

Developing a New Market Strategy from Supply Chain Management Perspective: A Case of Jotun in Brazil

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Abstract

This paper proposes to develop a supply chain management strategy framework that will enable Jotun to better configure its operations in Brazil to enable effective and efficient delivery of its products according to its underlying key performance indicator, on time and in full (OTIF). In determining the scope of this study the paper applied different supply chain management models which include purchasing portfolio analysis, strategic outsourcing and Porter marketing approach analysis. The finding of the study prevails that integrating organizations requirement into logistics service provider scope of work enhances value for both contractual parties and fosters long term commitment. Sufficient market knowledge forms a platform upon which both outsourcing company and logistic service provider work on a win-win basis serving customers' needs efficiently and effectively. Based upon the heterogeneous structure of the new customers in Brazil for Jotun it is better to apply both cost leadership and differentiated strategy to become successful in the business area. Furthermore, Jotun has to implement SCOR model for a unique framework that supports communication between supply chain partners and enhances the effectiveness of supply chain management, technology, and related improvement activities. As recommendation, the 2009 world economic crisis has given a number of experiences on the dynamics of the business and their risk. In these modern days social scientists used experimentally simulated data to measure the impact of some variables. Therefore, Jotun has to quantify and precisely measure the performance of its suppliers using powerful stochastic models that are discussed in the advanced KPI's using simulated data.

Keywords: Simulation models, market strategies, Jotun, logistics service providers, key performance indicators, Brazil

1. Introduction

For the past half millennium businesses have witnessed a wave of internationalization. Businesses are going global so as to increase their market share and profitability. Internationalization however has further been triggered off by shorter product life cycles and saturated markets in the local markets which necessitated venturing into other geographical regions so as to increase its life cycle and glean more profit albeit for a short period. Besides going global businesses have been striving to differentiate themselves from the competitors.

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This chapter provides background information about Jotun and outlines the scope of this research paper. It also stipulates the problem statement, purpose, research objectives and delimitations.

1.1 Background

Jotun is a privately owned fast growing paint company headquartered in Sandefjord Norway it has hubs in Malaysia, Dubai and China. Founded way back in 1926,

Jotun comprises a matrix of 74 companies and 36 production facilities spanning across all continents, [2]. Ranking number nine amongst the biggest paint company in the world, Jotun spans across seven regions namely; Scandinavia, West Europe, East Europe and Central Asia, Middle East, India and Africa, South East Asia and Pacific, North East Asia, and Americas. It is responsible for the sale of Decorative paints and Performance Coatings (Marine, Protective and Powder Coatings) in more than 90 countries. The paints are meant to serving industrial, shipping and residential markets, [3].

Jotun's vision and strategy lie in the heart of its concern to protecting its business and environment. It states that, "Jotun protects its employees, customers, suppliers, shareholders, the environment, and all property", [2].

Jotun's four values include; loyalty which entails Jotun's long-term relationship with colleagues and customers underlines the trust placed in its products and people; care

which underscores Jotun's willingness to help and support others including protecting internal and external environment; respect; and boldness. The system of these values enables Jotun to enhance its unique penguin spirit.

One of the main elements in Jotun's overall strategic direction is organic growth through developing new and existing markets, and differentiated approach which centers on global view and local orientations.

In 2012 Jotun had NOK 15.8 billion in total operating revenues, and expenses before interest and tax (EBITA) totaling NOK 1.5 billion. Decorative Paints accounted for NOK 5.5 billion being 35% of the total revenue Marine Coatings accounted NOK 5 billion, being 32%, Protective Coatings accounted for NOK 3.6 billion being 23% of total operating revenue, and Powder Coatings accounted for NOK 1.6 billion, being 10% of the total operating revenue.

For the period up to August 2013 Jotun Group reported sales of paint and powder coatings of NOK 8 174 million. This is an increase from NOK 7 686 million in the same period in 2012. The six per cent increase was particularly driven by larger sales in Middle East and Central Asia. The Group's operating profit for the period from January to the end of August was NOK 1 050 million, an increase of 18% compared to 2012. Morten Fon, Jotun's President and CEO, said: "We are satisfied that Jotun is successful in delivering continued increase in sales and improved margins in an ever-changing world." "Raw materials represent approximately 60% of our total costs. It is therefore important for Jotun that the outlook for raw material prices is stable." "Jotun has invested almost NOK 500 million in new properties, plants and equipment. This level of investments is in line with our strategy, and is essential for Jotun for future growth." [3].

Jotun is divided into several R&D areas, these are; Antifouling, Anticorrosive, Powder coatings, Interior, Exterior, Binder technology research, Analytical research, and Multicolor. R&D works to ensure that least hazardous chemicals are used by Jotun when developing new products and the bottom line is products should at least contain minimum amount possible of volatile organic compounds, [2]

Jotun recognizes the fact that it belongs to chemical industry being a global manufacturer and supplier of paints and powder coatings and so it is concerned with chemical impact on both the users and the environment. With chemical regulations in place Jotun is in compliant with these regulations and ensures that health safety and the environment are protected accordingly from hazardous chemicals.

1.2 Problem statement

Pleshko and Heiens [4] posited that organizations need to initiate strategies particularly in today's highly competitive market place even if such initiative requires a change on operations or culture. Besides growth opportunities can still be found by improving customer value management and venturing into new markets to

better exploit part of the customers' segment that has never been served or is currently being underserved by the competitors.

The take off point for JOTUN is to carry out a market analysis by building on customer and competitor analyses to make strategic judgments about market and its dynamics [5]. The primary objective of market analysis is to determine the attractiveness of a market through conducting a SWOT analysis, enabling Jotun to know its strengths, weaknesses, opportunities and threats

Nevertheless as the way of increasing market share and global presence Jotun wants to enter a new market in Brazil for its currently existing paint products to serve different customers according to its product portfolio. New market development and strategy is analyzed from different perspectives. Therefore, the main motivation of this paper is to give strategic solutions about Jotun's new market in Brazil from supply chain management's perspective.

The principle of supply chain management suggests that it is appropriate strategy which makes a company success. In literature we can find a number of important business strategies, nevertheless this paper addresses which of these strategies are adequate to the new market in Brazil.

1.3 Purpose and research questions

The purpose of this paper is to discuss various ways Jotun can use to approach new markets for its products from the supply chain point of view. Furthermore this paper seeks to point out criteria and factors Jotun should consider when selecting a transport carrier during a tender. The paper will also discuss key performance indicators (KPIs) Jotun should consider in contracting with third party logistic provider. The following research questions will help fulfil the purpose of the study.

- How should Jotun approach new markets in Brazil?
- What criteria should be used in tender process with respect to selection of transport carrier?
- What are the criteria that Jotun should prioritize in screening for potential suppliers?
- What are the critical success factors for Jotun paints' market in Brazil?

