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Cost Optimization in Supply Chain Management

Case of a Finnish Distributor of Cosmetics

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<p>Costs are inevitable elements which appear in every activity in the supply chain: from procurement, to transportation and warehousing. The expenditures spent in supply chain activities open a topic of how supply chain could be optimized financially. With the focus on cost optimization, a business does not only reduce its short-term spending but is also benefited with resources for long-time investment.</p> <p>This thesis discusses different elements of cost optimization in a supply chain, especially from the viewpoint of a small Finnish cosmetics distributor. The thesis starts by providing different models to evaluate supply chain performance and common metrics to assess supply chain both operationally and financially. The section is followed by different costing techniques and how supply chain costs are defined. Different toolkits and practices for cost optimization are then presented in terms of purchasing, transportation and warehousing. Cost optimization should come from every single element of the supply chain, which are related to each other and contribute to the improvement of the whole chain.</p> <p>Both qualitative and quantitative data was collected to provide a coherent and convincing support for the thesis. The theory was followed by the case study of a Finnish Distributor of Cosmetics - company X, to examine real-life application of the findings. The case study consists of an overview about company X, how supply chain of company X is operated and the author's suggestions for improvements of the supply chain. Data collected for the case study comes from interviews with Company X's Chief Operating Officer and Demand Planner. The case study also incorporated the author's observance while working as a Purchasing Assistant for the company.</p> <p>The thesis inherited results from existing studies, and the outcome proposes further development of cost optimization processes in supply chain management. The thesis aims at providing small-and-medium-sized companies with tools and tactics necessary for cost optimization process. The case company is a demonstration of how these methods applied in the scope of a Finnish small-and-medium-sized company. Further research is needed when applying these methods to other companies of different scale and different industry.</p>	
Keywords	Supply chain, Cost management, Metrics, Optimization

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Glossary

ABC	Activity-based costing. A costing method that assigns overhead and indirect costs to related products and services (Kenton, 2020).
COGS	Cost of Goods Sold. Direct costs used to produce a good sold by a company (Fernando, 2021).
EBIT	Earnings before Interest and Taxes. Revenue earned by a company before excluding interest and tax (Murphy, 2021).
EOQ	Economic order quantity. The optimal order quantity that minimizes total costs of inventory (Inc.com, 2020).
ERP	Enterprise Resource Planning. Software used to plan and manage supply chain activities (Qad.com).
JIT	Just-in-time. A supply chain management strategy to increase efficiency and reduce waste by receiving goods only when the company needs them. (Banton, 2021).
KPI	Key performance indicator. A set of quantifiable measurements to assess performance (Twin, 2020).
LSP	Logistic Service Provider. Outsourcing companies that provide a range of distribution, storage, transport and fulfilment services (blumeglobal.com, 2019).
SC	Supply chain. A network comprises of different activities, people, entities, information and resources that the company needs to deliver goods from its suppliers to the final consumer (CIPS.org).
SCM	Supply chain management. The management of a supply chain's activities and its participants (Council of Supply Chain Management Professionals).

- SCOR The supply chain operations reference model (SCOR). A supply chain model developed by Supply Chain Council to help improve supply chain processes.
- SME Small and medium-sized enterprises. Business whose revenues, assets or a number of employees below a certain level which is determined by the country it is operating (Liberto, 2020).

1 Introduction

Supply chain management (SCM) has been a remarkable topic for a lot of researchers already since the 80's when the new concept was introduced and became more and more recognizable. The Council of Supply Chain Management Professionals defines supply chain management as:

...encompassing the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers and customers.

Participants of supply chain (SC) activities consist of material providers, manufacturers, contract manufacturers, logistics providers, distributors, retailers, etc., which are presented in Figure 1 (Schutt, 2004: 6).

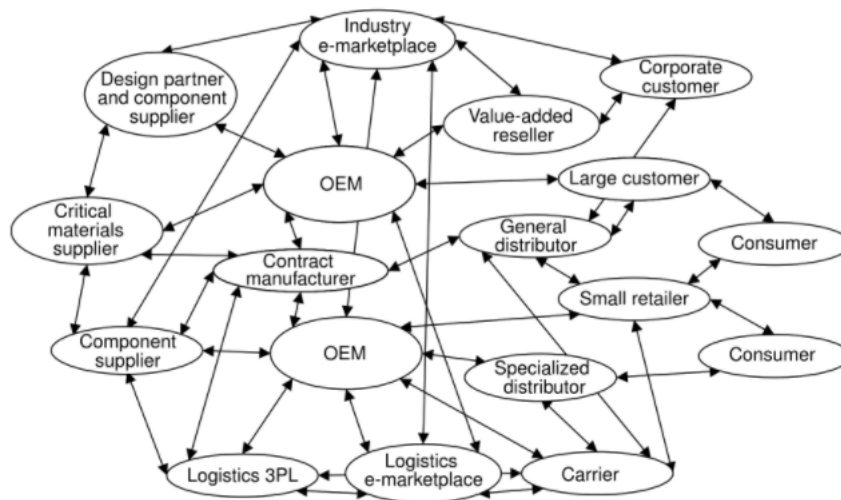


Figure 1. Participants of the supply chain (Schutt, 2004:6)

SC is considered as a value chain comprises of three rigid functions: inbound logistics, core process and outbound logistics (Foster, 2016: 31). These core functions create value from the company's initial investment. Because of the extensive nature of SC, the opportunities for cost savings and improvement might come from every single activities

of SC. The value is not limited to a singular product or service, but rather dispersed over the value chain, from raw materials to product dissemination and consumption (Ivanov and Sokolov 2009:1).

The ultimate purpose of cost optimization is achieving efficiency rather than only cost saving. Cost optimization also improves a company's competitive advantage and success. William Stevenson (2005), in his book about Operations Management, indicates the benefits of effective SCM as lower inventories, lower costs, higher productivity, greater agility, shorter lead times, higher profits, and greater customer loyalty.

However, reluctant to improve SCM still exists. Some regards supply chain as merely an extension of traditional functions such as operations, purchasing and logistics (Cook et al., 2011). When there is little effort for improving SC efficiency, the result can directly impact company's performance (Camerinelli 2009: 30). Neely (2002) also shows the importance of SC optimization in his study: "Failure to do this will lead to financial distress and ultimately for many organizations, to financial failure or bankruptcy".

It was interesting for the author, while working for company X, as an intern from August to October 2021 and later until the time being – April 2021, as a Purchasing Assistant in company X, to study how SCM in Company X is performing and how cost optimization might affect Company X's SC. The author realized that there is a substantial gap between the current SC performance and the desirable goal of cost optimization from the management board. The results of the research will provide a guideline for the company and for companies of similar scale to execute and redesign SCM into a more efficient way.

1.1 Objectives and scope of the thesis

The objective of the thesis was to emphasize the role of cost optimization to SCM and to explore methods to improve SC financially. As marketing, finance and sales functions

are seemingly more favourable among management boards, the role of SCM and SC optimization should be further developed and examined (Bailey et al., 2015). SCM should not be viewed only from operational perspective but should be recognized as part of the strategy-making process (Ketchen and Giunipero 2004). As a result, SC evaluation and optimization practices are critical for the growth of a company.

To achieve the objectives, a couple of research questions were formulated in order to evaluate the purpose of the thesis topic:

- What are relevant methods and metrics to assess SC and SC's financial health?
- What costs are associated with SC activities?
- How could the SC of a company be optimized financially?

After reviewing relevant literature relevant to the research questions, the paper provides further analysis through a case study of company X, an SME cosmetics distributor, to explore the applicability of the research findings in a more practical environment. The case study provides general information about the company, how SCM in the company is implemented, and to what extent could cost optimization be involved. The literature review as a result becomes a background to assess SCM with relevant indicators, tools and tactics.

1.2 Research methodology

To fulfil the designated objectives, both quantitative and qualitative data are adopted in the data collecting process. According to Chandra and Harindan (2017), the mix of quantitative and qualitative method provides better understanding of interaction effect of factors and is a mean for testing theory (Figure 2).

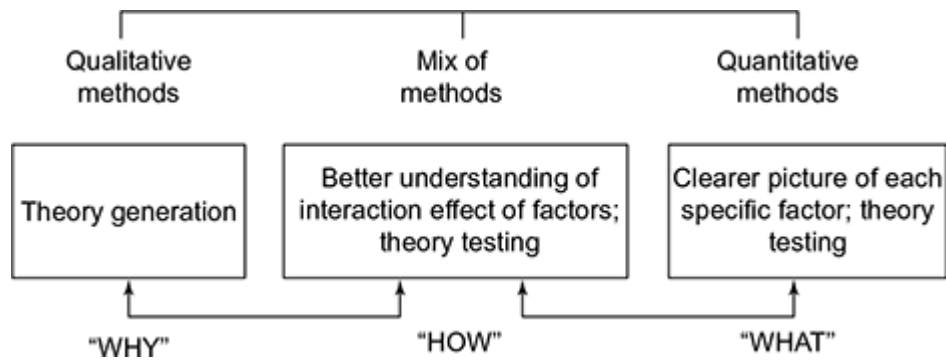


Figure 2. Characteristics of different research methods (Chandra and Harindan 2017)

Quantitative data was collected from reliable statistics sources and from the company's databases. Qualitative data consisted of primary data in a form of three interviews with Company X's Chief Operating Officer (Interviewee 1) and Demand Planner (Interviewee 2). The interview questions can be found in Appendix 1. Due to Covid-19 pandemic, the interviews were implemented online. Interview with Interviewee 1 was divided into two parts. The first interview was conducted in October 2020, with topics related to general SC performance in company X. The second interview was conducted in February 2021, with topics related to logistics partners' performance and KPIs in the SC. Interview with Interviewee 2 was conducted in March 2021, with topics related to purchasing. The interviews included close-ended questions, open-ended questions, and probing questions which provided a comprehensive approach to different aspects of SCM in the company. Questions were designed with top-down method, starting from general topics to concrete questions. The author also incorporated her own observation while working in the company as Purchasing Intern and later on as Purchasing Assistant. Qualitative data also comes from secondary sources including textbooks, journal articles and company materials. Keywords related to the topics such as "supply chain costs", "supply chain performance", "supply chain metrics", "supply chain optimization", "supply chain finance" and "cost optimization" were queried in reliable online databases, such as Emerald Insight, Ebook Central, EBSCO eBook Collection and Proquest Central, to obtain literature that meet the objective of the research.

