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EFFICIENT LOGISTICS OPERATION IN A SUPPLY CHAIN

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ABSTRACT

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<p>Logistics and supply chain management operations are of great importance to organisations ranging from small and medium size enterprises to giant multinational. Logistics operations are inevitable in an organisation and function as an integral part in boosting the supply chain process. Therefore, logistics operations cannot be underestimated.</p> <p>This thesis was aimed at analysing the ease with which logistics operations are executed in Ahola Transport OY. Revenues and operating expenses for the past four years of the case company were used as the values in measuring operational efficiency. Findings from the concept of supply chain management and logistics were discussed with the help of journals, books, online materials, websites and notes taken from courses done during my years of studies at Centria University of Applied Sciences.</p> <p>Based on the findings of the thesis, it shows that the company is operating efficiently, which indicates success in the organization operating activities. Also, the study revealed that the major political, economic, ecological and technological factors that could be threatening the company's future success are changing government policies, taxation system, climate change, exchange rate fluctuations and transport intelligence respectively.</p>		
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ABSTRACT

CONTENTS

1 INTRODUCTION	1
2 THE CONCEPT OF SUPPLY CHAIN MANAGEMENT AND LOGISTICS	4
2.1 Supply Chain	4
2.2 Supply Chain Management.....	5
2.3 Logistics	6
2.3.1 Reverse Logistics.....	8
2.3.2 Green Logistics	9
2.3.3 Third Party Logistics	11
2.4 Logistics Functions in A Supply Chain.....	12
2.4.1 Procurement.....	12
2.4.2 Production.....	14
2.4.3 Warehousing Management.....	16
2.4.4 Information Flow	19
2.4.5 Transportation	20
2.4.6 Financing.....	21
3 EFFICIENT OPERATION IN LOGISTICS ACTIVITIES	22
3.1 Ahola Transport	22
3.2 Road Transportation.....	23
3.3 Operational Efficiency.....	24
4 DATA ANALYSIS & RESULTS	26
5 CONCLUSION	31
REFERENCES	33
FIGURES	
FIGURE 1. Example of a Logistics System.....	7
FIGURE 2. Data Processing.....	19
FIGURE 3. Revenue and Expenses Trend.....	27
FIGURE 4. Operating Efficiency.....	27
TABLES	
TABLE 1. Characteristics of Different Types of Reverse Logistics flows.....	8
TABLE 2. The Changes in Procurement Process.....	13
TABLE 3. Revenue and Expenses	26
TABLE 4. SWOT Analysis of Ahola Transport.....	29
TABLE 5. PESTEL Analysis of Ahola Transport.....	30

1 INTRODUCTION

Supply managers and logistics coordinators in general are under pressures to improve the efficiency of the supply chain management system in which they operate. Supply chain management (SCM) has gained more interest in today's business environment because of its potentials to facilitate efficient operation in business activities as customers' needs increase daily. Increase in the world population which had led to increase in demand for goods and services has resulted to a globalize market facilitated by the availability of internet services. Operating globally, firms have got to build a chain process which enable them to supply the right products to the customers at the right time, right place, right quantity, right condition and at the lowest possible cost. Though it is difficult to say how efficient logistics activities can be not to mention how they can facilitate the efficiency in a supply chain especially when the chain process involves too many activities that are linked to each other. This research therefore, will help us understand the various logistics operation in a supply chain and how organisations are coping with the problems of mismatching their assets and liabilities by making use of the revenue and expenses of a given institution to measure operation efficiency.

Most organizations in the world ranging from small and medium size enterprises (SMEs) to giant multinationals make use of SCM as it functions as an integral part in running various business units, from the purchase of raw materials through the production process to distribution (inbound and out bound logistics) in various warehouses and the administrative works involved. There is therefore a need for an organized SCM process to facilitate the flow of activities and better communication. For companies to succeed globally, they must choose and try to manage certain networks to meet the demand of international customers in collaboration with suppliers to have a competitive edge in the marketplace (Gary 2005,341-342).

This study is aimed at analysing the ease with which logistics operations are executed. This will be done with the aid of an experienced logistics company called Ahola Transport Oy which operates in a couple of countries such as in Sweden and in Finland in the areas of road transport, inbound/outbound logistics. For the purpose of this study, the activities of Ahola will be confined to Finland only. The data collection is mainly from secondary sources because all attempts at getting primary data were not successful mainly because of language barriers between the researcher and Ahola board chair and this is one major limitation throughout the study. However, irrespective of this limitation, secondary data therefore acted as the

best possibility. Secondary data was obtained from official publications of Ahola transport such as financial reports.

To better analyse the problems raised, it was necessary to look at the following issues:

1. The operating expenses of the case company for the past 4 years
2. The net income for the past 4 years
3. Why the presence of the problem of efficiency in a logistics company?

SCM cannot be adequately defined without mentioning the concept of logistics. Logistics according to Muthiah (2009, 2-7) is viewed as part of the supply chain process which deals primarily with planning, controlling and the implementation of effective and efficient flow of all processes and ensures proper storage of goods, services and all related information relating either to point of origin, consumption or supply point ensuring that it meets the requirements of customer at every level of the entire supply chain. Shamim (2008, 2) described logistics as the management of inventory which is either at rest or in motion, and went further to explain that the goal of any logistic manager is to achieve the lowest level of cost in investing in inventory and ensuring that it is consistent with customer service and efficient production processes.

The contributions of other writers and managerial experts such as Rutner and Langley (2000,10-13) and in line with the seven R's of supply chain management concept, logistics functions as a catalyst in boosting the SCM process, aims at minimizing cost and maximizing profits by ensuring that raw materials, semi-finished goods, finished goods reach the consumers at the right place, at the right time and as agreed in the contract with the right quality and quantity of a product using the desired level of service, trying as much as possible to reduce or minimize environmental damages.

Most companies design and choose the best logistics strategy for their organizations, taking into consideration the situation in the industry. The situation in the industry is always a major factor because it is the only means through which an entity can examine and assess their strength and opportunities, the strength and weaknesses to better understand their source of competitive advantage, the strength of major players and the general market trend for a wider market competitive advantage. The key issues involved are selecting the right supply source, the best transport means, the best and most cost effective production methods, deciding on the appropriate batch size, packaging methods/ equipment choice of warehouse location, the control of finance, information flow using modern ERP system, agreeing on the choice of raw materials to be used and the recycling process after being used to protect environmental hazards

from the stand point of a responsible business and the legislative aspects binding contracts and terms of delivery .They are all essential elements used in the logistics process of a company.

Furthermore, looking into how businesses operate in the 21st century, where goods and services are made available to customers irrespective of their location thanks to reliable and trustworthy logistics systems. Transportation process and warehousing process can be considered the two major processes in the entire Supply chain logistics and for this reason this research finding was based on but not entirely limited to these processes. The choice to limit the research process within the SCM concepts and the logistics concept was partly guided by interest developed in Supply chain and logistics from a theoretical perspective and partly based on the interest to contribute to education through research, with the aim of improving knowledge and possibly providing practical solutions to problems related to logistics operations in the SCM process.

In this perspective, Ahola Transport was chosen by the researcher as it provides changing and reliable logistics answers to their many customers, in terms of their efficiency and their real requirements. All their goods involving small and large are under control all the time right from the handling destination to the final door delivery. Due to their reliability and cost effectiveness in handling cargos through their well-planned logistics environment earned their CEO Hans Ahola the logistician of the year 2018 in Finland (Ahola Transport 2019). In order to realize the aims of this work, the study will be conducted as outline below:

Useful data and relevant information shall be gathered from the institution under study using secondary sources of data

A research report shall be written that covers the complete understanding of the relevant theories and findings from the results of the quantitative research.