1.4 Delimitations

Market entry strategies and supplier selection processes are complex enough such that including other pertinent issues to this paper will make it unjustifiably long. No sufficient data were obtained from Jotun as such we have reverted to using artificially generated data. However we hope that the models used herein when applied with real data will produce guidelines necessary for supplier selection in the future company's endeavours.

1.5 Research paper outline

This paper is structured as follows:

The second chapter provides a review of the research conducted in market entry strategies and supplier selection. The third chapter focuses on discussion and

findings; here is where the problem will be analysed through the use of secondary data as well as hypothetical data for simulation purposes. The chapter consequently includes the objectives of this paper. The fourth chapter provides the justification of the study and further makes recommendations on improvement. The last chapter has the conclusion and future work which may contribute to this paper.

2. Literature Review

Each organization that competes on a market in a certain industry has competitive advantage strategy whether explicit or implicit. The strategy may have evolved absolutely through activities of various functional departments of the organization or may have developed through an explicit planning process. According to Barney [6], an organization's strategy is its theory of how to compete successfully which is carried out by analysing the impact that particular organization's theory has on its competitive position in the market or industry. A firm gains competitive advantage when its actions in the market or industry create an economic value and when a few competing firms are engaging in similar actions. On the contrary a firm experiences competitive disadvantage when its actions fail to create economic value, this is why it is essential for firms to develop theories that have the potential for generating competitive advantage. It follows that absence of competitive advantage in the firm's strategy may result into competitive disadvantage.

As Porter [7], pointed out firms achieve competitive advantage through acts of innovation, which they approach in its broadest sense including both new ways of doing things and new technologies. Innovation in this case can be manifested in a new production process or production facility, new way of conducting training, new product design or new marketing approach. Some innovations create competitive advantage by serving a market segment that others have ignored or by perceiving an entirely new market opportunity. However, for firms to succeed, innovation usually requires necessity, pressure and even adversity where the fear of loss often proves more powerful than the hope of gain.

2.1 Approaches to enter new markets

2.1.1. Competitive Strategies

This model of generic strategies, according to Porter [8], addresses firms with an analytical technique for gaining understanding of competitors and industries. Strategic planning is a key concern to firms as it may lead to significant benefits to the same. In effect, a process of strategy formulation determines a firm's long run competitive strength that generates a persistently higher rate of profits than its rivals through creation of a sustainable competitive advantage. Nonetheless, a firm must first choose a suitable positioning if it is to compete successfully in the long run. Hence Porter proposes three different generic strategies to strengthening or gaining competitive advantage and these include: overall cost leadership, differentiation and focus.

The three strategies may not be equally suitable for a firm even though they all have the potential to result in the above-average profits. The challenge lies in selecting the strategy that best suits the firm's resources and strengths and the one that is least imitable by competitors and to this end requires knowledge about the firm, its competitors and business environment.

2.1.2 Focus strategy

This strategy focuses on the choice of a narrow competitive scope within an industry. In other words, it aims at serving a special segment or target of the industry well. The focus strategy is typically labouring wherever the company distinguishes its segment and has products to competitively fulfil its necessities. The foundation principle and philosophy of the focus strategy concentrating the company's marketing determinations on few narrow market segments and the company's marketing combination to these specific markets, the company can better come across the requirements of that target market [9].

2.1.3 Overall cost leadership

This paper will not discuss cost leadership and focus strategies in detail bearing in mind that Jotun already focuses on differentiation strategy. The two will merely be touched upon. In cost leadership strategy, a firm sets out to become the low cost producer in its industry. Nevertheless, Porter asserts that the sources of cost advantage are different and rely on the structure of the industry. They may include the pursuit of proprietary technology, economies of scale, better access to raw materials and other factors. If a firm commands prices at or near the industry average, then it can achieve and sustain overall cost leadership, as it will be an above average performer in its industry [10].

2.1.4 Differentiation Strategy

In differentiation strategy, a firm seeks to differentiate its product or service by creating something that is perceived industry-wide as being unique [11]. Differentiation approach seeks appropriate and most suitable ways of aligning services and products to meet unique customer requirements and unlike cost leadership strategy, it deals mostly with the external business environment [12]. With this strategy, regardless of price being an important factor, it is not the primary concern of consumers when deciding on the purchase even though customers are willing to pay a premium price. Hence, product differentiation, according to [6], is a business strategy whereby firms increase the perceived value of their products or services relative to the perceived value of other firms' products or services in an attempt to gain a competitive advantage. The properties of the products or services are altered in order to create differences in the relative perceived value of a firm's products or services. Barney and Hesterley [13] further argue that "product differentiation is ultimately an expression of the creativity of individuals

and groups within the firms. It is limited only by the opportunities that exist or created in a specific industry and by the willingness and ability of firms to creatively explore ways to take advantage of those opportunities". As pointed out by Porter [8], it is important for a firm to differentiate itself among more than one dimension in order to reach the desired results.

2.2 Outsourcing of third party logistics activities

According to Aghazadeh [14], logistic management comprises three fundamental functions, transportation management, inventory management, and value added services. He further posits that third party logistics comes to life when an independent economic agent is brought in to manage the aforementioned core functions. In light of the above definition any transporter carrier independent of Jotun qualifies being a third party logistic provider.

TPL integrates knowledge and seasoned expertise in transportation management, inventory management, and value added services, moreover they infuse the state of technology in either of the functions above. Accordingly they create reliable distribution channels and thorough controls and they are efficient as they highly tap into specialized capabilities and functions that add value for any company..

Selviaridis [15], define third party logistics as outsourcing of logistics activities to specialized service providers as an economically viable method of achieving productivity and / service enhancements

The benefits deriving from using third party logistics include gaining expertise on the part of the outsourcing company from the TPL, the outsourcing company may also benefit from improved market knowledge and data access that the TPL providers have acquired in time, the outsourcing company stands to concentrate on the core competence and business objectives, it further entails high degree of flexibility in terms of catering to customers that are not in a regular schedule [14].

However for a successful third party arrangement to occur it is imperative that good communication flow between parties be maintained, furthermore [14] suggests that there is a great need for outsourcing company and the TPL provider to have a unified objective of succeeding and that reward structure be open. He argues also that the parties should have what he termed corporate chemistry, which occurs when two parties share common business beliefs and practices. This entails relational interaction between TPL provider and the outsourcing company.

Other benefits include; reduced need for personnel, reduced transportation and distribution cost, improved customer service, improved cycle time and freeing capital lock up in manufacturers and marketers non non-core areas, money is not spent on equipment like trucks and forklifts and supply chain software, this could be used in the more core activities of the organization.

The institute of outsourcing shed light on the contribution of outsourcing and that organizations can gain up to 9% cost saving and a 15% increase in capacity and quality, on average. Third party logistic providers generally act as a conduit between suppliers and buyers in the supply chain.

