical trade initiatives and brand-name manufacturers. Hence it has paved the way for many leading apparel manufacturing companies in Sri Lanka to outsource the logistic related activities to a reliable 3PL Provider and focus on best quality garment manufacturing.

One important observation we can develop is that the apparel growth rate of the Asian countries were high and continuously improving mainly due to the fact that availability of raw material like cotton and easy access to cheap labor.

2.2. Apparel Industry In Sri Lanka

According to the statistics of Sri Lankan board of investments 2019, the beginning of the apparel industry in Sri Lanka can be stoned as the era of early 1960s and the main focus was on clothing requirements for the local markets. However, the export focused apparel manufacturing in Sri Lanka began in 1070s with the implementation of open economy policy in the country in 1977. With this new beginning, the apparel industry in the country started evolving rapidly on a massive scale.

When considering the apparel industry in the Sri Lankan context, we've been considered as the top quality apparel manufacturer from decades. One important value that garments manufactured in Sri Lanka offers is that they produce The Garment Without Guilt" this can be named as the brand equity that Sri Lankan apparel industry has earned in the global apparel market. In Sri Lanka we assure that the garment produced here are with right conscience and care while protecting the rights of the employees upskilling and enhancing their quality of life. The apparel business does business with right amount of integrity and helps to create an equitable society. (garmentswithoutguilt.com, 2018)
Sri Lanka Apparel exports in 2018 were US$ 5 billion. The United States & European Union are the biggest importers of Sri Lanka apparels and accounts for more than 90% of total exports. As of the figures at the end of year 2018, the total apparel exports from Sri Lanka have been amounted to more than dollar 450 million (Sri Lanka Apparel Exporters Association, 2018)

Sri Lanka heavily depends on few large scale manufacturers. (Rupa Dheerasinghe, 2009) Most of the apparel manufacturing companies in Sri Lanka are either large scale or medium scale companies. When considering the statistics, out of 1061 apparel manufacturing factories around the country, close to 26% falls under the category of small scale companies (employees below 100). 51% falls under medium scale, And 23% falls under the category of large scale apparel manufacturing companies. The significance of this is the large scale apparel manufacturing companies accounts for nearly 62% of the employment in the country. And if we consider the market share of local entrepreneurs and foreign investors. 20% of the apparel manufacturing companies are owned by foreign investors or partnership of well known international brands and 80% is owned by local entrepreneurs.

The below tables will show the distribution of the factories based on the level of employments and export earnings covered by them.

Distribution of factories, employees by size

Category	No of Employees	NO of Factories	Percentage (Approximately)
Small	0-100	271	25%
Medium	101 - 500	546	52%
Large	501- 1000	183	17%
Extra Large	Over 1000	61	6%

Table 01: Distribution of factories, employees by size

Distribution of factories, employment and export earnings by size

Category (%)	Factories (%)	Employment (%)	Export Earnings (%)
Small	25.5%	3.1%	0.3%
Medium	51.5%	35%	9%
Large	23%	61.9%	90.7%

Table 02: Distribution of factories, employment and export earnings by size

(Bilesha Weeraratne, 2004) classifies apparel manufacturers in to large scale, medium scale and small scale based on the number of employees employed in the apparel manufacturers. The percentage of employees employed in the small scale companies are nearly three percent. Thirty five percent of the employees are employed in medium scale companies while sixty two percent are employed in large scale organizations.

When considering the data above it is evident that this global apparel trade is very important to a developing country like Sri Lanka. The main reason behind is apparel exports plays a major role as a source of foreign exchange earnings to the country According to the central bank statistics, 50% of total exports and 37% of workers involved in manufacturing, equal to 5% of the country's entire labor force.

Sri Lanka's apparel production cycle shows more of a seasonal production (Spring/Summer and Autumn/Winter)

When analyzing the apparel industry in Sri Lanka, we can identify a increasing trend that Sri Lankan apparel industry is moving towards ethically sourced higher value added production and the industry is moving away from basics and capitalized production. The main reason behind is that the apparel manufacturing companies essentially need to comply with the compliance requirements of their end customers.

This has become a major reason that most of the apparel companies in Sri Lankan context is very reluctant to outsource their logistics activities to 3rd party service providers.

To be specific the country specific service level and compliance which has resulted in Sri Lanka becoming a stronger player and advocate in Asian context for promoting and maintaining the ethical production of apparel goods than many of its Asian rivals.

2.3. 3PL Services

There is no standard or uniform definition to 3rd party logistics services. According to Hertz and Alfredsson (2003) define 3PL as "an external provider who manages, controls and delivers logistics activities on behalf of a shipper". This definition shows a broader aspect, and also refers to a hierarchy in the relation of 3PL and transport buyers. In this scenario the buyer usually establish the

focal company. 3PL services came into the operation with the immergence of customer demand created for lead time reduction and outsourcing the logistics activities. And this new trend was aligned with globalization and customer oriented market with a large market share. The demand for flexibility played a major role in this scenario. (Hertz and Alfredsson, 2003; Halldo´rsson and Skjøtt-Larsen, 2006; Selviaridis and Spring, 2007).

The main feature in 3PL companies are that they maintain the relationship with the customer which is totally different to a simple transaction between a small transport provider and buyer. 3PL companies always tend to maintain productive relationships with the customers which sustains in the long-run. When considering all the above points it shows that the relationship with a 3PL company be a strategic move to a focal company to manage its supply chain function efficiently and effectively.

In this respect, several publications addressed the relevance of the related purchasing process and the issue which criteria are used for decision making (Andersson and Norrman, 2002; Efendigil et al., 2008).

2.4. Different Criterion and tools of evaluating 3PL Providers

In recent years there has been a surge of publications and interest in the area of 3PL, this is mainly due to the trend of outsourcing of logistic related activities in the industrial sector (Transport Intelligence, 2004). The main reason is the emergence of large companies that have the expertise knowledge in providing wide range of sophisticated logistic solutions on a national or even in global scale. These logistic service providers plays a strategic role within the supply chain of the client (Selviaridis and Spring, 2007).

Yan et al. (2003) postulated a case-based reasoning model framework for 3PL evaluation and selection system. Zhang et al. (2004) formulated an AHP-based model to a case study for examining the function in 3PL vendor selection. Koh and Tan (2005) in this first they conceptualize several main dimensions of 3PL service quality, for an example – reliability, responsiveness, empathy etc.

Then AHP method was adapted to determine the relative weights of those service quality dimensions and eventually select the best 3PL service provider.

AHP model was created to select the best 3PL provider among multiple candidates. Işiklar et al. (2007) according to Isiklar, it is more effective to use framework integrated case-based reasoning, rule-based reasoning and compromise programming techniques in fuzzy environment.

This paper delivers several effective insights for apparel manufacturing company to streamline and efficiently run its supply chain through warehouse outsourcing. Identifies factors that significantly affected the operational efficiency of apparel 3PLs and proposed ways to improve the competitiveness of 3PLs.

Moreover, Hamdan and Rogers (2008) has introduced a new method call data envelopment analysis (DEA) as a effective tool to evaluate the efficiency of 3PL providers. Reported on choosing a 3PL partner and examines the perspective

of one major company heavily involved as a broker and provider of logistics services.

Evaluation and selection of 3PL service providers' can be viewed as a complex multi-criteria decision making (MCDM) problem mostly supported by decision information against subjective qualitative criteria. Such a decision-modelling requires human judgment to assign importance weight (priory) against each of the selection criterion as well as performance extent in terms of linguistic variables. Linguistic variables are difficult to analyze through mathematical operations unless these are represented by numbers. Because, these linguistic judgment may sometimes represents imprecise, incomplete information and highly influenced by the decision-making attitude of the experts. Fuzzy logic and the theory of grey numbers can fruitfully tackle such kind of uncertainty, inconsistency arising from subjective judgment of the decision-makers.

Chapter 03

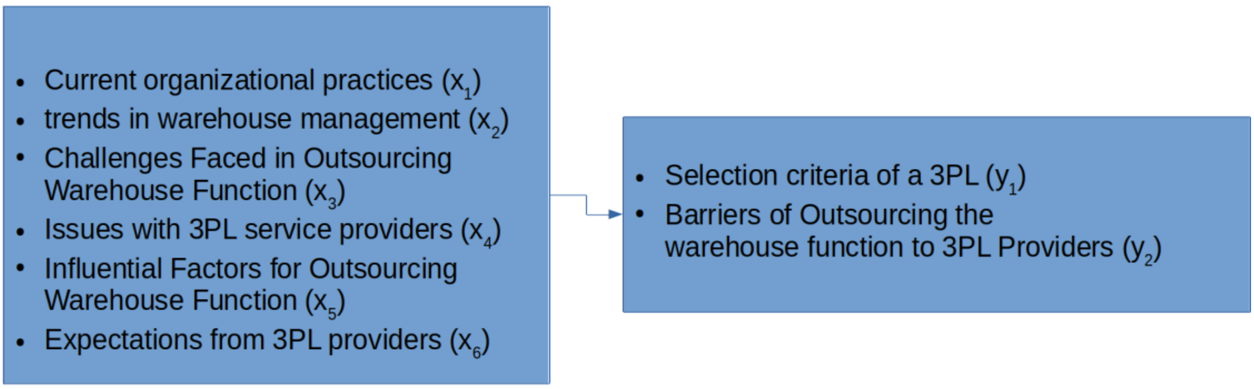
Research Methodology

3.1. Introduction

Following section explains the methodological approach of answering the research questions which was mentioned above at the beginning of this research. The conceptual framework, research methodology and research design have elaborated separately in this section.

