FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION

STRATEGIC COST AND PERFORMANCE MANAGEMENT IN THE SUPPLY CHAIN

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2 FOREWORD

This master's dissertation is written as the final work for my master study in Business Economics at Ghent University. I am interested in management and the combination of financials with the operational working of companies, therefore I selected the subject of strategic cost and performance management in the supply chain.

The writing of this work was a very educative experience since I got the opportunity to meet interesting and experienced people from the business environment.
Writing a master's dissertation is an intensive process where several people are involved. In this section, I want to thank in particular Prof. Dr. ir. Regine Slagmulder for her help and advice throughout the process. Special thanks to all interviewed persons for making time and providing me with a lot of interesting information and to my family for supporting me during my studies.

The aim of this dissertation is to study how strategic cost and performance management in the supply chain are approached in practice, how much importance is attached to them and to get insights into the interactions between the domains. The focus lies on strategic cost management in the supply chain and how performance management supports it. Firstly, a literature review is executed to gain insights into the concepts of supply chains, strategic cost management in the supply chain, performance management in the supply chain and enablers.

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4 LIST OF USED ABBREVIATIONS

ABC	Activity-based costing
BOM	Bill of materials
BRM	Business review meeting
EDI	Electronic data interchange
EMS	Electronic manufacturing service
EVA	Economic value added
COGS	Cost of goods sold
DCP	Direct cost price
DPP	Direct product profitability
FOB	Free on board
FPQ	Functionality-price-quality
JIT	Just in time
KPI	Key performance indicator
LOTIF	Lines on time in full
NPV	Net present value
OEM	Original equipment manufacturer
OTIF	On time full term
PDCA	Plan, do, check, act
PMS	Performance measurement system
PI	Performance indicator
RFID	Radio-frequency identification
SCOR	Supply chain operations reference
SDCA	Standard, do, check, act
SKU	Stock keeping unit
SME	Small or medium enterprise
TCO	Total cost of ownership
TDABC	Time driven activity based costing
TQM	Total quality management
VMI	Vendor managed inventory
VP	Vice president
ZBB	Zero-based budgeting

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6 LITERATURE REVIEW

6.1 Introduction

In supply chain management cost reduction is one of the most cited objectives (Seuring, 2002) and for more than half of the top executives, cost reduction is a primary strategic goal for supply chain management (Anderson & Dekker, 2009a). Improving supply chain performance also became one of the critical issues to gain competitive advantage (Cai, Liu, Xiao, & Liu, 2009). Most related researches have focussed on either strategic cost management in the supply chain or performance management in the supply chain. This literature review integrates both concepts into one work, discusses several models and stresses their contribution to improving supply chain performance in multiple ways such as lower costs, higher effectiveness, better responsiveness etc. Performance enablers are also included in the review.

Actively cooperating with upstream and downstream parties involved in the supply chain delivers optimisation potential beyond the borders of a company. Supply chain management is a collaborative strategy aiming integration of all activities, from the raw materials stage to the end user, through improved supply chain relationships in order to create more shareholder value and to achieve a sustainable competitive advantage. Not only physical goods but also the associated information and financial flows are involved in the activities (Seuring, 2002).
It is important to closely consider firm boundaries, the allocation of resources, the engineering of processes and to evaluate offerings in relation to requirements (Anderson & Dekker, 2009a).

The competitive environment where companies operate in has changed over time and core competencies that once provided sustainable advantages only deliver temporary advantages. Now, cost information is used as well to arrange the past as to manage the future. In cost management cost structures and cost behaviour are influenced by using all kinds of measures (Seuring, 2002).
Today firms even need to go further than reducing costs. They have to manage costs strategically to simultaneously reduce costs and enhance the strategic position of their firm. Strategic cost management involves the application of cost management techniques serving these outcomes (Cooper & Slagmulder, 1998a).

According to Anderson and Dekker (2009a), strategic cost management concerns the alignment of a firm's resources and associated cost structure with the long-term strategy and short-term tactics.

For cost management in the supply chain it is important that organisations understand their interfirm costs. This demands trust and collaboration between supply chain parties (Cokins, 2001). When studying strategic cost management in the supply chain, focus is on interactions across boundaries because this can deliver competitive advantages. This competitive advantage can reflect itself in lower costs, but also in higher productivity, quality, innovation and customer responsiveness.
Collaborating within a supply chain additionally generates increased flexibility, provides the opportunity to transform fixed costs into variable costs and gives the potential to benefit from economies of scale and scope. There is also the ability to deploy valuable, scarce, inimitable resources, the opportunity to share resources of all kinds (financial, technological, managerial, physical) and to benefit from supper-additive effects of working together and shared learning (Anderson & Dekker, 2009a).

Performance management consists of multiple processes where performance measurement is the most important step studied. Performance measurement systems are necessary for defining expectations by setting goals, reducing vagueness about outcomes and responsibilities, advocating goal-directed behaviour and enhancing feedback and learning. These systems support the achievement, measurement and monitoring of performance and deliver data to improve performance. In a supply chain context, it is quite challenging to define performance and to distinguish each firm's share in outcomes. The access to constant, detailed financial and non-financial performance information of partner firms is important to be able to monitor, advice, supervise and be involved with all operations (Anderson & Dekker, 2009b).
Cost and performance management are linked and there is a constant feedback path between the two (Anderson & Dekker, 2009b).

This dissertation will focus on the intersection between supply chain management and strategic cost management, namely strategic cost management in the supply chain. Several methods and concepts can be adopted to analyse and control all costs within the supply chain. It is important to be aware that costs are not only initiated by flows of goods and information, but also by relationships within the supply chain (Seuring, 2002).
This essay will also study performance management in the supply chain. Performance management is important to reach goals efficiently and effectively, but prior research on this topic is rather limited in comparison to research on cost management in the supply chain.
On top of this, some factors that enable the performance of launched initiatives are summarised.

6.2 Supply chains and supply chain management

Chopra, Meindl and Kalra (2017) describe that a supply chain consists of all parties that are involved, directly or indirectly, in fulfilling a customer request. This means that besides manufacturers and suppliers, also parties such as transporters, warehouses, retailers and customers are included. Within one firm there is also a supply chain that consists of all functions involved in receiving and fulfilling a customer request, examples of these functions are R&D, marketing, finance, customer service etc. (Chopra et al, 2017). This dissertation will focus on the first description of a supply chain, which spans multiple firms.

There are different types of supply chains that have other focuses and fit better with certain product characteristics and customer requirements.

A *lean supply chain* uses continuous improvement efforts to eliminate waste and non-value adding steps. It focuses on achieving internal manufacturing efficiencies and the reduction of setup and lead times in order to attain cost reduction, profitability an internal flexibility. The focus is on incrementally improving existing products and maximising performance while minimising the costs of these products (Vonderembse, Uppal, Huang, &Dismukes, 2006).

An *agile supply chain* wants to respond to fast changing markets in a dynamic and growth-oriented way. By interacting with customers and markets, agile supply chains try to understand customer requirements in order to deliver customised products (mass customisation). This kind of supply chains want to obtain new competencies, develop new product lines and target new markets. Deploying new technologies, methods, tools, techniques and information systems are very important in this context. The focus is on designing products meeting individual customer requirements (Vonderembse et al, 2006).

Hybrid supply chains want to achieve a certain degree of customisation by postponing the product differentiation until final assembly or by adding components that are innovative. Lean as well as agile supply chain techniques are adopted to produce components with differing characteristics. The agile part of the supply chain is used to understand and satisfy customer requirements (Vonderembse et al, 2006).

Supply chains are very dynamic and there is a constant flow of products, information and funds forwards and backwards. One mostly thinks of a supply chain as products moving from the supplier to the customer, but it is important to stress that the customer is key in the concept of a supply chain. The

satisfaction of customer needs is the primary purpose of any supply chain in order to generate profits (Chopra et al, 2017).

Due to intense and global competition, the introduction of products with shorter life cycles and higher customer expectations, supply chain management became more and more important (Simchi-Levi, Kaminsky, &Simchi-Levi, 2003). Simchi-Levi et al (2003) have defined supply chain management as follows: “Supply chain management is a set of approaches utilised to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations and at the right time, in order to minimise systemwide costs while satisfying service level requirements.” Effective supply chain management means thus that supply chain assets, product, information and fund flows are managed in such a way that the total supply chain surplus (customer value minus supply chain cost) is maximised. Several supply chain decisions, such as supply chain design, planning and operation influence this supply chain surplus with differing degrees of impact, it is also important that supply chains and supply chain management are adapted to their (changing) environment (Chopra et al, 2017).

Organisations that want to minimise costs and maximise performance in the supply chain through strategic cost and performance management in the supply chain must view themselves as a link in a value chain of business processes that create customer value and where competitors are defined as other supply chains that deliver value for the same customers. Each partner in the chain has interest in a high productivity level and effective performance of all the partners by working together collaboratively. To perform as one value chain, they will leverage information across the chain (Cokins, 2001).

According to Seuring (2009), supply chain management can be split up into two dimensions, the relationship dimension and the product dimension. Conceptual cost models, which will be described later in this dissertation, can be adopted in all four quadrants. However, most researches have focused on one dimension (Schulze, Seuring, &Ewering, 2011). The product-relationship-matrix approach is briefly summarised because it gives some valuable insights into the adoption of cost models for designing the supply chain and improving efficiency.
“I. Strategic configuration of product and network” concerns deciding which products and services will be offered and which suppliers a company will work together with.
In “II. Product design in the supply chain”, a company uses the knowledge and capabilities of its suppliers to develop the product.

"III. Formation of the production network" deals with the allocation of production processes to the supply chain partners and determines the associated decoupling points.

At last, "IV. Process optimisation in the supply chain" aims at continually increasing efficiency.

In short, I. and III. focus on supply chain design, while II. and IV. target increasing efficiency.