1.3 Background of Case of Company X

Company X, founded in 2014 in Finland, is a distributor of beauty and cosmetics products for retailers across Nordic and Baltic region. According to the CEO, Finland is just a small market, and it is the reason why the company has been constantly expanding its remark to other countries like Sweden, Norway, Denmark, Iceland, Estonia, Lithuania, Latvia and Belarus. The company's products are distributed to over 9000 retailers' door which include big players in the retail market that could be named such as H&M, Stockmann, Douglas, Apotek, Viking Line (Company X, 2018).

Company X's net sales experienced a moderate growth during 2016 to 2020 (Figure 3). From February 2019 to February 2020, nearly 18% of income was on the increase. Total sales in February 2020 surpassed 8 million euros and is still expected to continue growing.

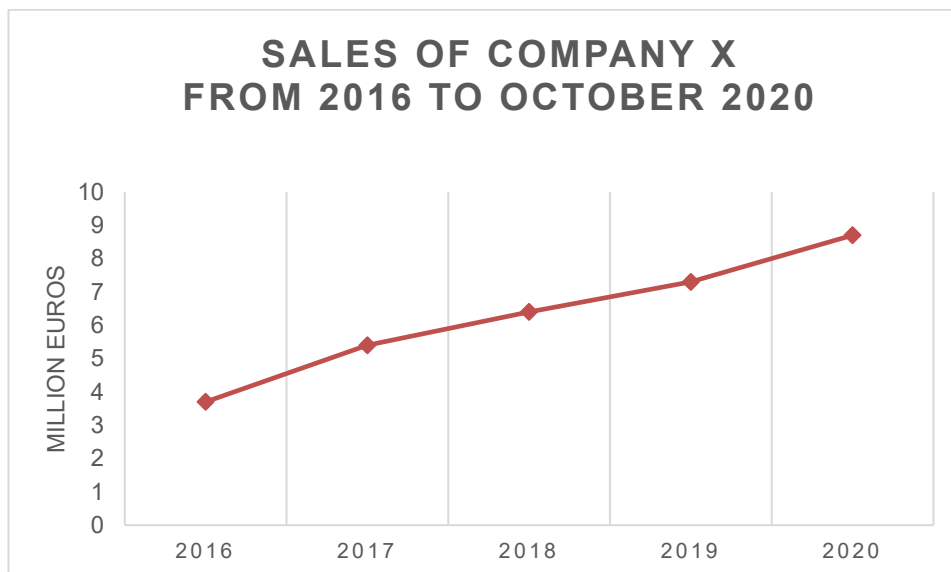


Figure 3. Sales of Company X from 2016 to 2020 (Company X, 2020)

Company X is a small size company with centralized organizational structure. The company is operated centrally, with decision-making process handled top down from executive levels to the operative level. In addition to partners and interns, the number of permanent personnel in the company is currently 27 (Figure 4).

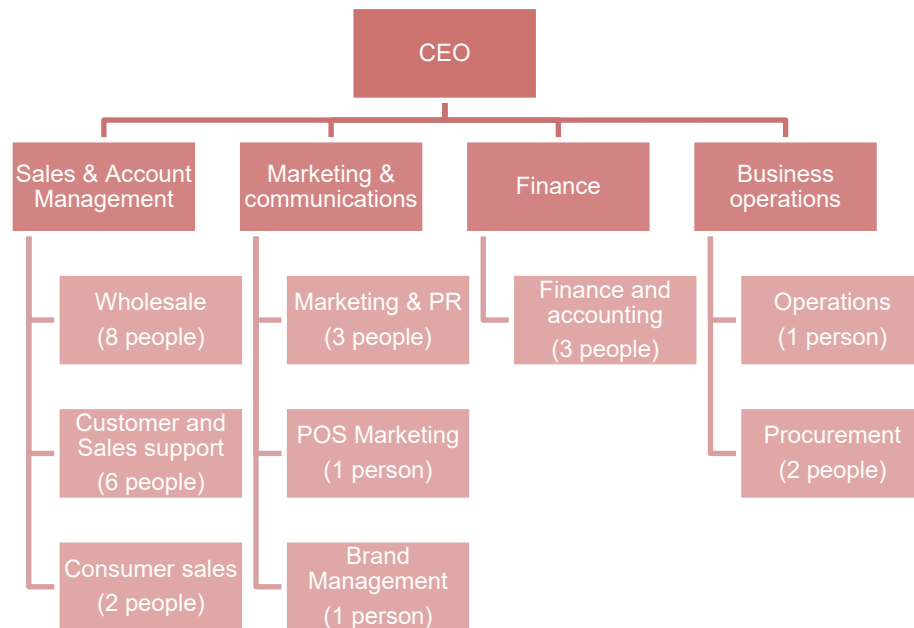


Figure 4. Organizational structure of company X (27 people)

The company holds the mission of promoting beauty and cosmetics products, especially for woman, while taking into considerations other factors such as quality, innovation and sustainability. Starting with only one supplier at the beginning, the company has been expanding its network to over fifteen supplier brands across different countries (Figure 5). The company offers over 3000 SKUs, with assortment falls into four different categories: haircare, skincare, makeup, and beauty accessories.

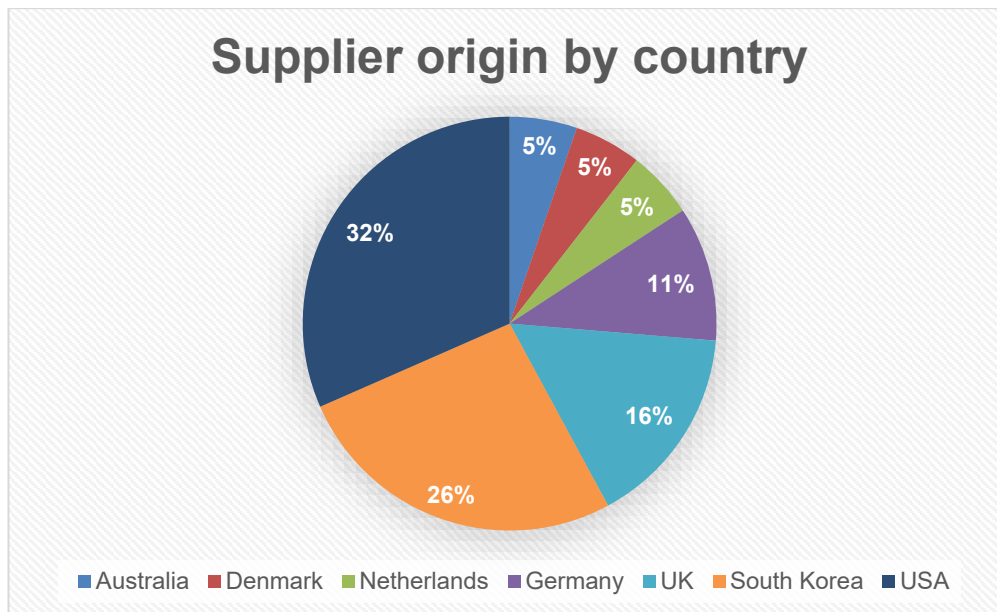


Figure 5. Company X supplier by origin country (Company X database)

Not only does company X offer physical products but branding and promoting are also part of the business. Key consideration for selecting partner brands are global promising growth, being ahead of trend and potential to create value together. The company's value towards beauty is considered as "functional, minimalistic, sustainable and pure" (Company X, 2021).

Playing a distributing role by bringing products from suppliers to the retailer, SC is recognized by management board as a key area in Company X's operation. However, a strategic plan is missing from the company's SCM. SC practices in company X only limits at performing necessary activities to keep the SC running. There is little effort in improving SC into a more strategic and systematic direction. Consequently, there is a high risk for company X to lose cost saving opportunities and improving efficiency.

1.4 Limitations of the research

Due to the complexity and extensiveness of SC, this paper experiences some limitations. Firstly, each organization's own strategy is not identical and is defined differently based on the management board's vision and objective. The ultimate purpose of optimizing

SCM financially cannot apply to every organization. Apart from costs, there are many aspects at which a company could utilize to optimize SC, such as SC performance, sustainability, technology advancements, etc. Further considerations about SCM other than costs, however, are not fully discussed in this paper.

The limit of the research paper also comes from the size of the case study. To test the validation of the research question, a case study of a small organization within a single industry is not sufficient. A more extensive and wider coverage from other research is needed to review the application of the theory in different sector and industry, different company size as well as their market coverage. As a result, the research might create an open door for later research in examining the cost optimization process in a more pervasive scale.

2 Supply Chain Performance

2.1 SC Model

Estampe (2014: 6) mentions the purpose of organizational modelling as: "...formalizing all or part of the company with a view to understanding or explaining an existing situation or to carrying out and then validating a design project". As important as organizational modelling, developing a SC model will result in a better examination of how SC operates. Considering the complexity of SC, SC model provides a general picture and simplifies SC for a better development of SC plan.

Supply Chain Operations Reference (SCOR) is a SC model developed by the SC Council to provide a methodology, diagnostic and benchmarking tools to help endorse SC processes. SCOR regards all SC processes to five main core processes: Plan, Source, Make, Deliver and Return (White, 2018):

- Plan: Determining resources, personnel, and other requirements to develop a better communication and operation process while taking into consideration factors such as compliance, transportation, assets, inventory, etc.
- Source: Obtaining goods and services to meet market demand, which includes demand planning, purchasing, receipt, and the supplier agreement and payment.
- Make: The act of creating a market-ready product, such as production planning and manufacturing.
- Deliver: Delivering finished products to meet customer demand, which deals with order, transportation and distribution management.
- Return: Processes deal with returning products after delivery.

