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SUPPLY CHAIN MANAGEMENT ANALYSIS TO MAERSK CONTAINER INDUSTRY SAN ANTONIO SPA.

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INTERNSHIP REPORT AT MAERSK CONTAINER INDUSTRY SAP

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Abstract

The following internship report titled “Supply Chain Management Analysis to Maersk Container Industry San Antonio Spa.” shows the major role that supply chain management has played for businesses within the last decades. It also shows the key activities and processes necessaries for its efficiency and effectiveness.

The method utilized to accomplish this purpose was through a qualitative research of supply chain and logistics literature, journals and academic papers. Also, the knowledge obtained from the internship within the logistics department.

The outcome demonstrates the importance of a supply chain strategy within each company to compete in global markets, and how necessary it is to improve performance continuously.

Resumen

El siguiente reporte de práctica titulado “Análisis de la cadena de suministro de Maersk’s Container Industry San Antonio Spa”, muestra que importante rol que ha jugado la gestión de la cadena de suministro para los negocios en la última década. Además, muestra las actividades y procesos claves necesarios para la eficiencia y eficacia.

El método utilizado para conseguir este propósito fue a través de una investigación cualitativa de la cadena de suministro y literatura sobre logística, documentos y diarios académicos. Además, del conocimiento obtenido en el departamento de logística durante la práctica profesional.

Los resultados demuestran la importancia de la estrategia en la cadena de suministro para las empresas, para poder competir en mercados globales, y cuán necesario es mejorar continuamente el desempeño dentro de ellas.

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Introduction

The supply chain strategy defines the connection and combination of activities and functions to fulfill the business value proposal to customers in a marketplace. (Porter, 1980). The effectiveness of supply chain has become crucial for favorable competition in international markets, given that now they compete against each other's supply chain, only the ones that perform effectively and efficiently will succeed. Partners of the supply chain are linked together through physical and information flows; therefore, a supply chain model can be made of various approaches, techniques, criteria and metrics per the supply chain strategy.

The general objective of this paper is to describe the supply chain strategy for business performance in a successful company. In addition, there have been established five specific objectives that help to undertake the present study. These objectives are to define supply chain and supply chain management; define supply chain efficiency and effectiveness; explore planning framework to implement supply chain strategy; identify the supply chain management hierarchical levels; and to identify the Key Performance Indicators to measure performance of the company. To accomplish the objectives proposed, it was considered to develop a qualitative-descriptive research. The data collected for this study was done through Internship in Maersk Container Industry San Antonio, also a review of Logistics and Supply Chain journals, and academic papers.

Description of the company

Maersk Container Industry specializes in developing and manufacturing top-quality reefer machines and boxes. Their most important product, the Star Cool Integrated reefer, features innovative technologies like Controlled Atmosphere and Automatic Ventilation. It is widely recognized as the most energy-efficient reefer container in the market. The headquarter, Maersk Container Industry AS, was founded in 1990, based in Tinglev, Denmark with a reefer factory in Qingdao and Chile; and a dry container factory in Dongguan. Maersk Container Industry AS operates as a subsidiary of A.P. Møller - Mærsk A/S, a worldwide conglomerate; the reefer factory located in San Antonio, Chile, has become one of the most important factories for the region, it employs over 1,000 people and has a global network of over 350 service providers. Maersk Container Industry engages in the development, manufacture, and supply of dry containers, reefer containers, and refrigeration machines for customers worldwide. The company´s distribution centers are in Denmark, China, the Netherlands, Singapore, Australia, Florida, California, South Africa, and Chile.

Global shipping companies rule the market for dry containers, reefer containers and tank containers. The shipping container market for Maersk Container Industry in San Antonio is in South America and the West Coast. Their Star Cool Integrated reefers offered locally to shipping lines, farmers, fruit distributors and leasing companies. The market represented with the world´s largest container shipping companies, known for reliable, flexible and eco-efficient services with the largest fleet of reefer containers in the world. The reefer container market formed by twenty-six shipping companies, that export reefer

containers from Chile to the world. The largest shipping companies that lead the market share are Mediterranean Shipping Company (27%), Hamburgsud (13%), Maersk Line (13%) and CMA CGM (7%), which also represents the most important customers for Maersk Container Industry.

One of the major factors driving the growth of the global reefer container market is the continuous development of seaborne trade in the world. The manufacturers are focusing on technological advancements by introducing high tech versions of containers. The main destinations for exported cargo in reefer containers are United States, China, Netherlands and Japan. Moreover, the most exported commodities are grapes, apples and berries, among others.

There are three types of customers for Maersk Container Industry; first are shipping companies like Maersk Line, Hapag & Lloyd, who purchase reefer containers to rent it to the exporters who sell fresh fruit or fish. Then, there are leasing companies like CAI, TAL, SEACO who purchase reefer container to rent it to shipping companies. Finally, customers that are at the same time shipping companies and exporters, like DOLE. Maersk Container Industry has 22 percent of share market of reefer containers factories; its main competitors are China International Marine Containers Ltd with 67 percent (CIMC) and Singamas Container Holding Ltd, 21 percent. (2015 Report, MCI.)

The company mission is to provide innovative, high quality, refrigeration technology and services to the intermodal industry, contributing to an improved competitive advantage for its customer. They are looking forward to further applying advanced refrigeration solutions to the very specific cargo needs of the local fruit industry. Their expectations were to start producing 25 thousand reefer containers per year in 2015; furthermore, the

factory is designed to produce 40 reefers by 2016. So far, they have not reached their maximum capacity with an average of 28 reefer containers a day. Maersk Container Industry aims to get return of investment through an exponential growth of sales and growth of market share in Latin America. Their revenue growth will do through new customers in new geographic segments and working on new market niche as containers with controlled atmosphere. To reach these strategic objectives, their proposition shows differentiation in the market, offering reefer containers with the lowest energy consumption, high refrigeration capacity, highest power factor, lowest unit weight, cost efficiency and the most important "lowest total cost of ownership" (Reefer Machines, Star Cool, AP MOLLER, Maersk Container Industry, 2013).

Description of the Internship Tasks

The first part of the internship focused on international foreign trade, especially on the international supply chain management as an overseas coordinator, who is responsible for the imports and exports of raw materials, spare parts and samples for Maersk Container Industry, San Antonio. This position plays a key role within the supply chain because it connects the requirements of the buyer with supplier and logistic service providers from origin to destination. It is also the link between Procurement Department and Supply Planning Department with direct stakeholders and facilities to pursue fulfillment of demand and customer order. The second part of the internship focuses on supply chain cost control, regarding freight cost for air and sea shipments from China and Europe. To achieve uniformity of the performance of a specific function, all instructions are detailed in a

Standard Operating Procedure (SOP) for imports. The job performed took place at Logistics Department.

The aims of the Logistics Department are in relation to cost control over transportation, warehousing, storage, and use of fixed assets.

The first part of the working cycle starts when the Sales Department receives a purchase order from the client for a specific number of containers; Production Department receives an internal request of production, and then informs Supply Planning Department about the inquiry. Supply Planning Department checks inventory to see what is necessary for order fulfillment. There is a general list of raw materials, where all items necessary to build a container are detailed and quantified. Supply Planning Department sends a purchase order to the suppliers necessary to manufacture the order (Appendix N° 1); the supplier has two working days to accept the order, signing the Supplier´s Acknowledgment field. The Logistics Department must be in copy in every mail to be aware of any urgent requirement. The second part starts when the supplier accepts delivery dates and quantities, and therefore confirms the purchase order. Only then, Logistics Department oversees the operation, otherwise the buyer (Supply Planning Department) must renegotiate terms of purchasing with the supplier.

The Transport and Logistics Manager, Mr. Luigi Gazzolo (2015) states that the key areas of the Supply Chain Strategy of the company in Chile are The International Transportation Management, Trade Compliance, Order Fulfillment, Shipment and Inventory visibility, and Financial Control. The International transportation management is the key activity of the department; every day, there is a constant communication with their logistics partners to arrange rates for airfreight or, on how to improve the use of space in

containers. The most used incoterms are Ex Works, FCA Warehouse and FCA Supplier´s Factory.

There are two types of cargo: raw materials for production, and spare parts for maintenance. Around ninety percent of the material for production is sent by vessel, because most of the cargo is imported from China, then they buy large quantities to avoid breaking stock, better use of container, and to access to better rates. The remaining ten percent are items that are usually needed with a shorter lead-time that ocean freight cannot comply with (Cost Control Report, 2015).

Rates for ocean freight are under a Global Agreement with Procurement Department in Tinglev. Damco, is part of the Maersk Group and one of the world´s leading providers of freight forwarding and supply chain management services, and has been the freight forwarder for Maersk Container Industry San Antonio over the last 3 years. The standard operating procedure for transportation of cargo indicates that all order for ocean freight (except CIF orders) are assigned to Damco. Most of the cargo moved is full container load (FCL), but a small number of shipments transport less than a container load (LCL). They also consolidate cargo from other vendors to reduce costs and buy larger quantities. It is usual to use airfreight for spare parts, because there is not enough planning and they are usually needed with shorter lead-times. When airfreight is requested the decision to choose a frowarder will depend on different variables like the cost of stopping production for a day, or a week; airfreight costs, speed and carrier`s reliability. To evaluate airfreight, it is mandatory to request at least three quotations from three different suppliers (Appendix N°2), make a comparison analyzing the total cost of airfreight or total landed cost (Appendix N°3). All charges are considered into the total landed cost; chargeable weight,

origin and destination costs, including trucking from the airport to the factory in San Antonio. The criteria to decide could rely on delivery time or the best offer. After the decision is made, the buyer sends a purchase order to the freight forwarder (Appendix N°4). It was also my job to coordinate local freight from airport and port to the warehouse (internal or external). After cargo arrives, the person who receives the cargo at the designated warehouse must send a copy by email with the delivery proof (dispatch guide) to close the cycle. In addition, delivery information must be registered into the Shipment Tracking File, filling the fields with information such as who received the cargo, date of arrival to the warehouse and which company delivered it.

When cargo arrives to the airport in Santiago, all cargo is consolidated into one truckload, taking cargo out of the airport twice a week only to save money and time. Transportation of dry containers is coordinated with Contopsa Inland Terminal, who at the same time storage the containers into their facilities because the company facilities are not prepared to received too many containers with raw materials. For containers with dangerous goods, regarding the IMO classification (International Maritime Organization), SAAM Extraportuarios oversees transportation and storage, because the factory does not have an authorized warehouse for dangerous cargo.

The purpose of the Logistic Department is to take trade compliance seriously. Trade compliance determines the steps that the company must take, also law and regulations that govern the process of export and import. The non-compliance of such laws and regulations can result in a range of negative consequences. To avoid it, Maersk Container Industry San Antonio hired the exclusive services of a custom broker on site from Agencia de Aduanas, Mr. Juan Carlos Stephens, who manages all the operations from San Antonio and

communicates directly with Airport in Santiago and the ports of Valparaiso and San Antonio.

The company knows how to manage suppliers from China and Denmark, so there are some guidelines to proceed that have been arranged with the Purchase Department. For new suppliers from China, Damco follows the same guidelines. However, for new locations, we must identify special requirements to proceed with the import process, and check with the custom broker first. Then we get to trade documentation requirements, to identify all documents required by all parties involved in the trade and transport process for the export of goods from one country and import into another country. One of the most complicated issues for the supplier is to understand how important is for the company that suppliers issue properly commercial invoice and certificate of origin. Mistakes will cause delays and unexpected costs that would make the operation inefficient and more expensive.

There is a formal procedure to handle original set of shipping documents; these usually arrive two weeks ahead of the vessel. Then a set of original documents is handed to the custom broker, including invoice, packing list, bill of lading/hawb and certificate of origin.

The basic elements of the purchase order that buyers send to the suppliers are (Appendix N°1): name and address of the supplier, date of the purchase order, number of the order, incoterm, delivery method, destination warehouse (for systemic purposes only), item number, quantity, description of goods, unit price, total of purchase order, currency, request delivery date and name of the buyer. The requested delivery date indicates when the supplier must contact freight forwarder to deliver cargo, and then the supplier books the cargo, and issues the shipping documents such as commercial invoice, packing list, and a draft of certificate of origin for the approval of the custom broker. After the approval, the

supplier will send them via courier to the overseas coordinator for custom clearance purposes. When the custom broker receives the original documents, he will proceed to issue a provision of funds, an estimate to cover all expenses of the operation. For airfreight, original documents usually arrive with the cargo at the airport, and there is less time to proceed with provision of funds.