The dimensions can be seen as sequential steps, but it is important to notice that an iterative process is present (Schulze et al, 2011).

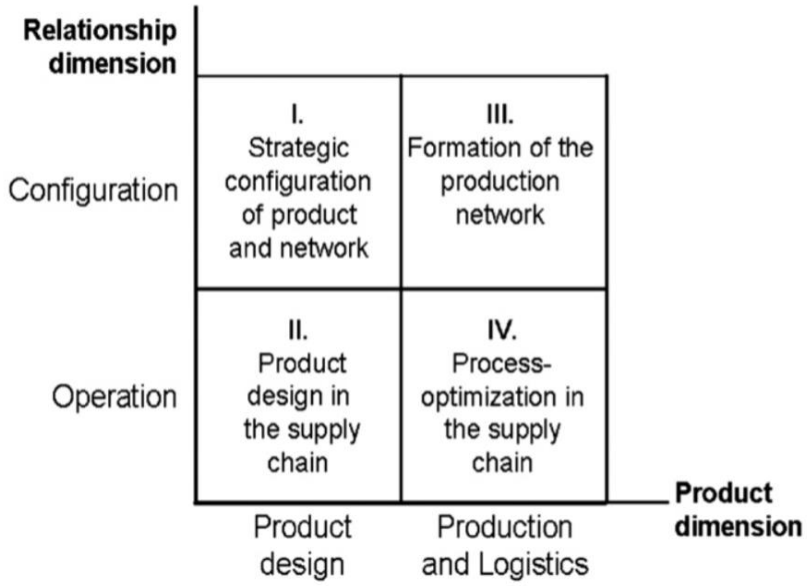

Fig. 1. The product-relationship matrix (Seuring, 2009)

6.3 Strategic cost management in the supply chain

In the introduction strategic cost management was described as management initiatives reducing costs and at the same time enhancing the strategic position of a firm or (in the light of this dissertation) a supply chain.

According to Cooper and Slagmulder (1998a), there are three types of cost management initiatives: initiatives that strengthen, lower or have no impact on the strategic position of a firm while reducing costs. It is important that firms, before they launch cost management initiatives, assess the impact of initiatives on the value they provide to customers and thus their competitive position. Initiatives weakening the strategic position should never be undertaken because the revenue reduction resulting from a worse strategic position often exceeds the cost reduction.

Cost management must be moved outside an organisation's four walls and spread across the supplier and customer chains (Cooper & Slagmulder, 1999). When firms broaden their cost management programs beyond their organisational boundaries, they can obtain lower costs by coordinating their actions than the cost reductions that they would realise individually. It is very important that firms communicate clearly and share (cost) information. Firms only want to launch joint initiatives when they benefit from it or at least do not get worse off (Cooper & Slagmulder, 1998b). Cost management models are very important in this respect because they give insights into the cost reductions and can be adopted to equally distribute costs and benefits.

6.3.1 Scope of cost management initiatives

Supply chain and firms' decisions exercise a lot of influence on supply chain costs. Cost management models, which will be described in another paragraph, can be employed to make those decisions in order to minimise the associated costs. Three important decisions are described in this section.

6.3.1.1 Product design

Ideally, cost management in the supply chain starts at the product design phase because a lot of future costs (about 90%) are already determined in this stage and cannot be easily changed afterwards (Cooper & Slagmulder, 1999). Choices relating to product design also have a large impact on the quality of products. When suppliers and retailers are involved in an early stage of the development of goods, the value of the outcomes will be higher and when retailers have understanding of the product, they will also do higher sales efforts (Anderson & Dekker, 2009a).

In the joint product design approach, some cost management concepts, such as direct product profitability (DPP), target costing, value engineering, functionality-price-quality trade-offs, inter-organisational cost investigations and concurrent cost management are very important. Also activity-based costing can be adopted to predict and weigh the costs related to certain product choices. These concepts will be elaborately described in the section about cost management models.

The design of products is important to the ease of manufacturing and assembly. This enables, for instance, the supply chain management technique of lean manufacturing in order to get productivity, cost and quality advantages. The most important condition to be able to manufacture efficiently and without errors, is thus to have good product designs (Anderson & Dekker, 2009a).

Recently, awareness awoke about minimising total lifecycle product costs and this resulted in developing efficient reverse supply chains. More and more firms recover products at the end of their lifetime, which stimulates making a joint design even more so that disassembly, disposal and reconditioning can occur at lower costs (Anderson & Dekker, 2009a).

6.3.1.2 Process design

The design and execution of processes have important cost implications. When target costing is applied to produce parts at certain costs, the necessary processes are determined and organised in a cost-effective way. After the product design has been fixed, manufacturing and other business processes can be continuously and incrementally improved, kaizen costing is an important term in this respect. Activity-based costing (ABC) is another cost management model that is often adopted to weigh processes and activities against each other. These cost management models will be described in the section about cost management models.

A lot of supply chain management techniques related to business processes have important cost-cutting implications and thus play a role in cost management as well. Some important concepts are briefly described hereafter. Notice that the described initiatives lead to win-win situations for multiple firms, which encourages the firms to execute them.

Inventory can be managed according to the just in time (JIT) principle, where manufacturers and suppliers work together closely. Production is pulled based on customer demand in order to limit waste

and enhance productivity. Not only inventory and thus inventory costs are limited, but also other advantages are gained (e.g. improved quality, sharper customer response time, higher productivity). JIT often involves co-location of the firm and supplier. This reduces costs of inventory, logistics costs and reduces performance and relational risks thanks to better communication and coordination (Anderson & Dekker, 2009a).

Vendor managed inventory (VMI) is another technique that is often applied. The management of inventories is then outsourced to suppliers. It is important that suppliers get up-to-date and correct information about the production plans and current inventory levels of the firm. This frequently leads to the integration of the information systems from both the partners. The parties must also be aware that inaccurate forecasts and misaligned incentives could cause a bullwhip effect, this leads to layers of safety stocks and this is suboptimal from a cost management point of view (Anderson & Dekker, 2009a). Thanks to electronic data interchange (EDI) or radio-frequency identification (RFID), information delays that lead to this bullwhip effect are reduced and shared information is transmitted fast, efficiently and correctly. These technologies carry high costs of use and implementation, so firms need to weigh the pro's against the cons carefully (Anderson & Dekker, 2009a).

Firms can adopt total quality management (TQM) and cause cost reductions for buyers who do not have to check every delivery and benefit themselves from internal cost reductions because TQM will result in less scrap and rework (Cooper & Slagmulder, 1998b).

6.3.1.3 Supplier selection

Strategic cost management in the supply chain starts with the selection of suppliers and the design of relationships with them. These choices influence the cost structure and how risks in the supply chain will be managed. Important is that there is a fit present between the skills of suppliers and the requirements of the firm and that formal and informal rules and controls are captured (Anderson & Dekker, 2009a).

When selecting suppliers and determining the relationship with them, cost management models related to ABC are often employed to compare the different modes, different suppliers and different relationship designs. It is important to recognise that the choice of certain suppliers influences costs across the entire supply chain and that these costs are not limited to the purchase price. Total cost of ownership is an example of a model that takes all costs related to the collaboration into account. Also target costing can be employed to select appropriate suppliers. The models are specified in the paragraph about cost management models.

Supplier selection and the development of relationships are preceded by the make, buy or ally decision. In the *make mode*, business units produce elements for other business units. An advantage of this approach is the strong internal coordination and adaptation. In the *buy mode*, elements are bought from unrelated suppliers. The firm can focus on its core competencies and take advantage of the supplier's efficiency, functionality, quality and technical capabilities. The *ally mode* combines aspects of both the make and buy modes because the firm and its suppliers are separate entities, but they collaborate closely and the interaction is present for a long or indefinite time horizon. An advantage of this ally approach is the combination of joint, high-powered profit incentives and strong coordination (Anderson & Dekker, 2009a).

The choice of suppliers does not only depend on the price offered by the supplier, but also on other criteria such as supplier capabilities, performance etc.
In prior studies, evidence was found that the criteria adopted for the selection of suppliers are based on the specific resources and competencies a potential partner possesses (e.g. pricing, quality, reliability, service, technological capabilities, inventory management, production planning and control). The criteria can be divided into hard (quantitative performance) and soft (qualitative relationship) measures. The recognition of risks is very important in the supplier selection process. Relational risks mean that there is some degree of mutual dependence when firms have a relationship (Cooper & Slagmulder, 2004) and is related to the fact that opportunistic behaviour can lead to locked-in relationships where the cost of starting over exceeds the cost of continuing. For example, firms often invest in specific assets that have no or little value outside of the relationship. The three most significant causes of performance risks are supply chain disruption, weak leadership in the supply chain and a lack of accurate, timely supplier performance measures. Most firms take into account the perceived ex ante risks (Anderson & Dekker, 2009a).
According to Ittner et al. (1999), success of collaboration with suppliers is significantly connected to the use of non-price criteria.

Some firms prefer to continue collaborations with few and known suppliers due to lower search costs, enhanced operational efficiency, higher levels of trust and limited information asymmetry, but from a cost and performance management point of view, this approach is not always the best one (Anderson & Dekker, 2009).

Several advantages are associated with the use of multiple suppliers. Risks of dependence are reduced, the firm can benefit from distinct competencies and shared information, organisations can more easily meet changing needs and 'test' new suppliers (Anderson & Dekker, 2009a).

In sum, it is clear that a balanced selection approach is important. Criteria related to costs and competencies of suppliers as well as performance and management risks must be taken into account. Again, the association between cost and performance management becomes clear.

6.3.2 Cost management models

Traditional cost accounting data do not deliver sufficient information to make trade-offs and to make effective decisions in the supply chain (Cokins, 2001). Intercompany accounting tools, based on basic cost accounting standards, are needed to evaluate the cost consequences of certain supply chain, product or process (re-)configurations and to effectively and efficiently manage the supply chain (LaLonde and Pohlen, 1996). The measurement system must trace how decisions within the supply chain will affect individual and overall costs and profitability (LaLonde & Pohlen, 1996). A detailed assessment at every supply chain level is required to come to an optimal configuration of the supply chain and to distribute the burdens and benefits (Schulze et al, 2011).