2 THE CONCEPT OF SUPPLY CHAIN MANAGEMENT AND LOGISTICS

The concept of SCM and logistics have received increase importance recently by companies and research institutions. SCM is of strategic important to companies as supply chains to many acts as significant source of competitive advantage (Flint & Gamelgaard 2012,765). Every business entity needs to operate their supply chain efficiently while ensuring that logistics activities are fully coordinated in order to achieve greater organizational success rates. Paying more attention to SCM and logistics as a whole. There is a need for a more in depth understanding of the main concepts dealt with during the research such as the concept of supply chain and logistics. The subsequent sections of this chapter therefore examine the concepts separately to better understand the concepts all together from the viewpoint of some earlier writers and researchers and finding a generally applicable and rational reasoning to each concept in relation to the study and analysis.

2.1 Supply Chain

The operation of business activities today requires a great deal of collaboration ranging from small and medium size enterprises (SMEs) to giant multinationals seeking to meet customers demand at the least cost possible with efficient time management and minimal used of resources. To create and delivered goods and services to the many end users, companies need an efficient and effective supply chain that facilitates the production process starting from the purchase of raw materials and semi components right to the point of consumption.

Prater & Whitehead (2012,9) outlined supply chain into internal, integrated and reverse process. The internal supply chain is made up of several department starting from procurement to customer service. Activities in the internal process ranges from materials or inventory acquisition, warehousing, manufacturing, transit, packaging, and distribution to different marketplaces to the final consumers. To carry this operation successfully, company`s need to plan, execute and monitored their activities under a given guidelines and other operational goals set by the company`s to meet customer satisfaction at the customers service level.

Prater & Whitehead (2012,9-12) further defined integrated supply chain refers to the viewpoint outside the company`s corporate structure where other players such as suppliers and customers are considered

for transaction purposes while reverse supply chain process exists depending on the industry or line of business. It makes use of the return of used products from the consumers. This process has gained more importance with the introduction of green supply chain management which is examined detailly in subsequent sections of this study. The reverse process facilitates recycling, manufacturing and responsible disposal of waste.

2.2 Supply Chain Management

According to Prater & Whitehead (2012,9-10) SCM is a process that business entities employ to ensure cost effectiveness throughout the flow, purchases, storage of raw materials, production of goods and services, in-process stocks, semi-finished and finished goods, and information management from the point of origin to the final customers.

Moraja (2013,4) views SCM as the integration of functions with the main aim of bring together or combining major business functions and processes within firms or across companies into a cohesive and high-level business models. An effective and efficient SCM process will includes the management of all the various activities of logistics.

The overall goal of SCM is to stimulates a company's supply chain into the highest efficient, client satisfactory process, where the effectiveness of the entire supply chain is more valuable or important than the effectiveness of individual group or department. SCM therefore focuses on business operations and their integration such as planning and forecasting, order management, order fulfilment, product design, inventory management and return management. Some core activities of SCM are outlined as below

- Predicting demand and supply
- Chosen the right suppliers
- Managing materials
- Collection and ordering of inventory
- Shipping and distribution
- Channelling and organizing information exchange to various departments
- Reuse and recycling of waste for responsible disposal

2.3 Logistics

The activities that determined the flow of materials and information exchange in an enterprise from the point of origin to the destination for consumption or further distribution is referred to as logistics (Ghiani, Laporte & Musmanno 2013, 1). Manufacturing, retailers and service companies greatly employed logistics systems to enhance the flow of resources in their business processes. Logistics is very relevant in today's business as competition is focused more between supply chains and not between firms.

The activities that occurs within a company is referred to as internal logistics and this involves process such as collection and storing of materials ready to feed the production lines or for packaging or arranging semi-finished goods and taking the finished products into the appropriate warehouses. Supply and distribution logistics (3PL and 4PL) are referred to as external logistics. The council of supply chain management professionals (CSCMP) described logistics as the smooth management or functioning of a system that operates in chains to ensure that information and material flow reaches the end users at the right time, right place with the exact quantities and qualities as required.

The Finnish Association of Logistics defines logistics as the physical, information and economical control of the material flows of companies and institutions from the point of origin to the end customers. The various stages of logistics or operations involved in logistics are purchases, transportation, warehousing, material handling and the administrative part of handling documents of the logistics chain (Finnish Association of Logistics ,2018).

Generally, logistics is viewed as a system which does not only incorporate the functional activities of the material flow and information exchange, but also looks at the means, organisation, buildings, equipment and the available resources that are necessary for the completion of these activities. A logistics system is therefore made up of various facilities where the functional activities of purchasing, production, warehousing, distribution, information and financial management are carried out in chains. Figure 1 below shows the manufacturing of a product into different phases. It begins from the point of suppliers to the production plants where the best suppliers are selected based on many factors. This process take place to help change the physical-chemical composition of a product. Production plant works in collaboration with the assembly plant and the central distribution centres (CDC) takes from the assembly plant

and supplied directly to the regional distribution centres (RDC) and to the customers for final consumption and recycling of waste follows there after.