This linkage is of paramount importance for optimization of supply chain system [15].

2.2.1. Selection criteria for Third Party Logistic Providers

There are numerous selection criteria for third party logistic provider in the literature, these criteria are generic and may tend to have varying degree depending on the industry the service provider is sought from. Selviaridis [15] enumerated the following criteria; technical capability and competence; capacity and flexibility; client references and provider reputation; communications; compatible information system or information technology; expertise and specialist knowledge; financial stability/strength; service quality; price/cost; harmonized planning horizons; geographical coverage/networks; experience in handling specific product types; subcontracting practices; supply of critical information; responsiveness/ability to meet promises; reliability/on-time shipment and delivery; personnel quality/human resource management; performance measurement; and experience in specific industry in respect of the regulations.

2.2.2 Statistical models with respect to selection criteria and factors.

In these modern days test of hypothesis using experimental data has become remarkably important and growing fast in managerial science. Simulation is an important method of generating experimental data to test some hypotheses. In this study we have used simulated data to demonstrate how to select the best transport carriers using several selection criteria

The data we simulated contain Lead Time, Car Accident, Total number of products shipped, and number of defected products after shipping.

Analysis of variance (ANOVA)

Analysis of variance is used to see the existence of the main differences of certain random variables with a single treatment over its levels. Such models help us to compare the means of different treatment levels of a random variable. The linear statistical model for ANOVA is given as [16]:

$$y_{ij} = \mu + \alpha_i + \varepsilon_{ij},$$

$$i = 1,2,3,\dots,a, \quad j = 1,2,3,\dots,n \quad (1)$$

where: μ = the grand mean, α_i = the i^{th} level effect and $\varepsilon_{ij} \sim N(0, \sigma^2 I_{an})$

The method of estimation for the model parameters is the Ordinary Least Square estimation method.

Poisson Regression Model

Poisson regression is a form of regression analysis used to model count data and contingency tables. Poisson regression assumes the response variable Y has a Poisson distribution [17]:

$$P[Y = y] = \frac{\lambda^y e^{-\lambda}}{y!}, \quad y \in W \quad (2)$$

where λ , is the model's parameter and W is the set of Whole numbers

The Poisson distribution is the exponential family distribution so that the Poisson regression model transforms the random variable into its logarithm. The transformation allows us to express the expected value of the random variable as a linear combination of its exogenous predictors.

$$\begin{aligned} \text{Log}E[Y | X] &= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k \quad (3) \\ &= X\beta \end{aligned}$$

Where $\beta = \beta_j$ are the model parameters, $X = X_j$ is the matrix of exogenous inputs

Model parameters are estimated by the maximum likelihood estimation method.

$$\ell = \prod_{i=1}^n \frac{[X\beta]^{y_i} e^{-[X\beta]}}{y_i!} \quad (4)$$

Reliability Analysis Model

Reliability analysis deals with analysis of time duration when one or more events happen. There are different probability models that are frequently applied in reliability analysis. These are Exponential distribution, Weibull distribution, lognormal distribution, Gompertz distribution, Gamma distribution, Log-logistic distribution etc. For the given set of data the appropriate model is selected by information criteria like the Akaike information criterion (AIC) and Bayesian information criterion (BIC).

As we have mentioned above there are different probability models for reliability analysis and therefore we restrict ourselves to exponential distribution.

Suppose we have exponentially distributed lead time (t) random variable [18]:

$$f(t) = \theta \exp[-\theta t], \quad t \geq 0 \quad (5)$$

The regression model is given as:

$$\begin{aligned} \text{Log} \theta &= \theta_0 + \theta_1 Z_1 + \theta_2 Z_2 + \dots + \theta_k Z_k \quad (6) \\ &= Z\theta \end{aligned}$$

Where $\theta = \theta_j$ are the model parameters, $Z = Z_j$ is the matrix of exogenous inputs.

Model parameters are estimated by the maximum likelihood estimation method.

$$\ell = \prod_{i=1}^n [Z\theta] \exp[-Z\theta] \quad (7)$$

Logistic Regression Model

Logistic regression model is one of the famous models of categorical data analysis. This model helps us to determine the factors that maximize the probability of the occurrence of the response variable. The regression model is given as [19]:

$$\begin{aligned} P[U | W] &= \frac{\exp(\alpha_0 + \alpha_1 W_1 + \alpha_2 W_2 + \dots + \alpha_k W_k)}{1 + \exp(\alpha_0 + \alpha_1 W_1 + \alpha_2 W_2 + \dots + \alpha_k W_k)} \quad (8) \\ &= \frac{\exp[W\alpha]}{1 + \exp[W\alpha]} \end{aligned}$$

Where U is a binary random variable (Like Yes, No), $\alpha = \alpha_j$ are the model parameters, $W = W_j$ is the matrix of exogenous inputs

Model parameters are estimated by the maximum likelihood estimation method.

$$\ell = \prod_{i=1}^n \left[\frac{\exp[W\alpha]}{1 + \exp[W\alpha]} \right] \quad (9)$$

Models of Proportion

The models of proportion give us insight to compare the proportionate distributions of the categories of the random variable. We estimate the proportion as [20]:

$$\hat{p} = \frac{n_d}{n} \quad (10)$$

Where n_d the number of one category of the random variable and n is the sample size

Mean $E[\hat{p}] = p$ and variance $\text{Var}[\hat{p}] = \frac{p(1-p)}{n}$

3. Results and Discussions

3.1 New market approach

Jotun can adapt to the following strategies to better get foothold in the new markets and regions in Brazil

Analysis of actual and potential market size

According to Thurston [21], there has been a prospective rising demand on marine and protective coating in Brazil. The maritime coatings market is estimated at \$45 million, which is a prospective destination for Jotun, with an aim of growing organically. The establishment of the new factory aims at producing 10 million liters, which will totally cater for the Brazilian market.

According to Thurston [21] with the booming economy in sight, Brazil has been expanding its maritime fleet as well as oil and gas rig fleet, inspired by discoveries of pre-salt

oil reserves off the shores of Santos state, near Rio de Janeiro. This means business for Jotun for both the onshore and offshore equipment involved in sub-salt production, which require special corrosion protection coatings as this will save over 75% of the cost of replacement due to corrosion.

Thurston [21] goes ahead to saying that Jotun has an assured market with Petrobras TransPetro, with a contract signed between the two in 2008 for Jotun to supply 250,000 liters of dry dock coatings per year for fleet maintenance. Petrobras has a fleet of about 52 vessels and 26 more have been ordered. Furthermore, Petrobras' latest new business plan of July 2011, to add 16 floating production and offloading platforms and modules and an additional 28 offshore drilling rigs, means an increase in portfolio for Jotun who have a contract with Petrobras who aim to triple production by 2020.