6.3.2.1 Direct product profitability

Direct product profitability (DPP) is a technique that is applied to identify the profit contribution of products, taking into account the related handling and space costs. This is important because a positive gross profit and gross margin do not always implicate that a product is profitable. Costs directly incurred by product decisions must be taken into account as well. The downside of this approach is that overhead and non-volume based costs are excluded from the calculations (LaLonde & Pohlen, 1996).

6.3.2.2 Activity-based costing and derivatives

Contrary to DPP, activity-based costing (ABC) assigns direct as well as indirect costs to the different activities that consume an organisation's resources and afterwards traces these costs to products, service lines, markets, sales channels and customers that consume the activities (Cokins, 2001). Another advantage of ABC is that different relationships and multiple cost drivers are recognised. Based on ABC, firms learn how different products, customers and supply chains influence their costs and overall profitability (LaLonde & Pohlen, 1996).

However, the traditional use of ABC concentrates on how supply chain parties affect the organisation's costs and profitability. In this form, ABC does not determine the landed marketplace cost and how other firms' activities affect this cost (LaLonde & Pohlen, 1996).

Interfirm relationships affect the costs of the purchasing firm. With total cost of ownership (TCO), which is often seen as an extension of ABC, firms recognise that supplier performance also influences their costs. All costs associated with the collaboration with a supplier are thus integrated, for example, costs of ordering, receiving, inspecting, holding, weak quality, delivery failure and product returns (LaLonde & Pohlen, 1996).

Again, the same shortcoming as described for ABC is present. TCO only includes the costs of one firm and does not take into account that the buyer's behaviour also influences the costs of suppliers (LaLonde & Pohlen, 1996).

A big and important disadvantage of the previously described cost models is that the costs of only one firm are included. It is not detectable how decisions affect the total costs and performance or costs and performance elsewhere in the supply chain. Because of this, firms could undertake actions that lower their individual costs, but increase the overall supply chain costs (LaLonde & Pohlen, 1996). ABC must be applied to all activities that cross firm boundaries and that are necessary for the key processes in the supply chain (LaLonde & Pohlen, 1996).

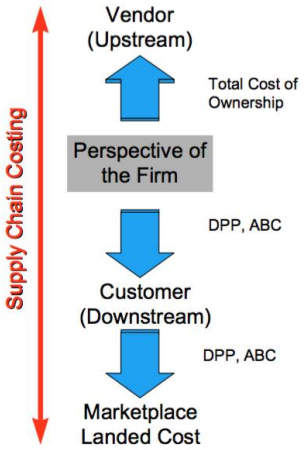

Fig. 2. Supply chain costing (LaLonde & Pohlen, 1996)

It is critical that in this form of ABC, all costs and activities over the supply chain are incorporated. Similar to TCO, it is important to take into account that supplier performance affects the costs of multiple activities in the supply chain. Costs to serve (Cokins, 2001), these are costs induced by customers and their requirements, must also be included because they influence the costs of the organisation and the costs of its vendors and suppliers.

Once all costs and activities are captured, firms will understand the upstream and downstream cost structure of the supply chain and will be able to make interfirm cost trade-offs (Cokins, 2001).

Stated differently, once the partners correctly figure out and measure how they create costs for one another, they can think about initiatives to reduce their collective cost (Cokins, 2001).

It is essential to mention that the success of these cost models strongly depends on the willingness of supply chain partners to share cost information.

According to LaLonde and Pohlen (1996), the extended form of ABC can be executed in six steps.
Firstly, the key supply chain processes must be analysed. This leads to placing the supply chain parties and their major processes in a flow diagram.
Secondly, the identified processes are broken down into activities (also activities for the exchange of information, processing of transactions and holding of inventory) until the activities represent homogenous functions, low relative costs or are enough detailed according to the management. A new flowchart that consists of subsequent activities is the result of this step.
The third step is to identify the resources that are required to perform an activity. General ledgers and budgets can be employed to identify these resources. Consistent with the method of traditional ABC, activities consume supply chain resources.
Step four concerns costing the activities. This means that a sum of the resource costs that are traced to the activities is made. The activity costs include direct and indirect resources.
Step five traces activity costs to supply chain outputs. Again consistent with the traditional ABC method, outputs consume activities and this determines the cost of supply chain outputs.
Finally, step six is the analysis and simulation of decisions and configurations. The different application modes of ABC will be discussed in the following paragraphs.

Schulze et al (2011) have developed an activity-based costing model for supply chain management, taking shortcomings from models developed by previous authors into account and building on LaLonde and Pohlen (1996). The model consists of two major steps: activity-based supply chain configuration and activity-based supply chain operations. These steps support the product design phase and the production phase from the previously described product-relationship matrix (Fig. 1.), again executed as an iterative process.
Firstly, a company determines its general supply strategy, which products it will offer and the suppliers it wants to collaborate with. These decisions are based on cost and performance information, but this information is not available when decisions are not made yet. Organisations can deal with this by firstly mapping the required processes, subprocesses and their activities, information for this can be obtained from potential partners. Based on the activities, cost drivers are determined and quantities are estimated. Through the simulation of variations, companies can see the impact from subprocesses,

activities, suppliers and designs on costs. This information is used to develop criteria for the selection of suppliers and for the design of products.

Secondly, when suppliers are chosen and products are designed, the rates of time-based cost drivers are calculated. Time driven activity-based costing (TDABC) is adopted because it is less complex than ABC. Certainly in a supply chain that consists of multiple enterprises, the bottom-up calculation of cost drivers rates is simpler than the top-down allocation of capacities to different activities. Afterwards, costs per activity, per process and per supply chain member can be determined. This offers opportunities as described in Fig. 3. under III. and IV.

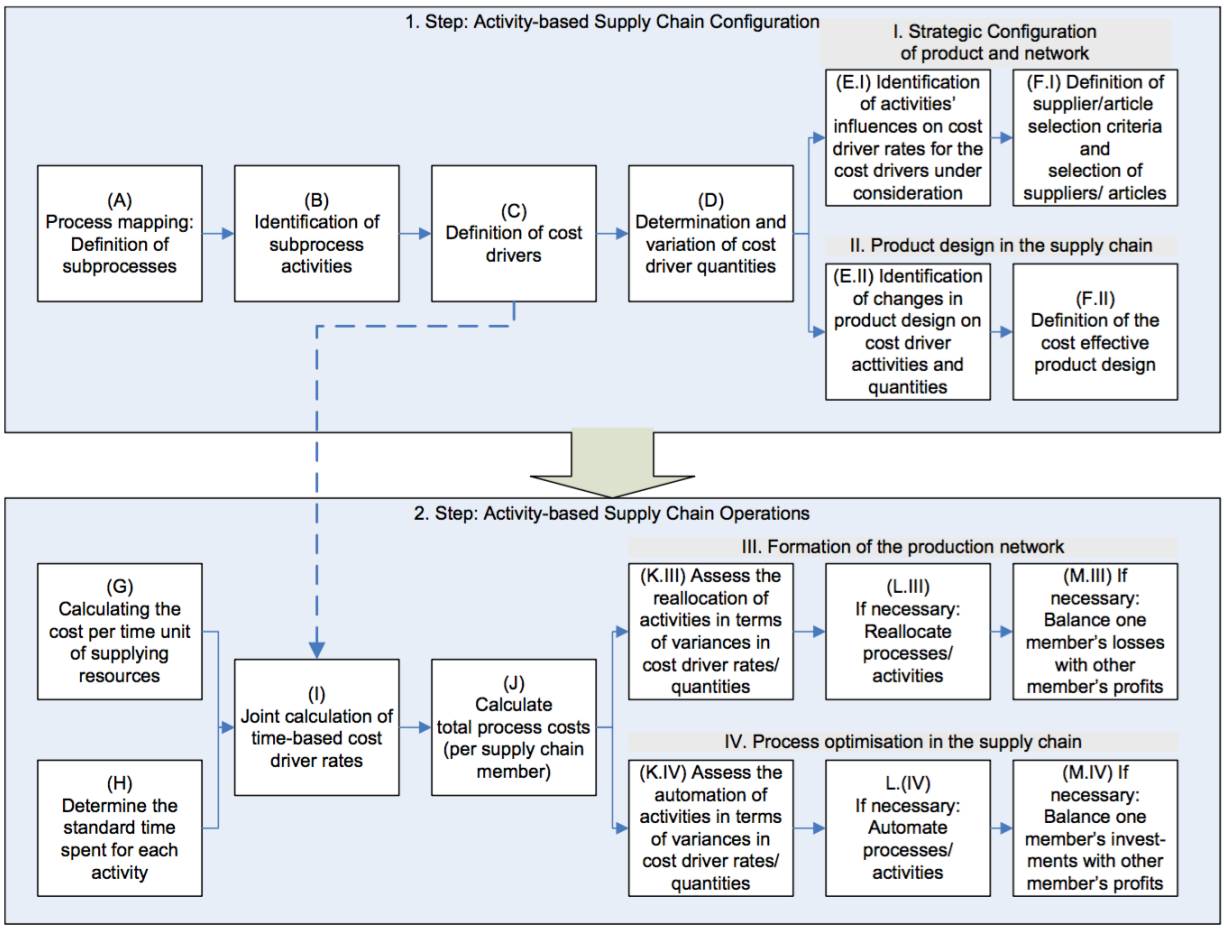

Fig. 3. Activity-based costing model for supply chain management (Schulze et al, 2011)

It is not only important to know what things costs, but also what the cost drivers are. ABC helps to detect activities and cost drivers within the supply chain. Firms manage their costs by influencing the regularity, quantity and intensity of cost drivers. ABC data can be employed to negotiate with partners and to improve the supply chain competitiveness when certain activities that are demanded by suppliers or customers are questionable, have a low value, are a result of an error or nonconforming event, or could reduce or eliminate the cost driver (Cokins, 2001).