In each process, different metrics are utilized to measure the performance based on five characteristics: reliability, responsiveness, agility, costs, and assets (Avelar-Sosa et al., 2019). Table 1 provides more details about each characteristic and typical metrics for each attribute:

Table 1. SCOR attributes and metrics (DeSmet 2018)

Attribute	Attribute Definition	Typical metric
Reliability	Defined by the ability a task meets its expectation. Reliability focuses on the anticipated outcome of the process.	Perfect order fulfilment: Measures the percentage of orders that fulfil the perfect quantity, perfect quality and at the perfect time in relative of all order fulfilment.
Responsiveness	The responsive level a task is performed or the speed at which customer's orders are fulfilled.	Order fulfilment cycle time: Measures the time when customer orders are placed to when the order is actually delivered.
Agility	How a company reacts to external forces and how it gains or maintains competitive advantage in a condition change.	The Level of Flexibility and Adaptability in SC.
Cost	Considers all the costs arises in SC: labor costs, material costs, management and transportation costs.	COGS: The cost associated with buying raw materials, producing finished goods rather than the acquiring cost. This includes direct costs (labor, materials) and indirect costs (overhead).
Asset	How asset is efficiently managed including inventory reduction and in-sourcing versus outsourcing.	Cash conversion cycle: Measures the length of time when the company makes an investment to when the company receives cash from that investment.

SCOR is a useful benchmarking tool that simplifies SC into more standardized processes. It also provides a framework for decision-makers to evaluate their company's performance based on the suggested areas.

Gartner, a research and advisory firm, proposes a roadmap for identifying supply chain maturity through the Five-Stage Maturity Model. According to Meulen (2017), one of Gartner's analyst, there are five stages defining the level of maturity of SC towards optimal performance. These steps include the following actions:

- Stage 1 (React): This stage focuses only on department functional scale, while cross-functional collaboration is disparate and not fully connected.

- Stage 2 (Anticipate): In addition to departmental operation, coordination is internally taken into account to improve overall costs, efficiency and productivity.
- Stage 3 (Integrate): There is a tendency for productivity and cost reductions through integrating logistics with overall SC. Logistics operation is carefully examined to identify the effect towards customer service, procurement and management.
- Stage 4 (Collaborate): Opportunities for further development are not limited with logistics function only but are now expanded to other parties in SC network, such as suppliers and customers.
- Stage 5 (Orchestrate): The whole value chain network is coordinated in optimal processes. Decision-making focuses on business excellent, market share and growth opportunities.

In overall, Stage 1 and Stage 2 focus mainly on individual department and its function to reduce costs and improve efficiency. Stage 3 takes intraorganizational function into consideration in order to deliver the optimized cross-functional cooperation. In its most advanced performance, in Stage 4 and Stage 5, SC performance aims towards interorganizational collaboration for ultimate value, as is shown in figure 6 (Lisica and Gonzalez 2019).

The Logistics Maturity Model Showing the Three Key Development Milestones

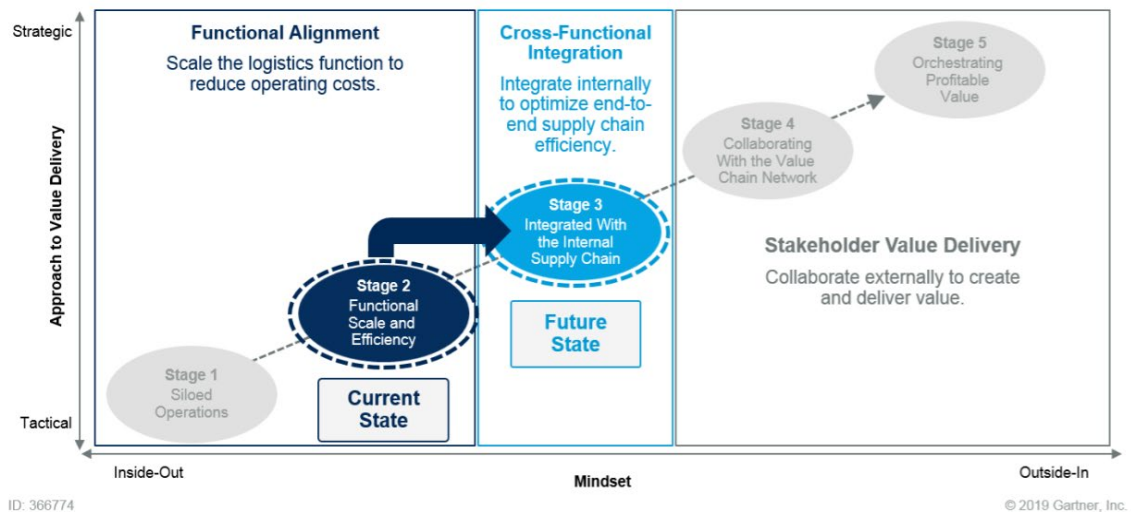


Figure 6. The five stages SC Maturity Model (Lisica and Gonzalez, 2019)

By understanding the maturity model, SC practitioners might be able to assess current SC's standpoint and to tailor suitable improvement strategy to close the gaps to reach to the next stage. In the highest stage of maturity level, functional departments perform with their best while maximizing stakeholder's value.

2.2 Key performance indicators

SCM cannot operate efficiently without a clear direction. By choosing a suitable ratio or a set of ratios, SC evaluation will be more effective. Measuring SC performance is in fact crucial to identify opportunities to cut costs and improve overall business functions. SC assessment is characterized by the ability to represent several aspects of the organization, such as financial, strategic, tactical, and operational. SC assessment defines a common language for SC participants to work towards a mutual objective (Estampe 2014: 13).

There is no standardized set of indicators to measure SC performance. "Performance evaluation should be contextualized by the activity sector of the organization environment of the SC" (Estampe 2014: 75). As the process of collecting, analysing and interpreting data takes time, money and effort, identifying suitable metrics that fit

the organization's objective will eventually reduce the frustration of the evaluation process (Leon 2016). SC manager plays an important role in selecting proper measurements that meet their organization needs from a vast array of metrics (Camerinelli 2009: 96).

Suitable metric or set of metrics should follow "SMART goal", which stands for Specific, Measurable, Achievable, Relevant and Time bound. These consideration helps a company to identify goals which are suitable for its needs. Goal should be clear and specific, which is a starting point for a higher chance of being accomplished. There is no better way to track the progress without measuring it, so it is critical to make a goal measurable. The goal also needs to be achievable. Setting the goal too low could lead to slow improvement while too high goal could lead to demotivation. A suitable goal is relevant to the designated area that the company aims to improve. Identifying a time commitment will set the act of achieving goal on focus and will be a preparation step for the next set of goal (Mindtools.com).

Key performance indicator (KPI) enables management board to audit, compare, assess and provide suitable planning (Martin, 2018). There are financial and non-financial KPIs to measure the performance of SC. Non-financial KPI measures the level of efficiency in supply chain operation. Some of the non-financial supply chain measurements could be listed as rate of defects, fill rates, order accuracy, inventory turns, customer satisfaction, etc. (Leon 2016). To measure SC financial performance, different KPIs from finance could be utilized. Typical accounting-based metrics such as Return on Assets (ROA), Return on Equity (ROE), Return on Investment (ROI) are used to assess capital utilization, while Profit Margin, Cost of goods sold (COGS) and Economic Value Added (EVA) are used to measure the ability to make profit (Gunasekaran et al., 2001).

A survey conducted in 2017 by Geodis, a worldwide transport and logistics service provider, examined the use of different key performance indicators in SCM (Figure 7). A total of 623 respondents from 17 countries provided their views about different key performance indicators in supply chain. Respondents were individuals whose professions involved directly with SCM, holding critical positions in their company, such

as top management executives, directors, etc. From the survey, one-third of the responses show their appreciation towards cost reduction as a KPI to monitor supply chain. Cost reduction is clearly indicated as the second most familiar and used KPI to monitor supply chain among the respondents.

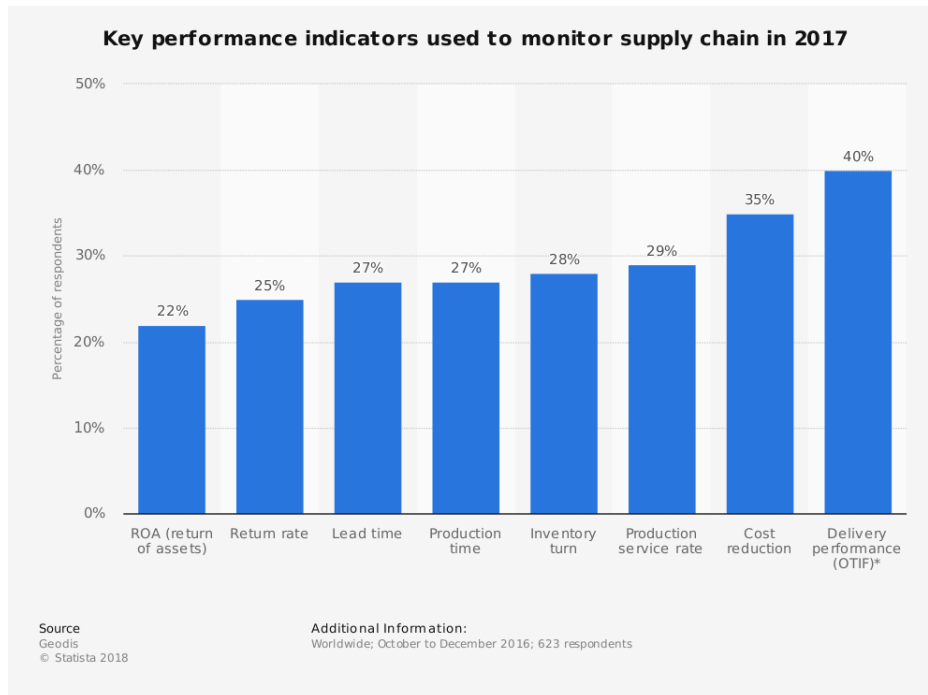


Figure 7. Results of Geodis survey about SC indicators (Statistica 2018)

However, when taking cost optimization into consideration, it is critical for SC managers to be aware of the issues that might be associated with the process. Reducing expenses should be limited only to the level which does not negatively affect core functions of the company such as product quality and customer service level (Bragg 2010: 28-29).