One of the common discrepancies is related with the certification of origin, especially with Certificate of Origin issued in China; the suppliers have a hard time understanding that they must send a draft of the certificate for review of the importer before they issue the original. Most of the times, the certificate is corrected several times and still the supplier sends the wrong certificate; therefore, the importer cannot use it because it does not comply with the norms of the Chilean custom. The common mistakes the suppliers make, is to type the wrong date of shipping, invoice number, and/ or incoterms into the certificate of origin (on field 13 of form F/ Euro 1). On the other side, suppliers from European Union are in a better place, because they can use a litany of origin on the invoice, which is just as valid as an EUR1 (certificate of origin). But these suppliers who might not be used to make business with Chile, they do not understand the requirements of certification and/or add a wrong litany. An example of the litany of origin: "The exporter of the products covered by this document declares that, except where otherwise clearly indicated, these products are of preferential origin." When the invoice is up to $6000 EUR only. However, if the total amount exceeds $6000 EUR, the litany of origin should also indicate the exporter´s code, given by the custom of origin. For example, "The exporter of the products covered by this document (add here customs or competent governmental authorization No.) declares that, except where otherwise clearly indicated, these products are of (add here name of country of origin) preferential origin."

Every supplier receives from their category manager or buyer, a Shipment Instruction file with guidelines to issue all shipping documents such as commercial invoice, packing list by container, certificate of origin, fumigation certificate, among others. The benefit of Free trade agreements is what brought Maersk Container Industry to Chile. To bring these agreements into force is when overseas role is becoming important, because the right questions must be made and the right information must be delivered to the custom broker, for him to do the correct classification; such as: less duties and taxes, this translates into a better use of the budget. Trade agreement compliance is both the responsibility of the custom broker and the overseas coordinator.

Visibility in a supply chain is completely necessary, because an international company only adds complexity to the supply chain management; therefore, the effort of the company is to synchronize activities, increase visibility, and control processes inside the organization with custom broker, freight forwarders, ocean carriers, logistic service providers, among others. The information is shared with the Planning Department and Control Department to monitor the status of each purchase order, to control delivery dates to comply with the schedule of raw material and avoid using airfreight or breaking stock. For ordering shipment and inventory visibility, the key tool used is INFORM3 Software to manage operations worldwide. Logistics Department uses the system of M3's Supply Chain Management which provides a powerful set of tools to plan, schedule, and execute across the extended value chain with functionality for demand planning, supply chain planning, plant scheduling, global available-to-promise, capable-to-promise, and procurement. With this tool, the overseas coordinator confirms departure date, creates a distribution order, a picking list and confirms arrival to the port/airport. First, it is necessary to confirm how

many items of the purchase order were delivered to Damco´s warehouse or to the carrier, followed by estimated departure date and arrival date. This information is updated into the function: "pps 270¨, indicating number of Bill of Lading or Air Way Bill. To get this information, it is necessary to identify booking information and follow up with tracking information. For example, tracking a booking of Maersk Line shows when cargo was loaded to the port, and final departure and arrival date. After confirming departure and arrival information, the function "pps 300" allows to give goods receipt to the purchase orders that are in transit into a virtual location, indicating number of container and arrival date. That reception is very important, because it allows all departments to be aware of the cargo in transit, and Finance Department can process payments for the supplier. Then when cargo finally arrives to the factory in San Antonio, the Warehouse Supervisor confirms the arrival into the warehouse and sends it to production.

For internal control of the shipments, the Logistics Department works with different shared files updated daily with valuable data. One of the most important is the excel work sheet "Shipment Tracking". This file represents a reliable source of data for the department to report tracking information about purchase orders and to respond questions from other departments, representing the most powerful tool of communication among the freight forwarder, internal customer, Logistics and Procurement. In addition, it is easy to find relevant information such as number of containers per shipment, delivery terms, Invoices per shipment, follow up of internal procedures, among others. Since Damco holds most of the operations, they must keep all parties involved updated with booking and packing list information. That is why they send a daily report named "Opex/Capex booking report". When a shipper has its cargo ready to be delivered to Damco`s warehouse in Qingdao/Shanghai/Shenzhen they request a booking to Damco, then the last informs to the

Logistics Department that the shipper is ready to deliver. This is also a way of communicating with the Logistics Department to coordinate how the shipments are to be sent. If there is not enough cargo for a full container load, they ask if we want to wait for more cargo or want to arrange LCL. To save money and optimize the use of carriers and containers, the cargo is usually consolidated with other shippers. Damco prepares other reports updated weekly, the Cargo in Transit Report (Appendix N° 5). These reports provide information such as arrival vessel, port of discharge, number of containers, quantity by item, number of HBL, and arrival date by shipment. With these reports, the overseas coordinator can confirm the information available, to prepare the certificate of origin, to plan inbound transportation needed, to plan when money is needed for custom clearance, among others.

Damco also offers an integrated, online toolbox, with all the elements needed to help maximize the efficiency and reduce time and money spent on supply chain management. Each overseas coordinator is given a user and password to the platform: https://www.damco.com, to access to information and get customized reports of shipments, for order fulfillment.

The financial department has an important role upstream the supply chain; they are responsible of the flow of capital, payments to the suppliers, for keeping material flowing. For finance control, goods must be received into the system so they can approve payments. Before doing goods receipt, the overseas coordinator must have received the commercial invoice and packing list, along with a copy of the bill of lading. Then, delivery would be confirmed if everything is correct, the quantities are confirmed into M3 system, and received into a virtual warehouse. Consequently, the commercial invoice is sent to the finance department once a week, for them to handle payments. When a purchase is under

CIF incoterm, they payment will be made once the cargo arrives to the port. However, for FCA/EXW payment is made against systematic goods receipt, once they get bill of lading, packing list and commercial invoice.

The second and final part of the internship was to control freight cost of the shipments. The objective was to identify how much money the department spends on freight cost, demurrage and storage. There is a Procurement Department in charge of the negotiations with suppliers, about rates and terms of delivery of the goods. The Logistics Department must work on getting the best rates and deals with freight forwarders and transport companies; also, they coordinate all logistics operation within the operation. Rates for ocean freight to San Antonio port are updated by Damco every three months, these usually are below market level. There is a Global Transportation & Logistic Master Framework Agreement between Damco and the AP Moller Group. Most of the origin charges are "pass-through", except for inland trucking, management fee, and others that belong to administration operations. This means Damco charges only what is related with their performance. All charges of the shipments from factory to the port are detailed into a summary that is sent for approval two weeks after departure of vessel. Charges must match with the information of the bill of lading, such as number of containers, port of loading, and incoterm; besides, rates are fixed for a period. Once the summary is approved, the freight forwarder will issue the original bill of lading, indicating the total amount of freight cost and other charges.

When Full Container Loads with dry cargo arrive to the port of San Antonio, Contopsa Inland Terminal oversees transporting the containers from Maersk Line carrier straight to the company warehouse or an external storage. But dry containers from other carriers are

taken to the company warehouse immediately, because demurrage costs are too high. The company has a frame agreement with Maersk Line to ensure all containers have 30 days free, and demurrage rate is around $4 dollars a day. Tank containers (tank-tainers) always pay demurrage, since they only have ten free days, and it takes around two weeks to start using it. The material is purchased in batches of four tank-tainers, which arrive every two weeks. Dangerous cargo, moved in tank-tainers, is transported from port to an external warehouse by Saam Extraportuarios. Hoyer and Ultramar charge demurrage in Chile for the tank-tainers with dangerous cargo. In addition, charges are made under the concept of storage and demurrage. The average rate for demurrage for polyol/Imo cargo is $35 per day, while storing is $180 USD fixed rate for 5 days, and $20 each additional day.

Supply chain costs are informed on a monthly report to the Logistic and Procurement Manager. Each department provides their input regarding costs of each department, and then a final report is elaborated with graphics and a summary of all charges involved by activity. Logistics department must keep track of all charges from the operations regarding the upstream, internal and downstream of the supply chain, and these cost report are updated every month with the shipments arrived during the month. There are two basic reports: 1) "Airfreight Cost Report" includes all charges involved such as air freight cost, origin charges, destination charges and trucking from airport to the end destination (Appendix N°6). 2)"Ocean Freight Cost Report "includes a detail of port of loading, number of containers, type of package, carrier, basic freight cost, origin charges, destination charges, insurance cost, stacker use, gate in, gate out, among others (Appendix N°7). Other charges like demurrage and storage are taken separately from each supplier. From this report, we can pivot a table to see if shipment costs are going higher or lower the average; the number of container units arrived each month, the common lanes, among

others. This is valuable data to negotiate rates with carriers and freight forwarders, and do benchmarking to compare it with market rates. Third party service providers are paid against a commercial invoice and a signed purchase order. Once the estimate is approved, the coordinator must issue a purchase order, and then send it for approval. After service is completed, supplier will send the commercial invoice with a reference to the purchase order number. The compliance of that requirement will avoid payment delays. The internship was developed upstream the supply chain, while internal supply chain is more related with logistic yard and production. On the other side, downstream the supply chain is part of the Sales Department and Customer Service.

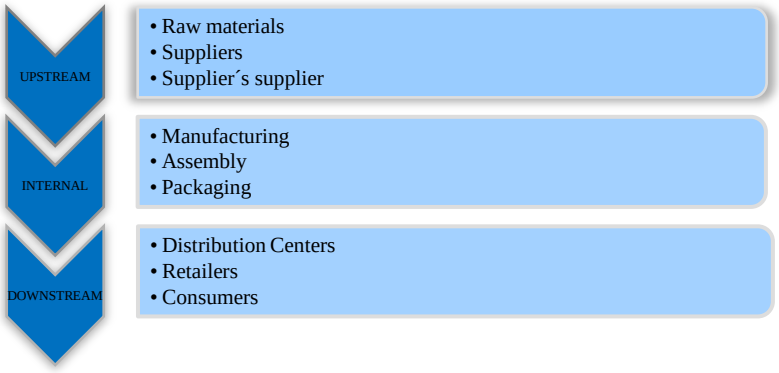
At the end of the month, the Performance Control Department measures the performance following the objectives set at the beginning of the year by the Manager. For that, the overseas coordinator must keep updated all sources of information such as Shipment Tracking, Cost Reports, Purchase Orders Workbooks, among others. The most important Key Performance Indicators measured within the Logistics department are total cost of goods sold, supply chain cost per unit sold, labor utilization, warehousing and transportation costs, M3 software performance (number or orders open and closed), order compliance, shipping accuracy, on time delivery, total supply cost, container capacity utilization, among others (Appendix N°8). Later, they hold a meeting with all departments related to Logistics and Procurement, and they compare it with the performance of other factories such as MCIQ and other competitors.

Chapter 1

Theoretical Framework

The term supply chain emerges from the study and practice of physical distribution and logistics in 1960-1970. In 1980, consultants in logistics emphasized that supply chain must be a single entity that needs to be managed with strategic decision-making at the top level. Ten years later, the term Supply Chain Management took a paradigm shift within the management literature stating that individual businesses now compete as a supply chain. Initially, it was related to inventory management; later, management of all functions was included within a supply chain (Habib, 2011). The supply chain is a structured manufacturing process wherein raw materials are transformed into finished goods, then delivered to end customers, (Beamon, 1998). Fig. 1 shows that is a single process that centralizes on the transformation process of goods, the flow of information, money and goods upstream, internal and downstream the supply chain (Mentzer, Witt, Keebler, Min, Smith& Zacharia, 2001). There are different parties involved within each part of the supply chain including manufacturer, suppliers, transporters, warehouses, wholesalers, retailers, other intermediaries and even customers (Chow & Heaver, 1999).

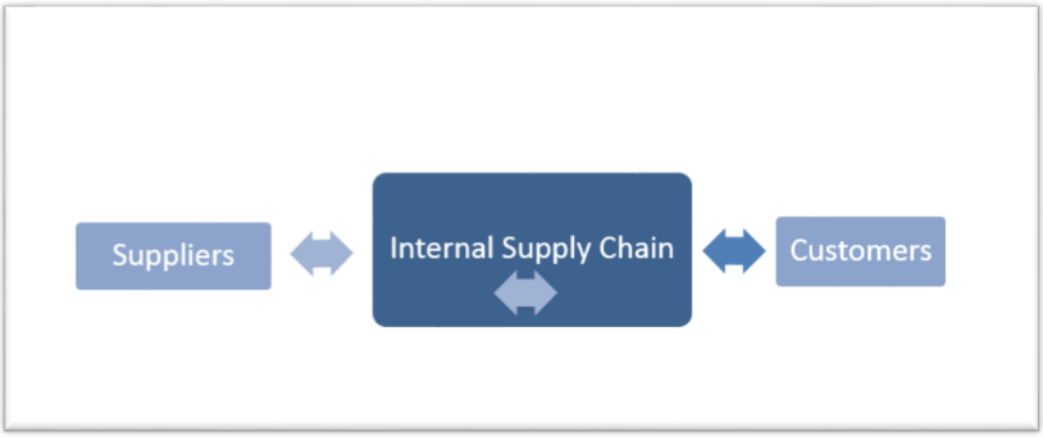
Fig.1Basic Supply Chain Flow of information, money and goods. Own elaboration.