3.2. Conceptual Framework

The conceptual framework of this study was formulate with the knowledge gathered through literature review of this report and the conceptual framework has been built on the independent and the dependent variables which have identified by the researcher and the relationships of of this framework will be elaborated and analyzed in detail in the next chapters of this report (Kothri, 2004; Pandey & Pandey, 2015)



$$y_1 = f(x_1, x_2, x_3, x_4, x_5, x_6)$$
$$Y_2 = f(x_1, x_2, x_3, x_4, x_5, x_6)$$

3.3. Research Philosophy

The choice of a specific research philosophy is impacted by practical implications. There are important philosophical differences between studies that focus on facts and numbers. The choice between positivist and interpretivist research philosophies or between quantitative and qualitative research methods has traditionally represented a major point of debate. However, the latest developments in the practice of conducting studies have increased the popularity of pragmatism and realism philosophies as well. Following are the possible research philosophies (Pandey & Pandey, 2015; Ranjit Kumar, 2011).

- **Positivism** focus on uncovering the one truth about how things are, or generally what research focus on. This is an structured method which combine logical deduction with well known observations. Discover and Clarifies casual relationships which are valid in general with identified probability. Hence, this philosophy expect to be used for predictions (Ranjit Kumar, 2011).
- **Interpretivism** is related to humanism, hermeneutic and constructivism. Used in researches where there's no eternally valid truth about the reality. Reality is considered as a social construction and lot of concepts describe things, which are not physically available aims at understanding how individuals perceive the reality. This philosophy focus on better understanding how human beings perceive the world around them which imply that the researcher should not be objective and yet try to be free of judgments (Zikmund, 2010).
- **Realism** refers to the scientific inquiries which emphasize on the projected reality by the sense of truth. It believes that objects independently co exists from human mind. This philosophy is related to the positivism and yet the view differentiate between direct realist and critical realist (Zikmund, 2010).
- **Pragmatism** emphasizes in utilization of both positivism and Interpretivism and consider both of them as continuum more than contradictions. Precisely a pragmatist avoid arguments on the concepts of truth and reality coming in to the play. Rather they focus on conducting he study on the issues of interest and value and use different approaches to bring out positive consequences (Zikmund, 2010).

According to the nature of this study the positivism is the most suitable psychology in conducting this study which is used by the researcher.

3.4. Research Design

A research could be designed in two ways, which has been identified by the researcher as exploratory research and conclusive research.

Exploratory research means that the research is conducted with an objective of developing or formulating a problem for a more clear inquiry. The objective of an exploratory research is to discover relationships between the variables (in general term: to discover ideas and thoughts). Overall design of an exploratory design is flexible by its nature. Research process is quite unstructured and sampling is done with non-probability sampling. There is no pre-planned design for an exploratory researches (Sekaran & Bougie, n.d.).

Conclusive research means that the research is conducted with an objective of testing the validity of particular theories which have been already identified or to make decisions about determined methodologies. Which are quite helpful in leadership to test whether the expected outcomes have been shown. Conclusive research describes characteristics and functions as its objective. Overall research of a conclusive research is known to be rigid and the research structure is well structured. In sampling, conclusive researches use probability sampling. Statistical design has a pre planned analysis approach and design. Descriptive research refers to a study which have conduced with intention of describing the circumstances, its usefulness and key qualities of what existing and in addition to that particular questions of the research requiring a descriptive study. Casual research by correlation is willing to observe more about circumstances and end results relationships (Pandey & Pandey, 2015; Ranjit Kumar, 2011).

This study contain an exploratory research in general in three phases where each phase represent a research objective.

1. Identifying current organisational practices and trends in warehouse management of Large Scale apparel manufacturing and export companies in Sri Lanka.
   - ➘ This objective require an exploratory research design which will be used to achieve the upper mentioned objective.
2. Assessing the barriers of Outsourcing the warehouse function to 3PL Provider by large scale apparel manufacturing and export companies in Sri Lanka.

- This objective also requires an exploratory research design which will be gather the challenges and issues in order to identify the barriers of outsourcing the warehouse function to 3L service provides. This will assess the priorities of the requirements to asses the most affective factors.

3. Establishing the most influential criterion of selecting a 3PL provider by Large Scale apparel manufacturing and export companies in Sri Lanka.

   - This objective is also requires an exploratory design to identify the criteria of selection of 3PL organization. This will combine and contrast the answers for the upper mentioned objectives and will explain the value of the barriers and requirements and will develop the criteria on that.

3.5. Research Approach

Research approach can be consider as a plan and procedure that consist of the steps of wide assumptions to detailed method of collecting the data, Analysis and interpretation. Hence, it depends on the nature of the research problem which being addressed (Pandey & Pandey, 2015; Ranjit Kumar, 2011).

There are few well known approaches for a research approach and Inductive, Deductive and Abductive approaches the top most used approaches (Pandey & Pandey, 2015; Ranjit Kumar, 2011).

Inductive reasoning starts with observations which are specific and limited in scope, then proceeds to get a generalized conclusion that is likely but not exact by accumulated evidence imply. In general terms inductive reasoning moves from specific to general. ,such scientific researches are carried out in inductive reasoning. Which gather, identify patterns and developing hypothesis or theory to explain the results (Pandey & Pandey, 2015; Ranjit Kumar, 2011).

Deductive reasoning begins with assertion of a general rule or theorem and proceeds to a guaranteed and specific conclusion. Deductive reasoning moves from the general rule to the specific application. In deductive reasoning the conclusion must be true if original assertions are through (Pandey & Pandey, 2015; Ranjit Kumar, 2011).

Abductive reasoning begins with an incomplete set of observations and proceeds toward the likeliest possible explanations for the set. This is same as the daily decision makings that does its best with the information at hand, most probably incomplete (Pandey & Pandey, 2015; Ranjit Kumar, 2011).

This research has both inductive and deductive approaches. Inductive approaches are used to understand the market and with gathered questionnaires the reasons are discussed with abductive reasoning and inductive reasoning.

3.6. Methodological Choice

Among the methodological choice alternatives can be identify as Mono Method Quantitative, Mono Method Qualitative, Multi Method Quantitative, Multi method Qualitative, Mixed method simple and mixed method complex (Kothri, 2004; Ranjit Kumar, 2011).

Mono Method Qualitative refers that the study only use Qualitative methods in answering research questions (Kothri, 2004; Ranjit Kumar, 2011).

Mono Method Quantitative refers that the study only use quantitative methods in answering research questions (Kothri, 2004; Ranjit Kumar, 2011).

Mix methods are where both qualitative and quantitative data collection techniques are combined together with analysis procedures. Hence, the research can either start with data collection or analysis and follow from it with the other, which is known as mixed method simple. When quantitative methods are used to analyze qualitative data and vice-versa is known as mixed method complex (Kothri, 2004; Ranjit Kumar, 2011).

In this study researcher have used an quantitative approach hence this research employs mono method quantitative as the methodological choice which is the most suitable for the study which is conducted.

3.7. Research Objectives and Research Design Strategy

Research strategies are the strategies, which takes apart in achieving research objectives. The most common research strategies could be listed as follows.

- survey
  - Surveys are considered as the common way to get answers from the sample population to core questions such what, why, who, how, how often and how many. The importance is upon collecting authentic primary qualitative data in large quantities using various data collection techniques (Kothri, 2004; Ranjit Kumar, 2011).
- Experimental
  - The center component of experimental research is the consideration on relationships. Usually these are casual relationships in between more than one variable, which could be either dependent or independent. The purpose of a an experimental study is to observe or discover how changes of independent variable would affect dependent variables (Kothri, 2004; Ranjit Kumar, 2011).