Financial performance measures the relationship between the financial results of a company in respect to the economic goals (Avelar-Sosa et al., 2019). Some of the key financial metrics in SC could be found in Table 2.

Table 2. Supply chain common Financial metrics (Leon 2016)

<p>Return on Investment</p> <p>ROI = Net return on Investment/Cost of Investment</p>	<p>ROI is used to assess a company's financial gain in relative to its costs. ROI can be either positive or negative. When a company experiences positive in ROI, returns exceeded costs. On the other hand, when costs exceed return, ROI will result in a negative number. Improving ROI can be done by better manage of costs and more efficient use of capital. SC can merit greatly from a more effective operation when purchasing materials, managing inventory and transportation.</p>
<p>Operating profit margin (%)</p> <p>Operating profit margin = Operating profit (EBIT)/Sales revenue (%)</p>	<p>Operating profit margin measures how much a company earns from its operations, and is calculated by dividing operating income, or earnings before interest and taxes (EBIT), by sales revenue. Operating profit margin shows how much costs and expenses contribute to producing and delivering final products. Looking at operating profit margin, the evaluator could identify how well the business is operated. A high operating profit margin figure shows that costs being managed effectively in comparison to sales revenue. A lower operating profit margin figure shows that costs are taking up a great part of sales revenue.</p>
<p>Return on total assets (ROA)</p> <p>ROA = Net income/Total assets</p>	<p>ROA indicates the relation between a company's operating profit in comparison to its assets. ROA reveals how much a company earns from the capital it invested (asset). Assets such as cash, inventory, plants and factories, stores, offices, and vehicles are taken into consideration to asset sales and earn profits. A high ROA is equivalent to a more money earn with less money invested.</p>
<p>Inventory turnover ratio</p> <p>Inventory turnover ratio = COGS/Inventory</p>	<p>Inventory turnover ratio indicates how many times inventory sold out and then a company bought new inventory to replenish stock for a given time period, conveys how efficiently company purchases, produces and sells its inventory. In general, a higher number of inventory turns is more desirable. This indicates that the firm is selling its inventory faster, thus earning revenue and a generating a return on its investment more quickly. A lower number indicates that the firm is holding onto inventory for longer periods of time, signaling poor sales. In addition, the longer inventory is held the greater the chance that the inventory will become obsolete, damaged, or stolen.</p>

Operational efficacy will be reflected on company's financial statements and implied through financial metrics. Operations and supply chain activities might have either positive or negative impacts on a company's cash flow, profitability, debt, and its ability to perform. How the company can pay bills, profitability, management of assets and debts are essential for not only short-term operation but also long-term growth of the company. Incorporating financial metrics into supply chain strategy will contribute to a concrete plan for further assessment and improvement.

3 Supply Chain Costs

SC costs include all costs happen in the SC activities, for instance, demand forecasting, inventory management, material handling, packing, service support, site selection, procurement, transportation, warehousing, etc. (Lambert et al., 1998). According to Anklesaria (2008), "a cost that is not measured is not managed". Costs reported from individual SC functions such as purchasing, warehouse and logistics should be collected to support decision making of the whole SC. A management accounting system is needed to measure the costs at different SC function and the total costs along the chain (Boute et al., 2014).

By identifying and developing a suitable costing model, the efficiency and effectiveness of an organization is concretely examined for better-quality decision. Essential cost data can be extracted from company's own databases or from information provided by supplier. Financial understanding is required from the modeler, as the cost modelling process requires proper analysis from financial documents, such as income statements, profit and loss statement, balance sheets (Sower and Sower, 2012:9-11).

Costing models from financial accounting such as traditional costing and activity-based costing (ABC) are often brought into comparison. Pierce and Brown (2006), highlighted different value of the two costing models: If ABC contributes to cost assessment from specific activities, such as stock evaluation and cost reduction, traditional costing is key to identify overall success of budgeting. Masters (2018) also shares the same view. He identifies the traditional method as addressing direct costs related to product, while in ABC model costs are generated by activities that have been completed (Masters 2018).

3.1 Traditional Costing Model

Traditional costing model has existed for a long history and it is utilized in many organizations (Pierce and Brown 2006). Traditional costing method refers to the allocation of manufacturing overhead costs to the products manufactured. Traditional costing method only concerns with the amount paid for goods and services. As a result,

traditional costing model often neglects underlying factors such as costs from operations, marketing, distribution, etc. (Bailey et al., 2015). However, SC costs are not always visible. SC costs are variable elements; hence they require SC practitioner to identify costs from different levels, from direct costs to costs derived across the supply chain other than just acquiring price (Masters 2018).



Figure 8. Price/cost Iceberg (Bailey et al., 2015)

Only 10% of the iceberg lies on the surface of the water, while 90% of the mass is invisible and lies beneath the water. Just like an iceberg, the visible cost of acquisition only makes up 10% of the total price, and should not be a landmark for decision making. Figure 8 shows the model of price/cost iceberg to clarify the Total Cost of Ownership (TCO) could be more than just the purchasing price (Sower and Sower, 2012).

Acquisition	Operating	Disposal
<ul style="list-style-type: none"> ▪ Unit price ▪ Freight ▪ Import duties ▪ Warehousing costs ▪ Payment terms ▪ Inventory ▪ Implementation services ▪ Training ▪ Installation 	<ul style="list-style-type: none"> ▪ Expedited freight ▪ Production program changes ▪ Production yield (scrap) ▪ Cost of poor quality: <ul style="list-style-type: none"> - Rejections - Concessions - Warranty - Recalls ▪ Maintenance ▪ Cost of use 	<ul style="list-style-type: none"> ▪ Recycling costs ▪ Disposal costs ▪ Sustainability ▪ Circular economy

Figure 9. Hidden Costs in SC operation (Cossio, 2019)

Cossio (2019) presents common hidden costs found in SC operation (Figure 9), and suggests SC practitioners to start review their SC practices by answering three questions:

- Where do we usually identify cost savings opportunity?
- What additional process that increase our costs?
- Which source can we find information of these costs?

3.2 Activity-based Costing Model

While traditional costing model concerns mainly with acquiring a product or service, it leaves out the operating factors (Sower and Sower, 2012: 115). Applying overhead cost is not sufficient to assess SC costs of different volume quantity (Haroun 2015). The idea of Activity-based Costing Model (ABC Model), as an alternative to traditional costing model is presented.

ABC has been an attractive topic for researchers since its eminence dated back in 1980s (Pierce and Brown 2006). ABC has its roots from manufacturing, identifies the activities that a firm performs and assigns indirect costs to products. In ABC model, activities, or even transaction or event, can be considered "cost driver". Examples of cost drivers are machine setups, maintenance request, power consumed, purchase orders, quality inspections or production orders. These expenses are calculated in a customizable way, and cost drivers are assigned in the most appropriate and relevant manner (Masters 2018). In another word, ABC has a deeper focus on the cost associated with a decision or specific process (Yu-Lee 2001:19).

According to Haroun (2015), costs are identified in different levels in ABC costing: unit level, batch level, process level and organizational level (Figure 10). In the most elementary level, ABC deals with unit related costs such as direct material, direct labour and machine costs. Batch-level costs cover costs related to unit in a greater volume, consist of machine setup, inspection, material handling and dispatching spare

parts in a specific volume. When it comes to the process of equipment changes, maintenance design or development costs, costs are identified in process level. Organizational is the broadest level, related to more generic costs such as building depreciation, insurance, administrative salary, and organizational advertising.

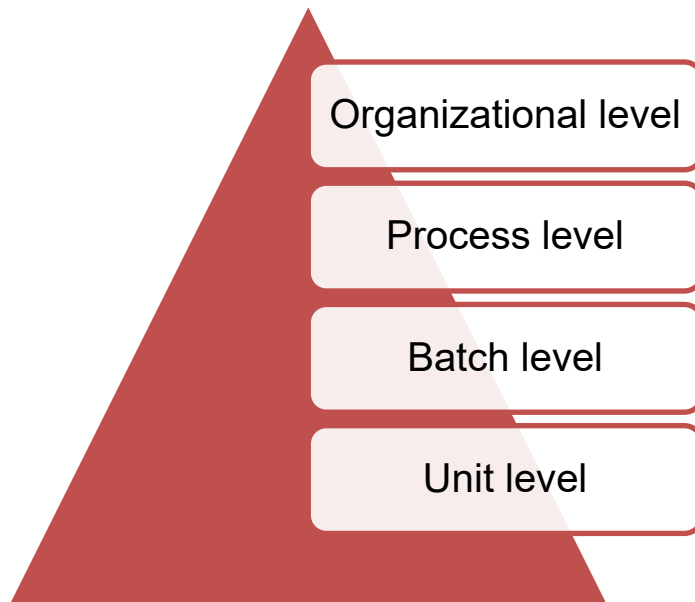


Figure 10. Level of costs in ABC (Haroun 2015)

The purpose of ABC costing method is to enhance cost data visibility and better classification of costs occurred in the process (Kenton, 2020). ABC shows its advantage when costs are associated with a specific activity but does not necessarily contribute to the general level of costs, such as facility sustaining costs (Masters 2018). ABC analyses costs in a concrete and relevant way, thus provides a framework to identify low value-adding activities. Benefits from this approach could be seen through identifying resources used, eliminating waste and promoting cost reduction and improve efficiency (Sower and Sower, 2012: 39). However, ABC also has limitations. ABC requires more precise information of cost factors, which makes it is more challenging when working with bigger data. This might result in more costs for maintaining the database and more skilful workforce for cost processing and management (Bragg 2010).