The supply chain of a manufacturing company extends from the extraction of raw materials from supplier, the transformation to a final product to the end costumer. Along this chain, materials, information and capital flow upstream, and downstream the supply chain. This show that goods flow and the supply chain starts with resources to combine several value adding activities and finish with the transfer of finished goods to the customer (Naslund, 2010).

The management of the supply chain incorporates logistics into the strategic decision of the business. Its first objective is to integrate and manage the sourcing, flow, and control of materials using a total system perspective across multiple functions and multiple tiers of suppliers, a relationship/link between buyer and suppliers, Fig.2, (Monczka, Trent, & Handfield, 1998). It is also seen as an integrative philosophy to manage the total flow of a distribution channel from supplier to the ultimate user (Cooper, 1997). Supply Chain Management as a strategy, encompasses the planning and management of all activities involved in sourcing and procurement, and all logistic management activities (Council of Supply Chain Management Professionals, 2014).

Fig 2 Illustration of a company´s supply chain, own elaboration, 2016.



The process perspective of supply chain management is critical to supply chain efficiency, understanding and improving activities involved in supply chain management, cross-functional and interorganizational linkages, sharing information, sustainability and related issues (Miksen, 2016). On the other side, supply chain as governance considers the fundamental nature of the organization regarding what we do ourselves versus what we outsource, how we treat others in the supply chain in terms of relationship issues, and who controls various aspects of supply chain (Ellram & Cooper, 2014).

For this report, I addressed the concepts of efficiency and effectiveness, where efficiency is a cost-related advantage, while effectiveness is an advantage of customer-responsiveness within supply chain management research. (Walter, 2001). Supply chain efficiency is defined as the processes of a company that are harnessing resources in the best way possible, resources such as financial, human, technological or physical. For example, when a company minimizes costs for materials, services, among others.

The efficiency of the supply chain is what happens within the supply chain system, when we can get products at the lowest cost, when we can coordinate with others in our supply chain for extended manufacturing processes. On the other side, supply chain

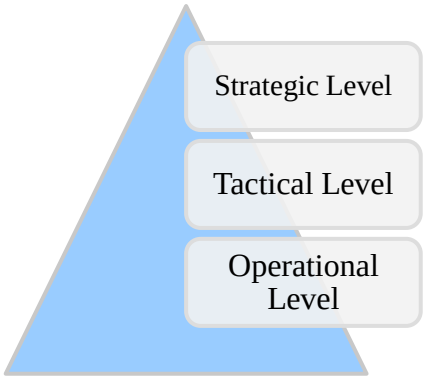
effectiveness is related with organizational effectiveness, defined as an external standard of how well an organization is meeting the demands of the various groups (customers, suppliers, vendors, among others) and organizations that are concerned with its activities (Shtemberg, 2016). The effectiveness of the supply chain can be seen from outside the company. Customers look to get the right product at the right time, stakeholders look for revenue, vendors and others on how well to solve problems. Figure 3 shows the activities of supply chain management which can be classified into three hierarchical levels, such as strategic, tactical and operational level.

The **Strategic level** of management involves long term decision making and determines the objective of the supply chain and prepares the resources to achieve it, such as quantity of materials to be ordered in line with production, manufacturing capacity, frequency of order batching, inventory levels, among others (Stadtler& Kilget, 2008).

At the top level of the hierarchy are involved financial managers (see figure N° 3), location managers, etc. The objective is to get the right quantity of resources available in the right time in a cost-effective manner. In the middle, **the tactical level** of management deals with medium-term decisions of the supply chain to ensure the effective and efficient utilization of the resources from the strategic level decisions. It is linked to logistics performance, the aim of these is to improve benefits and reduce costs such as storage, demurrage, electricity, gas, among others. And at the bottom, **the operational level** of management deals with short term decisions of the supply chain to implement the operations and tasks daily with the objective of order fulfillment. It executes the supply chain strategy. The operational activities are related to production, purchasing costs, and lead-times (Murray, 2016).

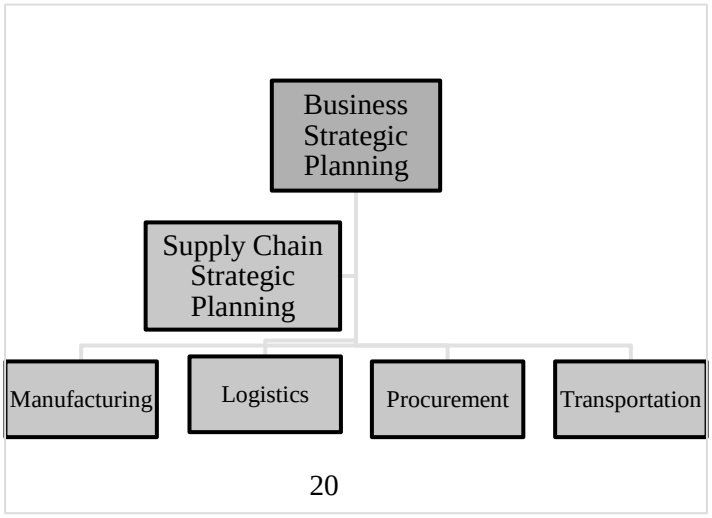
The supply chain management hierarchy deals with strategies of order batching or distribution and communicates them to the tactical and operational levels for efficient implementation.

Fig. 3, Hierarchical Levels of Supply Chain Management, Murray (2016).



The planning framework starts with the business strategic planning process. The goals and objectives developed at the business unit level establish requirements and define capabilities that the supply chain organization must provide to support business objectives. Fig 4 shows supply chain functions of strategic planning such as manufacturing, logistics, customer service, inventory, transportation and procurement (Murray, 2016).

Figure 4, Planning Framework, Murray (2016).



The business strategy is the direction that an organization wishes to go, and the supply chain strategy can be the enabler of the business strategy, it defines the connection and combination of activities and functions through the value chain, to meet a specific supply chain objective. A **supply chain strategy** defines how the supply chain should operate to compete. The proper alignment of the supply chain with business strategy is essential to ensure a high level of business performance (Porter ,1980).

"The supply chain strategy considers all the elements of operations strategy, in addition to building strategic partnerships, in sourcing and outsourcing, drives of supply chain performance, synchronization, integration of suppliers, internal supply chains, and customer systems, breadth of activities (designing, planning, and controlling), reverse logistics, product sustainability, regulatory compliance, and global considerations." (APICS Operations Management Body of Knowledge (OMBOK) Framework, 2011).

According with Sussan Happek, UPS Supply Chain Solution principal, there are four steps into developing a supply chain strategy. 1) *understand the business strategy*, how the company chooses to compete regarding their core competencies, focus and means of differentiation (for example: low cost or differentiation), 2) *asses the extended supply chain*, evaluating the organization´s assets and evaluate how well they support your strategy, 3) *develop an implementation plan*, consider activities, tasks, responsibilities and performance metrics, 4) *develop considerations*, cooperating and collaborating with supply chain partners, and evaluate opportunities to outsource areas that are not the company´s core competencies. (Happek, 2005).

Hernán David Perez, the developer of the Supply Chain Roadmap method, states that there are four elements in a supply chain strategy: a) the industry framework, b) the organization´s unique value proposition, c) its supply chain processes (internal), d) managerial focus (Perez, 2012).

The objective of working on a supply chain strategy is to improve customer satisfaction enhancing value added to the products, to minimize costs and resources needed while working on efficiency and effectiveness. Also, inventory control to reduce costs and increase profits (Mosavi & Ghaedi, 2012).

The success of a supply chain strategy depends on the ability of the company to fully execute it. The implementation of the supply chain strategy involves following the implementation plan and applying good project governance. Therefore, the company needs to work on performance management to see if they can achieve their strategy; on a periodic basis evaluate their supply chain strategy and adjust it according the current needs and resources; and finally keep communicating with your partners internally and externally to avoid misalignment and poor efficiencies. (Apics Supply Chain Council, 2016).

Successful companies work hard to get an efficient and effective supply chain, working on process improvements and on the needs of its customers and stakeholders.

“A planning framework helps managers to organize all major supply chain functions and activities to ensure their planning activities results lead to better business decisions from the long term down to day-to-day operations. Frameworks provide methodologies for organizing and managing critical activities such as supply chain strategic planning and project selection, integrated manufacturing and production planning, performance measurement and customer logistics and inventory deployment. Also, it is required for

individual supply chain functions such as transportation, manufacturing and logistics". (Miller & Liberatore, 2016)

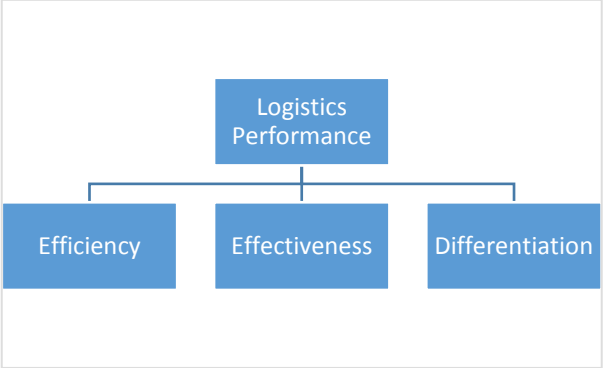
The development of information technology allows organizations to implement and optimize supply chain management, improving adaptability and competitiveness. The e-commerce environment provides several advantages for supply chain management, such as contributing to the management of customer relationship, improving efficiency, reducing intermediaries and operating/purchase costs. But most importantly improving operating performance of the enterprise (Yang, 2012).

The increasing interest in supply chain management for organizations is related with having effective supply chains to successfully compete in the global market economy. (Lambert, 2008). Another reason is regarding its benefits including improvement in return of investment and return of assets, achieving greater profitability by adding value and creating efficiencies to increase customer satisfaction. (Stock & Boyer, 2009). In order to achieve the desired customer satisfaction and minimizing costs, companies must examine and adopt supply chain management processes (Thomas, 2012).

The importance and complexity of logistics performance measurement has led to the development of numerous performance measurement frameworks and models. Literature provides frameworks that serve as a point of reference to understand supply chain management. The frameworks analyzed include the conceptual model by Mentzer, and SCOR model. Fig 5, illustrates the conceptual model of Mentzer (2001), which explains the elements that flow upstream and downstream of the supply chain. Also, describes an integrative relationship with coordination of traditional business functions and between supply chain partners from suppliers 'supplier to the end costumer.

Logistics function must also provide value added services to its customer to differentiate companies in the market today. This can be achieved through measuring the performance of logistics, which has become a high priority for the organizations nowadays. (Fig.7), shows the concept of simultaneous pursuit of efficiency, effectiveness and differentiation as part of the new model of logistics performance. Traditional logistics performance could only achieve one or the other, but not all at once. Value can be created through customer service elements such as product availability, timeliness and order fulfillment with the aim to differentiate from competitors (Fugate, Mentzer, & Stank, 2010).

Fig. 7, Model for Logistics Performance, Fugate (2010).



Similarly, other performance measurement systems analyze logistic performance through efficiency, flexibility, responsiveness and quality, which collect specific information about the industry (Bowersox & Closs, 1996).

Another more complex performance measurement system analyzes the relationship between logistic performance and financial performance of the company, where logistics performance is associated with efficiency and consistent operations, including costs efficiency and high productivity of fixed assets (Töyli, 2008).

The efficiency key performance indicator on production and distribution cost can be explained by the Transaction Cost Theory, to expand or source out activities to the external environment. If a company is able to perform its activities at lower internal transaction costs than it performed in the market, then the company will grow, but if the cost is higher than the external transaction costs, the company will be downsized (Coase, 1984). To measure the effectiveness of a company, the strategic level will include the aspects of the effectiveness that are the most important to the business. A logistics department would probably want to measure it on-time deliveries, operating costs, supply variability and performance to plan (Davies, 2015).

The Theory of Constraints or TOC indicates that limitations complicate the way to reach maximization of profits when focusing on their own strategy (Goldratt,1990). The traditional approach will only cause inventory excess or production interruption continuously, the phenomenon of successive mistakes in the information of the demand, it is known as a Bullwhip Effect (Lee,1997). Collaboration initiatives will result in better supply chain income, focusing on global gain and promoting fair gain distribution among supply chain partners.

Performance measurement can be defined as the process of quantifying the efficiency and effectiveness of action (Wood, Byron & Neely, 2015). Supply chain metrics help to measure and understand how a company is operating over a given period. And it is important to focus on the key metrics of each area (procurement, production, distribution, warehousing, inventory, transportation, among others). Key performance indicators are used when measuring the effectiveness and costs of the supply chain, and requires to set up and monitor the right key performance indicators to give visibility of cross functional

activities and individual components, to see its contribution towards the overall supply chain performance (O´Byrne, 2013). These performance indicators must be tied to the strategic goals and objectives, and must answer the most critical business questions. Key Performance Indicators allow to track the results of the improvement efforts, and allows for industry benchmarking (Advance Performance Institute, 2016).