- Case Studies
  - The case study approach to a research strategy could be independent case based or on comparative case based where many cases can be used for the analysis to answer the research questions (Kothri, 2004; Ranjit Kumar, 2011).
- Action
  - As the term implies this is a study which conduct reaction due to the changing something in the sample. Normally this is used when a company is adapting new procedures in to their supply chain. Moreover, this strategy is vastly used in continuous development environments to assert effectiveness of the improvements (Kothri, 2004; Ranjit Kumar, 2011).
- Archival
  - As name implies this refers to the studies, which involves seeking out and extracting evidence from archival records of organizations. These records could be held either in data collecting institutions or in the custody of business intelligence of organizations or in a successor body. These research can be contrasted with, secondary researches, primary researches and imperial investigations (Kothri, 2004; Ranjit Kumar, 2011).

This study focus on achieving three objectives as follows and all of the objectives are qualitative and are analyzed using quantitative analysis methods.

3.8. Time Horizon

Time horizon could be either cross sectional and longitudinal. Cross-sectional study refers to the observational studies where data is collected at a single point of time as a whole in order to study sample population and examines the relationships between variables in consideration. Longitudinal study is cross sectional study alike and an observational study which gather data from a sample repeatedly over time period. Longitudinal studies could be conduced from few years to many years according to the expectations of the study (Kothri, 2004; Ranjit Kumar, 2011).

This study is conducted on the current apparel and 3PL industries and the relationships of these services. Hence, this study is conducted as a cross sectional study.

3.9. Research instruments

Research Instruments are measurement tools designed to obtain data on a topic of interest from research subjects. Since this is an qualitative study most common instruments are identified by the researcher as questionnaire answer tests. This study has been conducted through a questionnaire, which is the most suitable data collection instrument as identified by the researcher (Kothri, 2004; Ranjit Kumar, 2011).

3.10. Data Collection and Data Analysis

Moreover, the researcher has used emails, face to face interviews, over the phone interviews, printed forms and google forms as channels of data collection.

Moreover the researcher have used Microsoft excel, R statistical programming language with R Studio working environment as software instruments of data cleaning and analysis due to the comfort and powerful solutions they offer.

The sample of this research has been 44 executive level employees from well known large scale apparel manufacturers and exporters.

3.11. Questionnaire design

This study has three major phases, which represent the each objective in one phase. The questionnaire is designed according to the requirements of these phases and will together answer the research questions and achieve research objectives.

There are many question types as dichotomous questions, open-end questions, multiple choice questions, rank order questions, rating scale questions. Dichotomous questions refers to the question, which have binary answers, Yes/No, Agree/Disagree. This is the quickest answer simplest questions to analyze but not a highly sensitive measure. Open-ended questions allow the respondent to respond with no limitations. These are useful for gaining insights of the exact requirements and feeling of the respondent but can be very challenging in analyzing the data. It is recommended to use open-ended questions to answer "why" types of questions. Multiple-choice questions consist of three or more categorical choices and ask the respondent to choose one or many from that. These are easy for the analysis but will not reflect exact feelings of the respondents. Rank order scale questions are the type of question where respondents are to choose items in a particular order from a set regarding to the question. These types of questions force the respondent to priorities the alternatives but do not address the reasons for that particular prioritization. Rating scale questions are the questions where respondent are provided to assess a particular issue based on a dimension given. As an example, the respondents could be asked to rate an issue from "strongly disagree" to "strongly agree". These are very flexible to answer but not compatible in answering "why" questions (Kothri, 2004; Ranjit Kumar, 2011).

Phase 1

The objective of phase one is to Identifying current organisational practices and trends in warehouse management of Large Scale apparel manufacturing and export companies in Sri Lanka.

To do this the researcher have used multiple choice questions, Dichotomous questions, and open-ended question.

Phase 2

The objective of this phase is assessing the barriers of Outsourcing the warehouse function to 3PL Provider by large-scale apparel manufacturing and export companies in Sri Lanka.

The researcher have employed open ended questions, rank order questions and rating scale questions to achieve this object.

Phase 3

The objective of this phase is establishing the most influential criterion of selecting a 3PL provider by Large Scale apparel manufacturing and export companies in Sri Lanka.

The researcher have used rank order questions, rating scale questions and dichotomous questions to achieve the objective.

3.12. Validity and reliability of the research data

This research collected data in a cross sectional time horizon. Due to that, this research is valid for the present market characteristics of large-scale apparel garments and exporters in Sri Lanka. Hence, the validity of these data and the analysis would reduce the validity and the reliability with time from the day, which this study was conducted.

Moreover, this research is highly depended on the humans who have been engaged in large-scale apparel sector, who are employed at executive level. Hence, the answers are expected to reflect the absolute nature of the industry.

Chapter 04

4.0. Analysis of Data

4.1 Introduction

This phase will demonstrate the findings and the analysis of the data collected. Analysis of the collected data are conducted with R Statistical Programming and Microsoft Excel. All of the data are collected from executive level employees and assumed they have the knowledge and understanding overall. Moreover, all the executives represent their relevant organizations and organizations values assumed to be represented by the executives answers.

All of the executives are selected from the major players in the industry and 44 executives represent 12 organizations. Moreover following analysis generally takes exploratory data analysis methods. For getting and cleaning data dplyr, plyr packages in R statistical language are used and for the tables and grafts DT and ggplot2 packages are used.

4.2 Findings

Frequency table

Variable		Frequency				
		Strongly disagree	Disagree	Neither	Agree	Strongly agree
Q4	How concerned you are on the cost of the 3PL Provider when shortlisting one 3PL provider?	0	0	0	23	21
Q6	Do you believe the 3PL Provider you select should have a good reputation and a brand image?	3	11	16	9	5
Q7	Do you believe the 3PL Provider should be a leading player in the 3PL market	3	16	15	8	2
Q8	Do you consider the size and the scalability of the 3PL Provider in selection criterion.	6	8	9	13	8
Q9	Do you believe the 3PL Provider you select should have sound knowledge experience in your industry vertical?	0	0	0	20	24
Q10	Do you consider former projects handled by the 3PL Provider related to your operation area.	0	6	17	16	5
Q11	Should they have a standalone WMS platform you can integrate with your ERP or any other system through an EDI or via FTP file transfers?	2	3	12	18	9
Q12	Should the 3PL Provider you select should have implemented latest technology such as Automation/RFID etc.?	3	7	14	14	6
Q13	How concerned are you on your 3PL Provider being a compliance certified partner such as ISO/OSHAS/CITIPAT/SA8000 etc.	0	1	17	16	10
Q15	Do you believe one 3PL Provider should handle all the logistic requirements of your organization?	5	19	11	5	4
Q16	How concerned are you on the financial stability of the 3PL Service provider on the selection criteria?	0	2	7	18	17
Q17	Do you consider referrals for the 3PL Service provider on the selection criteria?	0	13	19	11	1
Q18	How concerned are you for the 3PL provider having multiple fulfillment warehouse locations for faster delivery	5	7	15	11	6
Q19	How concerned are you on former projects handled by the 3pl provider on Lean and other productivity improvement?	0	5	13	17	9
Q20	Are you concerned your 3PL Provider to be a sustainable supply chain and green supply chain practitioner?	0	18	13	12	1

Variable		Frequency	
		Insourced	Outsourced
Q1	How does the warehousing Function of your organization Operates	11	33