ABC is employed to make strategic decisions about the structure and composition of the supply chain because it delivers cost information about activities, products, customers and suppliers and in this way uncovers opportunities to increase profitability and competitiveness. Supply chain relationships that yield the greatest contributions are targeted, boundary-spanning activities are integrated, activities that consume a lot of resources are reviewed, non-value-adding activities are eliminated and functional shiftability transfers tasks towards that position in the supply chain where the total costs are minimised and the desired performance is achieved (LaLonde & Pohlen, 1996). ABC can be utilised in the design phase of products too (Schulze et al, 2011). Similarly, ABC will be adopted to make decisions about changes in order to exploit efficiencies and create competitive advantages.

ABC can be employed to link non-financial performance measures to activity costs that are necessary to achieve that performance. By doing so, the value provided to the customer can be improved while profits increase. For instance, a company that wants to deliver a certain level of customer service should identify the activities, resources and time needed to achieve this and determine the associated costs. The linkage can be adopted to evaluate and select partners as well (LaLonde & Pohlen, 1996).

ABC can also be adopted to determine how benefits and costs resulting from cost management in the supply chain will be distributed among supply chain partners. This is important to leverage change, because often some firms bare the costs and others pick up the benefits. ABC traces costs and benefits to the resources contributed and to the partners. This information can be employed to identify imbalances and serve as a negotiation mean (LaLonde & Pohlen, 1996). Notice that the parties could also agree to let the benefits flow to the end consumer through lower prices (Cokins, 2001).

The utility of ABC increases when partners apply it too. This makes all the parties understand that they generate cost effects on each other and that some costs at activity touch points across boundaries can be collectively shifted, lessened or even removed (Cokins, 2001). For example, a company delivering chocolate as a raw material could reduce packaging costs by delivering chocolate as a liquid and a company that shapes the chocolate into Christmas figures could reduce unpacking and melting costs.

The use of ABC can be combined with economic value added (EVA) to align partners with enterprise-wide objectives, to convince partners of the value of collaborative actions and to understand how each firm's behaviour influences other firms and the created value (Pohlen & Coleman, 2005). The effect on all firms of any action taken by any firm in the supply chain must be taken into account. It is important

to translate the used measures into shareholder value in order to make accurate cost trade-offs and to deal with conflicting objectives (intra- vs. interfirm) (Lambert & Pohlen, 2001).

In their research, Pohlen and Coleman (2005) apply the framework of Lambert and Pohlen (2001) to measure and analyse interfirm performance and to link performance measures with value drivers for shareholders. The framework combines economic value added (EVA) to evaluate the value of changes, and activity-based costing (ABC) to measure costs and to determine cost drivers. The framework consists of five steps.

The first step is to capture the strategic objectives of the supply chain. For this, analyses of the industry are made and the effects of different strategies on value and competitiveness are evaluated. Additionally, processes are configured and the firms that best meet the needs of end users and deliver the greatest competitive advantage are selected.

Subsequently, a map of the supply chain firms is drafted. The map, which is a complex web of firms and their links, can be employed to discover where the most profit is made, where risks and unnecessary costs occur, where opportunities lie etc. and thus where the company must focus on. A firm can, for example, discover that multiple supply chain parties purchase parts from the same supplier. They could place their orders together and attain lower prices.

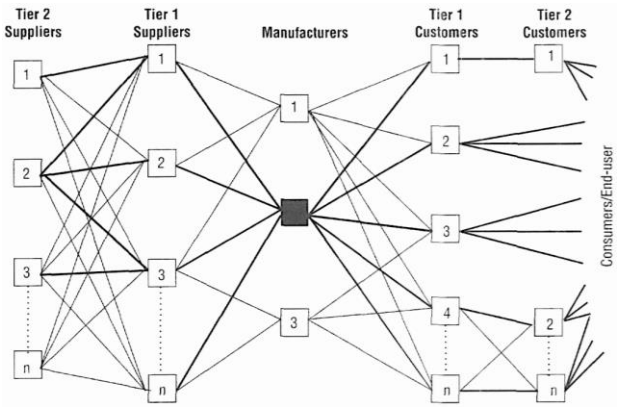

Fig. 4. Supply Chain Complexity (Pohlen & Lambert, 2001)

In the third step, dyadic EVA analyses are made to examine decisions. Dyadic EVA analyses are applied to measure the value creating effect of initiatives across multiple companies and to align decisions with supply chain objectives. EVA uses the effects of initiatives on associated intrafirm operational measures and subsequently on value drivers, which are calculated using ABC. As shown on Fig. 5., EVA takes the effect of the value drivers from the perspective of the supplier and the perspective of the customer on revenues, cost of goods sold (COGS), expenses and assets into account. Dyadic EVA analyses also support communication and the identification of problems and opportunities when all value drivers are included. An initiative creates value when the change in net operating profit after tax is higher than the cost of capital multiplied by total assets.

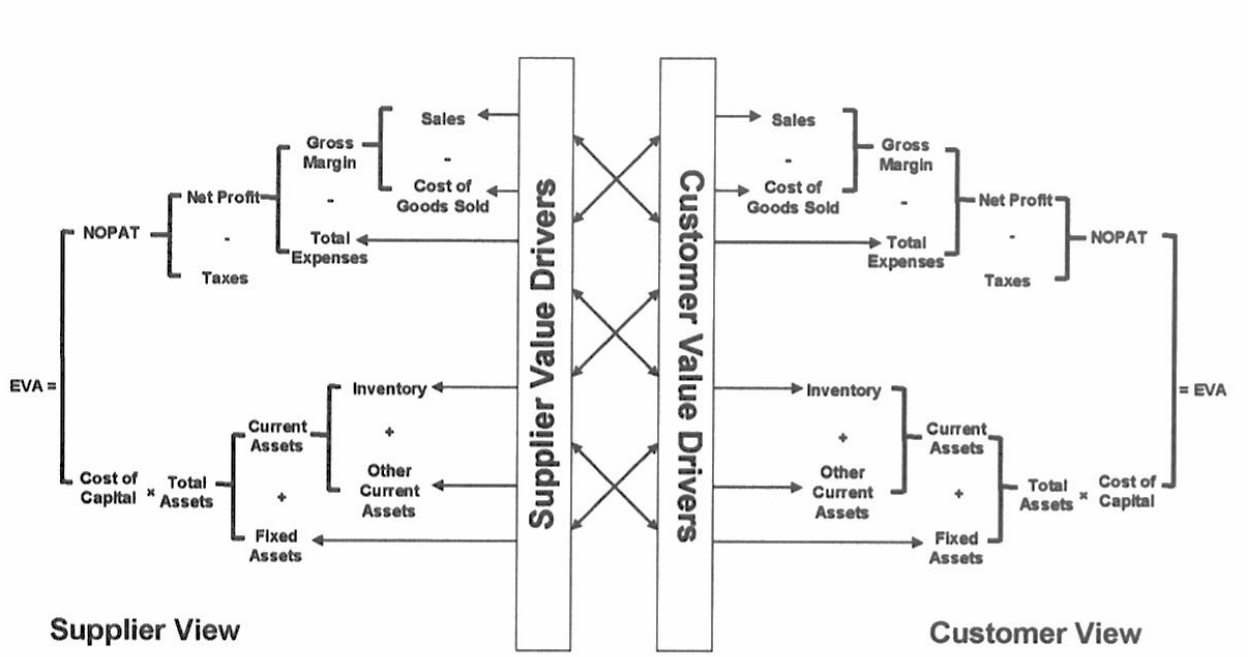

Fig. 5. Dyadic EVA analysis (Pohlen & Coleman, 2005)

ABC is adopted to translate the effects of changes in non-financial performance into costs for the partners and it links the employed operational measures with value drivers and financial measures. The information calculated using ABC serves as input for the EVA analysis. The linkage shows how improved performance at an activity level initiates value creation and higher profitability at the corporate level.

In the final step, the analysis is expanded to more partners. Executing the analysis at each link provides insights into the value each link creates. One must start with the links of the focal company and move outward link per link. Performance at each link must be aligned with the supply chain objectives to provide the best value for customers and the highest shareholder value for each firm. It is necessary to involve all the supply chain partners when considering initiatives and to see the contribution of each firm to achieve the supply chain objectives.

The use of EVA and ABC helps to align behaviour of all the interdependent firms, to discover opportunities, to gain understanding of how decisions affect performance and costs of supply chain partners and to assess whether burdens and benefits have been allocated honestly.

Similar to most models that are described in this dissertation, success strongly depends on the willingness of partners to exchange information. Another disadvantage of EVA is that it overemphasises the need to create immediate results (Pohlen & Coleman, 2005).

6.3.2.3 Target costing in the supply chain

Smith and Lockamy (2000) based their work on the fact that effective supply chain management systems must be less cost-centred. Proponents say that the previously described systems focus too much on costs and that they do not pay enough attention to how supply chains can increase customer value and satisfaction. Activity-based models do partially integrate customer requirements into the value of activities, but they do not use buyer input for this. Because only the costs of existing activities are calculated, managers are encouraged to perform existing activities more effectively and efficiently instead of reconfiguring activities or exploiting new opportunities that deliver customer value. In this respect, target costing is a better approach since customer requirements are key, while costs are seen as an end result (Smith & Lockamy, 2000).