Another potential market for Jotun is the Brazilian navy, which is the second biggest in the Americas after the United States. According to Thurston [21], Brazil is set in expanding its navy fleet and ocean patrol vessels. They recently signed a £ 133 million contract with BAE Systems for the production of three ocean patrol vessels, a contract that also has a manufacturing clause that will permit more vessels of the same caliber to be built in Brazil.

Findings and arguments on market growth

According to Aaker [5], after the size of market has been estimated, focus is shifted to the market growth rate. The main question here is a company to ask itself "What will be the market size in the future?" For the case of Jotun, there are some key driving forces that guarantee a potential market in the future. These include; panama canal expansion,

The Panama Canal Expansion

The Panama Canal is one of the most important global trade links in the Americas with an estimated 5% of the world's total cargo volume. According to the Panama Canal expansion study, Phase 1 Report [22], "the expansion will double capacity in terms of trade volume and allow passage of much bigger ships than the current Panamax size". This is expected to open up Brazilian waterways to the world therefore Brazil will stimulate the production of bigger and better post-Panamax vessels, with the aim of quadrupling its exports by 2030, which will be a potential market for the marine and protective business for Jotun.

Growth of Brazilian Ship Building Industry

According to NCE [23], Brazilian shipyards are experiencing a new booming, with attraction from a lot of investments. They now stand at an order book of 367 for both ship building and offshore constructions. 9 new shipyards are under implementation in different parts of the country. Brazil now stands as the 4th biggest drilling unit builder and 2nd in platform construction in the world, with 20 oil platforms and 33 offshore deep water drilling rigs under construction. The Brazilian order book

accounts for the 8% of total activity worldwide. With this in mind, Jotun has to capture the market share, especially through increasing volume output as time goes by, bearing in mind also the recent discoveries of oil and gas that might prompt for the production of more exploration and rigging vessels

Growth of 3PL services and transport infrastructure

According to PWC report [22] transportation must become one of the highest priorities if Brazil is to achieve true competitiveness with other countries.

Brazil is heavily dependent on its road system for transportation, and so is Jotun through distribution of its products through trucks to different regions in the country. According to Araujo [24] road freight transportation (road freight) is responsible for more than 60% of the volume of goods handled in Brazil and accounts for around 6% of GDP of Brazil's economy. With this in mind, Brazil government has set to expand and improve its roads systems. In 2007, Brazil set aside USD 19.6 Billion for roadways alone in its project to improve road transport.

For JOTUN is a business opportunity, because more local markets will be accessed through truck delivery, therefore more cross docking points can be established, therefore shortening lead times from factory to the customer.

Assessing Market Profitability

According to the Porter's model, there are five factors that influence profitability, including the intensity of competition among existing competitors, the existence of potential competitors who will enter when profits are high, substitute products that will attract customers if prices become high, the bargaining power of customers and bargaining power of suppliers. In this context, much emphasis is put on existing competitors of Jotun in Brazil.

There are over major 50 paints and coatings manufacturers in Brazilian market, with the biggest Jotun competitor being Akzo Nobel, whose main segment is the decorative paints. According to Thurston [21] Akzo Nobel in May 2012 won a deal to provide coatings for the roof of Brazil's Maracanã Stadium, in Rio de Janeiro this will host the FIFA World Cup final in 2014. Industrial coatings, including marine and protective industrial products, are also a major segment for AkzoNobel sales in Brazil. A research and development joint venture with Petrobras helps AkzoNobel pinpoint products needed for the oil giant's new investment program, which is valued at \$225 billion over the next few years.

3.2 Developing sound strategic business plan

In order to decide the business strategy in for different regions of Brazil first we have to see the distributions of the customers with respect of sales volume of Juton. The sales volume of Juton in different regions of Brazil is given in annex D.

92.44% of the total sales volume is covered from customers of three cities Rio de Janeiro, Minas Gerais and Pernambuco. If we sum up the sales volume up to 98.43%

this is accounted from the inclusions of cities of Sao Paulo, Rio Grande do sul and Santa Catarina. The only 1.57% of the sales volume is covered from the other cities of Brazil. This information tells us Juton has highly heterogeneous customers in Brazil.

Using the statistics from Annex D we can analyse the proper implementation of business strategy for Juton in Brazil. The solution of the problem must address how to increase the sales volume in the other regions and maintain the best performing market areas. As the solution, first, in order to be sustainable and having loyal customers in the market Juton must be respectful, on time delivery, improve quality, by reducing production cost decrease selling price to their customers. Second, using a single business strategy (i.e. one of cost leadership, differentiation Strategy or focus strategy) cannot make the company to be effective and efficient in grasping new customers. Juton has to implement mixed strategy for different regions of Brazil with respect of short and long run economic growth and activity, competitors, Facility Parameters, Upstream Parameters (suppliers) and Downstream Parameters (end customers). Third, Jotun's network and distribution configuration must be flexible, responsive and dynamic according to the magnitude of their customers. Here Juton has to implement dynamic demand management for forecasting using both stationary and non-stationary models (ARMA, ARIMA, GARCH...Etc.) for different regions with respect of the products. Fourth, in supply chain management literature we found that by performing analysis and setting proper market segmentation strategy and demand projection Jotun's market share can significantly modified by advertising.

Fifth, Juton with the assistance of supply chain management professional try to implement the Supply Chain Operations Reference (SCOR). The SCOR model is world widely acknowledged framework for assessing and comparing supply chain accomplishments and their enactment. The SCOR model systematically unifies the five important components (plan, source, make, deliver and return) of the organization. The SCOR model is responsible for a unique framework that links performance metrics, best practical operations, and supply chain partners into a unified structure. The framework also supports communication between supply chain partners and enhances the effectiveness of supply chain management, technology, and related improvement activities.

Organizational remunerations of implementing the SCOR model comprise of quick evaluation of supply chain performance, flawless empathy of performance gaps, efficient supply chain network redesign and optimization, improved operational control from standard essential practices, rationalised management recording and organizational structure, configuration of supply chain team assistances with strategic purposes, a comprehensive plan for introduction new businesses and products, organized supply chain coordination that capture predictable savings.

3.3 Criteria and factors Jotun should consider when selecting transport carrier during a tender

Literature suggests numerous criteria and factors that need be considered when selecting a transport carrier. We suggest that Jotun could use the following to achieve the objective of the project.

Flexibility of the transport carrier

This is an important element as Jotun will gain an understanding into how individual transporters react to different market situations For instance when demand is high in places where the transporter does not normally serve, can the same serve these customers?, this calls upon flexibility on the part of the transport carriers, furthermore flexibility enhances an ability to handle customized services [25].

Cost

So long as transportation cost reduces overall profitability of Jotun, cost structure of each service provider needs to be carefully evaluated, for Instance Jotun could request the service providers to draft their cost breakdowns and thereafter agree upon certain contingent items such as fuel price which changes from time to time these should be clearly stated in the escalation clause in the logistic service provider's contract. Furthermore Jotun should consider cost of a transporter in its totality that includes indirect cost associated with incapacity of the transport carrier, [26].