Q1 - How does the warehousing Function of your organization Operates

	Frequency	Percentage
insourced	11	25
outsourced	33	75
Total	44	100

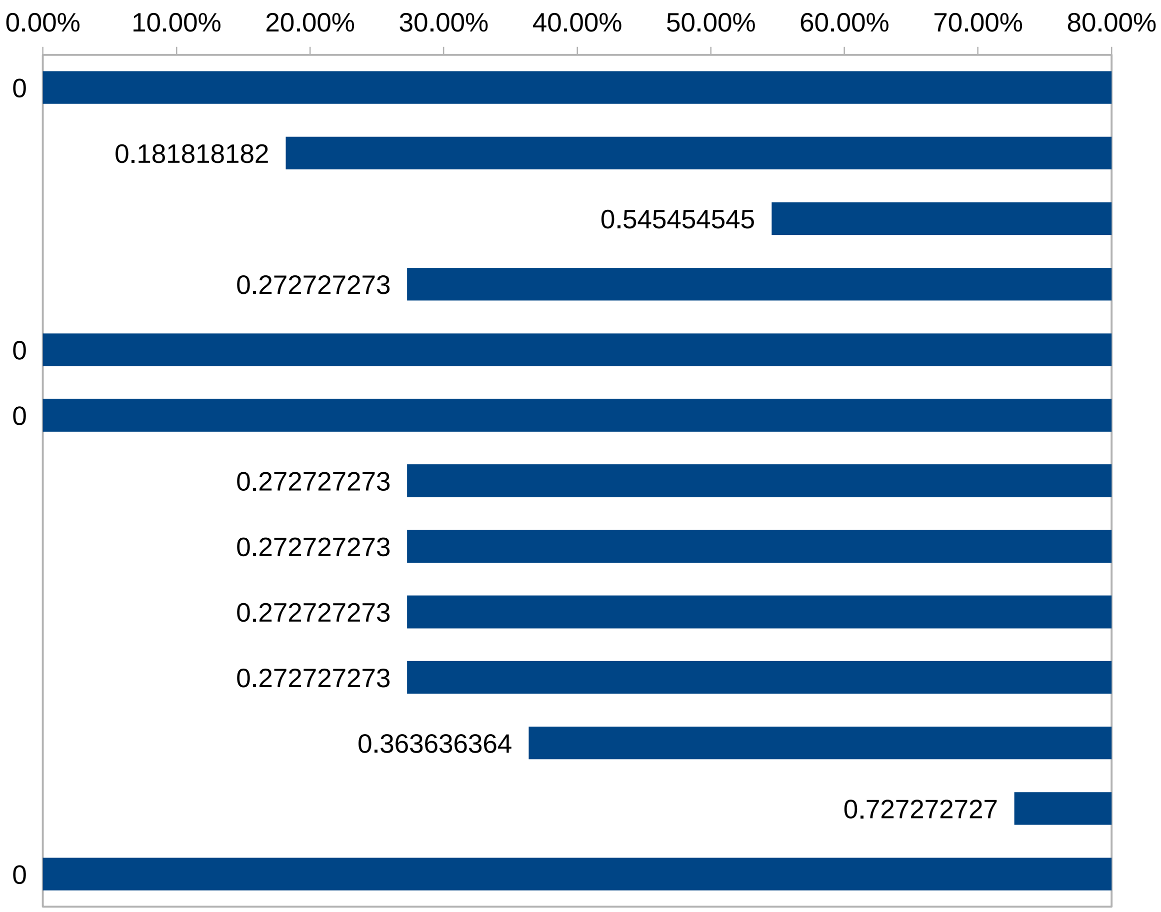
Table 03: question no 01 outcome

According to the answers given, only 25 percent of the organizations have insourced their operations. Hence, majority of the companies have outsourced their operations. Hence, it indicates that the industry has considerable shift toward outsourcing their operations. Moreover, it indicates that 3PL service providers have been proved to be succeeded.

Q2 - If insourced, The reasons for not outsourcing warehousing function of your organization

	Frequency	Percentage
Logistics is a core competency at our firm	0	0.00%
Cost reductions would not be experienced	8	72.73%
Control over the outsourced function(s) would diminish	4	36.36%
Logistics too important to consider outsourcing	3	27.27%
Service level commitments would not be realized	3	27.27%
We have more logistics expertise than most 3PL providers	3	27.27%
Corporate philosophy excludes the use of outsourced logistics providers	3	27.27%
Too difficult to integrate our IT systems with the 3PL's systems	0	0.00%
Global capabilities of 3PLs need improvement	0	0.00%
Issues relating to security of shipments	3	27.27%
We previously outsourced logistics, and chose not to continue	6	54.55%
Inability of 3PL providers to form meaningful and trusting relationships	2	18.18%
Other (Please Specify)	0	0.00%
Number of feedbacks	11	100.00%

Table 04: question no 02 outcome



According to the answers given, among the organizations which has insourced their operations, 72.73 percent specify that cost reductions would not be experienced through outsourcing. 54.55 percent specify that previous experience on 3PL service providers were not satisfying, hence they prefer insourced operations. Moreover, 36.36 percent specify that they loose the control over the outsourced function and due that they prefer not to. 27.27 percent of the population consider that logistics is too important to consider outsourcing and due that they prefer insourced operations. Moreover, since operating through a third party the preferred service level of the focal organization and the commitments in achieving that would not realized, which imply that through outsourcing the system thinking of the supply chain decreases and due that the competitive advantage. Furthermore, 27.27 percent of the organizations which is not outsourced their operations believe that they hold more expertise rather 3PL service providers in logistics, this refers to the situations where 3PL service providers have less experience in the respective industry and due that many practical challenges in operating will be hidden in blind side.

Moreover, 27.27 percent of the organizations which operate with insourced logistics of the sample population specify that their corporate philosophy does not prefer the integration of 3PL service providers. This could be a strategic decision or a decision to secure the sensitive internal information. Furthermore, 27.27 percent of the organizations which operate with insourced logistics of the sample population specify that they do not outsource due to the issues related to the security of the shipments. This reason also yield in situations where system thinking and game theory lacks.

Moreover, 18.18 percent of the organizations which operate with insourced logistics of the sample population specify that the inability to form a proper relationship with 3PL service provider as a reason behind insourcing their operations.

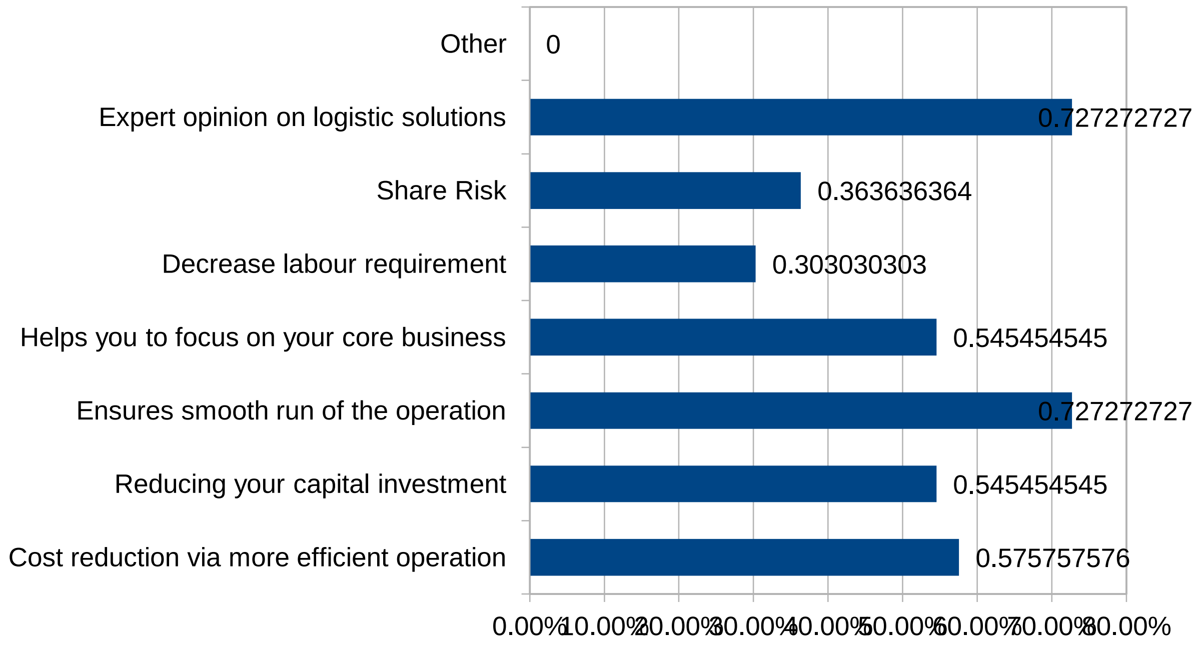
Hence all of the answers specify that 3PL service providers act as separate entity and due that when integrated to the supply chain of the focal company, the supply chain lose the system thinking and the focal company has to depend on 3PL service provider rather extracting the essence which 3PL service providers has to offer.

Moreover, there are non which specify logistics is the core competency at their organization and non which specify that integration of IT systems is too difficult and non which specify that lacking global capabilities as reasons for not outsourcing their operations, within the organizations which operate with insourced logistics of the sample population. Moreover, there were non who specified any other reason apart from the answers given, which imply that the researcher of this research has identify the reasons by experience and through literature review.

Q3 - If Outsourced, reasons for outsourcing the warehousing function of your organization

	Frequency	Percentage
Cost reduction via more efficient operation	19	57.58%
Reducing your capital investment	18	54.55%
Ensures smooth run of the operation	24	72.73%
Helps you to focus on your core business	18	54.55%
Decrease labour requirement	10	30.30%
Share Risk	12	36.36%
Expert opinion on logistic solutions	24	72.73%
Other	0	0.00%
Total Feedbacks	33	100.00%

Table 05: question no 03 outcome



According to the answers given, there are 72.73 percent of the population which has outsourced their operations, specify that the 3PL service providers ensure the smooth run of the operations and that's within the reasons for outsourcing their operations. Moreover, 72.73 percent of the population which has outsourced their operations, specify that expert opinion in logistics solutions, which is offered by the 3PL service provider is within the reasons for their outsourcing decision. Moreover, 57.58 percent of the population which has outsourced their activities specify that cost reduction through more efficient operations were one of the reason for them to outsource their activities. 54.55 percent of the population who has outsourced their operations specify that they outsourced to increase the capacity for the core business area of the focal organization. 54.55 percent specify that reduction of the capital investment were one of their reason for the decision of outsourcing.