These metrics monitor the cost, value, service and waste on a supply chain. The most commonly used key performance indicators are 1) total delivered cost, to determine overall profitability for a company; 2) customer service, to measure on-time full delivery, 3) supply variability, to measure the status of inventory against lead times and promise dates; 4) demand variability, to measure forecast accuracy; 5) operating costs, measures all costs involved within the company; 6) Inventory (Davies et al, 2015).

Supply chain management in the process industry is important to gain competitive advantage (Sillanpää, 2014). A planning framework through strategic, tactical and operational level makes a solid supply chain and helps them to organize all major supply chain functions and activities where performance measurement plays a key role to achieve efficiency and effectiveness of the supply chain. The supply chain management activities and problems found addressed in this Internship Report will cover the decision making in all the three level of management.

Chapter II

Methodology

The analysis of this research is based on secondary data, including online databases, digital libraries, books, journals, conference papers, etc. Evolutionary timeline and future trends were developed based on the analysis of literature.

For the supply chain management analysis of the company all Standard Operations Procedures were reviewed, internal existing reports such as Shipment Tracking, Cargo Arrival Report, Cost Summary from Damco, Opex Booking Report, Monthly cost report of imports. Then these were compared against the objectives of the department and the information needed to comply and measure those objectives.

2. S.W.O. T Analysis

The analysis of strengths, weakness, opportunities and threats of the company is based on primary and secondary data. Descriptive information used is taken from the company annual report, online research and primary data from inside the company.

2.1 Internal Analysis

2.1.1 Strengths

The internal analysis of the company has shown that the strengths of the company are its well -known brands around the world, an advantage that will open doors into this new markets. The organization´s unique selling proposition is to offer containers with the lowest cost of ownership for the customer, given to an efficient design that allows lowest energy consumption on the market. Being part of the group means they have the "know how" of the business, because they own another factory in Qingdao. Also, they only work with suppliers who are reliable and are familiar with their complex supply chain, such as Damco and Contopsa. (Maersk Container Industry,2016).

2.1.2 Weaknesses

On the other side, their weaknesses are related to the lack of local supplier to meet their requirements, relaying primarily on imports. Most of their raw material suppliers are located mainly in China. Moreover, location is the big issue for cutting down costs when importing means paying for ocean freight/air freight, custom clearance, trucking, demurrage of containers (lack of space in their warehouses, makes it hard for them to return empty containers on a short period), storage, among others.

Another critical issue is single sourcing of critical items that are only manufactured in China, taking on unnecessary risk depending on a single source for supply such as; failures at the supplier, and greater supplier power. For example, decals are high priority when

producing containers because it is the last part before delivered, and lead-time is always longer than expected due to external factors. Only one supplier from Shenzhen, China produces all the sets needed. This single sourcing is not helping to control inventory and costs. If this only supplier goes bankruptcy or natural disasters destroy their factory, there will be no back up plan to finish the order.

In February 2016, supply problems at MCIS resulted in the temporary, two weeks' shutdown of the Chinese New Year, in China. The source of the supply problem was a delayed of the Design Department to approve the design of the decals. Those two-week delay cost thousands of dollars on containers stacking and going behind schedule with the customer because they could not meet delivery time. Single sourcing, imported supplies, among other issues are increasing cost and making fluctuating profit margins a concern.

Another critical issue that represents a weakness for the company is the unexperienced and unqualified work force the company now employs. The factory is far from their goal of producing 40 containers a day, producing only an average of 25. High costs of gas and electricity are divided into those 25 containers a day. The factory produces the most expensive containers in comparison with the factory in Qingdao. All this costs are then absorbed for the company, affecting the ROI.

2.2 External Analysis

2.2.1 Opportunities

The external analysis shows that the opportunities are promising, since South America relays primarily on exports, and business sector is expanding, with future opportunities for success. The changes in technology allow now to offer a good value proposition to its customer, high quality, low energy consumption, and a low total cost of ownership, which will traduce into a better price for the customer. Markets are changing and are now more complex and demand better technology to export fresh food, a high-priority commodity for the carriers.

The competition among the global liner carriers to transport food items seems fiercer than ever, including on Latin America, the world´s biggest reefer market. Companies like Maersk Line and CMA CGM are investing in renewing and growing its combine reefer fleet. In 2015, Maersk Line purchased 500 containers and in 2016 purchased another 1250 reefer container. The carriers look set to place more orders in the years to come. The global fleet of reefer container vessels will grow by 20 percent ahead of 2018, shippers are increasingly relying on reefer container ships when transporting their goods- and continuously growing cargo volumes accelerate this development further. Hence, growing cargo volumes will increase the number of reefer container with high quality, that vessels will need in the future (Andersen, 2016).

2.2.2 Threats

Threats in the environment can affect the company directly, because Maersk Container Industry develops reefer containers that meet the needs of the customer and the end user. However, developments in technology may change this market beyond their ability to adapt. Every change requires large amounts of investment, work force that delivers what is needed to produce high quality and high tech containers. At one point, a small change into the requirements of the carriers will cost the company a lot of money to adapt. Quality standards or specifications for reefer containers are changing every year, the market becomes more complex and specialized. Carriers must renovate their fleet constantly to offer the best technology. A small change in the focus of a large competitor might wipe out any market position they achieve. Singamas Container Holding Ltd has same share of the market as Maersk Container Industry (both have 21% of market share), if this one competitor changes their value proposition that will give them an advantage in the market, their market share will increase and the share of Maersk Container Industry will decrease. However, the weakness that can seriously threaten the business of Maersk Container Industry San Antonio is the lack of experience of the production line. So far, too many rejected reefer containers, slow production, thousands of dollars in scrap are affecting directly on ROI. If reefer containers from Chile get a bad reputation for the worldwide customers, it will affect sales seriously, and eventually cause bad debt or cash flow problems.

S.W.O.T analysis of Maersk Container Industry San Antonio.

Chapter III

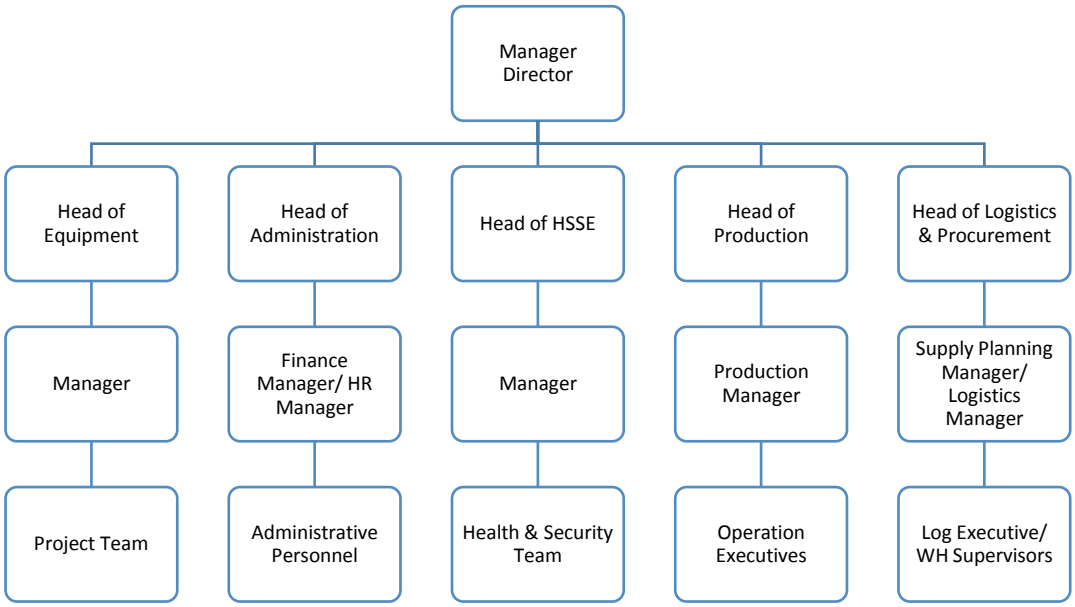
Results

The business strategy of the company is to take over the Latin American market, as the first reefer container factory located in South America. Its main value proposition is to offer container with the lowest total cost of ownership and high technology. Its supply chain strategic planning is to reach an annual production capacity of 25,000 reefer containers a year. Its main supply chain functions of strategic planning are manufacturing, logistics, supply planning, and procurement. Its goal is to cut down costs and improve overall performance of production and logistics, given that these represent the highest costs of the company.

Fig, 1 shows the supply chain hierarchy at top, middle and executive level of decision making. At the strategic level the director of the company is the head of the company, along with strategic managerial team. They are engaged in determining the plant location and networking system so that the right quantity of resources can be available in the right time and on a cost-effective manner. They chose San Antonio because of its location close to the port, and because it is the main port for all type of cargo. When they started building the factory they imported machinery and robots in large quantities to assemble each part of the production line. At this level, all complex decision making was made, such as to agree on global rates for ocean freight with worldwide carriers, negotiating with their partners in other subsidiaries and then instruct the middle level to implement and control the compliance of the agreements. At the middle or tactical level, we find the managers of each department, such as Production Manager, Logistics Manager, Quality Manager, and

Purchasing Manager. They schedule the strategy of the top level, short term decisions such as weekly demand forecasts, production planning activities, among others. As a sublevel of managers, we find production planner, material planners, and transport supervisors to control that suppliers provide what is necessary to manufacture containers. At the executive or operational level, we find the personnel who is concerned with the ultimate execution of the supply chain strategy at the floor level. The activities in here are carried out daily to comply with order fulfillment. Here we find logistics executive such as overseas coordinators, transport coordinators, and yard personnel; also, warehouse supervisors.

Supply Chain Strategic Planning chart. Top Level,2016, own source.



The efficiency and effectiveness of the supply chain management is measured with Key Performance Indicators. Each level is measured differently regarding the level of decisions they made. The top or strategic level is evaluated in terms of results, for example their key performance indicators (KPI) are related with returned of investment, and returned of

assets. The KPI of the middle or tactical level are related with safety stock level, manufacturing costs over sales value, among others. But the executive or operational level is measured in terms of the execution of the strategy, their KPIs are related to order fulfillment, open orders, logistics costs (origin and destinations costs from supplier's warehouse to the company´s storage).

The attributes measured for the company are supply chain costs, supply chain responsiveness, supply chain asset management efficiency, and supply chain reliability.

The supply chain costs are very critical for the Logistics and Supply Planning department. The total delivered cost indicator helps to determine overall profitability of the company. This is a high-level metric that shows operating costs, demand and supply variability and inventory. It shows how much the goods cost and how long it takes for a product to pass through the supply chain. This is related with the decisions involved within the strategic level of the hierarchy but executed within the operational level. The supply chain cost data is taken from the cost reports from Logistics Department, and is primarily driven by import costs. From these reports, we can find international and national freight costs, insurance costs, rental of equipment and stacker, demurrage and storage costs.

Other such as human resources cost, electricity consumption, water and gas are taken from Indirect Procurement reports. The supply chain responsiveness attribute is related with the tactical level of the hierarchy, because they follow the instructions of the strategic level, and push their team to fulfill it. In here, they set up order fulfillment lead times, indicating to the supplier when cargo is needed and when to start producing. Supply chain reliability, is directly related with Logistics department, measures the performance of the supply chain

when suppliers deliver the goods. Indicators such as the correct products (approved by quality inspection), to the correct place (right warehouse), at the correct time (must meet buyer´s request delivery date), with the correct quantity (must match the invoice with the purchase order), and with the right documentation (must include original shipping documents, certificate of origin, and quality certificate). The workbooks they use and the reports of the M3 System allow the control team to measure this indicator. For example, number of shipments without original documents, or without certificate of origin (mandatory documents). For "correct time" indicator, the criteria used is to show the total number of purchase orders delayed, which means that have not met the request delivery date, because its lower status is under 75 (Status 75 means the material is received and the purchase order is closed). Finally, the supply chain asset management efficiency ratio is related with the top level of the strategy or strategic level, and it is related with cash to cash cycle time, inventory days of supply and asset return. It is measured internally by the top level and their headquarters in Tinglev.

There are other KPI´s reported to the Logistics Department but are related with ocean freight operations, and is held by Damco in China. It measures booking timeliness, vendor compliance of orders, booking confirmation timeliness, document dispatch timeliness, documentation accuracy, container utilization, and invoice accuracy among others.

Conclusion

A company must have a supply chain strategy to achieve supply chain efficiency and effectiveness. Companies work hard and use a lot of resources to gain an advantage over competitors, but most importantly to add value to the customer. Supply chain management is key for assessing supply chain effectiveness through control over speed, reliability, cost and consumer satisfaction, but also the efficient use of resources. To provide competitive and cost-effective goods and services, performance of the whole supply chain must be measured continuously. The process perspective provides insights on how can supply chain activities be linked and integrated for improved performance.