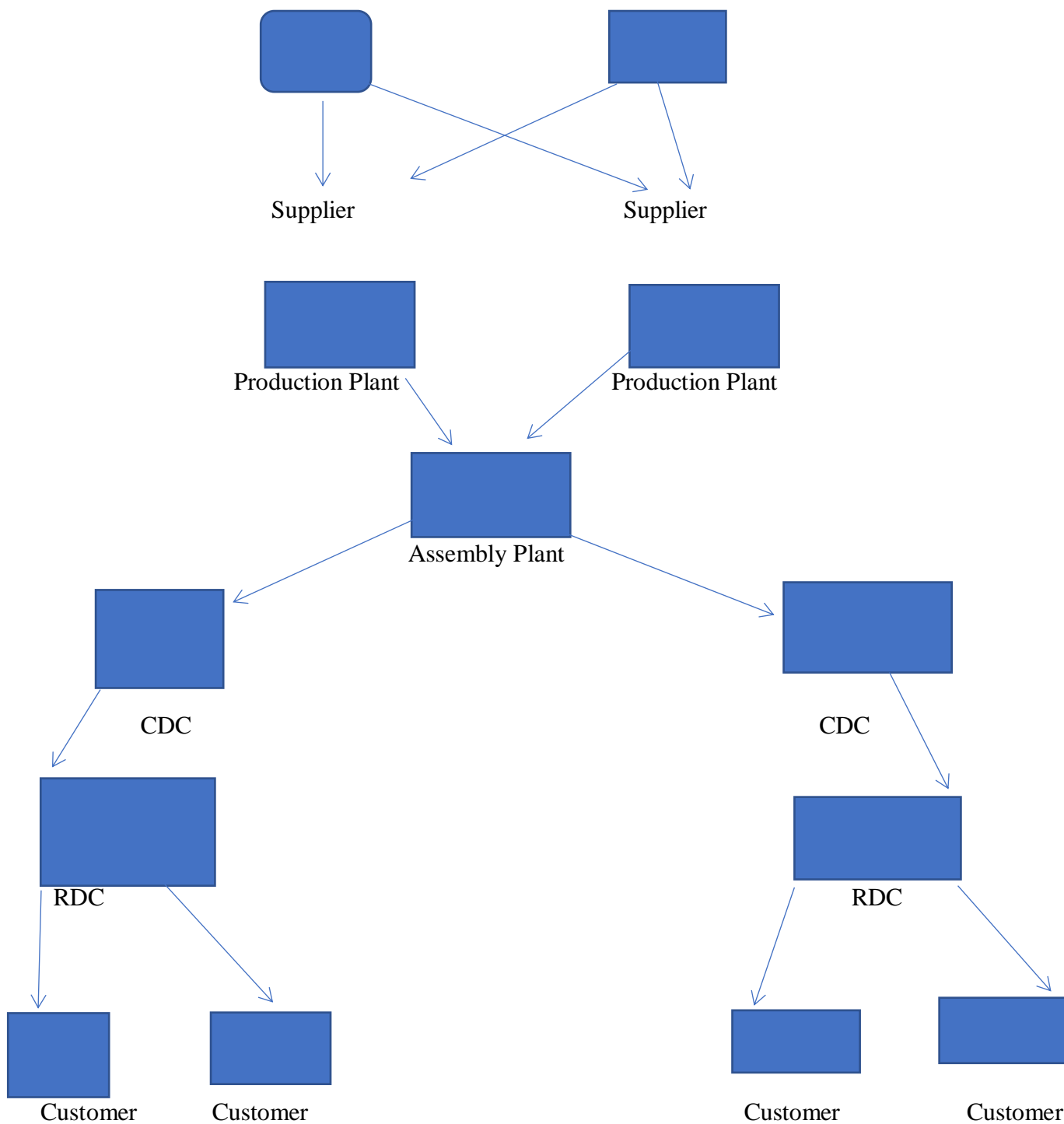


FIGURE 1. Example of a Logistics System (Adapted from Ghiani et al 2013, 2)

2.3.1 Reverse Logistics

The concepts of reverse logistics refer to a situation where the management of products recycling take place. Ait-Kadi, Chouinard, Marcotte & Riopel (2012,37) describe reverse logistics as a process of planning, implementing, and directing goods, the inbound movement of materials (in-process inventory) to the related final products from the point of consumption to the point of origin together with the information exchange for the purpose of revaluation or clean disposal for a reverse products flow in an efficient and cost effective way.

Generally, there are several types of product returns that occurs in this field generated by the services which retailers provide to customers. Customers are sometimes not satisfied with the products purchased and they have the chance of replacement or refunding of those merchandise as a result of none compliance to the product standards and or specifications. When goods are replaced or returned due to customer dissatisfaction is referred to as commercial returns. However, there are other forms of return some of which include but not limited to Return of unused products, return of products under warranty and waste and products derived from network activities. (Ait-Kadi et al 2012,38.)

TABLE 1. Characteristics of Different Types of Reverse Logistics flows (Adapted from Ait-Kadi et al 2012,39)

Description	Consideration	Examples
Return of Unused products	Economics, marketing Recovery of Value	Shoes, bags, recycle carpets and electronic equipment. Recovery of computer component and Ink cartridge collection
Commercial Returns	Marketing	Clothing and cosmetics
Product Warranty Returns	Marketing & Legislation	Spare parts and bad appliances
Derivative product and product waste	Economics Legislation	Pharmaceutical firm and steel component
Packaging	Economics	Pallets, bottles, plastics & crates

2.3.2 Green Logistics

Increase in global warming results from changes in climatic condition cause by the emission of harmful substances to the atmosphere by industrial wastes, has impacted the logistics operation of many companies as there are called upon to operate responsibly to ensure that their activities and operations are environmentally friendly. Green logistics can be referred to as a form of reverse logistics though with some differences related to purchasing, packaging and transportation in an environmental-friendly atmosphere within the supply chain. Logistics companies are becoming more concerned about the rising carbon footprints and are seeking for solution to minimise them and to operate in the best possible carbon free environment.

The business environment and market conditions are changing all the time causing logistics firms to adopt new approach to withstand the intense competition. Globalization, government policies, the use of modern technology and the increasing importance of the internet in e-commerce and trade is very crucial for organizations to think and re-strategize their logistics functions towards an environment free of noise and pollution in an efficient and effective manner, making use of the least cost possible (Macharis, Melo, SMDDBM, Woxenius, & Vrije, 2014,32). By functioning in an efficient and cost-effective logistics processes, the company's bottom lines improve.

To support an organisations greening effort, the choice of suppliers is very significant. Suppliers with high ability to increase the share of the organisational values and to provide good quality products on time are considered best. Suppliers may have to change strategies to meet customers expectation regarding the greening products. Raw materials and transportation systems that were not environment-friendly are being substituted to more environmentally friendly process through continuous engagement in communication between suppliers and customers.

Suppliers with a high greening capacity will gain competitive advantage in the market environment in terms of combining and selecting supply chain activities to ease their business operations and make it more efficient and cost effective (Morana 2013,54-57). Firms, therefore, actively engage in a visiting program where all manufacturing sites of its suppliers are checked to ensure that the production processes are not causing any dangerous effect to the society. Moreover, suppliers are required to send full-load trucks with vehicles carrying the 'pollution under control certificates which are steps taking by firms in ensuring that their businesses are becoming greener. This process of going greener cannot just

happen overnight so it requires continuous learning, knowledge, skills development, general awareness campaigns and the encouragement of carbon reduction related discussions between the suppliers and customers (institutions) to understand the importance both to the individual firms and to the community of greening their business activities (Venkatesh 2017, 25-35).

Since logistic activities such as the transportation process is one of the main causes of environmental pollution, green logistics has generated lot of interest in the supply chain process for examples the waste and business operations that are dangerous to the environment is a truck not fully loaded or carrying less than the full capacity and makes several trips to deliver products in the same warehouse. To reduce these impacts of emitting harmful substances to the atmosphere, proper fuel usage in vehicles, proper planning and management may be beneficial if implemented to avoid unnecessary and wasteful movement of products before it reaches the warehouse or its destination. By so doing, great cost can be saved.

Furthermore, firms have realized that implementing green logistics in the corporate world is not just to protect the environment but also led to increase in productivity, reduced cost resulting to increase in the profit margin and leading to a rise in the value of goods and services provided to the customer. This further stimulates growth in the economy resulting to sustainability. An organization that succeeds in its greening policies can therefore gain competitive edge in the market environment.

To make logistics greener, companies providing transportation services are shifting and paying more attention to intermodal railroad transportation. The carriers and shippers' viewpoints have all been consider by researchers of green logistics and it is encouraging always to understand the trade-off between one logistics activities to another. In the future, best logistics companies or logistics excellence will be major by the ability of the organization to handle environmental issues efficiently and effectively. In this regard, organization are redesigning their logistics activities to be environmentally friendly and energy efficient.

The overall goal of green logistics is to mitigate the environmental impact of logistics operations, ensure that production cost is at it minimum and improve product quality or product value. Researchers In this field have suggested the green logistics performance index (GLPI) as a tool which can be used to measure environmental performance within the logistics industries. The three key logistics components outline by this index were green transportation, green packaging and designing and the used of materials that are environmentally friendly.

2.3.3 Third Party Logistics

To manage a supply chain effectively and efficiently, 3PL are used to facilitate the process of outsourcing. 3PL logistics is a business process where external organizations are hired to carry out logistics functions which have been traditionally performed within an organization. (Sahay 2006, 9). The logistics activities provided by 3PL companies can be the whole logistics process or some selected activities within the logistics process. One of the major causes of outsourcing logistic activities is the increase in globalization.