36.36% of the population which has outsourced their operations specify that risk distribution with 3PL service provider was a reason for them for the decision of outsourcing. Moreover, 30.30% of the population who has outsourced their 3PL operations specify that, decreasing labor requirement was one of the reason for the outsourcing decision of the firm. There were non who specified any other reason for the outsourcing decision.

Q4 - How concerned you are on the cost of the 3PL service provider when shortlisting one 3PL service provider?

	Frequency	Percentage
Not concerned at all	0	0
Slightly concerned	0	0
Somewhat concerned	0	0
Moderately concerned	23	52.27
Extremely concerned	21	47.73
Total	44	100

Table 06: question no 04 outcome

According to the answers given, all of the organizations is in consideration of the cost of 3PL provider which shows that it's important to concentrate about the cost factor of the 3PL service provider since it directly effect on their charges and the total supply chain efficiency and effectiveness. Cost is a major factor in choosing a 3PL and in deciding whether to outsource or not. 47.73% from the total 44 respondents indicates that they are extremely concern about the cost factor. Moreover, majority (52.27% of the total respondents) specify that the cost is moderately considered which means that the cost can be trade-off with other relevant factors.

Q5 - Between cost of the operation and the minimizing complexity of the operation which goes top priority in the selection criterion of a 3PL service provider

	Frequency	Percentage
Cost of the operat ɒn	25	56.82
Minimizing operat ɒn complexity	19	43.18
total	44	100

Table 07: question no 05 outcome

According to the answers given, majority specifies that the cost is the major concern. But the difference between the cost and the complexity of operation are low. Hence reduction of complexity can be also identified as a major reason for organizations to integrate 3PL services into their operations. Hence both complexity of the operations and the cost reduction can be considered as major factors in outsourcing operations. Moreover it implies that in Sri Lankan context even though the cost efficiency is less there are many more criteria for the decision of outsourcing.

Q6 - Do you believe the 3PL service provider you select should have a good reputation and a brand image?

	Frequency	Percentage
Strongly Disagree	3	6.82
Disagree	11	25.00
Neither agree nor disagree	16	36.36
Agree	9	20.45
Strongly agree	5	11.36
Total	44	100.00

Table 08: question no 06 outcome

From the total 44 respondents, 14 have said they don't believe that the 3PL service provider should have a good brand name or good reputation while another 14 says they consider the reputation and the brand image. According to the answers given, majority of the answers (16) conclude that the brand image is neither a considerable factor nor inconsiderable factor. It's 36.36% from the total number of responds, which is an considerable amount. So that the result shows that the 3PL companies with good reputation and the good brand image does not have more possibility of getting the business.

Q7 - Do you believe the 3PL service provider should be a leading player in the 3PL market

	Frequency	Percentage
Strongly Disagree	3	6.82
Disagree	16	36.36
Neither agree nor disagree	15	34.09
Agree	8	18.18
Strongly agree	2	4.55
Total	44	100.00

Table 09: question no 07 outcome

According to the answers given 6.82 percent strongly disagree that the 3PL provider should be a major player in the industry to consider in outsourcing while 36.36 percent disagree, 34.09 percent neither disagree or agree and 18.18 percent agree and 4.55 percent strongly agree. So the majority says that they don't believe whether the 3PL provider should be a market leader while only 10 from the total 44 respondents says they consider that. Hence it indicates that the majority of the organizations consider that being a major player in the industry as inconsiderable factor.

Q8 - Do you consider the size and the scalability of the 3PL service provider in selection criterion.

	Frequency	Percentage
Not concerned at all	6	13.64
Slightly concerned	8	18.18
Somewhat concerned	9	20.45
Moderately concerned	13	29.55
Extremely concerned	8	18.18
Total	44	100.00

Table 10: question no 08 outcome

According to the answers given 13.64 percent indicates that the size and the scalability of the 3PL Provider in selection criteria is not concerned at all while 18.18 percent specify it's slightly concerned, 20.45 percent of the population specify it as somewhat concerned factor and 29.55 percent specify it as a moderately concerned factor while 18.18 percent specify it as a extremely considered factor. More than 80% of the respondents mentioned that they at least slightly concerned about the mentioned factor. Hence the majority imply that the size and the scalability of the 3PL Provider is a concerned factor in selection criteria.

Q9 - Do you believe the 3PL service provider you select should have sound knowledge experience in your industry vertical?

	Frequency	Percentage
Strongly Disagree	0	0.00
Disagree	0	0.00
Neither agree nor disagree	0	0.00
Agree	20	45.45
Strongly agree	24	54.55
Total	44	100.00

Table 11: question no 09 outcome

According to the answers given, 45.45 percent agree and 54.55 percent strongly agree and nobody disagree or strongly disagree to the fact that having sound knowledge experience in their industry vertically is considerable factor. Hence almost all the organizations consider having sound knowledge experience in their industry vertically as a considerable factor. This indicates that these organizations expect the 3PL service provider to consist the knowledge and the understanding of the best practices and the practical aspects of the possible implementations in operational aspects.

Q10 - Do you consider former projects handled by the 3PL service provider related to your operation area.

	Frequency	Percentage
Not concerned at all	0	0.00
Slightly concerned	6	13.64
Somewhat concerned	17	38.64
Moderately concerned	16	36.36
Extremely concerned	5	11.36
Total	44	100.00

Table 12: question no 10 outcome

According to the answers given, 0 percent of the organizations do not consider former projects handled by the 3PL service provider related to their operation area. 13.64 percent are slightly concerned and 38.64 percent are somewhat concerned. 36.36 percent are moderately concerned and 11.36 percent are extremely concerned. Hence it indicates that the former projects handled by the

3PL service provider related to their operation area is a considered factor and majority are more than somewhat concerned. Hence when choosing a 3PL service provider the projects they've been handled which related to the operation area of the organization is a considerable factor.

Q11 - Should they have a standalone WMS platform you can integrate with your ERP or any other system through an EDI or via FTP file transfers?

	Frequency	Percentage
Not concerned at all	2	4.55
Slightly concerned	3	6.82
Somewhat concerned	12	27.27
Moderately concerned	18	40.91
Extremely concerned	9	20.45
Total	44	100.00

Table 13: question no 11 outcome

4.55 percent of the population indicate that having a standalone WMS platform which can integrate with the organizations ERP system through EDI or FTP services is not considered as a considerable factor in their organizations in selecting 3PL providers. 6.83 percent are slightly concerned on the fact and 27.27 percent are somewhat concerned. Majority of the population indicates that having a standalone WMS which can communicate with organizations ERP system as a highly considered factor which is implied by 40.91 percent of moderately concerned answers and 20.45 percent of extremely considered answers. Since more than 95% of the total population have mentioned that they at least slightly concern about the mentioned factor, It must be highly important to have a good WMS with the 3PL service providers to attract customers. Due to the technological improvements, most of the larger scale apparel companies have moved to the newest technologies in order to minimize their wastages while maximizing the efficiency and the effectiveness. This study shows that the majority of them expect the other stakeholders such as 3PL service providers also expected to align with these larger scale apparel company's improvements in order to have more benefits.

Q12 - Should the 3PL service provider you select should have implemented latest technology such as Automation/RFID etc.?

	Frequency	Percentage
Not concerned at all	3	6.82
Slightly concerned	7	15.91
Somewhat concerned	14	31.82
Moderately concerned	14	31.82
Extremely concerned	6	13.64
Total	44	100.00

Table 14: question no 12 outcome

According to the answers given, majority concerns that having the latest technologies implemented as a considering factor in outsourcing operations according to the 13.64 percent of extremely concerned, 31.82 percent of moderately concerned, 31.82 percent of somewhat concerned and 15.91 percent of slightly concerned answers. Yet majority does not consider this as a necessity factor but as a moderate or less than moderately concerned factor. Hence having the innovative technologies can be considered as a moderately concerned factor.

Q13 - How concerned are you on your 3PL service provider being a compliance certified partner such as ISO/OHSAS/C-TPAT/SA8000 etc.

	Frequency	Percentage
Not concerned at all	0	0.00
Slightly concerned	1	2.27
Somewhat concerned	17	38.64
Moderately concerned	16	36.36
Extremely concerned	10	22.73
Total	44	100.00

Table 15: question no 13 outcome

According to the answers given, majority of the organizations concern being a compliance certified partner such as ISO/ OHSAS/ C-TPAT/ SA8000 etc. as a considering factor, which is implied by the 22.73 percent of extremely concerned, 36.36 percent of moderately concerned, 38.64 percent of somewhat concerned and 2.27 percent of slightly concerned answers. Moreover since almost all organizations concern more than somewhat concern, it is implied that being a compliance certified partner such as ISO/ OHSAS/ C-TPAT/ SA8000 etc. is a major consideration in outsourcing operational activities. So that the 3PL service providers should concentrate more on improving their qualities as complies with the mentioned quality certificates in order to have more business.