Client references and service provider's reputation

For the suppliers who have brought in their bids, Jotun needs to conduct scanning with respect to the type of the client the service providers have served, and how big those clients are, in so doing Jotun can be able to evaluate each service provider's capacity and reputation, moreover this type of analysis ensures that should any particular transport carrier be issued a contract they will uphold Jotun's image in the eyes of the customers and other stakeholders at large [27].

Technical capability and competence

Jotun should also conduct some sort of audit on transport carriers so as to evaluate their technical capability in terms of required handling equipments, personnel competence and similar aspects, doing so will enhance both its policy on health safety and environment.

Communications

In any environment communication is a vital organ among trading partners. Jotun should also conduct a preliminary survey of the service providers' communication system to determine whether it is compatible to its own or rather supports its mission, a well established communication system will eliminate information gap and therefore enhance Jotun's core mission in Brazil.

Service quality

Jotun should ensure that service providers who are top performers in terms of on-time delivery, accurate order fill rate, frequency of damage in handling and transit, speed with which service provider attends to customers' complaints and willingness of the service provider to commit to continuous improvement. Logistic service provider should be able to demonstrate to Jotun that they have these qualities at least using past records [28].

Reliability and on-time delivery

Jotun should ensure that transport carriers who will be selected are responsive to customers' needs in terms of meeting tight delivery schedules and that they should always be dependable, this factor however takes into considerations other parameters such as flexibility and capacity of transport carrier [29].

Financial stability and strength

Transport carriers should be financially liquid to ensure this Jotun may request financial statements and scan through to assess liquidity of the service providers. This is of particular importance for ensuring business continuity and smooth operations, because should any transport carrier become insolvent the ripple effect goes beyond Jotun to its ultimate customers which may translate into loss of revenue as well as reputation damage and other cost associated with securing a replacement supplier [26].

Geographical coverage and networks

Transport carrier needs to cover sufficient geographic regions in Brazil and Jotun should look for one because it is for this reason economies of scope can be achieved, besides having one transport carrier who is able to efficiently cater for customers in Rio de Janeiro is cost efficient and time efficient than having two or more serving three different locations. Furthermore logistic service provider who is well networked in Brazil should take precedence of all others who cover only their immediate local territories this reduces marketing and distribution cost [26].

Personnel quality

Transport carriers must recruit personnel who are up to speed in the latest developments in the industry and who are well seasoned to cater for varying needs of heterogeneous customers, to attain this objective transport carriers ought to have sound human resource system. Jotun should look into these to obtain sufficient comfort that logistic service provider's staff meet minimum qualifications.

Supply of critical information

Outsourcing part of logistic function to a third party logistics provider may necessitate sharing confidential business information Jotun should therefore identify at the outset what policies with respect to confidentiality and disclosure of information service providers have. It is from these policies that Jotun can get to select the ones whose policies are in line with business policies of Jotun in addition to this there should be mutual trust and

understanding between Jotun and logistic service provider this is particularly important for continuous improvement of service, [27].

Labor relations records

Calm work environment facilitates labor productivity and efficient use of scarce organization resource it is imperative that Jotun assesses records of potential service providers' labor relations to obtain comfort that the same are in good terms with the workforce, this is important in particular because bad relationship results into tense environment which may trigger off strikes lockouts, and sit-ins which normally interfere daily logistic operations. [28]

Experience in specific industry regulations

It is imperative that logistic service providers are well seasoned in the industry in terms of underlying rules and regulations, (health, safety and environmental), and should be able to demonstrate to Jotun how they have been implementing their health, safety and environmental policies. It is from such policies Jotun can develop supplier strategies whether to take on a specific service provider and develop them decision of which depends upon other qualifying criteria and factors.

Experience in handling hazardous products

Logistic service providers need to demonstrate how they have been handling dangerous goods and duration of time that they have been doing that, this will enable Jotun to select service providers who are experienced and hold relevant certifications [29].

Operational performance

This is reflected in the service providers' ability to deliver on-time, detect faulty in the system, system security and responsiveness including handling of confidential information. Moreover size and quality of assets logistic service provider has enhance good operational performance [30].

3.4 Modeling key performance indicators for selection of logistic service provider

In supply chain management literature we found three types of flows. These are product flow (consist of the movement of products from the supplier to the customer, as well as any from the customer returns to the supplier), information flow (involved transmitting orders and updating the status of delivery) and financial flow (consists of credit terms, payment timetables, and delivery and title ownership). The supply chain management of Jotun must address problems of distribution network configuration and distribution Strategy in Brazil as a newly growing business area. The distribution network configuration is responsible for number, location and network tasks of suppliers, production services, delivery centers, warehouses, cross-docks and customers, delivery strategy including questions of operating control, delivery scheme, and means of transportation, replacement strategy, and transportation control [31].

Now our focus is the solution with how to coordinate with the suppliers of road transportation in Brazil. Road transportation is very sensitive to the price of crude oil in the international market. Regardless of cost from supply chain management perspective the best Road transport supplier is characterized by two categories factors. These are the primary factors (those are factors that directly affect the competitive advantage of Juton) and secondary factors (those are factors that affect the overall cost reduction strategy of Juton and its business partners in the chain).

Modelling Lead Time

Lead time is surveyed closely in supply chain management as companies want to decrease the amount of From Table 1 we observe that Supplier B has the smallest lead time distribution with high degree of reliability, supplier A is the better supplier in reduction of lead time

Comparison of the mean Lead Time of the suppliers

In this section using the analysis of variance (ANOVA) we are going to compare the average Lead time of the suppliers to select the best supplier. The result is given in Table 2: From Table 2 we observe that the mean lead time of supplier B is significantly different compared to other suppliers. If we select supplier B then the average lead time is decreased to 2.3 units of time than using supplier A and 2.65 units of time than supplier C. The mean lead time of supplier A and C are statistically equal.

Based up on the exponential reliability regression analysis and analysis of variance (ANOVA) the best supplier in terms of the lead time is Supplier B followed by supplier A and lastly supplier C.

Modelling the Number of Defect

In supply chain management it is crucial to minimize the defects during process and transportation. In this section we are going to model the distribution of defects in transit from three suppliers. The result is given in Table 3.

From Table 3 we observe that the prevention of defect during transportation by the different suppliers is estimated. The 95% confidence intervals suggest that supplier B significantly performs the best than the other suppliers. While the performances of supplier A and supplier C are statistically equal.

Therefore, based up on the analysis of proportion the best supplier which reduces the number of defect item during transportation is ranked supplier B is the first and the other two suppliers have the same performance.