4 Supply Chain Cost Optimization

The financial impacts of SCM have been recognized by several studies and many of them have proven the significant relationship between SCM and financial performance. According to Shi and Yu (2013), many companies acknowledged the importance of investing effort in SCM, as they realized that it is necessary in order to stay competitive. This is a crucial view and company executives should be aware of it, as improving SCM plays a positive contribution to enhancing the competitive advantages and optimizing financial outcomes. Foster (2016) also supports investment in SCM because it will help to improve the overall quality of supply chain performance and thus to reduce defect, reduce cost, improve organizational performance and improve profitability. In order to be globally competitive, company needs to have a strategic approach when managing SC working capital (Camerinelli 2009: 53). What the company could inherit from this strategy is the so-called "sustained competitive advantage". Anklesaria (2008:38) also believes that the lower the SC costs the better the sustained competitive advantage will be. This sustained competitive advantage will not only bring profitability to SC but also to the whole organization (Khalid 2010: 48).

Unlike the uncertainty of increasing revenue, which concerns with pricing, margins, the actions of competitors, and governmental regulation. Cost reduction is the simplest path to increase profitability and enhance cash flow. The advantages of cost reduction could be seen as lower costs, fix cost base and elimination of total cost rises in unstable circumstances. Cost optimization should not be a one-time event, but rather be a continuous improvement during the life-time of the company (Bragg 2010:4-7). A company financial situation will have an impact on its operation in the short run, such as purchasing inventory, paying employee's salary and shareholder dividends, and other miscellaneous operation on daily basis (Leon 2016). Also, cash flow situation will also affect long-term growth of the company when investment is needed.

SC cost optimization should come from the development of end-to-end SC activities which requires optimal execution of every SC activities, from purchasing to warehousing and transportation. The following sub-chapters provide different methods and tactics to manage SC from the perspectives of these key areas.

4.1 Purchasing

Purchasing is the act of supplying of products, materials, services and information that are important to support daily activities of the organization. In addition to acquiring costs, it is important to consider other associated costs, such as cost to enter orders, process approvals, processing after receipt (quality checking, invoice checking, before concluding a purchasing decision) (Martin, 2018).

Benton (2010) mentions about the responsibility of purchasing in contribution to cost saving. Because the process of acquiring, storing and moving commodities take up a large part of the COGS, purchasing also open up opportunity for big cost reduction and increase profit.

Planning is an integral part of purchasing. A strategic purchasing plan could improve company's profitability by proactive controlling of TCO and order cycle time (Bailey et al., 2015). According to Pagano and Gyimah (2017: 34, 35), SC planning is executed with the act of comprehensive monitoring, analysis and planning of all policies, plans, actions for the enterprise. Key consideration in purchasing are volume, purchase discounts, storage costs, transportation costs, lead time, customer service (Khalid 2010: 55). As a consequent, supply management is the strategy that deliver valuable outcomes to not only organization, but also its suppliers and customers (Benton 2010). It is imperative for procurement to collaborate with other department, such as sales, marketing, finance, and customer service to achieve the desire performance outcome (Khalid 2010: 149).

4.1.1 Product positioning

Identifying and segmenting company's assortment will improve purchasing planning process. The portfolio matrix by Kraljic proposes a framework for classifying products into different categories in terms of risk exposure and procurement potential (Figure 11). The level of risk determines the vulnerability of the product from supply and quality. Procurement potential is the consideration of product towards company profitability (Bailey et al. 2015).

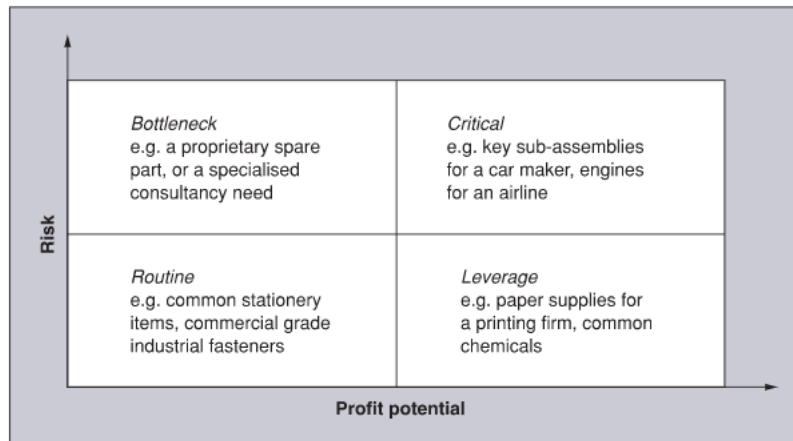


Figure 11. Kraljic portfolio matrix (Bailey et al. 2015)

In Kraljic portfolio matrix (Bailey et al. 2015), a portfolio could be divided into four categories:

- **Critical:** items with high risk and high profit potential
- **Leverage:** items with low risk and high profit potential
- **Bottleneck:** items with high risk and low profit potential
- **Routine:** items with low risk and low profit potential

Information to perform product position could come from the company own's databases, such as sales data or purchase data, or from other parties in the SC network, such as customers and suppliers.

4.1.2 Supplier Relationship Management

It is critical to not only improve cost efficiency internally but also to find opportunities for cost optimization from other participants of the whole chain. Suppliers play a key role in determining the profitability of a business. By developing relationship with suppliers,

the company creates win-win alliance that eventually improve service level, technological innovation, product design and cost saving (Benton 2010).

Just as company's assortment, some suppliers are more important, while some contribute less value. O'Brien (2018) presents a supplier portfolio analysis based on Kraljic's portfolio analysis (Figure 12). According to O'Brien, segmenting supplier profile is important to make sure that resources are prioritized to the most important (O'Brien 2018: 78). The supplier portfolio model is based on the impact on profit and the degree of market complexity:

- Critical: high risk and high profit potential
- Leverage: low risk and high profit potential.
- Strategic: high risk and low profit potential
- Acquisition: low risk and low profit potential.

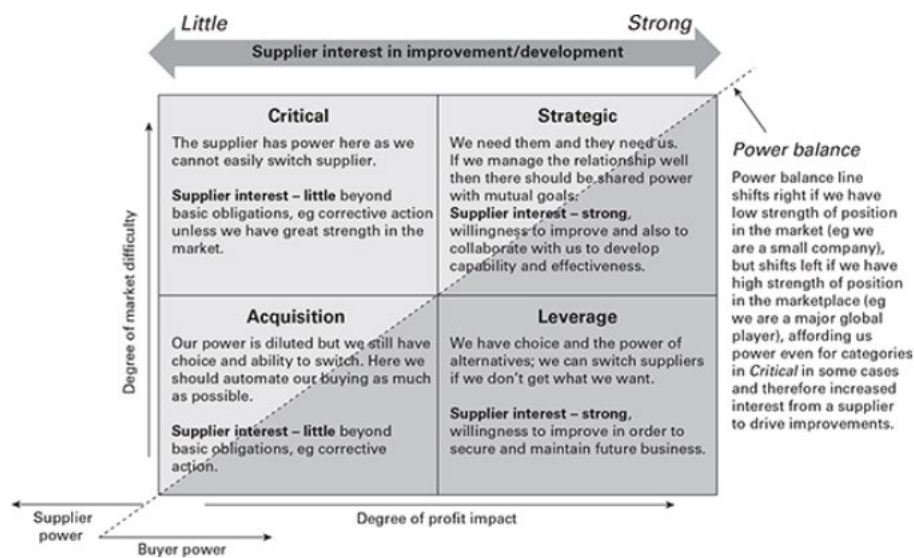


Figure 12. Supplier portfolio matrix (O'Brien 2018)

O'Brien (2018) suggests two different ways to consider in a supplier development plan: supplier improvement and supplier development. Supplier improvement is a reactive method to correct, prevent faults and continuous improvement. This could be done by fixing a supplier related problem, reducing, or eliminating a known risk, reducing costs, etc. Supplier development, on the other hand, is a proactive way to improve supplier quality in advance. Supplier development is the collaboration process between an organization and its supplier to seek and develop for ultimate supplier optimization. Supplier development could prevent potential hidden problems, by developing a new product or service, improve capability and create a new differentiator.

4.1.3 Supply Chain Risks

In the dynamic and ever-changing environment of SC, risk is inevitable (Liliana 2019). SC risks could come from either internal or external sources. Supply Chain Council (2012) identifies potential risks that can occur within SC, such as insufficient quality, unreliable suppliers, machine break-down, uncertain demand, etc. or out of SC, such as flooding, terrorism, natural disasters, etc.

Table 3 provides uncertainty factors as well as measures for handling them in SCM at strategic level as well as tactical and operational level. In general, risks are unavoidable and might lead to the event of significant losses. The role of SC Manager is to be aware of these risks, identify and control risks in the most potential economic performance (Ivanov and Sokolov, 2009: 75).

Table 3. Potential risks in SC

Decision-making level	Uncertainty factors	Handling measures
Strategic	Multiple management goals	Multi-criteria analysis technique
	Terrorism, piracy	SC security management
	Financial and political crisis	Liquid assets reserves
	Natural disasters	Strategic material inventories
		Market diversification and outsourcing
Product lines' flexibility and modularity		
Tactical and operational	Weak coordination	Safety stocks and time buffers
	Stockless processes	Reserves of SC capacities
	Weak control of cargo security	SC coordination, monitoring, and event management
	Technological breaks	
	Human error	

As risks are unavoidable and might happen in every SC activities, it is important to prepare a risk planning and controlling plan. Supply Chain Council (2012) presents a three-phase approach that company could do to address risks (Table 4). This approach shows different phases that a business can include in its risk plan, such as listing potential risks that affect the company, evaluate the impacts that might appear and develop a strategy to reduce the impact level of potential risks.

Table 4. A Three-phase approach to address risk in SC (Supply Chain Council, 2012)

Risk Identification	Identify what potential risks can have negative impact on the SC.
Risk Assessment	Visualize the risk portfolio with dimension probability of occurrence and its negative impact.
Risk Mitigation	Decrease the likelihood that a risk will occur or decrease the impact of the risk.

Risk management are often underestimated among SMEs because of its complexity and costly which requires extra organizational support. However, a comprehensive SC risk management program will eventually be beneficial for an organization, whether in terms of cost saving or efficiency improving.

4.1.4 Order point and order quantity

A review of stock level could support the idea of replenishment. A target stock level made of cycle stock and safety stock. The cycle stock is the stock on the move, which are used and replenished on a frequent manner. The safety stock (or buffer stock) is extra stock in addition to cycle stock, held in inventory as a "cushion" in case of variability with supply and lead time (Stuart 2005).