Q14 - Rate your service level expectation from your 3PL partner on the below attributes. Scale from 1-5 where "1" means least priority & "5" means Top priority.

	Frequency				
Priority	Reliability	Service Quality	Flexibility	Customer Support	Responsiveness
1	6	15	21	0	0
2	25	16	3	0	2
3	6	9	6	10	13
4	5	0	4	15	19
5	2	4	10	19	10

Table 16: question no 14 outcome

	Percentage				
Priority	Reliability	Service Quality	Flexibility	Customer Support	Responsiveness
1	13.64	34.09	47.73	0.00	0.00
2	56.82	36.36	6.82	0.00	4.55
3	13.64	20.45	13.64	22.73	29.55
4	11.36	0.00	9.09	34.09	43.18
5	4.55	9.09	22.73	43.18	22.73

Table 17: question no 14 outcome percentage

Reliability

According to the answers given and the distribution of the priorities, majority concerns reliability as their 2nd least priority which is 56.82 percent of the population. 13.64 percent consider reliability as their least Priority and 13.64 percent consider reliability as their 3rd priority, hence majority of the population represent the less than 3rd priority in reliability. 11.36 percent consider reliability as their

2^{nd} priority and 4.55 percent as their 1^{st} priority. Hence reliability is a more lower priority factor than top priority factor for majority of the population.

Service Quality

Majority of the population consider service quality as their 2^{nd} least priority, which is 36.36 percent. 34.09 percent consider service quality as their least priority and 20.45 percent consider service quality as their 3^{rd} priority. Only 9.09 percent consider service quality as their 1^{st} priority and there are non observations in the sample which represent service quality as their 2^{nd} priority. Hence service quality is a factor within less than 3^{rd} priority for the sample. Which indicates that many organizations doesn't consider service quality as their major priority within the choices given in selecting a 3PL.

Flexibility

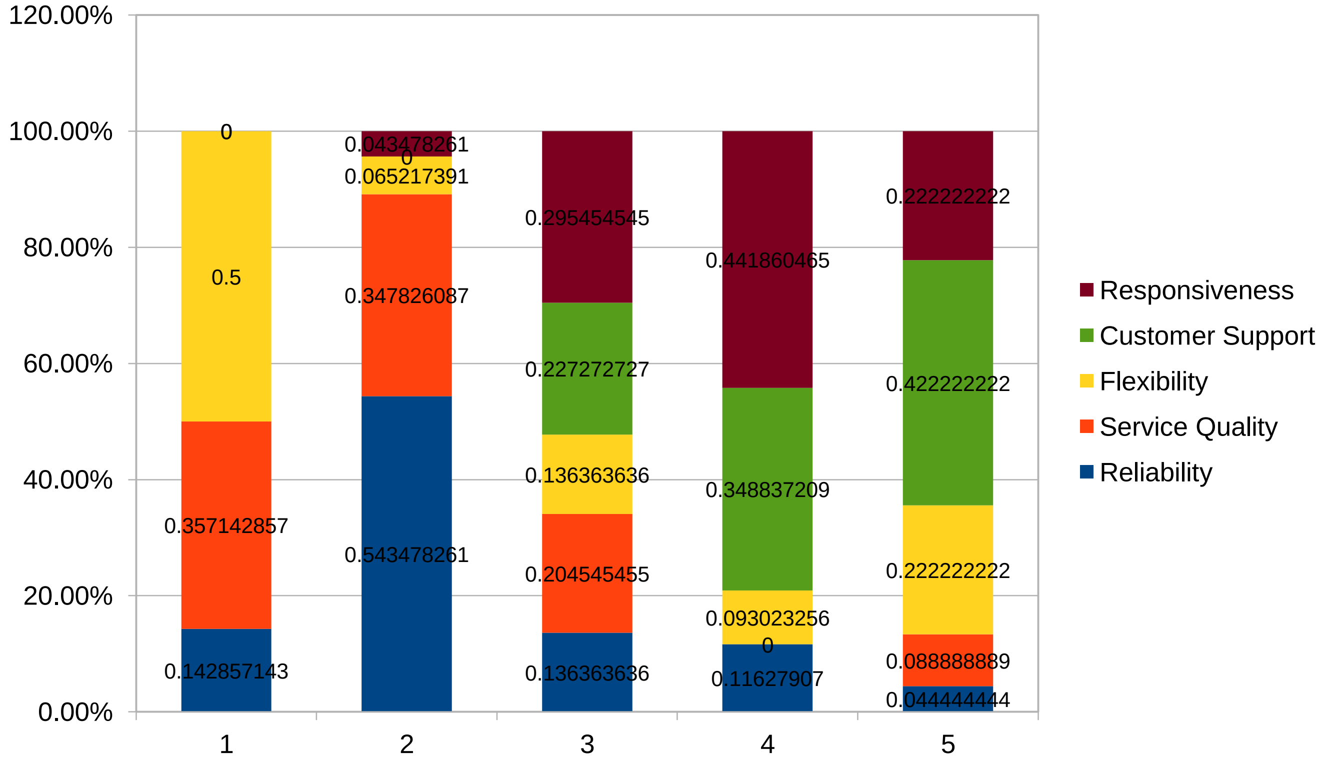
Most of the organizations in the sample population consider Flexibility as their least priority, which is 47.73 percent overall. Meanwhile 22.73 percent of the population consider flexibility as their top priority. Hence flexibility is top priority for some organizations and flexibility is the least priority for some organization, in a nutshell flexibility can be identify as a least priority factor. Moreover, 13.64 percent of the population consider flexibility as their 3^{rd} priority and 9.09 percent of population consider flexibility as 2^{nd} priority while only 6.82 percent consider flexibility as their 4^{th} priority.

Customer Support

According to the answers given, majority of the population consider customer support as their top priority with 43.18 percent of the population. 34.09 percent of the population consider customer support as their 2^{nd} priority and 22.73 percent of the population consider customer support as their 3^{rd} priority. There are no organizations with least priority and second least priority on customer support. Hence all the organizations consider customer support as a above 3^{rd} priority factor. Hence customer support can be identify as a most prioritized factor among the sample population.

Responsiveness

Responsiveness is considered as the 2^{nd} prioritized factor among the population with 43.18 percent of the population. Moreover, 29.55 percent of the population consider responsiveness as their 3^{rd} priority and 22.73 percent of the population consider responsiveness as their top priority while only 4.55 percent of the population consider responsiveness as their 2^{nd} least priority and non of the population consider responsiveness as their least priority. Hence responsiveness could be identify as a most prioritized factor which is only less prioritized than customer support.



1st Priority

As given answers imply, customer support is considered as the top priority of the sample population with 42.22 percent overall. Moreover, responsiveness and flexibility is considered as 1st priority by 22.22 percent each and 8.89 percent on service quality and 4.44 on reliability. Hence according to the majority rule, the first priority of the population can be identify as customer support.

2nd Priority

As given answers imply responsiveness is considered as the 2nd priority by the majority, which is 44.19 percent of the population and 34.88 percent consider customer support as their 2nd priority. Moreover 11.63 percent consider reliability as their 2nd priority and 9.30 percent consider flexibility as their 2nd priority with non considering service quality as 2nd priority. Hence by the majority rule responsiveness can be identify as the 2nd prioroty for the sample population.

3rd Priority

According to the answers given, most organizations consider responsiveness as their 3rd priority with 29.55 percent of the population. Moreover 22.73 percent of the organizations consider Customer support and 20.45 percent of the organizations consider Service quality as their 3rd priority. Moreover, 13.64 percent of the population consider the flexibility and the reliability as their 3rd priority. According to majority rule and the previous prioritizations, Service quality can be identify as the 3rd priority of the sample.

4th Priority

According to the given answers, 54.35 percent of the population consider reliability as their 4th priority which represent the majority. Moreover 34.78 percent consider service quality as 4th priority and 6.52 percent consider flexibility as theiir 4th priority while only 4.35 percent consider responsiveness as their 4th priority and there are non who consider customer support as their 4th priority. Hence reliability can be identify as the 4th priority of the population according to the majority rule.

5th Priority

50 percent of the given answers conclude that flexibility is the least prioritized factor among the factors given. Moreover 35.71 percent consider service quality and 14.29 percent consider reliability as their 5th priority. Hence according to majority rule flexibility can be identify as the least prioritized factor.

Hence the prioritization of the attributes are customer support, responsiveness, Service quality, reliability, flexibility in descending order.

Q15 - Do you believe one 3PL service provider should handle all the logistic requirements of your organization?