The company governance shows that functions on each level of hierarchy are well distributed and all departments must work together to reach a common goal. The analysis of the Supply Chain Management of Maersk Container Industry shows that Supply Chain Performance Measurement has been implemented, and departments started to work together with the same goal of achieving Supply Chain Efficiency and Effectiveness. A key performance Indicator´s monthly report is implemented to benchmark the performance of the company against the market. The common goal now is to get cost effective, and improve profits.

Discussion

Most of the problems found were related with information sharing, and the lack of unification of channels of information. Between Damco and the Logistics Department, there were at least four different reports with different information, but when we had to measure performance of suppliers it was difficult to track it down because these reports were incomplete. So, first as a department we discussed and identified which information was relevant to set objectives and measure performance in the future. After, we discussed with Damco about how they should share information with our department, and asked them to provide valuable information at on a fixed format so we make sure we get exactly what we need. Also, we realized that their reports from the platform online were not reliable or does not meet the needs of the logistics department.

The second problem found was related with how to manage data of demurrage costs and storage. It took us longer to fix it because it was too much information to handle at one, because it required discipline from the department to assess the goal of efficiency. There were no historical data about containers from which they had to pay demurrage, if there were invoices unpaid or missing. During the 2015 the company received over 100 container units that were not under Maersk Line agreement, and did not have free days so these had to be returned immediately, but it was impossible to do so, a month, around 95% of them paid demurrage. There was no way to report with detail, the only way to fix it was to start over.

The company pays demurrage to at least 7 different service providers such as Hoyer, Ultramar, Maersk Line, Orion, among others, so using the supply chain management software of the company we export excel sheets with a summary of purchase orders per supplier, and then list them down with all the invoices related per shipment. Each invoice detailed the number of the container and number of days of demurrage charged. Once the workbook was finished, we used a pivot table to summarize how much money we have paid per container during the year. The total of the purchase order was not enough, we needed a detail per container so we could control that all charges were made properly, and to cross information with the Shipment Tracking and control that all containers arrived were included into the list of containers that paid demurrage. So, we were not paying than we should have had, it must be exact.

The biggest problem was then visibility of the information through the supply chain. Missing information was not helping the decision-making process to achieve cost reduction goals. To identify constraints, we needed to see the whole scenario. At the beginning of this internship there was a lack of synchronization within the parties involved and the information sharing, since the focus was on the individual departments instead of the complete supply chain. When key performance indicators were implemented, all departments started to work together and unified the information required to show the real status of the company to improve performance of the departments. It is key to manage the supply chain effectively, to be organized and keep all information updated with valuable data to measure performance and to plan the activities in advance.

References

1. Advance Performance Indicator, (2016), What is a Key Performance Indicator (KPI)?. Retrieved September, 2016 from: https://goo.gl/WXQP7r

2. Apics Supply Chain Strategy Executive Summary, (2011). Retrieved September, 2016 from: https://goo.gl/cVbgmB

3. Beamon B. (1998). Supply Chain Design and Analysis: Models and Methods. Retrieved March 3, 2016, from http://nubr.co/WHbv3s

4. Bowersox D.J., Closs, D.J. (1996). Logistical Management: The Integrated Supply Chain Process. New York. McGraw-Hill Companies. Retrieved August, 2016 http://goo.gl/544PYw

5. Coase R. (1984). The New Institutional Economics. Zeitschrift Für Die Gesamte Staatswissenschaft / Journal of Institutional and Theoretical Economics, 140(1), 229-231. Retrieved August, 2016, from http://www.jstor.org/stable/40750690I

6. Cooper M, Lambert D. & Pagh J., (1997) "Supply Chain Management: More Than a New Name for Logistics ", The International Journal of Logistics Management, Vol. 8 Iss: 1, pp.1 – 14. Retrieved September, 2016 from: https://goo.gl/ZCM8ZU

7. CSCMP; Haozhe, C; Clifford D.; Gibson, B.; Hanna0, J. (2014). United States: Definitive Guide to Integrated Supply Chain Management, The: Optimize the Interaction between Supply Chain Processes, Tools, and Technologies. Retrieved from http://nubr.co/5Qa1Oe

8. Davies S. (2015), 7 critical KPIs for the best supply chain management process. Retrieved August, 2016 from: https://goo.gl/TFihMg

9. Ellram M. & Cooper M. (2014). Supply Chain Management: It's All About the Journey, Not the Destination. Journal of Supply Chain Management, 50: 8–20. Retrieved August, 2016, from https://goo.gl/3rWTjQ

10. Goldratt, Eliyahu M. What is this thing called Theory Of Constraints and how should it be implemented?. Retrieved August, 2016, from http://goo.gl/mhMyqc.

11. Fugate B.S., Mentzer, J.T. and Stank, T.P. (2010), "Logistics performance: efficiency, effectiveness, and differentiation", Journal of Business Logistics, Vol. 31 No. 1, pp. 43-62. Retrieved from , http://goo.gl/otZGRN

12. Happek S. (2005), Supply Chain Strategy: The Importance of Aligning Your Strategies. Retrieved September, 2016 from: https://goo.gl/vKCQ2p

13. Habib M. (2011). Supply Chain Management (SCM): Theory and Evolution, Supply Chain Management -Applications and Simulations, Prof. Dr. Md. Mamun Habib (Ed.), ISBN: 978-953-307-250-0, retrieved August 2016, from http://goo.gl/h0E3sE

14. Lambert D. (2008). An Executive Summay of Supply Chain Management: Processes, Partnerships, Performance. Retrieved August, 2016 from: https://goo.gl/7ECJ5C

15. Lee H. L.; Padmanabhan, V. and Whang, S. (1997), The Bullwhip Effect in Supply Chains, Sloan Management Review, Cambridge, Spring, pp.93-102. Retrieved August, 2016, from http://goo.gl/I22jRq

16. Maersk Container Industry (2016), ReeferMachines. Retrieved June, 2016 from: https://goo.gl/PekrWG

17. Maersk Container Industry (2016), Company Profile. Retrieved June, 2016 from: https://goo.gl/quy96g

18. Mentzer J., DeWitt W. , Keebler J. , Min S. , Nancy W. Nix D. Smith C., (2001). Defining Supplychain Management, Journal Of Business Logistics, Vol.22, No. 2, 2001, Retrieved March 3, 2016, from http://nubr.co/2q20YN

19. Miksen C. (2016) What Is the Difference Between Efficiency and Effectiveness in Business?. Retrieved October,2016 from: https://goo.gl/zsqzT8

20. Miller T. & Liberatore M. (2013) Framework Makes a Solid Supply Chain, retrieved August, 2016 from: https://goo.gl/wLRCdZ

21. Mosavi S. and M. Ghaedi. (2012) .A survey on the relationships between customer satisfaction, image, trust and customer advocacy behavior, African Journal of Business Management, 6: 2897-2910. Retrieved August 2016, from http://goo.gl/rDS5E3

22. Monczka R., Trent R., & Handfield R. (1998). Purchasing and Supply Chain Management. Cincinnati. Retrieved June, 2016 from: https://goo.gl/p8FUJ1

23. Murray M. (2016). Introduction to Supply Chain Management. Retrieved August, 2016, from http://goo.gl/eGPdz3

24. Naslud D. (2010) Sweden. What is Management in Supply Chain Management? - A Critical Review of Definitions, Frameworks and Terminology. Journal of Management Policy and Practice vol. 11(4). Retrieved July 20, 2016, from http://goo.gl/bBgBjX

25. O´Byrne R. (2013), KPI Key Performance Indicators in Supply Chain & Logistics. Retrieved August, 2016 from: https://goo.gl/K2PnLP

26. Perez D. (2012) Supply chain strategies: Which one hits the mark?. Retrieved from September, 2016 from: https://goo.gl/9q849

27. Porter M. (1980) Competitive Strategy. Retrieved October, 2016 from: https://goo.gl/lS0PYH

28. Silanpää I. (2014), Implementing supply chain strategy, retrieved, 2016 from: https://goo.gl/CvGlD1

29. Shtemberg D. (2016). Supply Chain Efficiency vs. Effectiveness. Retrieved October, 2016 from: https://goo.gl/xJqx4S

30. Statler H. & Kilget C.(2008) Supply Chain Management and Advanced Planning, Retrieved September, 2016 from: https://goo.gl/YfQUSi

31. Stock, J.R., Boyer, S.L. & Harmon, T. J. (2010), Research Opportunities In Supply Chain Management. Retrieved August, 2016 from: https://goo.gl/x03z2E

32. Thomas K. (2012). Supply chain segmentation: 10 steps to greater profits. RetrievedAugust, 2016 from: https://goo.gl/9YVt01

33. Töyli J., Häkkinen L., Ojala L. & Naula, T. (2008). Logistics and financial performance: An analysis of 424 Finnish small and medium-sized enterprises.International Journal of Physical Distribution & Logistics Management 38: 57-80. Retrieved August, 2016, from http://goo.gl/OIzUej

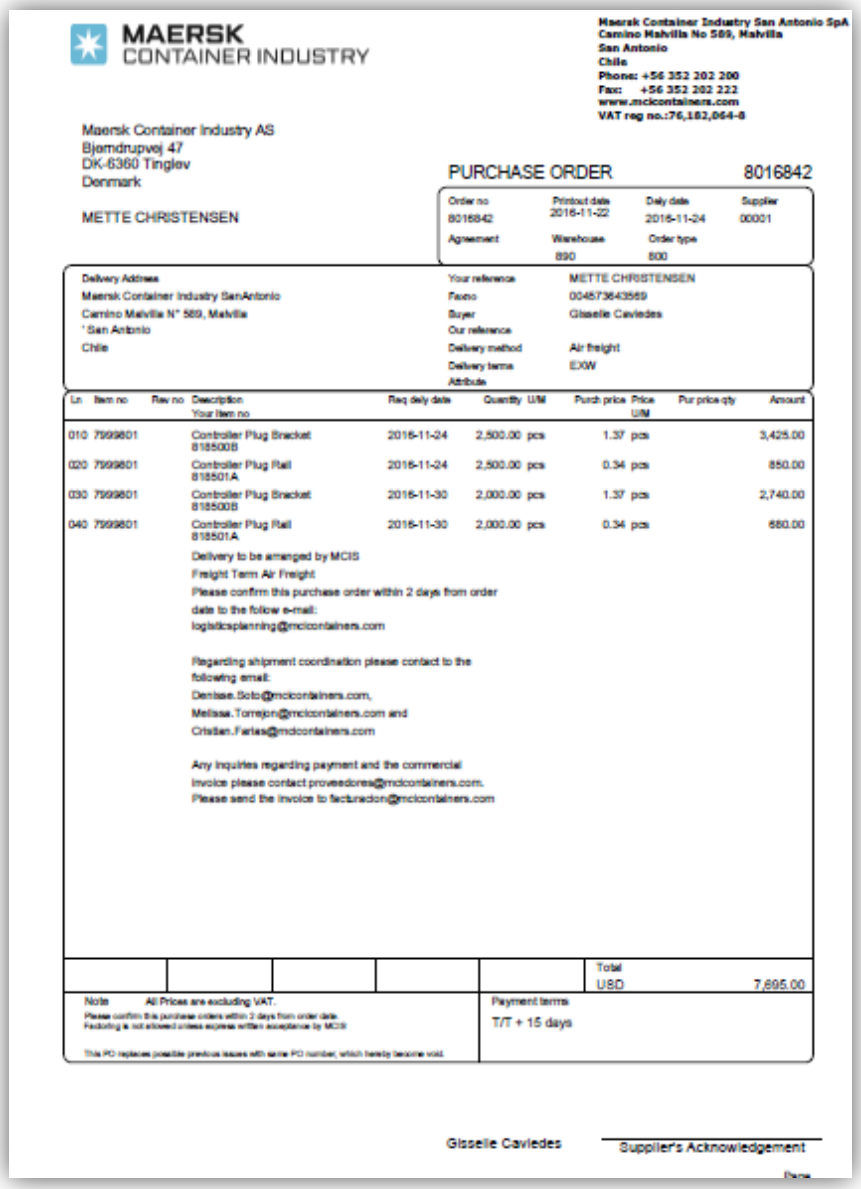
34. Wood J., Byron J., & Neely S. (2015) Supply chain management:Global business and human rights developments and effective supply chain due diligence. Retrieved October, 2016 from: https://goo.gl/EFYi8G

35. Yang C. (2012). Assessing the moderating effect of innovation capability on the relationship between logistic service capability and firm performance for ocean freight forwards.International Journal of Logistics: Research and applications 15:53-69. Retrieved August, 2016, from http://goo.gl/s7V2s9

Appendix

Appendix N° 1:

Purchase Order from Supply Planning Department to a Supplier of raw materials



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METTE CHRISTENSEN

PURCHASE ORDER 8016842

Order no	Printout date	Dely date	Supplier
8016842	2016-11-22	2016-11-24	00001
Agreement	Warehouse	Order type	
	890	800	

Delivery Address
Maersk Container Industry SanAntonio
Camino Malvilla N° 589, Malvilla
' San Antonio
Chile

Your reference METTE CHRISTENSEN
Faxno 004573643569
Buyer Gisselle Caviedes
Our reference
Delivery method Air freight
Delivery terms EXW
Attribute

Ln	Item no	Rev no	Description Your item no	Req dely date	Quantity	U/M	Purch price	Price U/M	Pur price qty	Amount
010	7999801		Controller Plug Bracket 818500B	2016-11-24	2,500.00	pcs	1.37	pcs		3,425.00
020	7999801		Controller Plug Rail 818501A	2016-11-24	2,500.00	pcs	0.34	pcs		850.00
030	7999801		Controller Plug Bracket 818500B	2016-11-30	2,000.00	pcs	1.37	pcs		2,740.00
040	7999801		Controller Plug Rail 818501A	2016-11-30	2,000.00	pcs	0.34	pcs		680.00

Delivery to be arranged by MCIS
Freight Term Air Freight
Please confirm this purchase order within 2 days from order date to the follow e-mail:
logisticsplanning@mcicontainers.com

Regarding shipment coordination please contact to the following email:
Denisse.Soto@mcicontainers.com,
Melissa.Torrejon@mcicontainers.com and
Cristian.Farias@mcicontainers.com

Any inquiries regarding payment and the commercial invoice please contact proveedores@mcicontainers.com.
Please send the invoice to facturacion@mcicontainers.com

Total USD 7,695.00

Note All Prices are excluding VAT.
Please confirm this purchase orders within 2 days from order date.
Packing is not allowed unless express written acceptance by MCIS

This PO replaces possible previous issues with same PO number, which hereby become void.