Modelling the number of car accident of the suppliers

In order to get a concrete difference of the performance of the suppliers we to the asses the structure of the number of car accident that the suppliers account in order to

From Table 5 we see that the estimate of the Poisson regression model supplier C has the largest model parameter and B has the smallest. This shows that Supplier C is the most risky supplier in terms of the number of car accident and B is the least risky supplier. Based on our analysis of the Poisson regression model we

time it takes to transport products to the market or in to Company. In supply chain management lead time minimization is a vital task for all of the participants of the business partners in the chain.

Modelling the Lead time distribution of the Suppliers

When Juton select the transport carriers it has to give much attention to the lead time history of the same. The appropriate model for the lead time is parametric reliability analysis. In this study we use three suppliers of transportation for Juton. The exponential regression model fit of lead time distribution of the suppliers is given in Table 1.

distribution. For further information see the lead time distribution of the suppliers from Figure 1.

Modelling of Car accident accounted by logistic service providers

The ultimate success through supply chain management is achieved by reducing the overall cost and risks of the chain. For a big company like Juton such analysis and decision to select the supplier requires further analysis.

In literature we find the usual factors associated with the car accident case in the road transport are associated with use of alcohol and drug, knowledge on safety road practices, speed limit utility, work experience, road alignment, traffic conditions, Population density, existence of animals, to mention but a few. Careful consideration of these factors enhances sustainability advantage, cost reduction, and low rate of defected items.

Modelling the existence of car accident by the suppliers

In our case we first evaluate the prevention of car accident by the potential logistics service providers. The appropriate statistical model to reach the conclusion in favor of a suitable supplier in terms of prevention of car accident is logistic regression. The response variable is a binary response that whether car accident exists or not. The results of the logistic regression for the existence of car accident by the three suppliers are given in Table 4.

From Table 4 we see that all of the logistic regression model parameters are statistically insignificant with respect to reference group supplier C. This shows that all the suppliers have similar performance regarding the existence of car accident.

characterize the best supplier. The appropriate statistical model to analyse such situation is the Poisson regression. The result of the Poisson regression model is given in Table 5:

rank Supplier B as the best supplier followed by supplier A which performs better than supplier C in terms of reduction of the number of car accidents.

3.5 Criteria and factors that Jotun should prioritise to achieve success

Jotun should specify explicitly to transport carriers their roles and responsibilities in as much as requirements and expectations, this can be achieved through well configured communication between Jotun and its service providers. Compatibility of transport carrier's technology with that of Jotun should also be prioritized. This should enhance goal congruence as suggested by [28].

Criteria and factors above seem to be generic however each organization may choose the ones that are aligned to its mission and strategic direction. General criteria that Jotun has to prioritize during selection of business partners based on company's mission and strategic direction: communication with respect to information sharing; Understanding customer supply chain needs; clear service specifications and service level agreements and Joint planning and management of relationship.

3.6. KPIs that Jotun should require from their transport carriers in Brazil

In order to ensure that its objectives are met Jotun needs to seek some basic metrics or Key Performance Indicators (KPIs) from logistic service providers: The key performance indicators should evaluate systematically the performance of integrated third party logistics operations and reflect accurately the relationship between the third party logistics providers and Jotun.

Cerasis [32] suggests a number of key performance indicators that we found applicable in Jotun's context. These are explained in turn hereunder;

On-time delivery

Logistic service provider should always ensure that customers' orders are delivered promptly in good time Jotun should measure this indicator by inspecting delivery documents against delivery times. Jotun requires a 97% service level in respect of this performance metric (Jotun, 2014).

Invoice accuracy

This entails error-free invoicing procedures, logistic service provider must ensure their systems are calibrated in a manner that permits error free invoices, and this practice will eliminate customer complaints emanating from wrong invoicing. Jotun requires a 99.9% service level and that there should be a complete and on time documentation, (Jotun, 2014).

Customer complaints/ voice of customer feedback handling

Logistic service providers should be able to attend to customer complaints promptly, this metric can be measured by establishing customer complaint form that clearly shows the cycle time when a complaint was raised and the time when it was ultimately resolved, a within 24

hours metric of resolution of customers' complaint should be a priority.

Inquiry response time

This metric is closely linked to customer complaint resolution time, however taken from a different perspective logistic service providers should be able to respond to customer enquiries well in time and urgently, this enhances customer satisfaction and good will, a performance metric in this respect could be responsive within 24 hours.

Over/short /damaged goods

Jotun requires a 99.6% claim free service from logistics service providers, number of damaged products in transit or during loading and offloading should be identified and monthly report concerning this ought to be produced and submitted to Jotun, Logistics service provider should clarify the cause of such defect and corrective measures to be taken thereof.

Order cycle time

As Jotun shall be placing orders before 12:00 noon for all orders (Jotun, 2014), logistics service provider need to ensure that the same are processed on receipt and shipment should there after follow to close the cycle time as much as possible, for instance this metric should be measures by comparing the times between when an order was received and when actual delivery to the actual customer was made against customers' cut off time

Cost reduction and continuous improvement

Logistics service provider should continuously embark upon reducing marketing and distribution costs and should biannually submit to Juton operational plans that reflect this. Cost reduction schemes should be given priority because of their impact on the overall operational revenue.

Information system integration

Logistics service providers should demonstrate to Jotun that they have information systems that support Jotun's operation and that they agree to adapt to changes whatsoever that may be necessary to facilitate Jotun's strategic positioning in Brazil.

The frequency should the KPIs be measured and followed up

Once key performance metrics have been identified and agreed upon by both Jotun and logistics service provider review can be done on a monthly basis at the beginning and quarterly reviews to follow thereafter as suggested by Cerasis (2014). It is from these metrics that both Jotun and logistics service providers will come to know how the partnership is moving along based on meeting the targets in the logistics service agreement document.

Cerasis (2014) suggests that there should also be a quarterly business review on the logistics service provider

of one choice and that this review should also be accompanied with a contract with agreements and milestones. Jotun should invariably use collaboration and trust in dealings with logistics service provider to ensure a win-win situation as Cerasis (2014) posits that; “not everything is costs or price discussions”.

4. Conclusions and Recommendations

4.1 Conclusions

This paper is proposed to give the solution of the new market from the supply chain management perspective. The assessment of new market for Juton in Brazil is analysed from the dimensions of actual and potential market size, market growth and market profitability. Using the indicators of the Panama Canal expansion, the growth of Ship building industry, and growth of logistics services and Infrastructure we conclude that Juton can make successful business in Brazil.

In today's competitive market place what distinguishes successful companies from the less fortunate ones is the ability to differentiate themselves through their service and product offerings. The success is geared by many factors such as well managed logistic operations. Jotun should ensure that key logistic processes are aligned with its strategic goals and measured against predetermined performance objectives.