Stuart (2005) presents two replenishment method to identify a suitable time to make a replenishment: at a specific remaining level of stock (Reorder level) or at a specific time period (Reorder point).

When replenishment is made at a specific level of stock, the replenishment is defined by Reorder level (ROL). This method continuously review stock and replenish the needed quantity at variable order time period.

When replenishment is made at a specific time period, the replenishment is defined by Reorder point (ROP). ROP is defined as the reorder point is the sum of safety stock, and the quantity expected to be used during the delivery time (Figure 13), and is defined by the following formula:

$$\text{ROP} = (\text{Lead Time} \times \text{Average Demand}) + \text{Safety stock}$$

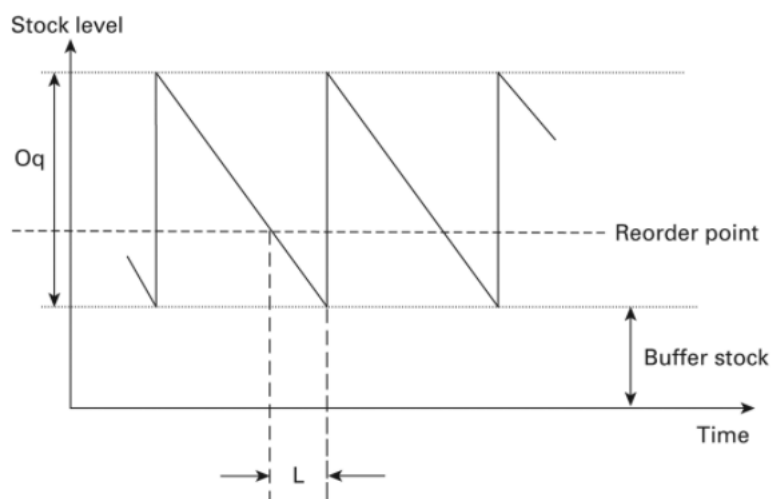


Figure 13. Level of stock (Richards and Grinsted, 2016)

After answering the question of "When to order?", another question should be "How much to order?". A small quantity might result in high cost of administration and delivery. On the other hand, a large quantity might help with administration and delivery costs burden but will increase inventory. Khalid (2010) endorsed the most cost-effective quantity to order is Economic Order Quantity (EOQ). EOQ is the point at which order costs and inventory carrying costs are minimized. EOQ bases on the idea that the cost of ordering and holding stock should be balanced. The benefits of EOQ could be seen as less stock and more frequent deliveries. Low stock level will require less storage capacity and more manageable inventory. Moreover, frequent deliveries will result in fast react

to changing demand and capable of removing obsolete items (Richards and Grinsted, 2016). EOQ finds the optimum order quantity, at the balance between the cost of placing and cost of holding order (Figure 14).

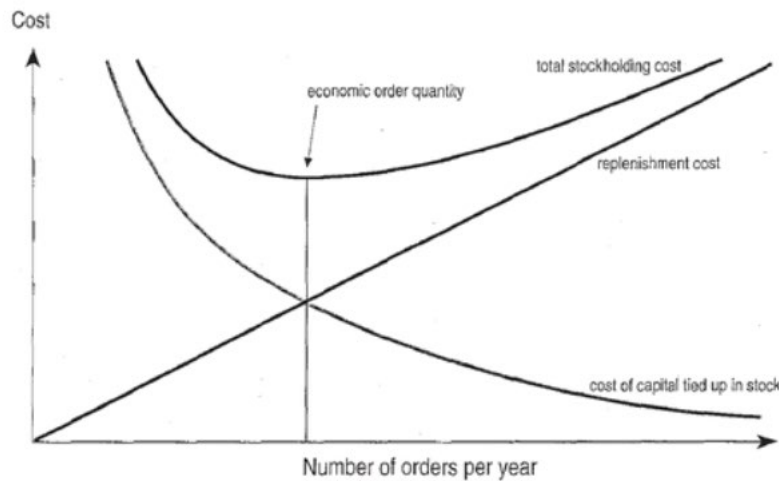


Figure 14. Economic order quantity (Stuart 2005)

Reorder point and EOQ should work hand in hand to reach optimal in purchasing. Reorder point provides an alert for replenishment and ensure sufficient stock for operation. EOQ define the order level that covers business needs until the next reorder point is made. Reorder point and EOQ ensures inventory are replenished in a timely manner that is enough to meet demand, which increase efficiency, decrease waste, and reduce costs.

4.2 Warehousing

Warehouse is a space for storage and handling of goods and materials. Main activities in warehousing are receiving, storing, assembling, picking and dispatching orders (Stuart 2005). The costs of these activities fall from these following categories, which are defined by Martin (2018):

- Inventory costs: Stockholding costs, insurance; costs of loss in value due to aging, damage and theft.
- Personnel costs: Costs of personnel in charge of management, training, storing, retrieving, removing, transporting stock.
- Operation costs: Warehouse furnishings, storage aids
- Building costs: depreciation, interest, heating, ventilation, and lighting. Moreover, costs of inspecting, maintaining, repairing building should also be taken into consideration.

As every item in a company's assortment does not have equal value and frequent usage, ABC is a method to categorize the assortment to identify the most important items. ABC analysis is based on Italian economists Pareto's 80/20 rule that 80% of one incidence in one set of variables equate to 20% incidence in a corresponding set of variables. In ABC analysis, the items with high value of fast-moving items comprises of small number of items, while the items with low value and slow-moving will account for majority of the products Stuart (2005).

- A category: Fast-moving items with high value but only comprise of a small number of items.
- B category: Medium-moving item with high value but with less quantity than A items.
- C category: Slow-moving items with low value and take up the most part of the portfolio.

In addition to categorize inventory based on the level of importance, it is critical to do a regular stock checking to identify the capital that is tied up in inventory. Stock checking could be calculated yearly or quarterly. Two basic methods of stock checking are continuous stock checking or periodic check. Continuous checking is often executed in

larger operations, where stocks are calculated throughout the year. Periodic checking is often done in small companies where warehouse is shutdown during certain time period for stock checking.

4.3 Transportation

Transportation is the process of moving goods from locations where they are sourced to locations where they are demanded (Goldsby 2014). Transport processes include loading, unloading, capacity utilization, handover and identification (Richards 2016). Some attributes of transportation are weight, volume, shape, perishability, flammability, substitutability, breakability. Key consideration when determines transportation costs are rates, minimum charge, loading and unloading facilities, packaging and blocking, damages in transit (Lai and Cheng 2016).

Transportation decision is a trade-off between time, service and cost (Figure 13) (Christopher 2016: 125). The cost of transportation determines the speed of transportation service. Faster modes of transportation mean the cost of transportation will become more costly and vice versa. However, when speed is critical to meet customer demand, cost becomes less important. Transportation optimization's ultimate goal is to find strategies to meet customer's demand but still ensure that costs are minimized for the company.

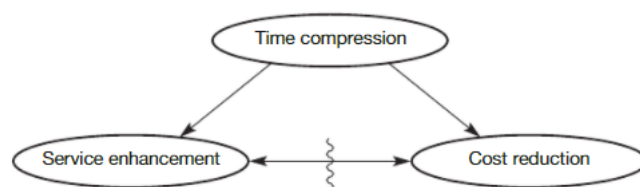


Figure 15. Transportation trade-off (Christopher 2016)

Just-in-time (JIT), a management method originated in Japan in 1950s, aims at providing the right product at the right time, in the right quantity, at the right place by eliminating wasteful practices (Kaynak 2011). Waste is defined as "anything other than the minimum

amount of equipment, materials, parts and workers (working time) which are absolutely essential to production". JIT's purpose is to deliver high-quality products/services with reducing wastes and increasing productivity (Lai and Cheng 2016). JIT could be seen as a combination of four different instruments: an inventory reduction tool, a suppliers' performance evaluation program, a production planning tool and a manufacturing principle (Kaynak 2011).

When choosing transporting modal, it is necessary to take into consideration factors such as service supply, transport costs, routes, time, reliability; and other additional features and limitations of the services. Logistiikanmaailma presents different checklist when choosing a suitable mode of transport, such as value of the goods, urgency of transportation, technical characteristics of the goods and handling as well as intermediate procedure requirements.

5 Results of the Case Study of Company X

5.1 Overview of Supply Chain Management

The case study focuses on the supply chain practices of company X, a distributing company of cosmetics, with an analysis of not only inhouse function of purchasing, but also outsourcing services such as warehousing and transportation. Company X's supply chain personnel is depicted in Table 5. Since warehousing and transportation are outsourced, main functions of the department at the office are mostly planning, purchasing and management. Research results for the Case Study X in this chapter were collected from interviews with Company X's Chief Operating Officer - Interviewee 1 and Company X's Demand Planner – Interviewee 2. Information from the case study also comes from the author's observance as a Purchasing Assistant of the company.

Table 5. Supply Chain Roles in Company X

Position	Main roles
Chief Operating Officer (1)	Responsible for monitoring the supply chain process, coordinates supply chain plan to comply with strategic vision of the company
Demand Planner (1)	Collaborate with sales and marketing department to execute forecasting for the following period, create purchase requisition
Purchasing Assistant (1)	Coordinate with suppliers and freight forwarder to ensure timely and efficiently fulfillment of stock replenishment.

Internal information is being presented on a weekly basis when people from different departments share their highlight of the week. In the meeting, information regarding future campaigns and important customers' orders is brought forward. Purchasing departments also presents an update on purchases, stock situation and incoming

delivery. Moreover, sales and purchasing often collaborate to exchange ideas about demands and forecasts in an additional meeting. Collaboration between different departments is executed in terms of market knowledge, department insights (SC, marketing, sales, finance) and partner insights (suppliers, customers and LSP) (Interviewee 1, 2020).