Payment terms
T/T + 15 days

Gisselle Caviedes

Supplier's Acknowledgement

Appendix N° 2:

A request of quotation for airfreight sent to Freight Forwarders

COTIZACIÓN FLETE AÉREO

Solicitante	**MAERSK CONTAINER INDUSTRY SAN ANTONIO**
RUT	**76.182.064-8**
Contacto	**Melissa Torrejón Oñate/ Overseas Coordinator**
Correo	**melissa.torrejon@mcicontainers.com**
Fono	**56 9 42831996**

Fecha	jueves, 24 de noviembre de 2016
Referencia	NEW CENTURY 15.2A/37A
PO INTERNA	6101970-6101359

	DETALLE DE LA CARGA A COTIZAR
Origen	NEW CENTURY DECALS Add:1-2/F.,No.10 Bldg.,Heng Chang Rong Hi-tech Park., Yangbei Ind. Estate Bao An, ShenZhen, P.R.C. 518128 Tel: +86 755 8606 3716
Destino	SANTIAGO, SCL
Incoterm	FCA
Producto	DECALS
Tipo Carga	GENERAL
Gross Weight	**0,00 kgs**
Measures	PO 6101970, BEACON for CMA CGM, 4 pallets 110cmX 110cmX 122cm, 512kgs 120cmX 114cmX 104cm, 613kgs 128cmX 114cmX 80cm, 458kgs 145cmX 114cmX 104cm, 748kgs PO 6101359, Serial number, 3 cartons 90cm x 57cm x 15cm , 50kgs x 3cartons
N° Packages	4 PALLETS, 3 CARTONS.

Proveedor	
Contacto	
Teléfono	

Ruta Aérea	
Tiempo de Entrega	

Servicio Aéreo	**$ USD**
USD Rate/kg	
Chargeable Weight	
Airfreight	
Fuel	
Security	
Otros	

Origin Charges	**$ USD**
REF:	**4 PALLETS, 3 CARTONS.**
Pick Up	
Handling	
THC	
X-RAY	
Customs	
Otros	

Destination Charges	**$ USD**
AWB	
Handling	
Otros	

TOTAL	**$ USD**
Servicio Aéreo	$ -
Origin Charges	$ -
Destination Charges	0,00 +VAT

Importante
Tiempo de Respuesta 24hrs
Indicar Vencimiento Cotización

Appendix N° 3:

Example of a comparative table, to choose a Freight Forwarder for airfreight.

AIRFREIGHT/OCEAN FREIGHT COST
COMPARATIVE TABLE
ref:

Total Gross Weight	0,00 kgs
Chargeable Weight	0,00 kgs
Measures	
Type	
Origen	
Destination	CHILE

SUPPLIER	VIA	Type	DELIVERY TIME	AIRFREIGHT COST	ORIGIN CHARGES	DESTINATION CHARGES	TOTAL	USD/KG
DAMCO		Puerta-Puerta					$ -	#DIV/0!
KUEHNE NAGEL		Puerta-Puerta					$ -	#DIV/0!
JAS FORWARDING		Puerta-Puerta					$ -	#DIV/0!
GEODIS WILSON		Puerta-Puerta					$ -	#DIV/0!

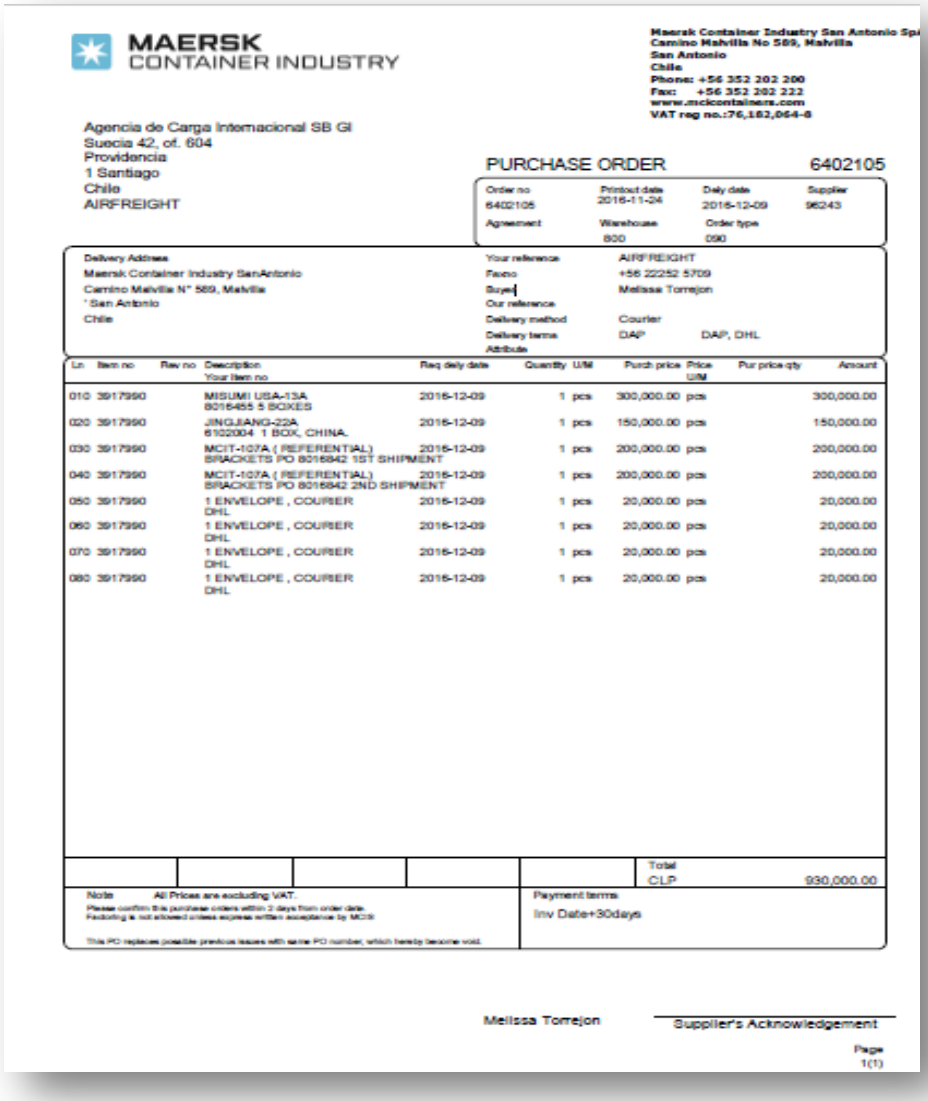
Nota
Cotización incluye: Todos los gastos en origen, flete a destino final, gastos de manejo de documentos.

Flete Nacional	$	121,43
Oversize	$	35,21

DATE

Appendix N° 4:

Example of a Purchase Order for a Freight Forwarder chosen.



MAERSK
CONTAINER INDUSTRY

Maersk Container Industry San Antonio Spa
Camino Melvilla No 589, Melvilla
San Antonio
Chile
Phone: +56 352 202 200
Fax: +56 352 202 222
www.mcicontainers.com
VAT reg no.:76,182,064-6

Agencia de Carga Internacional SB GI
Suecia 42, of. 604
Providencia
1 Santiago
Chile
AIRFREIGHT

PURCHASE ORDER 6402105

Order no	Printout date	Dely date	Supplier
6402105	2016-11-24	2016-12-09	96243
Agreement	Warehouse	Order type	
	800	090	

Delivery Address
Maersk Container Industry SanAntonio
Camino Melvilla N° 589, Melvilla
' San Antonio
Chile

Your reference AIRFREIGHT
Fecno +56 22252 5709
Buyer Melissa Torrejon
Our reference
Delivery method Courier
Delivery terms DAP DAP, DHL
Attibute

Ln	Item no	Rev no	Description Your item no	Req dely date	Quantity	U/M	Purch price	Price U/M	Pur price qty	Amount
010	3917990		MISUMI USA-13A 8016455 5 BOXES	2016-12-09	1	pcs	300,000.00	pcs		300,000.00
020	3917990		JINGJIANG-22A 6102004 1 BOX, CHINA.	2016-12-09	1	pcs	150,000.00	pcs		150,000.00
030	3917990		MCIT-107A (REFERENTIAL) BRACKETS PO 8016842 1ST SHIPMENT	2016-12-09	1	pcs	200,000.00	pcs		200,000.00
040	3917990		MCIT-107A (REFERENTIAL) BRACKETS PO 8016842 2ND SHIPMENT	2016-12-09	1	pcs	200,000.00	pcs		200,000.00
050	3917990		1 ENVELOPE , COURIER DHL	2016-12-09	1	pcs	20,000.00	pcs		20,000.00
060	3917990		1 ENVELOPE , COURIER DHL	2016-12-09	1	pcs	20,000.00	pcs		20,000.00
070	3917990		1 ENVELOPE , COURIER DHL	2016-12-09	1	pcs	20,000.00	pcs		20,000.00
080	3917990		1 ENVELOPE , COURIER DHL	2016-12-09	1	pcs	20,000.00	pcs		20,000.00

Total
CLP 930,000.00

Note All Prices are excluding VAT.
Please confirm this purchase orders within 2 days from order date.
Factoring is not allowed unless express written acceptance by MCIS

This PO replaces possible previous issues with same PO number, which hereby become void.

Payment terms
Inv Date+30days

Melissa Torrejon

Supplier's Acknowledgement

Page
1(1)

Appendix N° 5:

Example of Cargo in Transit Report by Damco.