Target costing aims at rationalising costs instead of minimising them. Firms want to meet customer requirements related to quality, functionality and price and at the same time generate a desired level of profits. The technique of target costing in the supply chain works as follows: firstly, the company investigates the price that customers are willing to pay for a product with specific characteristics, taking the prices of competitors into account. Then, the firm subtracts the profit margin that it requires for R&D and for pleasing its stakeholders. The resulting amount is the target cost of the product throughout the whole supply chain (Smith & Lockamy, 2000). The target cost is thus based on customer requirements, market conditions and the firm's target profit (Anderson & Dekker, 2009a). When the target cost is not met firms can adopt managerial techniques (such as value engineering) and make adjustments to meet the customer requirements at the targeted cost (e.g. redesign products, processes, distribution systems) (Smith & Lockamy, 2000).

Target costing is typically adopted in the product design phase where product designs are linked to a target cost. The determined target cost is broken down to the component level and translated into requirements for suppliers to deliver the components at a certain price while still creating sufficient returns for themselves. In their turn suppliers can also execute target costing for the development of their products and initiate joint design efforts in order to realise some cost reductions. This chain of target costing distributes the competitive pressure over all firms in the supply chain. Formal systems created by interorganisational cost management help supply chain partners to interact and realise more effective cost reductions throughout the supply chain compared to individual chained efforts (Cooper & Slagmulder, 1999).

Value engineering, which assumes that value is the ratio of function to cost, examines the individual factors that influence the costs of products in order to achieve the required product quality at the target cost. Value engineering identifies ways to alter the design of a product so that it can be produced at the target cost without losing its functionality (Cooper & Slagmulder, 2004). Similar to target costing, value engineering often cascades through the supply chain (Anderson & Dekker, 2009a).
When design teams of suppliers slightly change the quality or functionality of their components and do not influence the specifications of the final product, the interfirm interactions are called functionality-price-quality (FPQ) trade-offs. The interaction with the design teams of the buyer is limited, the supplier design teams and the buyer design teams only discuss whether the proposed changes to the components are acceptable for the buyer. When design teams work together to redesign parts more significantly so that all steps in the supply chain can be performed more cost-efficiently, but the design of the finished product remains essentially the same, the efforts are called interorganisational cost investigations. Certain activities are avoided or relocated and this results in cost reductions. Levels of communication remain quite low. Concurrent cost management is the most advanced type of design collaboration. The design of the parts as well as the design of the end product are modified. Nevertheless, the end product must preserve its functionality. Cost negotiations begin early in the product development process and continuous interaction is necessary. Concurrent cost management is costly, so it is only executed for high-value items (Cooper & Slagmulder, 2004).

Target costing can only be adopted in supply chains where a maximal end value, continuous improvement, the fairly sharing of benefits and burdens, the free exchange of management information and the ability to execute target costing are key in the strategy (Smith & Lockamy, 2000).

The framework for applying target costing in the supply chain differs substantially in accordance with customer requirements and supply chain agility. Dynamic customer requirements mean that wishes are diverse and change rapidly. Static customer requirements represent uniform, well known and slowly changing needs. When supply chain agility is high, the supply chain can be reconfigured (e.g. new members, reassembly, reassignment of activities) so that competencies match customer requirements better, at lower costs and without a huge impact on relationships. Low supply chain agility on the other hand is characterised by high switching costs and difficulties to reconfigure the supply chain (Smith & Lockamy, 2000).

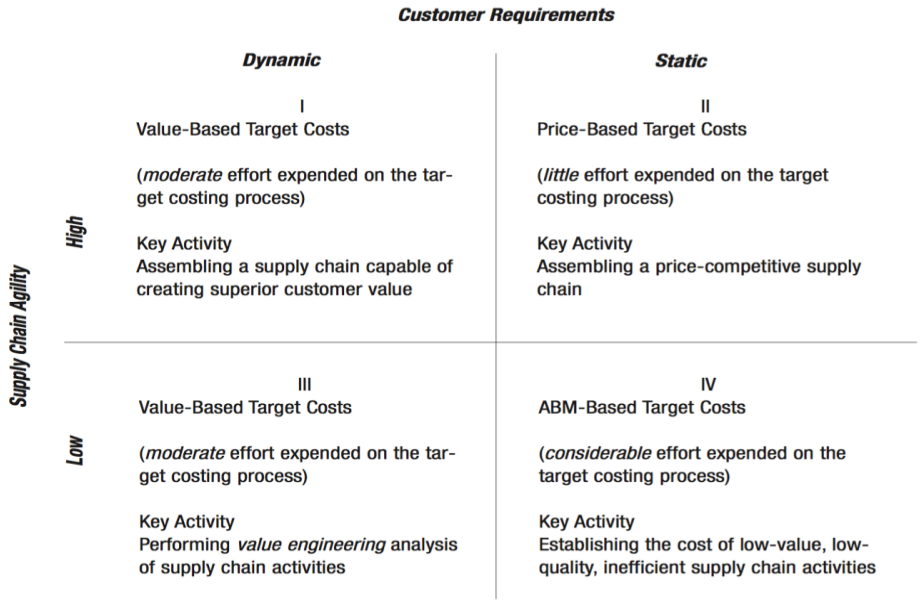

Fig. 6. Framework for applying target costing in the supply chain (Smith & Lockamy, 2009)

Quadrant I supply chains apply target costing to support the reconfiguring process. Target costing apportions the target cost among activities, proportional to their value creation. Companies use this information to determine the prices they want to pay to supply chain members. Target costing techniques are also adopted to identify members that are capable of performing activities at a certain cost (Smith & Lockamy, 2000).

In quadrant II, target costing is employed to determine the prices and profit margins of products and it is adopted to negotiate with members over the prices paid and received (Smith & Lockamy, 2000).

The function of target costing in quadrant III is to allocate the target cost to supply chain activities, in proportion to the value they create. In contrast to quadrant I, members that cannot meet their amount are not dropped, but joint engineering efforts are started instead (Smith & Lockamy, 2000).

Quadrant IV employs target costing to stimulate and structure the continuous improvement of cost competitiveness since there is competition on the price level for products from this type of supply chain. Target costing can serve as a cost-plus pricing system in firms that apply activity-based management systems (Smith & Lockamy, 2000).

Kaizen costing is a technique similar to target costing, but it is executed during the manufacturing stage when the product design has already been fixed. Cost-reduction objectives are set for suppliers as well, the competitive pressure is thus distributed over all firms in the supply chain. This can reflect itself in across-the-board cost-reduction objectives that are the same for every supplier or specific cost-reduction goals. As with target costing, more effective cost-reduction opportunities can be found when supply chain partners cooperate. For instance through joint engineering teams that modify products or processes (Cooper & Slagmulder, 1998b).

6.4 Performance management in the supply chain

Performance management consists of several processes, such as identifying measures, setting targets, planning, communicating, monitoring, reporting and providing feedback in order to increase the effectiveness and efficiency of the supply chain. Because KPIs have tangled relationships and different priorities, it is useful to employ a framework helping to select the critical KPIs that need to be improved (Cai, Liu, Xiao, & Liu, 2009).

The success of performance management relies heavily on performance measurement. According to Lorenzoni and Baden-Fuller (1995), supply networks with the best performance have performance measurement systems and interactive means for sharing performance data and diagnostic problems. In supply chain environments where success depends on the combined capabilities of firms, it is important to understand the system-wide performance and the contribution of each firm in the value of the supply chain. For this, measurement and analysis tools that capture performance across multiple firms simultaneously are necessary (Lambert & Pohlen, 2001). A good performance measurement system is vital to identify success, problems and opportunities, to find out whether needs are met, to understand processes, to track and enable progress, to support factual decisions and to facilitate open and transparent communication and cooperation (Gunasekaran & Kobu, 2007). Akyuz and Erkan (2010) made a critical literature review of performance measurement and concluded that current performance measurement systems are not sufficient in the new supply chain era. New performance measurement systems must learn from shortcomings in existing systems such as incompleteness and inconsistency of the performance measures, too many metrics, not enough strategy alignment, being too much inward looking, a static nature, a lack of systemic thinking and failure to develop a balanced framework of financial and non-financial measures (Akyuz & Erkan, 2010). When focus is put on performance within one firm instead of interfirm performance, this could lead to firms undertaking actions that create inefficiencies in the supply chain because the initiatives are not aligned with the supply chain strategy (Lambert & Pohlen, 2001).

McCormack et al. (2008) summarised the changes that must be made to traditional performance measurement systems (PMS) in the following table:

Traditional PMS	Innovative PMS
Based on cost/efficiency	Based on value
Trade-off between performances	Compatibility of performances
Profit oriented	Client oriented
Short term orientation	Long term orientation
Individual metrics prevail	Team metrics prevail
Functional metrics prevail	Transversal metrics prevail
Comparison with the standard	Monitoring of improvement
Aimed at evaluation	Aimed at evaluation and involvement

Table 1. Comparison of traditional and innovative performance measurement systems (McCormack et al, 2008)

Two concepts are meaningful for the development of performance measurement systems. The first one is the balanced scorecard approach that provides an equilibrium in multiple ways (short term – long term; internal focus – external focus; learning and growth – internal processes – customers – financials; organisation levels; stakeholder perspectives). The SCOR (supply chain operations reference) model delivers a standardised manner to look at the supply chain in a balanced way at multiple levels (plan, source, make, deliver and return). It provides a consistent scorecard framework, it is process oriented and it enables the use of benchmarks (Akyuz & Erkan, 2009).

Performance measurement must be aligned with the supply chain strategy, balanced, systemic, take dynamics into account, be hierarchical and dependent, take human and organisational aspects into account and there must be a fit present among the parameters (Akyuz & Erkan, 2009).

Gunasekaran, Patel and Tirtiroglu (2001) and Gunasekaran, Patel and McGaughey (2004) have organised performance metrics and measures into six categories and provided some examples of suitable metrics for each category. The subdivision is based on the following supply chain processes: plan, source, make/assemble and delivery/customers.

The first category is *metrics for order planning* since order planning is the starting activity for any firm and it influences the performance of downstream activities. In this context, the order entry method (how and to which extent are customer specifications converted into information), order lead-time (the time between the receipt of a customer order and delivery) and the customer order path (the time an order spends in different channels) are some proposed metrics.