In recent years, globalization has been the driving force in redesigning business strategies and firms controlling the market have taken a step forward to develop and design products to fit global markets and global components (Sahay 2006, 10). This has resulted in more complex supply chains and needs active participation of managers in logistics functions. Issues arising from the lack of specific knowledge of taxes, customs and the operating procedure of commerce in the destination countries has forced industries to hire the expertise of 3PL services providers. This enables firms to concentrate on the main activities and allow the rest to specialist firms.

Moreover, other issues that boost the 3PL is the increasing use of SCM as a source of gaining competitive edge in the business environment. To manage time and resources within the supply chains, new manufacturing approaches have been developed like the just-in-time, flexible production and manufacturing aided by computer. These approaches have brought much improvement facilitated by 3PL, leading to reduction in lead time and improved quality of products and services. Since 3PL is all about outsourcing, some reasons for outsourcing are listed but not limited to the following;

- Reduction in logistics cost
- Flexibility in business operations within the supply chains
- Focus on specialization leading to reduction in business errors
- Improvement in product quality
- Improvement in customer service
- Easily understand unfamiliar market or new markets
- Increase in return of assets (ROA)
- Access to new technology
- Better inventory management /inventory turnover

2.4 Logistics Functions in A Supply Chain

Integrating efficient and effective logistics functions in a supply chain is a call for concern that an organization should strive to have. In a typical building process, there is a need for a solid foundation, proper and adequate building equipment's, there is need for enough and skilled labour and but not limited to, there is a need for other resources. All these when put together will contribute to building a solid and firm foundation and the strength and solidity of the foundation is a determinant of the kind and type of house which can be built on it. The house in this example can be likened to the SCM process while logistics is the foundation. It is therefore important to identify some of the components of the logistics process needed to build a strong, reliable, efficient and effective Supply chain. These components can be termed logistics functions which include constructs such as Procurement, production, transport and distribution just to name a few. These functions and more will be discussed below. A firm that successfully implements the right combination of logistics functions, can possibly gain competitive advantage then a firm which either does not make any use or does not make use of the right combination of logistics functions.

2.4.1 Procurement

Procurement is described as a process where organisation actively searched and agreed the terms of acquiring products, services and works from an external body through a tendering or bargaining process (Laffont & Tirole 1993, 48-56). Purchasing or supply management has increasingly become important as it is seen as the mainstream process that can add value to the firm through strategic operation. Authors have argued that the best firms in the 2000s will be the once with the most efficient procurement process in it supply chains. Large organization viewed purchasing to have strategic importance in their competitive position (Cousins, Lawson & Squire 2006,777).

Selecting the right supplier, deciding on the choices of raw materials to used, components and semi-finished goods needed for production together with handling of information flow during these processes are the actual function of the procurement department. To minimize overall cost and the timing of procurement together with the quantity to be purchase base on the inventories level need to be plan accurately. Active search for the right procurement source can add value to the company and customers. The main reason for procurement is to secure products raw materials and related components, and services needed for the day to day running of a business and to manage cost involves in the SCMP (Erridge, Fee

& McIllroy 2001, 6-9). Procurement can occur in many ways based on the company needs, type of activities to invest in, raw materials and components needed for production and procurement services of experts. Companies use different terms to refer to this function depending on their line of business. It can be referred to as acquisition, purchase, purchasing, and/or procurement.

Procurement is one of the primary functions of most firms though less attention was paid to it only until recently that firms are actively involved in the function through continuous awareness created by intense competition. Traditionally, the area of concern was on marketing, production, distribution and finances. Procurement thus plays a significant role in running a company as it adds value to the company and customers. Retailers and shopkeepers try as much as possible to optimize the amount of stock in warehouses and the level of stock on the shelves by paying more attention to the order placement time and batch size. This helps to reduce waste there by adding value to the organization through accurate procurement. Companies sometimes ask if it is profitable to produce all the necessary raw materials and components needed for production or should we subcontract by purchasing from an external source. This is common in the automobile industries where different car components can be manufactured by different producers and made available to the market. The table below illustrates the changes in the procurement process.

TABLE 2. The Changes in Procurement Process (Adapted from the Council of Supply Chain Management 2019)

Passive procurement	Active Procurement
Suppliers contacts are not search	Alternative solutions are being search
Items are chosen or selected from the menu	Actively creates solutions
Unit costs are minimized	Client value are increase and measure total expenses of the procurement
Purchase occur once	Buyers and suppliers have good relationship
More attention is paid on quality	Development program of the suppliers

To determine what needs to be purchased, to search for effective procurement providers, increase the organization's competitive edge, looking for suppliers, deciding on which suppliers to use, debating on which trading method to use, price and contract agreement, arranging the bargaining position, planning

for purchasing budget, measuring and reporting business functioning are all examples of the functions of a procurement experts.

2.4.2 Production

Production can simply be referred to the transformation of goods and services in to finished and semi-finished products and this is most often mistakenly used with manufacturing. Some earlier writers have defined production in various ways. as a process which combines various material and immaterial inputs which are transformed, and value added to produce outputs of goods and services which can be utilized. (Kotler, Armstrong, Brown, and Adam 2006,45-63).

Production according to Aswathappa & Bhat (2009,1) is the process through which inputs such as raw materials and semi-finish goods are converted into final products ready for consumption. The process involves the production of tangible and intangible goods and services. The inbound and outbound movement of goods in the factory during the production process is greatly enhance by an appropriate and efficient logistics network. Production these days need to be flexible, effective and cost efficient through which customers can be served or attend to in better way than before. Since production ties down capital, management try as much as possible to control the costs involves and ensure that the necessary features of the products are in good condition during the production process as it is a key factor to the success of every company. By so doing, customers will be willing to value and pay the price charge for the products or will not value and do not buy the goods.

Production can increase societal wellbeing because it is always believed that higher productivity will lead to more goods and services available for consumption hence increasing standards of living and community wellbeing. Production no doubt creates wealth for the nation there by providing income to households and increases revenue to the state. An efficient production process gives leverage to a firm to easily control a greater share of the market and also gain a higher competitive advantage. According to (Aswathappa et al 2009,5) firms can offer these competitive advantages in the following areas.

- Shorter new-product -lead time
- More stock turns
- Using the least manufacturing lead time
- Improve quality

- Minimise waste
- Quality customer services

What can hinder a firm from achieving competitive advantage remains a puzzle with multiple options from which they have to choose right combinations of inventory, cost, delivery and transportation bottlenecks, poor quality and reliability of the production function employed. Developed countries enjoy high standards of living and economic progress due to increase in productivity. The effective and efficient management of materials, better allocation of cost and reduce lead time, will lead to more output being produced from a given input at better cost.

The product design can be a plus to the firms in the market environment. Design and improved quality of goods and services increases the competitiveness and profitability of a firm. Production managers must therefore hold the product designs and process technology at a very high esteem. In today's global economy, developing products, designing and employing good production processes are crucial elements in a successful production and business strategies. For all business entities or companies being high or low technologically driven or no technology, product design plays a significant role their profitability and their very existence or survival.