In order to give the appropriate business strategy for Juton in Brazil we analyzed the total sales volume. The result showed that 92.44% of the total sales volume is covered from customers of three cities Rio de Janeiro, Minas Gerais and Pernambuco. If we sum up the sales volume up to 98.43% this is accounted from the inclusions of cities of Sao Paulo, Rio Grande do sul and Santa Catarina. The only 1.57% of the sales volume is covered from the other cities of Brazil. Using such useful information we found that Juton has to implement mixed strategy for different regions of Brazil with respect of short and long run economic growth and activity, competitors, Facility Parameters, Upstream Parameters (suppliers) and Downstream Parameters (end customers).

4.2 Recommendations

In this paper we tried to give best strategic solution for Juton for its expansion of new market in Brazil. In order to implement successful business strategy we recommend the following points.

Juton with the assistance of supply chain management professional try to implement the Supply Chain Operations Reference (SCOR). The SCOR model is world widely acknowledged framework for assessing and comparing supply chain accomplishments and their enactment. The framework also supports communication between supply chain partners and enhances the effectiveness of supply chain management, technology, and related improvement activities.

The purchasing process of Juton is found that a well-organized scientific procedure. Therefore, from such angle we recommend that Juton has to keep up the pace. However, in order to make effective, efficient, transparent, less likely for corruption, in general successful coordination with its business partners (which

including transport suppliers), Juton has to organize Decision Making Unit (DMU). The organization of the Decision Making Unit (DMU) and their involvement is summarized in ANNEX B. Further, in order to reduce and optimize risks with respect of Lead time and proportion; and reduce the overall cost of the supply chain Juton with the assistant of data analysts quantify these factors variables. The general method of analysis using SPSS is given in ANNEX C.

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6 Tables

Supplier	Mean	Std. Error	Estimates of theta	95% Confidence interval	
				Lower Bound	Upper Bound
B	4.156	0.788	0.241	0.1	15.33344
A	6.453	2.586	0.155	0.2	22.57794
C	6.810	1.534	0.147	0.2	25.12127

Table 1: The Estimate of the Exponential regression Model of Lead Time

(I) Supplier	(J) Supplier	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
B	A	-2.29667*	0.463	0.000	-3.2177	-1.3756
B	C	-2.65333*	0.463	0.000	-3.5744	-1.7323
A	C	-0.35667	0.463	0.444	-1.2777	0.5644

Table 2: Comparison of the average Lead time of suppliers

*The mean difference is significant at the 0.05 level.

Dependent Variable: Lead-Time

Supplier	Proportion	Std. Error	Z	Sig	95% confidence interval	
					Lower	Upper
Supplier-B	0.009	0.00172	5.220	0.0000	0.00562	0.01238
Supplier-A	0.021	0.00262	8.022	0.0000	0.015869	0.026131
Supplier-C	0.031	0.00318	9.851	0.0000	0.025099	0.037568

Table 3: Estimates of defected item of the different Suppliers

*The mean difference is significant at the 0.05 level.

Dependent Variable: Proportion of defected item

Supplier	Beta	Std. Error	95% Wald CI		Hypothesis Test		
			Lower	Upper	Wald χ^2	df	Sig.
[Supplier_C] Reference	0.268	0.3684	-0.454	0.99	0.53	1	0.467
[Supplier_A]	1.118	0.5866	-0.032	2.268	3.633	1	0.057
[Supplier_B]	0.921	0.5675	-0.191	2.034	2.635	1	0.105

Table 4: Logistic Regression Parameter Estimates of existence of car accident

Dependent Variable: Existence Car Accident, Model: Supplier_C, Supplier_A, Supplier_B

Suppliers	Beta	Std. Error	95% Wald CI		Hypothesis Test		
			Lower	Upper	Wald χ^2	df	Sig.
[Supplier_C] Reference Group	0.693	0.1291	0.44	0.946	28.827	1	0.000
[Supplier_A]	-0.836	0.2348	-1.296	-0.376	12.685	1	0.000
[Supplier_B]	-1.696	0.328	-2.339	-1.054	26.753	1	0.000