High variability and unstable demand are the nature of the cosmetics market, which makes it the biggest challenge in purchasing and planning. Apart from regular replenishment, purchasing decisions need to take into account information regarding new launches, marketing campaign, seasonal peaks in order to cope with unpredictable sales order and imprecise forecasts from customers (Interviewee 2, 2021). However, the expansion of product assortment is seen as a key factor contributing to the company competitive advantage. Gustafsson et al. (2019) introduces a term "product fitting", which measures the ability of a company to satisfy a market through its product assortment. Product fitting is not only an opportunity but also a threat for retail SC. Product fitting will increase product variety, gain market share and brand quality. However, there are challenges underlying in management of stock holding and inventory management. A significant gap in supply and demand will result in unsold and obsolete products which requires extra effort either through discounts or disposal for clearance. Because of this challenge, the company needs to maintain a good product variety in order to meet customer's demand, and at the same time identify exact order points, order quantities and manage coordination between different functions to optimize efficiency.

As a distributing company, company X does not engage in the manufacturing process, which makes the company dependant on suppliers for the final products. As a consequence, this high dependency on the suppliers affects directly the level of product offering and planning of SCM if there is any non-availability or delay happen from suppliers' side.

The company utilize the network and expertise of different Logistics Service Provider (LSP) in terms of transporting and warehousing. With the help of personnel, skills and network of these LSPs, in-house function will be able to focus more on planning and

executing. Key considerations in choosing a logistic partner are service level, expenses and location (Interviewee 1, 2020). Communication with LSPs is done mostly through video calls, emails and integrated IT-systems.

5.1.1 In-house activity – Purchasing

Purchases are done based on report from Enterprise Resource Planning (ERP) system. This report includes sales data, sales forecast and warehouse quantities. In addition, information regarding novelty launches and retail campaign forecasts from weekly meeting are taken into consideration when calculating needed purchase quantities. Safety stock equals the amount of consumption of three months before the next replenishment. Other factors affecting purchasing decisions are seasonal peaks, trends, and additional disruptive events (Interviewee 2, 2021).

Purchase orders are done with the help of Excel sheets and are recorded to ERP system for tracking. Orders for brands are made either once or twice per month. The order takes into consideration regular customer demands and forecast from sales accounts. There is a challenge between keeping sufficient stock level, while complying with preliminary purchasing budget and timely delivery. Interviewee 2 commented that the most challenging part is to balance customer demand and changes in supplier deliveries, especially during the unstable time of Covid-19 (Interviewee 2 2021).

To assess purchasing performance, stock sufficiency and stock value level compares to last year performance are taken into consideration. There is no concrete KPIs used for purchasing. Purchasing reports are captured in ERP system but there is a lack of tool to combine these data. Interviewee 2 (2021) wish to have deeper reporting system to extract data for desirable metrics.

5.1.2 Outsourcing – Warehousing and Transportation

The company's logistics operations are outsourced to third-party logistics providers in order to focus on core function of planning, forecasting and managing. The benefits of utilizing LSP for transportation and warehousing could be their better-developed skills,

expertise and network. By working with LSP, the company as an SME will save initial costs of setting up a warehouse and investing in extra equipment and IT systems (Interviewee 1, 2021). Assessing LSP performance are mostly done by company X personnel's personal evaluation and there are no official KPIs to monitor LSP activities.

Company X's warehouse is located in Turku, Finland. The requirement criteria set by the company when choosing the warehouse were quality, scalability, location and pricing (Interviewee 1, 2021). These factors are critical and directly contribute directly to the daily operations of SC. Services in agreement include inbound orders, warehousing, picking and dispatching outbound orders. Orders are integrated with warehouse management system and communicational method are mostly by emails and phone calls. To evaluate warehousing performance, collection errors, stock deviations, speed of processing inbound/outbound orders are taken into consideration (Interviewee 1, 2021).

Company X forms strategic cooperation with logistics providers to handle transportation outside of EU and inside EU. Freight modal varies between each PO, depending on the type of product, order quantity, the level of urgency and the budget available (Interviewee 2, 2021). Logistic provider is in charge of choosing routes and offering best optimal solution to the company. Different measures used for logistics providers are speed and quality, pricing and expertise to provide value-added services, such as IMO goods, special deliveries and expertise in customs handling procedure (Interviewee 1, 2021).

5.2 Suggestion of Company X's current Supply Chain practices

The purpose of this chapter is to propose tactics which the author considers could positively improve SC performance of company X. The proposal is based on the author's opinion about the areas of setting up SC goal, SC execution and SC auditing. The proposal focuses on developing SC towards a more systemized and value-adding SC, thus reducing costly procedures and instead developing cost optimization. According to Uskert (2019), cost optimization is an ongoing process, gained by conducting

programmatic and structured improvements, to reduce costs and improve efficiency, rather than short-term savings and immediate outcomes (Figure 16).

Establish Your Cost Management Approach

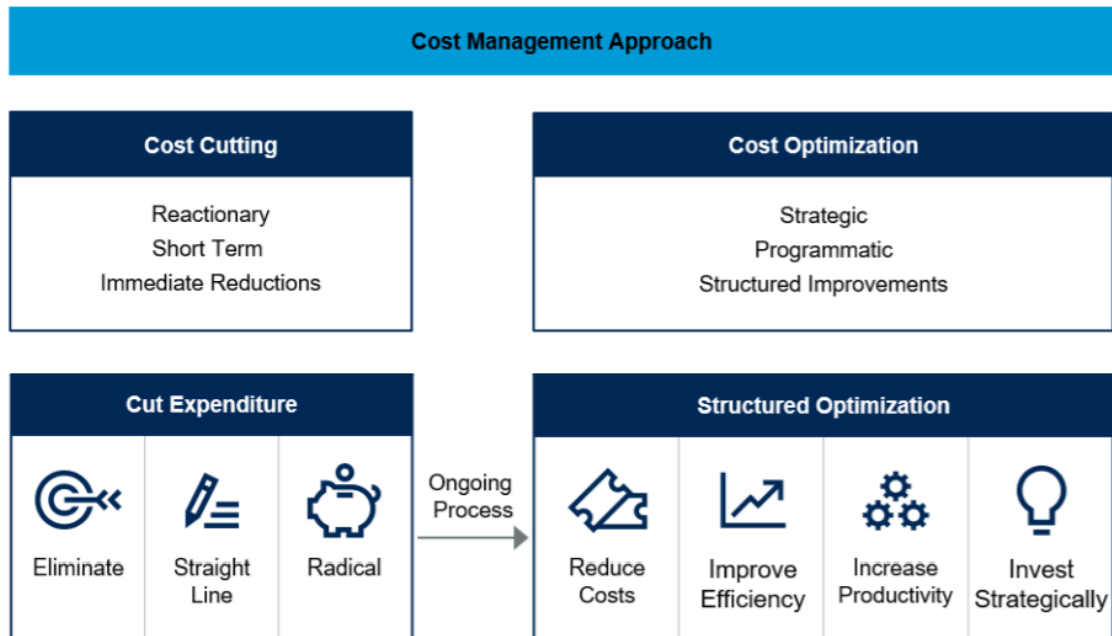


Figure 16. Supply Chain Cost Management Approach (Uskert, 2019)

Based on this Cost Management approach by Uskert, the author is suggesting to company X to enhance SC goal and redesign SCM, and regard SC planning as an ongoing process. These suggestions contribute to a more precise and systematic method of management, thus identify opportunities to reduce costs and improve efficiency. Since company X is currently in stage 2 of the Maturity Model mentioned in Figure 6, the plan focus on improving current towards stage 3 of a more integrated SC. The angles of inter-organizational of stage 4 and 5 could be set as development targets in future improvement.

Table 6. Company X's development plan

Development areas	Objective	Tasks
SC plan	Design cross-functional SC plan, enhance SC visibility for end-to-end SC communication	<ul style="list-style-type: none"> - Identify company X's position in the Maturity Model - Develop SC plan with concrete goals and how SC goals align with company goal
Cost management	Identify hidden costs	<ul style="list-style-type: none"> - Utilize TCO/ABC costing model to identifying SC cost drivers in all functional area: purchasing, transportation, warehousing.
KPIs	Develop a suitable set of KPIs for SC and SC functions	<p>Setting concrete metrics to measure SC performance:</p> <ul style="list-style-type: none"> - General SCM: ROI, CCC, supply chain cost as % of revenues - Purchasing: Purchase Order cycle time, Forecast accuracy - Warehousing: Order picking accuracy, inventory count accuracy, order fill rate - Transportation: Number/percentage of units broken/damaged in transit, Freight Cost Per Unit
Optimization practices	Optimize SC functional area	Develop category management plan with the help of <u>Kraljic</u> matrix, Pareto 80/20 analysis.
SC evaluation	Analysing developing performance to improve in future plan	<ul style="list-style-type: none"> - Identify performance gap between current performance and target KPIs. - Providing feedback for each SC functions.

A plan of improving Company X's SC practices proposed by the author is depicted in Table 6. The aim of the plan is identifying development opportunities from SC functional practices and quantifying SC performance to more concrete metrics. The proposal is based on results from theoretical reviews from previous chapters and company interviews. The author designs the proposal according to five main development areas: SC plan, Cost management, KPIs, Optimization practices and SC evaluation.

5.2.1 SCM planning

SC in company X is performed in a reactive manner and is not clearly incorporated as one of the company's strategy. According to the Maturity model depicted in Figure 6, company X's SC performance is currently in Stage 2 of the maturity level, with functional department provides basic operational function. In order to move to the next step in the maturity model, a concrete plan is important to tackle any inefficiency happen in SCM and to optimize logistics practices. Short-term and long-term plan are important to the direct growth and to cope with ever-changing situation. The plan will act as a guideline to document SC performance and enhance SC visibility to end-to-end SC participants.

Since SC strategic goals and objectives set clear direction for SC growth, they are fundamental for SC improvement process. SC goals are shared within stakeholders, clarify ambiguity and act as a benchmark to monitor SC practices. A SMART goal is necessary in defining performance gap and adjusting SC to align with the whole business's objective. Since the company does not define concrete goal for SC, the author suggests three main goals for Company X's current stage of maturity:

- Become a cost-saving area for the company.
- Improve current planning and scheduling practices.
- Engage periodical evaluation and continual development.