The aim of most organisations is to offer product or services which provides higher value to customers as much as expected. There is a positive correlation between the product design and achievement of the institutions. Companies with products which are well designed easily achieve their objectives than those whose products are poorly designed and so companies pay more attention in product designing. Designing a product is simple the arrangement of its form and function as expected. Functional design entails the product is developed to perform the function for which it is intended for example a tv set. Product form includes characteristics such as weight, size, appearance and volume of the product. Nevertheless, the production method is also significant in the logistics process and two methods can be identified namely the pull-push methods. The pull-push method of production is crucial in selecting which basic production method the company is to use.

The just-in-time (JIT) method of production requires that only what is needed is being produced. The process of storing inventory and unfinished products is avoided and more cost is reduced leading to greater customer satisfaction. JIT is very important in inventory management due to reduce in the amount

of safety stocks. Since production managers struggles to plan production with regards to customers demand, the JIT is the best approach to use as it eliminates all activities that do not add value to the production process or services render to customers.

The main objective of JIT is to eliminate all waste in the production process. It becomes easy for organizations using JIT method to provide solutions which match the demand and supplies instead of increasing safety stocks which might lead to more cost incur. Customers are the mean concern of this approach and hence production or manufacturing is gear towards satisfying their wants as they only pay for what is necessary. JIT approach will help to eliminate all waste and ensure that the stock level is kept as low as possible.

Furthermore, production needs to be carefully managed because goods and services differ from one industry to another. Production managers use different approaches to ensure the daily functioning, planning, monitoring and execution of activities using the available raw materials to reach the final production stage. Production managers also requires that the amount of capital tied to asset should be control, the distribution of goods is done under good condition using shorter time and the efficient utilization rate of capacity.

The order-driven-logistic process of production helps managers to produce based on customers demand. It is mostly used in projects and unit production where goods are designed and produced base on customer order. It is more of JIT as it seeks to eliminate all unnecessary work. The strategies used to deliver products in order-driven -logistics are:

Manufacture to Stock (MTS)

Assembly to order (ATO)

Manufacture to order (MTO)

Design to order (DTO)

2.4.3 Warehousing Management

The increase in international business resulting from increase globalization has force company to create warehouses at different stages from the production to the distribution chain. Warehouse management therefore involves the process of collecting and storing raw materials, semi-finished and fished goods, components to satisfy customers' needs or for business purposes (Behara 2009,6). A lot of reasons

account for the needs of warehousing in today's business. Some of which are: demand and supply rarely occur at the same place, time and quantity, customers have been culture in way that they prefer to have their products delivered to them at their home immediately after purchase, there is seasonal fluctuation where certain goods can be available only for a given time period, safety stocks and many more.

Different warehouses exist for different reasons and is a cost to the company as it does not add value to the products in question. The absence of warehouses can also lead to a lost to the company for not having good at stock. The different types of warehouses can be classified according to the stocks they deal with. For example, we have the organization raw materials and supply stock that ensures the constant availability of goods to customers, companies' temporary stock which consists of stocks of several parts assembly to come out with the finish products, Operating stocks needed for day to day running of the firm, spare part stocks to ensure continue productivity in cases of breakdown of machinery since it usually take some time for machines part to be manufacture. Active stocks (replenishment lot), wholesales stocks, sales stocks, safety stocks and terminal stocks are other example of managing warehouses through the different types of stocks.

The ideal behind warehousing management is to control the level of inventory to the best possible level to minimize cost. Inventory is an organization tangible or intangible (records on accounts) items used for business operation. Inventory includes an organizations stock of raw materials, supplies of good and services used for running the business, work in process and goods ready for consumption or reused (Muller 2011,13). To manage this inventory in the various warehouses, the Pareto or ABC analysis is used to coordinate the level of stocks.

The Italian economist by name Pareto discovered the ABC analysis some 100 years ago. He stated that, a small percentage of the population usually or always have a significant or greatest effect in the business environment (Viale 1996,34). He elaborated that when applying this law to determine the levels of inventory, we need to look at it in a practical point of view by asking ourselves which products or customers contributes 80 percent of the company revenue. He further mentions that customers should be classified according to ABC and caution business entities not to tell their customers if they belong to the B or C groups.

The ABC analysis of goods refers to the categorization of items according to sales or consumption. This analysis is based on the 20/80 percent rules or the 80/20 percent rules which state that,80 percent of the products bring in 20 percent of total revenue or in effects 20 percent of products brings in 80 percent of

the revenue. This analysis (ABC) also measure the number of times stock changes hand and categories items or goods in the warehouse that are easily bought. Items that turn to stay long in the warehouse can also easily be detected by using this analysis. Most goods that have a slow turn over are view at the point of sale or the accumulation of sales margins as useless products

In most cases, the products that usually contribute a high percentage of sales are term to be the relatively smaller quantity of the company items in the warehouse. If these items are properly managed and control, it can result to a situation where a 20/80 percent rule results can be achieved. According to the ABC analysis, items are split into three categories namely A, B and C. Where in, the items are rank into high value, medium value and low value for the three categories respectively. The items in the A categories are rank high value items and are relatively few in relation to total goods available. They amount to about 15 to 20 percent of goods available but on the contrary they account for the highest revenue of about 75 to 80 percent. The reason of high revenue is because they have a high turnover. These items are check monthly. B items have the medium value and constitute 30 to 40 percent of the total inventory level and accounted for about 15 percent of revenue. This item is checked quarterly.

The C items have low value and constitute most of the inventory accounting to about 40 to 50 percent of the total inventory and 5 to 10 percent of revenue. The C items are considered almost negligible and are check yearly. Different tasks are performed in the warehouse to ensure proper functioning on a day to day basis. Some of these tasks include the following:

Receiving goods and checking the quality and quantity if it is in good condition as order and controlling the necessary documents related to the products

Maintaining the warehouse which includes taking care of the storage's facilities by checking the temperature, lighting system, allowing room for ventilation and the humidity and keeping the entire storing environments clean to ensure job satisfaction

Releasing of the goods which follows the stock order and pay attention to the principles of first in first out (FIFO) and last in first out (LIFO)

Warehousing accounting where goods are check and provide real time solution to ease the placement of order stocks or replenishment lot. This task has been facilitated with the introduction of modern technology

Monitoring how efficient the warehouse operates to reduce the errors of fluctuation in demand and supplies since it does not occur at the same time. Monitoring also help control cost by looking at the services the warehouse provides comparing it to the annual profit generated.

2.4.4 Information Flow

At every stage of the logistics process, a great deal of information is required for operation to be successful. The information technology system employed by any institutions depends on the size of the business and its field of operation. Through proper information management, an organization problem can be communicated, and solutions provided to help mitigate the outcome. In this process, raw data are being transformed into information to facilitate the understanding of the recipient.

Sarngadharan, & Minimol (2009,10) define information as the process of transforming organized data into useful and meaningful context to benefit a specific recipient. The systematic act of transforming data into information is referred to as data processing. The value attached to an organization's information is based on the decision or actions put in place after reviewing the information. Example of information transformation process is shown in the figure below.