Measures for the evaluation of supply link evaluate suppliers in a varied way with measures that do not only focus on price, but also on lead time, quality, defect free deliveries, the ability to meet the firm's long-term needs etc. Relationships with suppliers are evaluated using parameters that promote and strengthen relationships, such as the level of assistance in mutual problem solving.

Measures and metrics at the production level are important because this performance influences product cost, quality, delivery speed, reliability and flexibility. Metrics for capacity utilisation and the effectiveness of scheduling techniques are examples for this category.

The category of the *measures for the evaluation of delivery link* is relevant because delivery has a huge impact on customer satisfaction. There are measures for delivery performance such as on time order fill, number of faultless notes invoiced and flexibility of delivery systems (the extend to which customers' delivery requirements such as place, mode of delivery and packaging are met). Measuring total distribution costs is important because individual cost elements and their impact on customer service must be followed up to make trade-offs for distribution systems.

Contenting customers is the central goal of supply chains, *measuring customer service and satisfaction* is thus very important. In this respect, some factors such as flexibility to meet customers' individual demands (e.g. product development cycle time and machine setup time), customer query time (time needed to formulate a quick and accurate answer to customer questions) and post transaction customer service are very important.

The sixth category is *supply chain and logistic costs*, which applies financial measures to assess the efficiency of supply chains. The strategy and practices that take care of the flow of products influence costs such as transportation, fuel, inventory management, packaging, handling etc. The authors also describe measures for costs associated with supply chain assets such as total cash flow time and return on investment, but also costs associated with inventory and information processing.

The authors also worked on a framework for the classification of measures based on supply chain activities (plan, source, make/assemble and deliver) and planning levels (strategic, tactical and operational level). Measures are classified in the intersections of the two dimensions, some measures are appropriate for multiple planning levels. This framework is useful to find out which measures should be adopted where and which management level should deal with them.

Once the right performance measures are developed, management can employ the information they provide to improve performance. Cai et al (2009) developed a framework to analyse interdependencies between KPIs, to find critical KPIs that must be prioritised and to develop improvement strategies. Traditional supply chain performance management can be summarised in a six-step cycle, as shown in Fig. 7. Goals and KPIs are only adjusted after the cycle has been executed completely, there is thus a long feedback loop. Because KPIs are related in a complicated way and companies must react faster to their environment, Cai et al (2009) added a loop to the cycle, i.e. analyse KPI. This step analyses the relationships between KPIs and estimates the accomplishment cost of KPIs. It also makes an optimisation calculation that is adopted to find critical KPIs and possible improvement patterns. The feasibility and financial and operational impact of KPI accomplishment are evaluated as well. KPI accomplishment is the term that the authors use for the mechanism to achieve KPI goals.

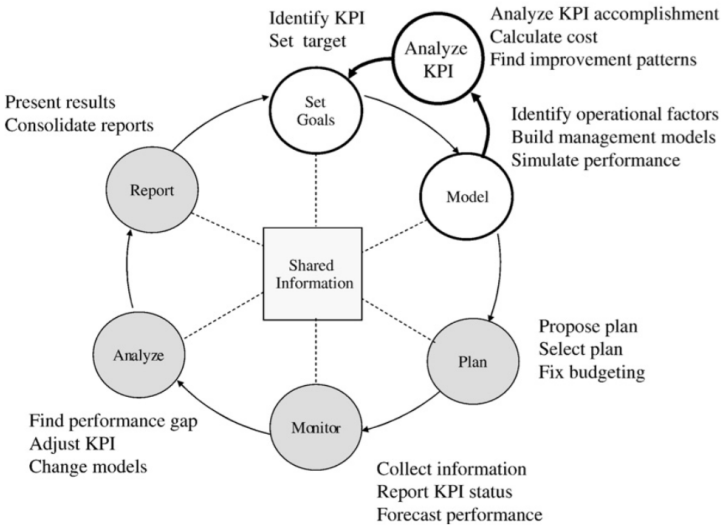

Fig. 7. An improvement model of business performance management cycle (Cai et al, 2009)

Since KPIs in supply chains have complex relationships, KPI accomplishment is a very iterative process. The relationships between KPIs must thus be studied; these relationships can be parallel (two KPIs are independent), sequential (one KPI has influence on the other) or coupled (both the KPIs influence each other).

Subsequently, an analysis that simulates the iterative KPI accomplishment process and that predicts the total costs of several performance management strategies (that consist of a set of KPIs) is performed. In each iteration, costs will occur and some KPIs will cause extra costs for other KPIs. The calculations make it possible to identify the KPIs that are crucial for overall performance improvement and substantially affect the overall cost. The essence of the analysis is thus that the cost for each alternative performance management strategy is compared to the contribution of the accomplishment of each KPI.

The analysis is adopted to identify where improvements of KPI accomplishment could have a maximum effect and to develop feasible improvement patterns. The results are also consulted to derive the

optimal pattern that fits the supply chain objectives so that performance goals can be adjusted and appropriate KPI accomplishment strategies can be applied.

This framework solves some of the before stated problems, such as long feedback loops and unidentified relationships between KPIs, but it does have its own limitations. It is important to mention that the results of the analysis must be treated as supportive information for making decisions, decision makers eventually select a pattern of critical KPIs that are aligned with their supply chain strategy (Cai et al, 2009).

Performance management and measures are not only applied to evaluate the current situation, to discover opportunities, to set goals, to make decisions etc. They can also be adopted for the selection of suppliers and the evaluation of (relationships between) supply chain parties.

For the selection of suppliers, it is important that a low and stable price can be obtained in combination with traits such as good quality, delivery reliability and accurate inventories. Again, a balance between financial and non-financial measures is recommended. A scorecard can collect financial and non-financial metrics and these are often weighted in order to create a supplier rating. There is no standardised technique to incorporate risks into performance measures, even though this is very important since risks associated with one supplier can have a huge impact through the supply chain and affect other partners (Anderson & Dekker, 2009b).

During relationship design, not only the coordination of activities and the assignment of decision rights (centralised, decentralised or shared) take place, but management control practices to control losses and reduce risks are specified as well. These management control practices can be formal, such as contracts that record rights and obligations, requirements and sanctions. Management controls can also be informal (e.g. performance feedback, joint budgeting and forecasting). The more risks that are present in collaborations, the more types of formal management controls that are adopted. Managers have the task to balance the benefits and costs related to controls (Anderson & Dekker, 2009a). Incentives (that are based on performance measures) are means to motivate supply chain partners to make the right decisions. This is important since supply chain parties have the tendency to optimise their own performance and to serve their individual interest. Incentive systems can be explicit (e.g. payments based on performance) or implicit (e.g. alliance funds that finance new projects or are paid out to the parties to motivate collaboration for achieving cost reductions) (Anderson & Dekker, 2009a).

Mahama stated that the use of performance measures is directly related to better supplier performance (Anderson & Dekker, 2009b). Performance measures are important because they clearly communicate expectations and realisations. They are also employed to assess how well collaboration is executed, whether the current supply base will be able to meet current and future needs and they make suppliers aware of inconsistencies between current and expected performance. Supplier performance can be improved using the performance measures for benchmarking and yardstick competition. Comparable financial and non-financial information of suppliers with similar characteristics is then used to help firms identify shortcomings and to give them the opportunity to learn (Anderson & Dekker, 2009b).

It is also relevant for a firm to assess whether the current supply chain configuration and relationships are sustainable. They can, for instance, incorporate data on the health of suppliers, this means that not only transactions with the own firm are taken into account. For a supply chain to be sustainable, it is important that each party in the supply chain contributes value in proportion to its costs, that all parties receive a fair value for their contribution and that no changes in the value propositions or relationship designs could deliver a greater net value. Measurement systems have to be adapted to those criteria (Anderson & Dekker, 2009b).

6.5 Enablers of cost and performance management initiatives in the supply chain

Certain factors affect the degree of success of cost and performance management initiatives in the supply chain or determine whether they will have any results at all. These factors thus influence the effect of initiatives on performance. This dissertation does not aim to provide an extensive and finite list of all existing enablers, only the most important factors that are treated in multiple works are briefly discussed.

6.5.1 The buyer-supplier relationship

For firms the value of supply chains is particularly determined by feedback and (cost management) opportunities that result from collaborations between buyers and suppliers. The generation and sharing of cost and performance data stimulate discussions about optimising the supply chain (Anderson & Dekker, 2009b). This justifies the importance of appropriate relationships between buyers and suppliers. Cooper and Slagmulder (2004) even observed a one-to-one relationship between relationships and interorganisational cost management initiatives.

The type of relationship between firms is related to the strength of collaboration and (cost management) initiatives. The closer the relationship, the more resources, strategic and important information that are shared, the more stable and supportive the connection is and the more intense, frequently and early collaboration is initiated. Governance also differs based on the strength of relationships. Trust and mutual benefits gain importance, while hierarchy diminishes in stronger relationships. Self-enforcing mechanisms (such as trust) are more effective than third party enforcement mechanisms (such as contracts) for minimising transaction costs and stimulating value-creating initiatives. When joint actions yield few or no benefits, firms avoid becoming interdependent and rely on market transactions and contracts instead of self-enforcing safeguards (Cooper & Slagmulder, 2004).

Trust is defined as the willingness to rely on an exchange partner in whom one has confidence and it is a major determinant of relationship commitment (Mentzer et al, 2001). Trust can contribute significantly to the long-term stability of collaboration (Barrat, 2004), it has effects on sharing risks and rewards and often contributes to overcoming other difficulties as well (Mentzer et al, 2001).
Because it is an implicit or explicit word of honour about relational continuity, commitment is also very important for the long-term duration of relationships (Mentzer et al, 2001).