REPORTE CARGA EN TRANSITO

Reference	Incoterm	PO Number	HBL Number	Booked Origin Serv	Equipment Number	Equipment Size	Equipment Type	Packages	Weight	CBM	Carrier	Port Of Loading	Port Of Discharge	ETD	ETA	Last Vessel
ANHUI-1A	AIR	N/A	0407852SHA	0	08187638585	0	AIR	1	212,00	0,48	QANTAS AIRWAYS I	SHANGHAI	SANTIAGO	19-Nov-16	21-Nov-16	0
CLEMCO-103	EXW	9123897	AAR0028840	CY	MRKU2971903	40	HIGH	20	3.533,60	61,07	MAERSK LINE AS	AARHUS	SAN ANTONIO	17-Nov-16	30-Dec-16	SOROE MAERSK
ADI-12.2	0	6101856	TST0598100	CFS	MRKU2462758	40	HIGH	173	2.076,00	76,12	MAERSK LINE AS	QINGDAO	SAN ANTONIO	16-Nov-16	24-Dec-16	MAERSK GIRONDE
QUNLI-22	FCA Ware	6101838	SGH2510822	CFS	MRKU2001355	40	HIGH	5	4.119,30	2,88	MAERSK LINE AS	SHANGHAI	SAN ANTONIO	14-Nov-16	17-Dec-16	MAERSK GATESHEAD
SSR-23	FCA Ware	6101818	SGH2510820	CFS	MRKU2001355	MS	40	HIGH	36	9.343,00	66,96	MAERSK LINE AS	SHANGHAI	SAN ANTONIO	14-Nov-16	17-Dec-16	MAERSK GATESHEAD
TRIGOLDEN-2	AIR	N/A	0407594SHA	0	8187638014	0	AIR	1	524,00	1,40	QANTAS AIRWAYS I	SHANGHAI	SANTIAGO	13-Nov-16	15-Nov-16	0
MODEMS ML-	0	6101729	KULH008098	CY	MSKU3518832	20	DRY	150	2.092,00	7,38	MAERSK LINE AS	PENANG	SAN ANTONIO	13-Nov-16	31-Dec-16	LAURA MAERSK
YINHAO-21.3	FCA Ware	6101859	TST0597059	CFS	MRKU7419477	20	DRY	44	572,00	17,16	MAERSK LINE AS	QINGDAO	SAN ANTONIO	11-Nov-16	17-Dec-16	MAERSK GATESHEAD
YORK DALY-11	FCA Ware	6101855	TST0597057	CFS	MSKU0946478	40	HIGH	118	542,80	45,90	MAERSK LINE AS	QINGDAO	SAN ANTONIO	11-Nov-16	17-Dec-16	MAERSK GATESHEAD
ADI-12.1	FCA Ware	6101856	TST0597056	CFS	MRKU4326869	MS	40	HIGH	346	4.152,00	152,24	MAERSK LINE AS	QINGDAO	SAN ANTONIO	11-Nov-16	17-Dec-16	MAERSK GATESHEAD
ADI-12.1	FCA Ware	6101856	TST0597056	CFS	MRKU4326869	MS	40	HIGH	346	4.152,00	152,24	MAERSK LINE AS	QINGDAO	SAN ANTONIO	11-Nov-16	17-Dec-16	MAERSK GATESHEAD
TIAN SHUN-10	FCA Ware	6101830	TST0597058	CFS	MRKU7419477	20	DRY	1	540,00	0,80	MAERSK LINE AS	QINGDAO	SAN ANTONIO	11-Nov-16	17-Dec-16	MAERSK GATESHEAD
YAYUAN-15	FCA Ware	6101831	TST0596931	CFS	MRKU7372488	MS	20	DRY	13	51.598,99	13,32	MAERSK LINE AS	QINGDAO	SAN ANTONIO	11-Nov-16	17-Dec-16	MAERSK GATESHEAD
MING CHENG-	0	6101868	TST0597060	CFS	MRKU7419477	20	DRY	1	95,50	0,23	MAERSK LINE AS	QINGDAO	SAN ANTONIO	11-Nov-16	17-Dec-16	MAERSK GATESHEAD
IMPACT GUAR	0	N/A	NYCH002575	CY	MAEU6354694	DX	40	DRY	20	39.890,00	80,00	SEALAND	PHILADELPHIA	SAN ANTONIO	9-Nov-16	2-Dec-16	AOTEA MAERSK
ACL-M27	FCA	9123563	SGH2509158	CFS	SUDU9013820		40	HREF	1	450,00	0,29	VANGUARD LOGIST	SHANGHAI	VALPARAISO	8-Nov-16	8-Dec-16	SANTA URSULA
LUVATA-8	FCA Facto	6101851	SGH2504744	CY	PONU1793537	TG	40	DRY	46	15.020,00	90,80	MAERSK LINE AS	SHANGHAI	SAN ANTONIO	7-Nov-16	11-Dec-16	SAFMARINE MAFADI
LUVATA-7	FCA facto	6101851	SGH2505304	CY	CLHU4585770	MR	40	DRY	69	22.530,00	136,20	MAERSK LINE AS	SHANGHAI	SAN ANTONIO	7-Nov-16	11-Dec-16	SAFMARINE MAFADI
LUVATA-7.1/8	FCA facto	6101851	SGH2505245	CY	CLHU4511058	MR	40	DRY	92	30.040,00	181,60	MAERSK LINE AS	SHANGHAI	SAN ANTONIO	7-Nov-16	11-Dec-16	SAFMARINE MAFADI
LODAM-29 / L	FCA Facto	6101770 / 6101871	BKK0857286	CY	MSKU6537899 / M		40	DRY	46	15.100,00	81,70	DAMCO INTERNATI	LAEM CHABAN	SAN ANTONIO	1-Nov-16	3-Dec-16	SAFMARINE MAKUTU
OCEANSHINE-	FCA Ware	6101834	YAT5929894	CFS	SEGU5805877		40	HIGH	1	114,00	0,15	VANGUARD LOGIST	YANTIAN	VALPARAISO	31-Oct-16	6-Dec-16	NYK LIBRA
PKT-4.1	EXW	6850740	HAM0043297	CY	MRKU0057015		40	DRY	12	8.810,00	13,44	MAERSK LINE AS	BREMERHAVEN	SAN ANTONIO	5-Nov-16	9-Dec-16	CHASTINE MAERSK
VIGOUR-14	A Warehou	6101810	NPO0690468	CY	MSKU3115101	20	DRY	84	549,00	13,97	MAERSK LINE AS	NINGBO	SAN ANTONIO	31-Oct-16	3-Dec-16	SAFMARINE MAKUTU

Appendix N° 6:

Example of Airfreight Cost Report

PO Numbe	MCIS ID	TYPE	POL	Request Deliver	Carri	Type	Weight K	Confirmed Departur	Confirme d Arriv	MON	Delive ry	FFW	AIRFREIGHT COST USD	AWB+HANDLI NG USD	TOTAL FFWW	TRUCKING	TOTAL TRUCKING	N° Tru	TOTAL
6101479	MING CHENG-2A	OPEX	QINGDAO	31-Dec-15	DHL	1 BAG	40,00	4-Jan-16	7-Jan-16	JAN	EXW	DHL	$ 512,13		$ 512,13	DHL	$ -	0	$ 512,13
6101457	VIGOUR-9A	OPEX	ZHEJIANG	10-Dec-15	DHL	8 BOXES	88,50	4-Jan-16	8-Jan-16	JAN	FCA	DHL	$ 1.011,65	$ 110,00	$ 1.121,65	DHL	$ -	0	$ 1.121,65
6101479	MING CHENG-2.1A	OPEX	QINGDAO	31-Dec-15	DHL	1 BAG	40,00	6-Jan-16	8-Jan-16	JAN	EXW	DHL	$ 524,13		$ 524,13	DHL	$ -	0	$ 524,13
6101499	NEW CENTURY-18A	OPEX	SHENZHEN	30-Dec-15	DHL	1 BOX	40,00	5-Jan-16	9-Jan-16	JAN	FCA	DHL	$ 9.741,08	$ 110,00	$ 9.851,08	SB GLOBAL	$ 83,92	1	$ 9.935,00
6101497	NEW CENTURY-16A	OPEX	SHENZHEN	23-Dec-15	DHL	19 BOXES	1.061,00	5-Jan-16	9-Jan-16	JAN	FCA	DHL	$ -		$ -	SB GLOBAL	$ 83,92	0	$ 83,92
6101426	KISWEL-9A	OPEX	BUSAN	30-Dec-15	DELTA CA	2 PALLETS	1.669,00	6-Jan-16	11-Jan-16	JAN	FCA	DAMCO	$ 9.390,00	$ 170,00	$ 9.560,00	SB GLOBAL	$ 83,92	1	$ 9.643,92
6101495	LEDAR-1A	OPEX	SHANDONG	29-Dec-15	DHL	10 PACKAGES	189,00	7-Jan-16	11-Jan-16	JAN	FCA	DHL	$ 2.196,16	$ 110,00	$ 2.306,16	SB GLOBAL	$ 83,92	0	$ 2.390,08
6101394	EBV ELEKTRONIK-1A	OPEX	POING	11-Jan-16	FEDEX	2 PACKAGES	20,77	8-Jan-16	12-Jan-16	JAN	CPT	N/A	$ -		$ -	SB GLOBAL	$ 83,92	1	$ 83,92
6101502	NEW CENTURY-19A	OPEX	SHENZHEN	8-Jan-16	DHL	5 PACKAGES	284,00	11-Jan-16	17-Jan-16	JAN	FCA	DHL	$ 2.741,34	$ 110,00	$ 2.851,34	SB GLOBAL	$ 83,92	0	$ 2.935,26
6101532	MCIT-59A	OPEX	BILLUND	14-Jan-16	DHL	2 BOXES	27,20	15-Jan-16	17-Jan-16	JAN	DAP	DHL	$ 334,92		$ 334,92	SB GLOBAL	$ 83,92	0	$ 418,84
NO PO	**LODAM-11.15A**	OPEX	BILLUND		**AIR FRAN**	**32 BULTOS**	**336,00**	**17-Jan-16**	**18-Jan-16**	JAN	**CPT**	N/A	**$** -		$ -	**SB GLOBAL**	**$ 167,83**	**1**	$ 167,83
6101504	YORK DALY-8A	OPEX	BEIJING	11-Jan-16	AIR CANA	11 BOXES/4,2	4,6 KGS	16-Jan-16	19-Jan-16	JAN	FCA	DAMCO	$ 722,50	$ 170,00	$ 892,50	SB GLOBAL	$ 83,92	1	$ 976,42
8013649	LODAM-18A	OPEX	BILLUND	23-Dec-15	DHL	1 BOX	17,00	18-Jan-16	20-Jan-16	JAN	FCA	DHL	$ 158,87		$ 158,87	DHL	$ -	0	$ 158,87
NO PO	**LINRUI-19A**	OPEX	**SHANGHAI**		**DHL**	**1 BOX**	**0,50**	**20-Jan-16**	**23-Jan-16**	JAN	**FCA**	**DHL**	**$ 40,89**		$ 40,89	**DHL**	$ -	0	$ 40,89
NO PO	**LODAM-11.16A**	OPEX	BILLUND		**DHL**	**36 BOXES**	**368,00**	**24-Jan-16**	**26-Jan-16**	JAN	**FCA**	**DHL**	**$** -	$ 110,00	$ 110,00	**SB GLOBAL**	**$ 167,83**	**1**	$ 277,83
6101536	EMERSON-2A	OPEX	PU DONG	18-Jan-16	DHL	3 BOXES	42,00	26-Jan-16	30-Jan-16	JAN	EXW	DHL	$ 548,14	$ 110,00	$ 658,14	DHL	$ -	0	$ 658,14
NO PO	MATHERM-5A	SPARE PARTS	BRESOLLES		TNT	1 BOX	2,25	7-Jan-16	14-Jan-16	JAN	DAP	N/A	$ -		$ -	DHL	$ -	0	$ -
9122094	YINHAO-14A	SPARE PARTS	QINGDAO	8-Jan-16	DHL	5 boxes	63	21-Jan-16	23-Jan-16	JAN	FCA	DHL	$ 746,99	$ 110,00	$ 856,99	DHL	$ -	0	$ 856,99
9122001	CALDAN-19A	SPARE PARTS	BILLUND	29-Jan-16	DHL	2 BOXES	33,2	21-Jan-16	23-Jan-16	JAN	FCA	DHL	$ 281,69		$ 281,69	DHL	$ -	0	$ 281,69
9121907	LIANGTONG-5A	SPARE PARTS	CHANGZHO	19-Feb-16	DHL	2 BOX	81,5	25-Jan-16	28-Jan-16	JAN	EXW	DHL	$ 916,39	$ 110,00	$ 1.026,39	DHL	$ -	0	$ 1.026,39

Row Labels	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	Grand Total
OPEX											
Sum of TOTAL FFWW	$ 28.921,81	$ 8.350,18	$ 36.807,97	$ 90.234,65	$ 182.518,71	$ 8.939,32	$ 5.705,27	$ 4.132,41	$ 19.129,53	$ 33.512,31	$ 418.252,17
Sum of TOTAL TRUCKING	$ 1.007,02	$ 493,33	$ 877,78	$ 1.309,27	$ 1.021,43	$ 40,00	$ 189,78	$ 550,29	$ 1.328,57	$ 1.121,90	$ 7.939,37
Sum of INSURANCE	$ 232,63	$ 193,94	$ 319,80	$ 231,29	$ 384,67	$ 80,00	$ 134,33	$ 467,63	$ 80,00	$ 280,00	$ 2.404,29
Count of MCIS ID	16	15	11	13	14	5	7	9	10	24	124
SPARE PARTS											
Sum of TOTAL FFWW	$ 2.711,69	$ 8.614,08	$ 12.717,02	$ 12.884,63	$ 13.146,83	$ 5.578,34	$ 17.741,82	$ 3.003,33	$ 9.088,45	$ 25.329,23	$ 110.815,43
Sum of TOTAL TRUCKING	$ 83,92	$ 293,33	$ 505,08	$ 385,71	$ 454,76	$ 178,86	$ 145,99	$ -	$ 364,29	$ 1.017,14	$ 3.429,08
Sum of INSURANCE	$ 80,00	$ 314,33	$ 247,13	$ 271,10	$ 315,84	$ 200,00	$ 250,49	$ 140,00	$ 184,98	$ 286,60	$ 2.290,47
Count of MCIS ID	6	20	19	18	28	20	15	14	18	21	179
Total Sum of TOTAL FFWW	**$ 31.633,50**	**$ 16.964,26**	**$ 49.524,99**	**$ 103.119,29**	**$ 195.665,55**	**$ 14.517,66**	**$ 23.447,09**	**$ 7.135,74**	**$ 28.217,99**	**$ 58.841,54**	**$ 529.067,61**
Total Sum of TOTAL TRUCKING	**$ 1.090,94**	**$ 786,67**	**$ 1.382,86**	**$ 1.694,99**	**$ 1.476,19**	**$ 218,86**	**$ 335,77**	**$ 550,29**	**$ 1.692,86**	**$ 2.139,04**	**$ 11.368,45**
Total Sum of INSURANCE	**$ 312,63**	**$ 508,27**	**$ 566,93**	**$ 502,39**	**$ 700,51**	**$ 280,00**	**$ 384,82**	**$ 607,63**	**$ 264,98**	**$ 566,60**	**$ 4.694,76**
Total Count of MCIS ID	**22**	**35**	**30**	**31**	**42**	**25**	**22**	**23**	**28**	**45**	**303**