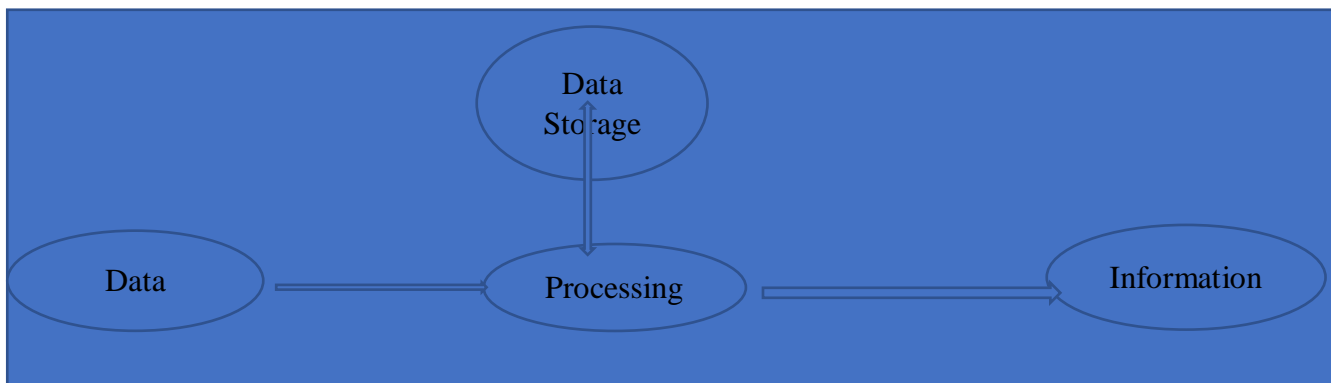


FIGURE 2. Data Processing (adapted from Sarngadharan & Minimol 2009,10)

The old system of information technology was used mostly in departments or functions to control the activities of that department without giving access to the other department to know what is happening within that department. For example, the warehouse manager could not see what is happening in the production department using the old system. With the introduction of modern systems such as the ERP, the procurement manager, sales manager, warehouse personnel, finance and administration department, and production workers could easily communicate as the system allows access to everyone to know what is happening in various departments.

As the technology era develops, there has been intense competition in relation to providing accurate information by organization and to ease communication within the various functional departments. As a result, a more sophisticated system has emerged which is called the interorganizational information

system (IOS). This system connects two or more organization. When a company develops its ERP system it then switches to the IOS system using high internet band to transmit data from one organization to another.

2.4.5 Transportation

Increases in business operation because of globalization have brought about increase in the needs of different modes of transportation to make businesses function smoothly. Production cycle function more easily and faster, delivery time is shorter, smaller batch sizes easy to transport, due date and the reliability of product to reach agreed destination is higher and certain. Transportation is broken down in two parts within the firm environment known as inbound logistics which can be referred to as production logistics where conveyors and forklift delivery are used and outbound logistics where goods and services are taken outward from the company environment.

According to (Chopra & Meindl 2007,385) transportation is a chain process that involves the movement of goods and services from one destination to the other to satisfy customer needs and usually take place from the start of the supply chain to the final customer. Stock & Lambert (2001,322) outline five modes of transport. These modes are air, water, road, pipeline and rail that ensure the movement of people, goods and services across the globe.

Choosing the right transportation modes, defining the routing, creating of intermediate warehouses, handling of the goods, choosing the desired service level, green logistics and many more are incorporated with the holistic perspectives of developing a company transportation management chain. Most important to consider when choosing the choice of transportation are the characteristics of the firm, the characteristics of the goods and consignments to be carried, characteristics of the transport mode and the factors that influence the efficiency of transportation. An efficient transport system in a supply chain facilitates the distribution of goods and services and reduces cost of production. When the transport system is efficient, the industrial and public sector functions properly as the available resources can easily be distributed within the economy.

In the production chain, an efficient transport system will reduce lead time and increase the reliability of suppliers. Economic development and national wellbeing will increase with the flow of an efficient transport system. More goods and services will be available and the quest for new and cheap markets for

raw materials for the modern economic institutions are easily reach. The quest of speed, reliability, accurate timing, planning of routes and the efficient supply of goods and services in a cost-effective way has brought about the increase developments of wireless technologies which is refer to as intelligent transportation system. To meet the increasing demands of the twenty-first century customers and withstand competition in the changing markets environment. Both the hardware (radar sensors) and system application (IT services) are view as a means of facilitating communication and information from terminal to terminal.

2.4.6 Financing

The costs of logistics must be managed in such a way that the company profitability level can increase. Logistics cost are quite huge, and management should therefore plan the budgeting of every activities to minimize such cost or put in place strategies that will help reduce overall cost (Anklesaria 2007,49-56). Internationalization of organisation as they try to focus on core businesses create an increase demand for financing and how cost can be managed. Steve competition in a situation of open market economy force company to create a steady, fast and quality logistics process that entails more costs using information technology to ease communication and the flow of information.

3 EFFICIENT OPERATION IN LOGISTICS ACTIVITIES

Operational reviews are of great importance to organization as it helps to evaluate cost and put businesses on track. For businesses to grow and prosper, managers must operate efficiently using the limited resources available to produce an optimum result (Reider 2008,30.). The importance of efficient operation in a logistics company cannot be under-estimated. It is a great tool for organizational success. Efficient operations in purchases, warehouse management, production, transportation and / or distribution, information flow and finances will place a logistics company in an unbeatable position in the market. Therefore, to withstand competition and stay in the market at the long run, logistics companies need to operate efficiently to ensure customer satisfaction. In this chapter, Ahola transport which is our case company will be discussed and operational efficiency will be introduced as a tool that will be used in further chapters to measure efficiency in logistics activities.

3.1 Ahola Transport

Ahola transport is a 3PL company as they perform external services in areas such as providing courier services to their customers such as parcelling and express services, transportation and forwarding services and the special offering of the integration of the attract ERP system to their customers. Ahola transport offers cross-border transportation involving the delivery of goods and services to its customers across the European member states area. The company was founded in 1955 by Helge Ahola when he realized the growing need of trucks in Finland to transport cargo and other goods useful for industrial processes. Today the business has been formed under the operation of Ahola family with his son Hans Ahola being the chief executive officer of the company.

The main activities of the case company were to provide cross-border transportation services for industrial products and retail customers. Due to changes in business strategies in the 1980s, its activities were focused on transporting goods in trucks or ensuring a long-lasting chain of responsibility for logistics. Great opportunity was viewed as the company customized and provided a comprehensive solution for local transport services. Values to customers and other important groups were derived as the company provided efficient Europe-wide transport and logistics services to its many customers.

Furthermore, as demand increases, the business strategies also need to be reviewed as goods need to move more quickly, effectively and in a cost-efficient manner. In the early 1990s, the company experienced a drastic change with the introduction of a modern IT-based Enterprise Resource Planning (ERP) system to boost its activities. From 1996 to 2009, it was characterized with strong growth in the company as the transport planning system was developed. This system was to support the transportation of goods in different volumes. Other projects such as the Attracs project began. The company was awarded the ISO 14001 certificate in 2002 followed in 2003 with the introduction of the Attracs ERP system. The ISO 9001 was awarded in 2004 followed with the opening of new transport services to the Baltic countries. The company has undergone a dramatic change from its creation to the present date.

3.2 Road Transportation

Road transport also referred to as highway, was the most important form of transport since the 1960s. According to Kardar, Farahani & Rezapour (2011,13) road transport is the most flexible and versatile means of transport. An example is a truck that offers door to door services to customers without the interruption of loading or unloading between the take off point and the destination. It is more advantageous compared to the other modes of transport as it offers a wide range of services and has a large range of vehicle types. Their services are fast and reliable and provide goods and services of all types to both far and short distances. Though with the disadvantage of a high percent of product damage using this mode as compared to air transport.