	Frequency	Percentage
Strongly Disagree	5	11.36
Disagree	19	43.18
Neither agree nor disagree	11	25.00
Agree	5	11.36
Strongly agree	4	9.09
Total	44	100.00

Table 18: question no 15 outcome

According to the answers given, the majority of the population indicates that organizations do not believe that one 3PL service provider should handle all the logistics requirement of the organization. Answers indicate that 43.18 percent of the sample population disagree with the statement. Moreover 25 percent of the population neither agree or disagree while 11.36 percent of the population agree and 11.36 percent of the population strongly disagree. There are only 9.09 percent of the population which consider outsourcing all the requirement to a 3PL service provider is effective. Hence the answers indicate that the majority doesn't expect a single firm to handle all the activities hence they expect the effectiveness of their operations over singularity of firms.

Q16 - How concerned are you on the financial stability of the 3PL Service provider on the selection criteria?

	Frequency	Percentage
Not concerned at all	0	0.00
Slightly concerned	2	4.55
Somewhat concerned	7	15.91
Moderately concerned	18	40.91
Extremely concerned	17	38.64
Total	44	100.00

Table 19: question no 16 outcome

According to the answers of the sample population, there are 40.91 percent of the population who moderately concerned about the financial stability of the 3PL service provider in selection criteria. Moreover, 38.64 percent of the population extremely concerned about the financial stability of the 3PL service provider. Furthermore, 15.91 percent of the population somewhat concerned and only 4.55 percent slightly concerned about the financial stability of the 3PL service provider in their selection criteria. Hence, it implies that financial stability of a 3PL firm gains competitive advantage by helping the firm to project more reliability and ability of risk management.

Q17 - Do you consider referrals for the 3PL Service provider on the selection criteria?

	Frequency	Percentage
Not concerned at all	0	0.00
Slightly concerned	13	29.55
Somewhat concerned	19	43.18
Moderately concerned	11	25.00
Extremely concerned	1	2.27
Total	44	100.00

Table 20: question no 17 outcome

According to the answers of the sample population 43 percent of the population are somewhat concerned of the referrals for the 3PL service provider in selection criteria. Moreover 29.55 percent of the population are slightly concerned and 25 percent are moderately concerned and only 2.27 percent are extremely concerned there are no organization who does not concern at all about the referrals in 3PL selection criteria. Hence, majority of the population represent more than somewhat concerned on this fact.

Q18 - How concerned are you for the 3PL service provider having multiple fulfillment warehouse locations for faster delivery?

	Frequency	Percentage
Not concerned at all	5	11.36
Slightly concerned	7	15.91
Somewhat concerned	15	34.09
Moderately concerned	11	25.00
Extremely concerned	6	13.64
Total	44	100.00

Table 21: question no 18 outcome

According to the answers given, 34.09 percent of the population somewhat concerned about the 3PL service provider having multiple fulfilment warehouse locations for faster delivery. Moreover, there are 25 percent of the population who moderately concerned and 13.64 percent of the population who extremely concerned about having multiple fulfillment warehouse locations. Moreover, there are 15.91 percent of the population who are slightly concerned and 11.36 percent of the population who does not concern at all. Hence, it indicates that having a more spreaded network of fulfilment warehouses gain competitive advantage for 3PL service providers.

Q19 - How concerned are you on former projects handled by the 3PL service provider on Lean and other productivity improvement?

	Frequency	Percentage
Not concerned at all	0	0.00
Slightly concerned	5	11.36
Somewhat concerned	13	29.55
Moderately concerned	17	38.64
Extremely concerned	9	20.45
Total	44	100.00

Table 22: question no 19 outcome

According to the given answers, there are 38.64 percent of the population, which moderately concerned about the previous projects handled by 3PL provider on lean and other productivity improvements. Moreover, 20.45 percent of the population are extremely concerned and 29.55 percent of the population are somewhat concerned about previous projects on lean and productivity improvements by the 3PL provider. Moreover, 11.36 percent of the population are slightly concerned and there are none who doesn't concern at all. Hence, all the answers are distributed within more than slightly concerned. Hence, it indicate that there's a demand for the 3PL service providers with better performance improvement experience in the field.

Q20 - Are you concerned your 3PL service provider to be a sustainable supply chain and green supply chain practitioner?

	Frequency	Percentage
Not concerned at all	0	0.00
Slightly concerned	18	40.91
Somewhat concerned	13	29.55
Moderately concerned	12	27.27
Extremely concerned	1	2.27
Total	44	100.00

Table 23: question no 20 outcome

According to the answers given, there are 40.91 percent of the population who slightly concern about the sustainable supply chain and green supply chain practices of the 3PL service provider. Moreover there are 29.55 percent of the population who somewhat concerned and 27.27 percent of the population which moderately concerned. There are only 2.27 percent of the population which extremely concerned about the green supply chin and sustainable supply chain practices of the 3PL service provider. Hence it indicates that being a sustainable operator gain competitive advantage for the 3PL providers.

4.3 Discussion of Research Findings

As findings of the research specify, the most common factor for not outsourcing the warehouse function of the sample population could be identify as the cost reduction would not be experienced. This is due to the high system thinking which insourced operations offer. When an organization operate with insourced warehouse function, their main purpose is to support all the related activities in any condition. In many practical cases most of the warehouses operates with higher efficiency levels rather than the efficiency level, which the facility is designed for. Which results in less standardized operations and many hidden costs. Hence, they are able to provide more efficiency than the standardized warehouses which offer by the 3PL providers. Most of the tasks in warehouse are labor intensive and adds more value with skilled labors. Most of the insourced organizations manage a proper hierarchy of human resource to manage the warehouse activities with proper skill development practices. Since all the employees are considered as internal employees, many sensitive information are shared and all the labors are updated about the activities within the supply chain of the focal company. This operational behavior increase the labor dependency but by controlling the factors affecting labor turnover ratio, these organizations were able to offer more continues cost efficiency rather 3PL service providers.

Moreover, most of the Large Scale apparel manufacturing and export companies in Sri Lanka hold less inventory and operates with manufacturing warehouses and distribution warehouses. Hence most of the times the flexibility of the operations offer competitive advantage over the supply chain. Most of the organizations which has insourced their operations have previously outsourced their operations and preferred to operate insourced. This is due to the factor that 3PL service providers which offered services had not achieved the customer expectations and satisfaction. Hence the image of the 3PL industry has projected in a less valued manner.

As findings imply, the most influencing barriers in outsourcing the warehousing function to 3PL service providers of Large Scale apparel manufacturing and export companies in Sri Lanka could be identify as 3PL service providers inability to provide cost reduction than insourced operations, not being able to maintain a proper customer relationship, not being able to provide expected efficiency level and lacking system thinking.

From the organizations which has outsourced their operations believe that smooth operations and expertise of the 3PL service providers as the major factors of making the outsourcing decision. The reduction of the complexity, expertise skills, risk distribution and cost efficiency has been caused for these organizations to outsource their operations. In situation where the behaviour is highly volatile, the organizations have not experienced the cost reduction. Hence the 3PL providers were unable to provide more cost efficiency in volatile flows.

Moreover, the cost reduction is moderately or extremely concerned in selection criteria of the 3PL service providers and the cost factor is identified as more influential than the reduction of the complexity. But yet reduction of the complexity is further identified as a unignorably factor.

In the selection criteria the organizations have considered the good reputation and the brand image of the 3PL service provider as a major concerned factor. This is due to the reliability which comes within those factors and the due demand for the dependability. Yet most of the organizations were not considered being a major player in the industry as a influencing factor for 3PL service provider selection criteria. Moreover the size and the scalability of the 3PL service provider has been identified as a major influencing factor. This is due to the increased service level through higher size and scalability for the flow of the organizations.

Moreover, all of the organizations in the population agrees to the fact that 3PL service provider should have the knowledge of the industry vertically. Moreover, they consider previous projects handled by 3PL service providers, which related to the operational area of outsourcing, as a projection of the understanding of the industry vertically. This refers to the system thinking value, which organizations demand.

Moreover, almost all of the organizations in the population consider ability to connect ERP systems with WMS of the 3PL service provider as a major concern. Moreover, they have specified that not being able to integrate both systems is not identified as a lacking feature. Furthermore, all of the organizations consider having implemented innovative technologies like RFID and Automation as a factor in consideration. This is due to the image they project on better efficiency levels through better technologies.

Moreover, all of the organizations consider being a compliance certified partner such as ISO/ OHSAS/ C-TPAT/ SA8000 etc. is a major fact. This is due to the projection of better operational performance by these certifications. Hence, all of the organizations expect 3PL service provider to be more standardized in operations.