The goals mentioned above cover the development areas which are presented in Table 6. Time frame for initial improvement execution could extend to as much as 12 months. After this period, the company is expected to be at stage 3 of the maturity model, with SC performance becomes more strategic and integrated. The company will then need to focus on a new development plan to align SC with company scale.

In addition to set a long-term review and audit, short term operation should be supervised and monitored. A review on monthly basis of current SC practices will contribute greatly to revealing potential risks and disruptive events happen in current

SC. The benefit of short-term review is that it allows to react on time on requirements and events that offer little value-adding.

5.2.2 Cost management

The company also lacks a cost management plan in its SC operation. Visualizing costs is critical to evaluate what costs are adding value and what costs are creating little-adding values. There are many saving opportunities to cut costs in different functions, such as warehousing, transportation, disposal, etc. Rather than focusing on acquisition cost, SC practitioners need to determine if other hidden costs are taken into consideration. By utilizing the concept of TCO and ABC costing model, company X can analyse potential cost drivers which contribute to total cost, thus identifying optimization opportunities from its cost structure.

Not all costs play the same role in the SC operation process. ABC analysis could be a useful tool for SC practitioner to look at costs from a bigger picture. Examining what costs occurred in SC and how they contribute to the overall efficiency will eventually lead to a proper cost optimization plan.

As the company is highly dependent on its suppliers, potential cost-cutting area does not come directly from purchasing cost but rather from hidden costs in logistics operations. The company should focus on defining warehousing and transportation costs, such as shipping rates, warehouse costs, obsolete and damage goods.

5.2.3 Key performance indicators

A lack of clarity in defining KPI to monitor SC performance can become a threat to Company X's. In the development plan, KPI and strategic goals should be clearly defined. The company could start by adopting top-down assessment. That means assessing how SC is aligning with financial health of the company by utilizing financial metrics, such as ROI, Operating profit margin and CCC, which were previously mentioned from chapter 2.

After setting department goals, the company can define a set of KPIs suitable for each SC functions. For purchasing, the company can measure Forecast accuracy and Purchase order cycle time to assess its current Order point and Order level. KPIs to evaluate logistics providers should be quantified in addition to personal assessment. Suggested KPIs for warehousing service are order picking accuracy, inventory count accuracy, order fill rate. Suggested KPIs for transportation service are Number/Percentage of units broken/damaged in transit and Freight Cost Per Unit. It is important to constantly follow, assess and provide feedbacks or training to LSP to ensure that mutual standards will be met.

5.2.4 Optimization practices

After concrete goals and measurement indicators are identified, reforming SC is important to close the gap between current operation and the expected performance.

A shortage of category management leads to poor allocation of attention and resources. By utilizing ABC analysis and Kraljic matrix for classifying its products and supplier base, the company can develop a plan of which items should be prioritized. ABC analysis could be used to classify product categories based on customer demand. Classifying product category could contribute to decision making process in terms of establishing accurate reorder points, reorder levels and choosing the most optimized transport modal. Figure 17 developed by the author shows one of Company X's brand with 48 SKUs divided into ABC group, in which A items take up to 50% of sales, B items are the next 30% of sales and C items are the rest 20% of sales. From ABC analysis, product group that generates high value in group A should be prioritized with more purchasing consideration and cash allocation. Respectively products in group B and C require lower effort when compared to products in group A.

Code	Sales (€)	Cumulative sales	Cumulative sales (%)	Class
KOCO058	32250.40	32250.40	15%	A
KOCO509F	18741.36	50991.76	24%	A
KOCO195	17422.60	68414.36	32%	A
KOCO308F	15260.80	83675.16	40%	A
KOCO751	10350.00	94025.16	45%	A
KOCO843	9819.20	103844.36	49%	A
KOCO469	9321.60	113165.96	54%	B
KOCO427	8680.00	121845.96	58%	B
KOCO452	7928.10	129774.06	62%	B
KOCO502	7386.08	137160.14	65%	B
KOCO430	6928.00	144088.14	68%	B
KOCO298	6522.39	150610.53	71%	B
KOCO338	6481.20	157091.73	75%	B
KOCO483	4630.50	161722.23	77%	B
KOCO710	4326.30	166048.53	79%	B
KOCO841	4143.60	170192.13	81%	C
KOCO717	4048.40	174240.53	83%	C
KOCO727	2739.30	176979.83	84%	C
KOCO526	2389.22	179369.05	85%	C
KOCO724	2070.60	181439.65	86%	C
KOCO434	2058.60	183498.25	87%	C
KOCO519	2003.97	185502.22	88%	C
KOCO571	1785.60	187287.82	89%	C
KOCO001	1593.24	188881.06	90%	C
KOCO348N	1558.70	190439.76	90%	C
KOCO703	1504.20	191943.96	91%	C
KOCO447	1501.10	193445.06	92%	C
KOCO049	1474.24	194919.30	93%	C
KOCO032	1442.96	196362.26	93%	C
KOCO311	1410.00	197772.26	94%	C
KOCO660	1405.80	199178.06	95%	C
KOCO232	1332.00	200510.06	95%	C
KOCO324	1309.00	201819.06	96%	C
KOCO018	1154.64	202973.70	96%	C
KOCO025	1041.76	204015.46	97%	C
KOCO799	936.00	204951.46	97%	C
KOCO130	870.75	205822.21	98%	C
KOCO133	868.50	206690.71	98%	C
KOCO109	665.25	207355.96	98%	C
KOCO775	620.25	207976.21	99%	C
KOCO294	620.00	208596.21	99%	C
KOCO755	604.34	209200.55	99%	C
KOCO687	414.00	209614.55	99%	C
KOCO089	295.50	209910.05	100%	C
KOCO805	295.50	210205.55	100%	C
KOCO871	213.00	210418.55	100%	C
KOCO865	174.60	210593.15	100%	C
KOCO065	86.40	210679.55	100%	C

Figure 17. Example of ABC analysis in one of Company X's supplier brand.

By applying ABC analysis with all other supplier brands, SC practitioners can have a better view of the company assortment. As quickly as the cosmetics market changes, it is suggested to perform ABC analysis on a monthly basis.

The company's supplier base should be taken into consideration. To categorize its supplier base, Kraljic matrix would be helpful in evaluating which supplier are generating greater impact with limited risk.

5.2.5 SC evaluation

The company currently does not have any formal feedback for SC performance. However, after concrete plans and metrics are defined, it is critical to perform periodical feedback to assess how its SC is performing compared to what has been expected. Functional feedback for each SC functions would be helpful to resolve any concerns and uncertainty in the process of achieving its goals. A self-reflection of SC participants will help at improving their tasks and how to develop their performance for the development of the whole SC.

It is also necessary to execute peer feedback between functional colleagues, as well as from other departments of the company in order to get the bigger picture of SC performance. The purpose of this practice is to solve any misunderstanding that might happen during the job and to propose any suggestions for mutual development.

6 Conclusion

The thesis discusses different elements of cost optimization in SCM, with a focus on a Finnish SME distributing company of cosmetics. SCM practices vary between companies and different industries. However, improving SCM is a long-term process, which requires SC practitioners constantly to reflect, update and upgrade the requirements of the market and adapt to their business's core value to the changing requirements.

The starting point of a cost optimization plan should lie in understanding the company's standpoint and core operation. A SCM development plan should first identify the company and SC current position (e.g., using SCOR and Maturity Model). By understanding where the company currently is, and where the company wants to be, SC practitioners can determine goals for their department by using financial and non-financial KPIs. These KPIs depend on the objective of SC and how these objectives align with the business objective. In order to analyze the opportunity for cost optimization, financial KPIs, such as ROI, Operating profit margin, Inventory turnover ratios are critical to assess the role of SC to the financial health of the business.

Costs are critical in SC activities. The cost optimization process deals with managing and controlling costs in SC. Rather than looking at acquisition costs, examining hidden cost drivers will reveal if costs appear in the SC are creating value. Optimization opportunity may lie in hidden costs that are often neglected in the costing process. Due to this, ABC costing model can be utilized for evaluating costs in SC functions, such as purchasing, warehousing and transportation, and eventually can contribute positively to overall SC efficiency and cost optimization goal.

The case company X's SC was analyzed based on models found during the literature review and on the author's own experience working as a Purchasing Assistant for the company. Data used for analysis was extracted from the company internal database and from interviews with two staff members, Interviewee 1 and Interviewee 2. The author reviews different challenges existing in company X's SC and suggests proposal for improvement. The development plan covers aspects related to defining SC goals,

SC functional metrics and application of category management using Kraljic matrix and Pareto analysis in management decision making.

The thesis could be a reference for any business developing SC growth with a focus on cost optimization. However, it is worth mentioning that any suggestions suitable for company X are not fully applicable to any other company or industry. Further research is required by the decision makers in order to meet their own company and industry characteristics.

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Appendix

Interview questions:

Interviewee 1: Chief Operating Officer, October 26th 2020.

1. Could you briefly describe current Supply Chain (SC) process of the company? In specific, how does the following functions operate: Purchasing, Warehousing, Transportation
2. What is your opinion about current SC practices of the company? Does SC function compatible with the company vision and objectives?
3. How do you think about the importance of SC in the company?
4. How do you think about the importance of cost optimization in the company?
5. What are the measures used for designing SC Management towards cost optimization?
6. How does the cooperation between SC and other departments of the company look like?

Interviewee 1: Chief Operating Officer, February 1st 2021.

1. What are criteria the company used for choosing suitable 3PL providers?
2. What conditions are defined in 3PL contracts?
3. How were instructions for 3PL providers implemented?

4. How does inventory calculation process take place?
5. What are metrics used for assessing 3PL's performance?
6. How often does the company perform 3PL evaluation and feedback?

Interviewee 2: Demand Planner, March 10th 2021.

1. Could you briefly describe NBI's purchasing process?
2. What are key determinants affecting order point and order quantity?
3. How does purchasing department collaborate with other departments in the company (sales, marketing, finance)?
4. What are metrics used for assessing current purchasing process?
5. What are some challenges that purchasing department is facing? What are some purchasing-related aspects that you wish to improve?