Appendix N° 7:

Example of Ocean Freight Cost Report

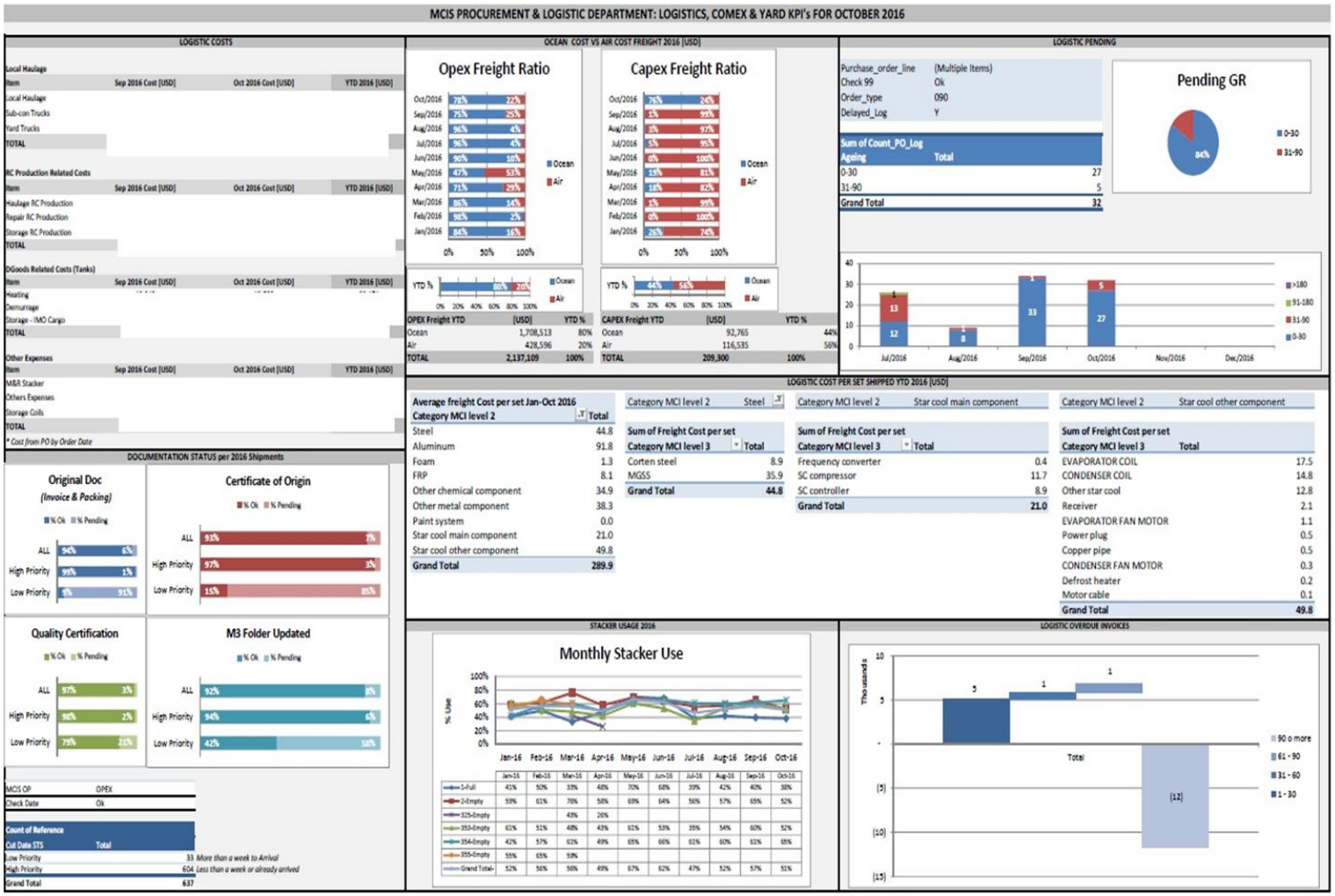
Row Labels	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	Grand Total
CAPEX/SP/OTHERS											
Sum of TOTAL FFWW	$ 805,72		$ -	$ 2.782,73	$ 2.921,49		$ 441,23	$ -		$ 83.813,91	$ 90.765,08
Sum of INSURANCE	$ 29,48		$ -	$ 46,23	$ 87,15			$ -	$ -	$ 120,13	$ 282,99
Sum of TOTAL USD TRUCKING	$ 164,29		$ 186,50	$ 234,14	$ 189,00		$ 564,08	$ 95,50	$ 94,50	$ 189,00	$ 1.717,00
OPEX											
Sum of TOTAL FFWW	$ 137.789,77	$ 358.228,64	$ 189.626,48	$ 212.412,77	$ 148.832,37	$ 49.390,40	$ 138.160,87	$ 107.367,38	$ 56.830,89	$ 115.063,48	$ 1.513.703,04
Sum of INSURANCE	$ 4.804,16	$ 4.273,78	$ 2.830,62	$ 2.963,98	$ 2.970,13	$ 797,04	$ 3.538,58	$ 1.681,93	$ 950,16	$ 2.059,52	$ 26.869,90
Sum of TOTAL USD TRUCKING	$ 16.242,30	$ 39.405,91	$ 38.391,07	$ 12.300,43	$ 12.563,50	$ 28.916,50	$ 8.214,68	$ 4.345,36	$ 3.213,00	$ 4.347,00	$ 167.939,75
Total Sum of TOTAL FFWW	**$ 138.595,49**	**$ 358.228,64**	**$ 189.626,48**	**$ 215.195,50**	**$ 151.753,86**	**$ 49.390,40**	**$ 138.602,10**	**$ 107.367,38**	**$ 56.830,89**	**$ 198.877,39**	**$ 1.604.468,12**
Total Sum of INSURANCE	**$ 4.833,64**	**$ 4.273,78**	**$ 2.830,62**	**$ 3.010,21**	**$ 3.057,28**	**$ 797,04**	**$ 3.538,58**	**$ 1.681,93**	**$ 950,16**	**$ 2.179,65**	**$ 27.152,89**
Total Sum of TOTAL USD TRUCKING	**$ 16.406,59**	**$ 39.405,91**	**$ 38.577,57**	**$ 12.534,57**	**$ 12.752,50**	**$ 28.916,50**	**$ 8.778,75**	**$ 4.440,86**	**$ 3.307,50**	**$ 4.536,00**	**$ 169.656,75**

Sum of N° SHIPMENTS / Row Labels	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	Grand Total
OPEX	55	76	51	45	34	22	29	15	19	29	375
CAPEX/SP/OTHERS	2		2	2	2		6	1	1	3	19
Grand Total	**57**	**76**	**53**	**47**	**36**	**22**	**35**	**16**	**20**	**32**	**394**

Row Labels	Sum of N° CONT	Sum of N° LCL	Sum of N° COILS
JAN	108	10	158
FEB	222	3	332
MAR	153	7	443
APR	126	6	0
MAY	133	2	0
JUN	43	5	259
JUL	83	10	0
AUG	45	2	0
SEPT	27	8	0
OCT	42	9	0
Grand Total	**982**	**62**	**1192**

Appendix N° 8:

Example of Key Performance Indicators Report, Logistics Department.


MCIS PROCUREMENT & LOGISTIC DEPARTMENT: LOGISTICS, COMEX & YARD KPI's FOR OCTOBER 2016
LOGISTIC COSTS
Local Haulage
Item | Sep 2016 Cost [USD] | Oct 2016 Cost [USD] | YTD 2016 [USD]
Local Haulage
Sub-con Trucks
Yard Trucks
TOTAL
RC Production Related Costs
Item | Sep 2016 Cost [USD] | Oct 2016 Cost [USD] | YTD 2016 [USD]
Haulage RC Production
Repair RC Production
Storage RC Production
TOTAL
DGoods Related Costs (Tanks)
Item | Sep 2016 Cost [USD] | Oct 2016 Cost [USD] | YTD 2016 [USD]
Heating
Demurrage
Storage - IMO Cargo
TOTAL
Other Expenses
Item | Sep 2016 Cost [USD] | Oct 2016 Cost [USD] | YTD 2016 [USD]
M&R Stacker
Others Expenses
Storage Coils
TOTAL
* Cost from PO by Order Date
DOCUMENTATION STATUS per 2016 Shipments
Original Doc
(Invoice & Packing)
% Ok
% Pending
ALL 94% 6%
High Priority 99% 1%
Low Priority 9% 91%
Certificate of Origin
ALL 93% 7%
High Priority 97% 3%
Low Priority 15% 85%
Quality Certification
ALL 97% 3%
High Priority 98% 2%
Low Priority 79% 21%
M3 Folder Updated
ALL 92% 8%
High Priority 94% 6%
Low Priority 42% 58%
MCIS OP OPEX
Check Date Ok
Count of Reference
Cut Date STS Total
Low Priority 33 More than a week to Arrival
High Priority 604 Less than a week or already arrived
Grand Total 637
OCEAN COST VS AIR COST FREIGHT 2016 [USD]
Opex Freight Ratio
Capex Freight Ratio
Ocean
Air
YTD %
OPEX Freight YTD [USD] YTD %
Ocean 1,708,513 80%
Air 428,596 20%
TOTAL 2,137,109 100%
CAPEX Freight YTD [USD] YTD %
Ocean 92,765 44%
Air 116,535 56%
TOTAL 209,300 100%
LOGISTIC PENDING
Purchase_order_line (Multiple Items)
Check 99 Ok
Order_type 090
Delayed_Log Y
Sum of Count_PO_Log
Ageing Total
0-30 27
31-90 5
Grand Total 32
Pending GR
0-30
31-90
84%
Jul/2016
Aug/2016
Sep/2016
Oct/2016
Nov/2016
Dec/2016
>180
91-180
31-90
0-30
LOGISTIC COST PER SET SHIPPED YTD 2016 [USD]
Average freight Cost per set Jan-Oct 2016
Category MCI level 2 Total
Steel 44.8
Aluminum 91.8
Foam 1.3
FRP 8.1
Other chemical component 34.9
Other metal component 38.3
Paint system 0.0
Star cool main component 21.0
Star cool other component 49.8
Grand Total 289.9
Category MCI level 2 Steel
Sum of Freight Cost per set
Category MCI level 3 Total
Corten steel 8.9
MGSS 35.9
Grand Total 44.8
Category MCI level 2 Star cool main component
Sum of Freight Cost per set
Category MCI level 3 Total
Frequency converter 0.4
SC compressor 11.7
SC controller 8.9
Grand Total 21.0
Category MCI level 2 Star cool other component
Sum of Freight Cost per set
Category MCI level 3 Total
EVAPORATOR COIL 17.5
CONDENSER COIL 14.8
Other star cool 12.8
Receiver 2.1
EVAPORATOR FAN MOTOR 1.1
Power plug 0.5
Copper pipe 0.5
CONDENSER FAN MOTOR 0.3
Defrost heater 0.2
Motor cable 0.1
Grand Total 49.8
STACKER USAGE 2016
Monthly Stacker Use
% Use
Jan-16 Feb-16 Mar-16 Apr-16 May-16 Jun-16 Jul-16 Aug-16 Sep-16 Oct-16
1-Full 41% 50% 33% 48% 70% 68% 39% 42% 40% 38%
2-Empty 59% 61% 70% 58% 69% 64% 56% 57% 65% 52%
325-Empty 43% 26%
353-Empty 61% 51% 48% 43% 61% 53% 35% 54% 60% 52%
354-Empty 42% 57% 61% 49% 65% 66% 61% 60% 61% 65%
355-Empty 55% 65% 59%
Grand Total 52% 56% 56% 49% 67% 62% 47% 52% 57% 51%
LOGISTIC OVERDUE INVOICES
Thousands
Total
90 o more
61 - 90
31 - 60
1 - 30