Commitment and trust encourage parties to preserve their relationships and the investments they made in it, they help them to resist attractive short-term alternatives and they reduce the risk perception of actions because of the believe that partners will not behave opportunistically (Mentzer et al, 2001).
Mutual dependence can contribute to the longer duration of relationships, solidarity and the willingness to negotiate about functional transfers, information sharing, joint planning etc. because firms need the relationship to achieve their goals (Mentzer et al, 2001).

To maintain relationships, it is important that all parties share in the benefits (Cooper & Slagmulder, 2004), this is called mutual benefits.

6.5.2 Cost and performance information across the supply chain

Multiple consulted authors highlighted the essential need for information sharing if supply chains want to improve their performance. Information must be transparent, of good quality, accurate, available, easily achievable and timely. The use of intermediates for information sharing is undesirable since this creates unnecessary costs and could lead to lower transparency and quality. Clear and broad communication lines are valuable to promote the continuous sharing of information and to create shared understanding, which is important as well (Barrat, 2004).

In the context of information sharing, information technology (IT) gained a lot of importance. Information technology is not only adopted to gather cost and performance data but also to respond efficiently to customer requirements. Technology can collect large volumes of data and exchange them on a real-time basis (Barrat, 2004). Barrat (2004) does stress that technology can become a barrier in organisations that focus too much on complicated or expensive information systems or systems that do not collect the right information. Sometimes, especially in a beginning stadium, simplistic technologies (such as documents and emails) are more effective. Notice that IT systems alone are not sufficient, companies must also be willing to share information.

6.5.3 Organisational factors

Organisational compatibility has a positive impact on the effectiveness of collaboration and thus on performance. Organisational compatibility can reflect itself in complementary objectives, similar operating philosophies, comparable corporate cultures and management techniques etc. (Mentzer et al, 2001).

It is important that the corporate cultures of supply chain partners support internal and external collaboration. A collaborative culture is thus important for the success or even the existence of joint initiatives. Openness and honesty are advantageous cultural traits that improve certainty and reliability and can lead to trust, respect and commitment (Mentzer et al, 2001).

Support of senior management and support of other areas in the enterprises strengthen the success of initiatives and collaboration (Barrat, 2004).
In supply chains it is also necessary that a firm assumes the leadership role, a leader in the supply chain is as important as in individual organisations since the leader coordinates and oversees the whole supply chain. Constructive leadership being capable of stimulating cooperation between participating firms is directly correlated with the success of supply chain management initiatives (Mentzer et al, 2001).

An agreement on supply chain vision and key processes is essential to provide firms with the goals and strategies needed to identify and realise opportunities (Mentzer et al, 2001).

A lot of initiatives require strong collaboration between supply chain parties, but boundaries are often restrictive in this respect. This is why cross-functional activities and a process focus where boundaries are crossed or even broken down are important. Joint decision making will also lead to stronger commitment and higher effectiveness (Barrat, 2004).
Collaborating in supply chains and launching initiatives require commitment of resources. Participants must be prepared to invest resources and posses them (Barrat, 2004).

In the previous chapter it became clear that traditional measurement systems are not appropriate to follow up performance and to align the direction of operations. Good supply chain metrics is an important enabler for the success of initiatives (Barrat, 2004).

7 EMPIRICAL RESEARCH

7.1 Research objectives

The major blocks that were described in the literature review provide a framework for the empirical study. These blocks are visualised to indicate the purpose of this research and to provide a summary of the studied subjects.

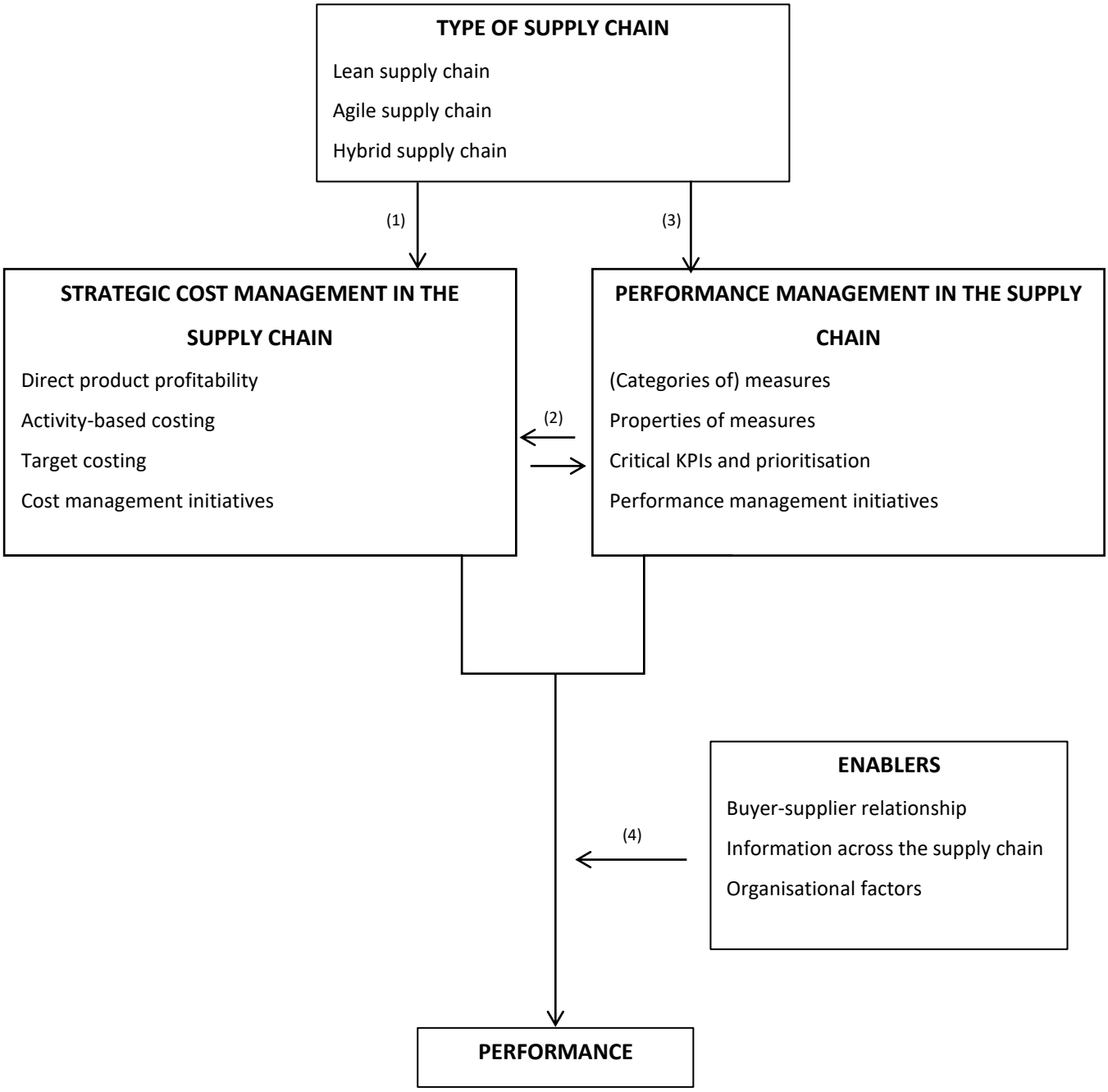

Fig. 8. Summary framework

The research conducted in this dissertation studies how firms with certain types of supply chains approach strategic cost and performance management in the supply chain. This means that the firms are firstly classified as part of a lean, agile or hybrid supply chain. Subsequently, they are questioned on which strategic cost management techniques are employed and what they are used for, which kind of measures they have, focus most on and how these measures support strategic cost management for their type of supply chain. The firms are also questioned about whether they point out several factors as crucial so that cost management initiatives lead to higher performance.

7.2 Design of the study

The research was executed in several phases, which are summed up below:

I. Literature review to gain insights into the concepts, to understand what has been researched in previous studies and to discover topics to tackle in this research
II. Decide on what will be studied in this dissertation
III. Development of a list of questions
IV. Contacting companies and getting more familiar with them by looking on their website, into annual reports etc.
V. Case studies: interviews
VI. Analyse information

7.2.1 Sample selection

The literature review focuses mostly on supply chain management in manufacturing companies. Therefore, I targeted manufacturing companies for the empirical study. After having performed interviews in an SME and some big enterprises, I noticed that the bigger companies have more formal management practices and thus have a higher likelihood to measure and document their management processes. They also have a higher tendency to go beyond their own boundaries than smaller companies, which are often more internally focussed. This is why I decided to focus on big companies executing manufacturing activities for the further research. The SME will be excluded from the cross-case analysis because it does not have formal cost management models and also because its performance management is not fully embedded in the company but lives only in the minds of the management. Additionally, all other participants are big, multinational, stock-listed companies while Gondella is an SME. Excluding Gondella is thus also favourable for comparability reasons. I will not exclude the company from the within-case analysis because it remains interesting to observe how an

SME approaches the topics, even though not everything is formally recorded. At ArcelorMittal, contact with the suppliers and clients is conducted at a higher level. The same applies to eventual cost and performance management in the supply chain. Therefore, I could not interview any members of staff who could provide me with the necessary information for this research. All studied companies seem to have particularly internal cost management models, but could provide me with a lot of information on how they involve supply chain partners in cost management while ArcelorMittal could not do so. The company is excluded from this dissertation because the gathered information would be too much out of scope for this study.

Managers in the business world are very busy and it is not evident to obtain their e-mail addresses using the Internet. That is why I relied on my personal network of acquaintances to get in touch with people working in big or midsized companies located in Belgium. Once I had a contact person within a company, this person or multiple people helped me to find the right person(s) to interview. An e-mail drafted to request participation can be found in attachment 10.2.