Most of the organizations consider customer support by the 3PL service provider as a major concern. This is due to the value of system thinking for the supply chain and due to the expectation of a better relationship with them. Responsiveness is concerned as second priority by the sample and service quality as third priority and reliability as fourth priority and the flexibility as the fifth priority.

Moreover, majority of the sample doesn't expect all the outsourced operations to be operated by a single firm and the sample consider financial stability of the 3PL service provider in selection criteria. The population consider having multiple fulfilment warehouses as a strength in selection criteria of 3PL service providers. Moreover, all of the organizations concern that having completed lean or other productivity improvement projects as a strength in selection criteria. Moreover, they consider sustainability practices as a concerned area in selection criteria.

Chapter 05

5.0 Conclusions and Recommendations

5.1. Introduction

This phase of the report includes the discussions related to the findings and Recommendations. Furthermore, this phase includes research limitations of the study.

5.2. Recommendations

As findings specify, the organizations refer that customer support, Responsiveness, Service Quality, Reliability, and Flexibility as the descending order of the expectations. Most of the insourced organizations specified that they previously outsourced their operations and preferred not to continue, and developing a relationship is identified as a barrier hence it's recommended for the 3PL service providers to satisfy the expectations mentioned above.

5.3. Selection Criteria and Gaining Competitive Advantage

- Most valuable point in selection criteria can be identify as the cultural alignment. In Sri Lanka, warehouses are mostly labor dependent and offer more service level than standardized warehouses with skill development, this is the reason for most organizations to experience no cost reduction as expected. Hence, the 3PL sector should offer more than the standardized practices and expertise operations, but increased efficiency rather the existing culture.

- Most of the large-scale apparel manufacturers or exporters in Sri Lanka has vast network of factories and spokes across the country. Hence, with a diversified network they could achieve more responsiveness levels.

- IT capabilities have been identified as a barrier in past but by today the industry have achieved integrate ability to a certain level. Moreover, Technology gets easier day by day. Hence, it is recommended for 3PL organizations to manage the current level of service. Moreover, enabling the integrate ability and the security of the information transferred through are considerable factors in affection.

- Proper relationship is expected and valued by the organizations and hence the 3PL providers should be able to flex, develop and optimize supply chain solutions according to the expected services and operations. 3PL organizations should understand that they are the expertise but not the focal firm.

- Metrics, Cost is identified as the most sensitive indicator, but the reduction in complexity is not inevitable. As the success of any supply chain partnership, it ultimately relates to customer satisfaction. This means that organizations and third-party logistics partners must establish agreed success benchmarks and often review measurement data to determine if logistics processes are performing well or need improvement. This process may involve measuring on-time performance, loss, cost per touch, total landed cost, and other metrics. Moreover, the 3PLservice provider should adapt the system thinking by transplanting the focal organizations values in to theirs.
- Cooperative intangible assets, If both parties are able and willing to invest together in a common success, then projects related to value-added customer service can be further enhanced. Moreover, the projects which have been conducted by the 3PL providers in past are evaluated to identify the capabilities of the 3PL provider.

5.4. Contributions and Implications

This study projects insights of the current nature of large-scale apparel manufacturers and exporters market and provide insights on how a 3PL service provider should project themselves in order to gain the competitive advantage. Moreover, this study projects the level of influence of the barriers for the 3PL providers in the market in present state in Sri Lanka.

Since all of the data are collected from the executive level employees, it is assumed that executive level employees bear the skills and the understanding of the overall nature of the organization they represent and it is assumed that the answers given by the executives represent the organization.

Data are gathered from the organizations which has outsourced and insourced their operations. Hence, it projects the reasons for the failures and issues existing in the market.

5.5. Limitations of the Study

Limitations of the research study can be identified in several aspects. Limitation of the considered population, time limitation to collect data, geographical limitation of collecting data are a concern. Furthermore, the data is collected from the major players in the market which represent the Sri Lankan industry and due that, it is limited to the Sri Lankan context.

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Appendices

Questionnaire

Most influential criterion of selecting a 3PL provider by Large Scale apparel manufacturing and export companies in Sri Lanka.

Please enter your personal information here
Company Name :
Contact person name :
Designation :
Email Address :

1. How does the warehousing Function of your organization Operates

- ○ Insourced
- ○ Outsourced

2. If insourced, The reasons for not outsourcing warehousing function of your organization.

- ○ Logistics is a core competency at our firm
- ○ Cost reductions would not be experienced
- ○ Control over the outsourced function(s) would diminish
- ○ Logistics too important to consider outsourcing
- ○ Service level commitments would not be realized
- ○ We have more logistics expertise than most 3PL providers
- ○ Corporate philosophy excludes the use of outsourced logistics providers
- ○ Too difficult to integrate our IT systems with the 3PL's systems
- ○ Global capabilities of 3PLs need improvement
- ○ Issues relating to security of shipments
- ○ We previously outsourced logistics, and chose not to continue
- ○ Inability of 3PL providers to form meaningful and trusting relationships
- ○ Other (Please Specify) ……………………………………………………………………………………………………..

3. If Outsourced, reasons for outsourcing the warehousing function of your organization

- ○ Cost reduction via more efficient operation
- ○ Reducing your capital investment
- ○ Ensures smooth run of the operation

- Helps you to focus on your core business
- Decrease labour requirement
- Share Risk
- Expert opinion on logistic solutions
- Other (Please specify) …………………………………………………………………………………………………..

4. How concerned you are on the cost of the 3PL Provider when shortlisting one 3PL provider?

- Not concerned at all
- Slightly concerned
- Somewhat concerned
- Moderately concerned
- Extremely concerned

5. Between cost of the operation and the minimizing complexity of the operation which goes top priority in the selection criterion of a 3PL Provider

- Cost of the operation
- Minimizing operation complexity

6. Do you believe the 3PL Provider you select should have a good reputation and a brand image?

- Strongly Disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

7. Do you believe the 3PL Provider should be a leading player in the 3PL market

- Strongly Disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

8. Do you consider the size and the scalability of the 3PL Provider in selection criterion.

- ○ Not concerned at all
- ○ Slightly concerned
- ○ Somewhat concerned
- ○ Moderately concerned
- ○ Extremely concerned

9. Do you believe the 3PL Provider you select should have sound knowledge experience in your industry vertical?

- ○ Strongly Disagree
- ○ Disagree
- ○ Neither agree nor disagree
- ○ Agree
- ○ Strongly agree

10. Do you consider former projects handled by the 3PL Provider related to your operation area.

- ○ Not concerned at all
- ○ Slightly concerned
- ○ Somewhat concerned
- ○ Moderately concerned
- ○ Extremely concerned

11. Should they have a standalone WMS platform you can integrate with your ERP or any other system through an EDI or via FTP file transfers?

- ○ Not concerned at all
- ○ Slightly concerned
- ○ Somewhat concerned
- ○ Moderately concerned
- ○ Extremely concerned

12. Should the 3PL Provider you select should have implemented latest technology such as Automation/RFID etc.?

- Not concerned at all
- Slightly concerned
- Somewhat concerned
- Moderately concerned
- Extremely concerned

13. How concerned are you on your 3PL Provider being a compliance certified partner such as ISO/OHSAS/C-TPAT/SA8000 etc.

- Not concerned at all
- Slightly concerned
- Somewhat concerned
- Moderately concerned
- Extremely concerned

14. Rate your service level expectation from your 3PL partner on the below attributes. Scale from 1-5 where "1" means least priority & "5" means Top priority.

- Reliability
- Service Quality
- Flexibility
- Customer Support
- Responsiveness

15. Do you believe one 3PL Provider should handle all the logistic requirements of your organization?

- Strongly Disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

16. How concerned are you on the financial stability of the 3PL Service provider on the selection criteria?

- ○ Not concerned at all
- ○ Slightly concerned
- ○ Somewhat concerned
- ○ Moderately concerned
- ○ Extremely concerned

17. Do you consider referrals for the 3PL Service provider on the selection criteria?

- ○ Not concerned at all
- ○ Slightly concerned
- ○ Somewhat concerned
- ○ Moderately concerned
- ○ Extremely concerned

18. How concerned are you for the 3PL provider having multiple fulfillment warehouse locations for faster delivery

- ○ Not concerned at all
- ○ Slightly concerned
- ○ Somewhat concerned
- ○ Moderately concerned
- ○ Extremely concerned

19. How concerned are you on former projects handled by the 3pl provider on Lean and other productivity improvement?

- ○ Not concerned at all
- ○ Slightly concerned
- ○ Somewhat concerned
- ○ Moderately concerned
- ○ Extremely concerned

20. Are you concerned your 3PL Provider to be a sustainable supply chain and green supply chain practitioner?

- ○ Not concerned at all
- ○ Slightly concerned
- ○ Somewhat concerned
- ○ Moderately concerned
- ○ Extremely concerned