Ahola Transport has taken advantage of this mode of transport since the 1950s. In this area, they introduced an online concept that ensures the products reach their destination at the right time and the least cost possible through efficient operation. They have combined their operations into a single integrated process by ensuring that pick-up, transport and delivery are jointly monitored to ensure punctuality and reliability of products to their customers. They have a strong based IT-Solution that supports their operation and is under constant developments and a vibrant working force that communicates the customer's language plan and monitors the whole transport process to ensure accurate delivery to their clients.

Furthermore, Ahola Transport operates in dynamic routes to satisfy their customer's needs. They have covered an extensive area of the transport market in Scandinavia owning a capacity of 400 modern vehicles ready to meet the market's condition with appropriate online planning tools which allow customers to have a vehicle of their choice every week. The industrial-adapted fleet is of great importance to the

company as it facilitates the quick delivery of goods of several types to different destination. Added to the above activities, they also carryout express deliveries of pallets, parcel, and bigger shipment together with partial and full loads.

In the area of goods handling, they operate efficiently through direct delivery that occurs in a smooth process whereby lead time is reduce between the period of booking and delivery. Terminal delivery is avoided and a roof concept of vehicle to vehicle is applied to fasten the process and goods are made available directly to the recipient. Information flow is carefully managed by staffs to ensure products are controlled from the beginning to the end point. The picture below is an example of truck used in road transport

The company has developed a strong ERP system called Attracs online ERP system to help solve logistics problems. This system took a period of 15 years of hard work and determination to develop. A subsidiary (OY Attracs AB) of Ahola transport takes care of the continuous development of the ERP system and makes it user friendly to their partners. The Attracs Online ERP system is one of the most widely used transport system and ERP management system in the world as it offers changing concept of routes optimisation and provide room for planning and controlling the streams of products in a cost - efficient, environmental-friendly and economic manner

In addition to the attracs online ERP system, is the attracs optimizers which is an automated planning tool that can be attached to the client own ERP system. It is the most accurate and reliable optimisation tool on the markets and facilitates the coordination of routes and freight spaces bearing in mind the different forms of transport in Finland and oversea.

3.3 Operational Efficiency

According to the productivity commission of the Australian government (2013,3-6) efficiency is seen as the act of proper allocation of resources in rendering services or carrying out production using the lowest cost possible. The ability to do things without the waste of materials, well and successfully is referred to as efficiency. Goel (2015,57-58) described operational efficiency as a means used by firms to measures the ability at which they can use their resources to produce an optimum output employing the lowest cost at the shortest possible time .Operational efficiency looks at how an organization can manage it available resources to ensure the reduction of waste in time, materials and efforts as much as they

can and still maintaining a high level of productivity (Lee & Johnson 2012,59-63). The importance of looking at how efficient a firm carry out its activities help organisation to accurately manage their liabilities and asset to generate revenue. operational efficiency is calculated by dividing the operating expenses that is income before fixed charges over the operating or sales revenue (www.businessdictionary.com). This research will make use of this formula as the operational efficiency ratio of Ahola Transport will be calculated for 4 years in the next chapter and make a comparative analysis to see how efficient they were managing their assets and liabilities.

4 DATA ANALYSIS & RESULTS

This chapter examines data collected from the financial -information of Ahola transport via secondary source and explores using the excel platform. The results will show a clearer understanding of how efficient logistics operation can boost a company supply chain by making a comparative analysis of the operating efficiency ratios of an organization using the yearly income statement for the period of four years. A SWOT and PESTEL analysis will also be employed to discuss how the future of our case company looks like.

Operating efficiency ratio also referred to as activity ratio look at how efficient a company manages its total assets and liabilities to generate income (Ramagopal C 2008,51-54). The higher the operating efficiency ratio the high the profitability indicating a better management of the firm resources. Therefore, managers that carefully manage an organisation assets and liabilities increase the company ability to generate income through quality management approach or cost minimization. Hence, it can be view that for an institution to improve its operational efficiency, it can either cut down its input while producing same output or increase output using same input or increase output and input simultaneously. Therefore, for a company to operates efficiently, it needs to look beyond cost and consider other issues like quality management, used of automation and personnel empowerment. The table below shows the operating efficiency ratio of our case company for the period of four financial years calculated by dividing the operating revenue over the operating expenses.

TABLE 3. Revenue and Expenses (adapted from Ahola Transport financial-information 2015-2018).

	2015	2016	2017	2018
Operating Revenue	93820	95348	98424	99534
Operating Expenses	92206	94011	96762	97335
Operating efficiency Ratio	1.018	1.014	1.017	1.023

Table 3 above presents the picture of Ahola Transport OY operating revenue and operating expenses from the year 2015 to the year 2018 and the computed operating efficiency ratio from the year 20015 to the year 2018.To further illustrate the revenue and expenses trend for the period 2015 to 2018, a graphical presentation was done as seen in figure 3 and figure 4 using table 3 above with the help of the excel platform.

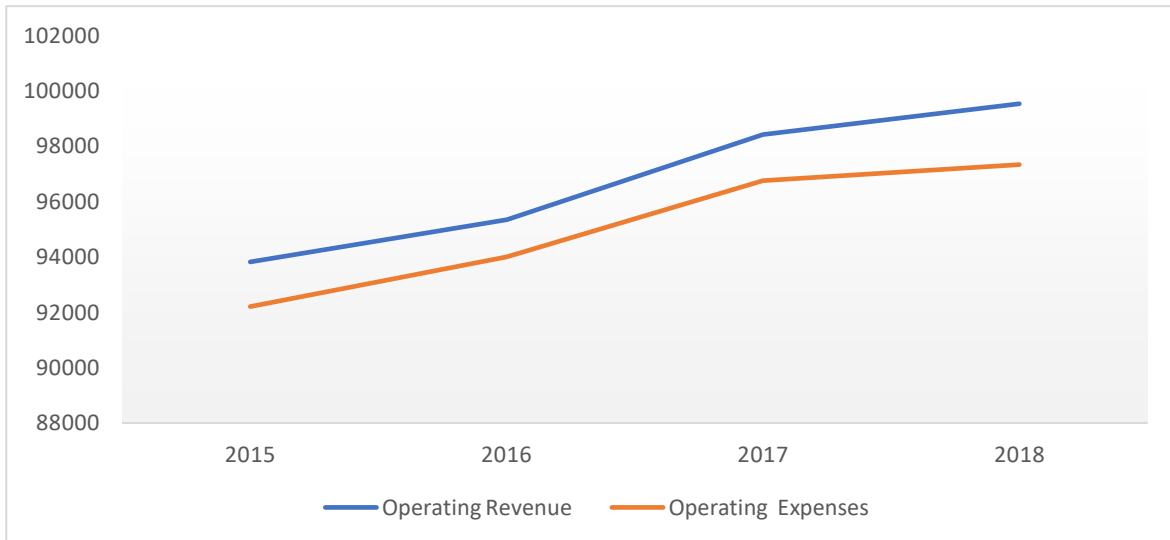


Figure 3. Revenue and Expenses trend

Figure 3 above clearly depicted that operating expenses of Ahola Transport OY increased consistently from 92206 in the year 2015 to 97335 in the year 2018 while the operating revenue also weakness the same trend increasing consistently from 93820 in the year 2015 to 99534 in the year 2018.