Table 5: Poisson regression model parameter estimates

Dependent Variable: Number of Accident

Model: Supplier_C, Supplier_A, Supplier_B

7. Figure

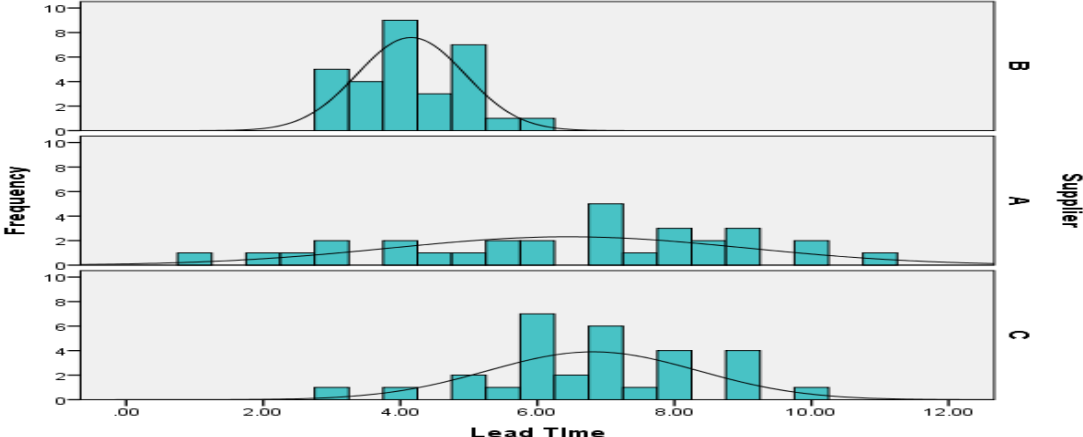


Figure 1: Lead time distributions of suppliers A, B, and C

8. Annexes

SUPPLIER A					SUPPLIER B					SUPPLIER C				
Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5
6.9	No	100	4	4	3.4	No	100	0	0	9	No	100	4	2
7	No	100	4	4	4.6	No	100	0	0	6	No	100	3	2
5.7	No	100	4	4	4	No	100	0	0	7	No	100	3	2
6	No	100	4	4	5	No	100	0	0	7	No	100	3	2
8	No	100	4	4	4	No	100	0	1	7.9	No	100	2	2
9	No	100	4	2	4.2	No	100	0	1	7	No	100	2	2
10	No	100	3	2	4	No	100	0	1	7.5	No	100	5	4
3	No	100	3	2	4.8	No	100	0	1	9	No	100	6	5
5.6	No	100	4	2	3	No	100	0	1	6	No	100	5	5
7.7	No	100	2	2	3.2	No	100	0	0	6	No	100	5	5
8	No	100	4	2	4.2	No	100	0	0	7.9	No	100	5	5
8.2	No	100	3	2	4.5	No	100	0	0	8.9	No	100	4	2
8.5	No	100	3	2	4.6	No	100	0	0	5	Yes	100	2	0
9.8	No	100	2	1	5	No	100	0	0	4	Yes	100	4	3
11	No	100	2	1	4.8	No	100	0	0	5	Yes	100	3	3
8.6	No	100	0	0	5.1	No	100	0	0	6	Yes	100	3	3
9	No	100	0	0	6	No	100	2	1	7	Yes	100	3	3
9	No	100	0	0	3.4	Yes	100	1	1	6	Yes	100	3	3
6	No	100	0	0	3	Yes	100	2	2	8	Yes	100	4	2
7	No	100	0	0	3.5	Yes	100	1	1	9.8	Yes	100	3	2
1	Yes	100	2	3	3.2	Yes	100	1	2	7.2	Yes	100	2	2
2	Yes	100	1	3	3.8	Yes	100	1	2	6.5	Yes	100	3	2
2.3	Yes	100	1	3	3.4	Yes	100	2	1	3	Yes	100	2	2
4	Yes	100	1	3	4	Yes	100	2	1	6	Yes	100	3	2
3	Yes	100	3	1	5	Yes	100	2	1	7	Yes	100	2	1
4	Yes	100	1	1	4	Yes	100	3	2	5.4	Yes	100	1	1
4.6	Yes	100	1	1	5.3	Yes	100	3	1	5.9	Yes	100	2	1
6.9	Yes	100	1	0	3.8	Yes	100	2	0	7.8	Yes	100	2	1
7	Yes	100	1	0	3	Yes	100	3	1	6.7	Yes	100	2	0
4.8	Yes	100	1	0	4.9	Yes	100	2	1	8.8	Yes	100	3	0

Variable Descriptions

Y1	Y2	Y3	Y4	Y5
Lead Time	Existence of Accident	Total Item Shipped	Defected Item	Number of Accident

ANNEX A: Simulated data for Advanced KPI analysis

	Partnership	Competitive bidding	Secure supply	Category management and e-procurement solutions
Objective	<ul style="list-style-type: none"> ■ Create mutual commitment in long term relationship 	<ul style="list-style-type: none"> ■ Obtain 'best deal' for short term 	<ul style="list-style-type: none"> ■ Secure short and long term supply ■ Reduce supply risk 	<ul style="list-style-type: none"> ■ Reduce logistic complexity ■ Improve operational efficiency ■ Reduce number of suppliers
Suitable for	<ul style="list-style-type: none"> ■ Strategic products (e.g. gearboxes, axles, engines) 	<ul style="list-style-type: none"> ■ Leverage products (e.g. commodities, steelplate, wire) 	<ul style="list-style-type: none"> ■ Bottleneck products (e.g. natural flavors, vitamins, pigments) 	<ul style="list-style-type: none"> ■ Routine products (e.g. consumables, office supplies)
Activities	<ul style="list-style-type: none"> ■ Accurate forecast of future requirements ■ Supply risk analysis ■ Careful supplier selection ■ 'should cost' analysis ■ 'rolling' materials schedules ■ Effective change order procedure ■ Vendor rating 	<ul style="list-style-type: none"> ■ Improve product / market knowledge ■ Search for alternative products / suppliers ■ Reallocate purchasing volumes over suppliers ■ Optimize order quantities ■ 'target' pricing 	<ul style="list-style-type: none"> ■ Accurate forecast of future requirements ■ Supply risk analysis ■ Determine ranking in supplier's client list ■ Develop preventative measures (e.g. buffer stock, consigned stock) ■ Search for alternative products / suppliers 	<ul style="list-style-type: none"> ■ Subcontract per product group ■ Standardize product assortment ■ Design effective internal order delivery and invoicing procedures ■ Delegate order handling to internal user
Decision level	<ul style="list-style-type: none"> ■ Board level ■ Cross functional approach 	<ul style="list-style-type: none"> ■ Board level ■ Purchasing 	<ul style="list-style-type: none"> ■ Purchasing ■ Cross functional approach 	<ul style="list-style-type: none"> ■ Purchasing ■ Cross functional approach

ANNEX B: Four basic supplier strategies

Source: Arjan J. van Weele (2009), [33]

Model	SPSS- Path
ANOVA	Analyze ⇒ Comparing Means ⇒ One way- ANOVA ⇒ Select and enter the dependent list ⇒ Select and enter the Factor ⇒ Post_Hoc ⇒ LSD ⇒ Continue ⇒ OK
Exponential Regression	Analyze ⇒ Regression ⇒ Curve Estimation ⇒ Select and enter the dependent variable ⇒ Select and enter the independent variable ⇒ Include the constant of the model (OK) ⇒ Exponential (OK) ⇒ OK
Poisson Regression	Analyze ⇒ Generalized Linear Models ⇒ Type of Model (Poisson) ⇒ Response (Select and enter the dependent Variable) ⇒ Predictors (Select and enter the Factors+ Select and enter the Covariates) ⇒ Model (Select and enter the Factors+ Covariates) ⇒ Main effect +Interaction ⇒ Include the constant of the model (OK) ⇒ Statistics (type of Analysis -I) ⇒ OK
Logistic Regression	Analyze ⇒ Generalized Linear Models ⇒ Type of Model (Binary Logistic) ⇒ Response (Select and enter the dependent Variable) ⇒ Predictors (Select and enter the Factors+ Select and enter the Covariates) ⇒ Model (Select and enter the Factors+ Covariates) ⇒ Main effect +Interaction ⇒ Include the constant of the model (OK) ⇒ Statistics (type of Analysis -I) ⇒ OK
Models of Proportion	Analyze ⇒ Non-parametric Tests ⇒ Legacy Dialogs ⇒ Binomial Test ⇒ Select and enter the Test variables ⇒ Enter the cut point ⇒ set the value of the proportion to be tested ⇒ OK

ANNEX C- SPSS paths for KPI analysis

Ref	Region	Volume of sales in %	Cumulative Volume of sales in %	Percentage of Customers	Percentage of Cumulative Customers
1	Rio de Janeiro	70.31%	70.31%	8.33%	8.33%
2	Minas Gerais	14.26%	84.57%	8.33%	16.67%
3	Pernambuco	7.86%	92.44%	8.33%	25.00%
4	Sao Paulo	3.82%	96.25%	8.33%	33.33%
5	Rio Grande do sul	0.67%	96.92%	8.33%	41.67%
6	Santa Catarina	1.51%	98.43%	8.33%	50.00%
7	Ceara	0.67%	99.10%	8.33%	58.33%
8	Amazonas	0.64%	99.75%	8.33%	66.67%
9	Bahia	0.11%	99.86%	8.33%	75.00%
10	Rio Grande doNorte	0.09%	99.95%	8.33%	83.33%
11	Mata Grosso do sul	0.04%	99.99%	8.33%	91.67%
12	Espirito Santo	0.01%	100.00%	8.33%	100.00%

ANNEX D. Sales Volume Distribution in Brazil