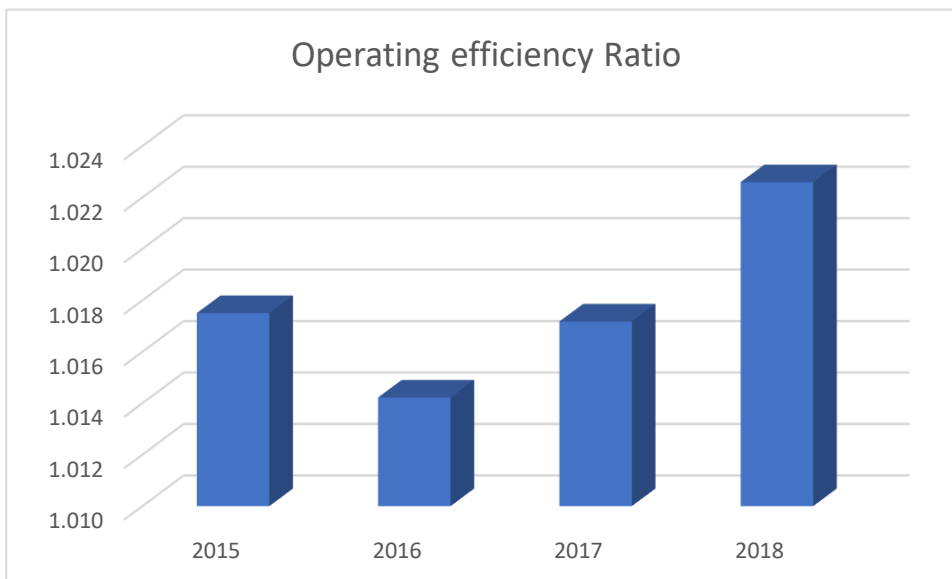


Figure 4. Operating Efficiency

From figure 4 above, the operating efficiency ratio fluctuated from the year 2015 to 2018, moving from 1.018 in the year 2015 to 1.023 in the year 2018. The operating ratio dropped by 0.04 in 2016 and increase in by 0.03 in 2017 and by 0.06 in 2018.

The dropped in operating ratio by 0.04 in 2016 could be due to the fact that the business atmosphere in 2015/2016 was characterized with the emergence of increased digitalization in logistics activities, used

of more vehicles having computers by drivers, functioning of new fleet, weak market situation, decrease of goods transported within the Baltic countries. Non-recurring cost or extraordinary cost such as design and development cost, investment cost, and losses on sales of asset incurred during the business year also contributed to the decreased in operating efficiency.

The success recorded in 2017 was because of increase in input, which lead to much more output hence creating an environment of a favorable supply chain process through quality management and intelligence logistics operations. The year 2017 also saw an increase in the flow of goods in international traffic; positive feedbacks of market development in the transport sector improve quality customers' services and increase in profitability as compare to 2016.

The operating efficiency ratio for 2018 was at the pick for the studied period and could be explain by the company specialty in transportation, more inputs invested and the purchase of an IT company Adminotech Oy to support the communication and technology system within the group to operate efficiently in carrying out their business activities. The year 2018 witnessed an increase in exports from Finland, the Baltic countries and Eastern Europe and a decrease in imports, which also acted as a boost in generating revenue from abroad. The continuous strive for customer satisfaction and increase in profitability took the right direction in 2018 as profit saw an increase of 1.1% compare to 2017.

To further examine how efficiently the case organization operates in rendering logistics activities, a SWOT analysis will be employed. The aim of a SWOT analysis is to identify for an institution the internal strengths and weaknesses that are important in meeting the outside threats and opportunities (Mariani 2017,40). The SWOT analysis is important as it could help in guiding the decision-making process for a company to reach a successful business deal. A SWOT analysis of Ahola Transport was carried out as seen in table 4 below.

TABLE 4. A SWOT analysis of Ahola Transport

<p><u>Strengths</u></p> <ul style="list-style-type: none"> • Family control • Specialty in Transport • Longevity • Staffs Professionalism • New Technologies • Secure source of financing • Powerful R & D 	<p><u>Weaknesses</u></p> <ul style="list-style-type: none"> • Cultural disparity • Family control • Transportation as the main source of income
<p><u>Opportunities</u></p> <ul style="list-style-type: none"> • Good road and rail-way network • Numerous emerging technologies • Powerful finish Economy • Strong Financing • Free Trade Zone 	<p><u>Threats</u></p> <ul style="list-style-type: none"> • Environmental pressure • New competitors • Legislation • Aging of experience staffs

Taking into consideration the organization internal factors such as the operating efficiency ratios and the SWOT analysis outlined above, it is also important to look at the external environmental factors that are beyond the case company control. Scanning the external environment is important to identify the factors that will influence an organization success (Brennan & Sisk F 2014,40). It is therefore important to make use of the PESTEL analysis to see how changes in political, economic, social, technological, ecological and legal factors can impact the case company from operating efficiently. Table 5 below presents the PESTEL analysis of Ahola Transport OY.

TABLE 5. PESTEL analysis of Ahola Transport

<u>Political</u> <ul style="list-style-type: none"> • Changes in Government Policies • Opposing group • Foreign policies 	<u>Economic</u> <ul style="list-style-type: none"> • Exchange rates fluctuation • Unemployment rates affecting per-capital income at the micro level • The existence of monopoly • Taxation system • Monetary policies
<u>Social</u> <ul style="list-style-type: none"> • Consumers confidence • Social infrastructure 	<u>Technological</u> <ul style="list-style-type: none"> • E-commerce • Transport intelligence
<u>Ecological</u> <ul style="list-style-type: none"> • Climate change • Local regulation 	<u>Legal</u> <ul style="list-style-type: none"> • Liability • Property rights

5 CONCLUSION

This report gives information on efficient logistics operation in a supply chain. The study was aimed at analysing the ease with which logistics operations are executed by looking into the following aspect: the operating expenses and operating revenue of Ahola Transport for the period of 4 years and why the presence of the problem of efficiency in a logistics company. Data analysis was done using the excel platform which outlined the variation of income and expenditures for the case company for the period of 4 years and the SWOT analysis was used to discuss how the case company can manage its internal environment by looking at the strength, opportunities, weaknesses and threats. To look at what is beyond the case company control, the PESTEL analysis was used to see how political, economic, social, technological, ecological and legal factors can affect the organisation from attaining efficiency.

The research analysis was focused on the operating efficiency of logistics activities in a supply chain using data from the income statement of Ahola Transport Oy. From the analysis the company is operating efficiently as the operating revenue for every year is higher than the operating expenditures leading to a higher efficiency ratio which indicates success in the organizational operating activities. Looking into how the case company can manage its internal environment, the SWOT analysis employed at the previous chapter outlines the company strengths and weaknesses that are relevant in meeting its opportunities and threats and also taking into considering other factors that are beyond their control by making use of the PESTEL analysis to ensure continuity and success in business operation.

This thesis was done with the help of secondary sources of data and no major challenges were faced in finding materials related to logistics and operational efficiency as I used mostly e-books from Centria library and online materials from the case company website and other recognised institutions dealing with logistics and SCM. However, it was difficult to contact the board chair of Ahola transport which could have helped in providing some important primary materials needed for this report. Therefore, I did not make use of primary sources of data in writing this thesis. In this perspective, the thesis therefore did not make use of all elements of logistics activities that can facilitate operational efficiency in a supply chain.

Besides, there are many other elements that can facilitate logistics activities to be efficient in a supply chain which lie beyond the scope of this study. For example, time management, proper communication

channel, leadership and/or management styles and customers' attitudes towards changes in new technology can boost the level of operation in a supply chain. To recommend, future research should be carried out using the qualitative approach and emphasis should be done on each of the logistics activities to see how they contribute in helping a supply chain to operate efficiently.

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