Twelve different companies were contacted to participate in the study. Eight of them gave me the opportunity to interview one or multiple persons. At Samsonite, I firstly talked to the planning manager and afterwards to the VP supply Europe because not all necessary information was gathered during the first interview. The supply chain manager at Barco was interviewed. At Colruyt Group, three members of staff were present during the interview: two financial controllers and a supply chain food projects coordinator. For Brewery, the logistics director BNL and South Europe was willing to give an interview. At Rogers Corporation, I interviewed the supply chain director. At Daikin, again three members of staff were interviewed: a production improvement engineer, a purchase officer and a manufacturing planning officer. The plant manager of Gondella was interviewed and at ArcelorMittal, I spoke to the head of performance steering. A table summarising data from the interviews is included in attachment 10.3.

7.2.2 Data collection procedure

Because it is important to understand the how and why of several management practices (Yin, 1981), I decided to do a more profound qualitative research with fewer respondents through case studies instead of a quantitative research with a big sample of respondents. This gives rise to the opportunity for a more in depth research, to ask extra questions to gain more understanding of their practices and to

explore the totality of the situation. Besides the subject of strategic cost and performance management in the supply chain not being very delineated and a lot of studied subjects cannot be summarised into exhaustive classes of answers, most companies have their own specific ways of approaching strategic cost and performance management in the supply chain. The goal of this research in the first place is to discover rather than justify and test. The results of this research are therefore rather impressionistic than definitive.

To gain the desired information, in-depth case studies were enacted to support the extensive and exploratory nature of the subjects. Its ability to cover both a contemporary phenomenon and its context are the specific strengths of the case study (Yin, 1981). For this study, interviews with some appropriate employees of multiple companies were held.

Since the research objectives were determined upfront, a list of questions that aims to generate the required information could be developed.
The list of questions was provided to every respondent at least a week before the interview was planned. This offered the respondents ample time to prepare themselves for the interview. The list of questions was semi-structured and the questions were open-ended. The interviewees mostly started by introducing their companies followed by a short description of the supply chain the company operates in to bring me up to speed with the context of their supply chain activities. The list of questions was used to lead the interview and to make sure that the main topics were covered, but interviewees often gave extra input which lead to additional questions and discussions. Based on the literature review, I prepared some additional explanation and examples per question to guide the interviewees in a consistent way. Interviewees always had the possibility to give their own input and suggestions.
The choice of semi-structured interviews leads to qualitative data that is reliable and comparable, especially because the same interviewer conducted all of the interviews. The application of open ended questions made it possible to cover some topics that stray from the list of questions and to identify new ways of seeing and understanding the covered topics (Cohen & Crabtree, 2006).
The list of questions provided to the companies is included in attachment 10.1.

All interviews were conducted in Dutch, but are described and analysed in English.
For confidentiality reasons, participants were asked whether the name of the company could be disclosed in this dissertation. Only one company preferred that its name is not mentioned in this report.

7.2.3 Analyses of the case studies

The gathered data will be processed through consecutively a within-case and cross-case analysis.
The interviewees got the opportunity to review what is written about their company, they helped to correct some specific facts and alerted me to places where my choice of words could potentially lead to biases. By and large, however, the interviewees were pleased with the results.

7.2.3.1 Within-case analysis

Case study research results in an overwhelming volume of data. A within-case analysis can help to cope with this early in the analysis process. The within-case analysis involves a detailed case study summary for each company. These are pure descriptions, but they are key to the generation of insight. The goal is to become familiar with each case as a stand-alone item, which accelerates cross-case analysis (Eisenhardt, 1989).

7.2.3.2 Cross-case analysis

Human beings are weak processors of information and are vulnerable to multiple information-processing biases. A good cross-case comparison can help to counteract these tendencies because the investigator is forced to go beyond initial impressions. I will group the case studies into companies with a lean, agile or hybrid supply chain and then look for within-group similarities coupled with intergroup differences (Eisenhardt, 1989). Companies will also be compared based on the studied topics and links between the studied topics will be investigated. For the cross-case analysis, I will rely on the within-case analysis and a table that summarises and tabulates the gathered information.

7.3 Within-case analysis

In total, I performed interviews in eight different companies. As aforementioned, one company is excluded from the research. On the following pages, a summary of the collected information per company is given. Comparisons between the companies and analyses will be made in the cross-case analysis.

7.3.1 Samsonite

Samsonite is the world's largest travel luggage company that trades in luggage, business and computer bags, outdoor and casual bags, travel accessories and slim protective cases for personal electronic devices under multiple brand names. The company is American and is stock listed. The company wants to meet the needs of its customers on the move with a full range of brands, extensive and exciting product ranges and the most comprehensive distribution channel coverage in almost every country of the world (Samsonite, 2018). Samsonite is headquartered in Luxembourg, counts 13 600 employees and the total global sales of Samsonite in 2017 amounted to about $ 3,49 billion (4-traders, 2018e).

Samsonite Europe HQ, the European headquarter of Samsonite that is located in Oudenaarde, was visited for this case study. The European Samsonite production sites are located in Belgium and Hungary where hard-side luggage is made. Most of the production is outsourced to Asia, but all products that are to be sold in Europe or Africa are stocked at Oudenaarde.

7.3.1.1 Supply chain

Samsonite classified its supply chain as a hybrid supply chain. For certain standard components that are used in multiple collections (such as wheels and zippers), they try to reduce as much costs as possible. For some smart features that are integrated later on in the production process (such as interiors), quality and satisfying customer needs are more important to Samsonite than striving for the lowest cost. The interviewees stressed that customer needs and satisfaction are very important. Inventory is high and transportation happens frequently to obtain a high service level. Product developers also take customer needs and expectations into account when developing products.

7.3.1.2 Strategic cost management in the supply chain

For strategic cost management in the supply chain, Samsonite collaborates with upstream parties and in a more limited way with downstream parties.

They, for instance, visit their Asian finished goods suppliers to train them in certain processes and to learn from them. Other examples of working together to reduce costs are taking into account some customisations for clients in the processes of the suppliers (e.g. integrating the client's logo on the product) in order to avoid this still needing to be performed when the products arrive at Samsonite, making the suppliers package the products efficiently to save space and materials, giving suppliers an indication of what they will take off so they can plan their capacity better etc.

Suppliers of components are involved in cost management as well. Samsonite negotiates lower prices because they indicate to the different finished goods suppliers which suppliers they must consult for certain components. This leads to larger volumes and lower prices. The suppliers of components are also involved in the design phase of products. Wheels are, for instance, developed jointly to have an optimal cost, quality and design.

According to Samsonite, cost management initiatives with downstream partners in the supply chain are more limited. An example of an initiative that they undertake is packaging some goods in groups when a distributor wants to cross-sell items. By doing so, transportation costs and packaging costs are reduced. Samsonite also has its own shops and would like to continue to expand. This reduces the amount of parties throughout the supply chain, resulting in higher margins for Samsonite.

Target costing is an important concept at Samsonite. The marketing department explores the retail price that can be demanded for a certain product. Subsequently, the free on board price that is needed to attain this retail price and a required margin is calculated. This price is set as a target for the finished goods suppliers, they thus have to meet a design, product and target price. Interaction with suppliers about the design is possible when they are not able to meet the targets. These interactions are functionality-price-quality trade-offs, the adaptations are limited and do not affect Samsonite's design. Even when the product design is fixed, interactions with finished goods suppliers continuously improve the product.

Cost calculations of Samsonite's products have an internal focus. The final landed cost is the sum of the price paid to the finished goods supplier, transportation costs and handling costs. Overhead costs are treated separately using budgets. Every year, studies are made in order to reduce the overhead costs and budgets are lowered.

Samsonite follows up the costs of its suppliers using bills of materials. They consist of a cost breakdown into materials, labour, overhead and profit. Samsonite analyses these costs to see whether they are consistent with comparable products and whether the distribution of the costs is reasonable (about 80% of the costs must be materials costs).

For the selection of suppliers, Samsonite does not only consider the price to be paid for the products. They also take into account other elements such as quality, skills, capacity, import duties etc. Additional costs implications that result from the selection of certain suppliers are thus considered, but they are not quantified into costs like TCO suggests.

Samsonite reports the final landed cost as the most important cost management method. This cost is crucial for decision making because it contains details of several cost classes.

Samsonite adopts its cost management models to follow up its costs, to simulate decisions (e.g. what is the influence of producing elsewhere on the cost) and to discover cost-reduction opportunities by studying the landed cost and simulating the influence of changes on this cost. The cost management models are also employed in the product development process because developers know the cost impact of processes on the final landed cost.
Samsonite reported that, besides cost reductions, strategic cost management in the supply chain also positively influences sustainability (e.g. a more efficient way of packaging leads not only to lower costs, but also to a smaller footprint) and quality (e.g. simplifying a product to reduce costs can also lead to lower complexity and thus higher quality because one can focus on less activities).

Margins are very important at Samsonite. When a margin cannot be achieved, the product is not brought to the market. Lower costs often result in a higher margin, cost management is thus very important at Samsonite. Also cost management in the supply chain is perceived as important for this.
At Samsonite, they try to reduce as much costs as possible, but sometimes priority is given to quality, design and service levels. It is important for them that cost management supports other characteristics of a product as well, costs are not the only success drivers of a product. This even means that costs are sometimes not minimised because other standards are prioritised.

7.3.1.3 Performance management in the supply chain

Samsonite has a range of KPIs. The most important individual KPI for them is the service level (=(sales+missed sales)/missed sales). The target for this KPI is set to 95% and the KPI is very important because Samsonite delivers on stock, customers basically do not need to keep large stocks.
The most important categories of KPIs for Samsonite are measures for the evaluation of supply link (suppliers are evaluated on multiple criteria such as delivery reliability, quality reliability, product development time, lead time etc.), measures for delivery link (on time order fills are very important), measures for customer service and satisfaction (the service level is classified under this category) and measures for supply chain and logistics costs (stock levels and warehouse costs are closely monitored, the payback time of investments is calculated).
In board meetings it is decided which measures will get priority, the strategy is adapted depending on the situation.

According to Samsonite, its KPIs support the hybrid supply chain strategy enough. They have a mix of KPIs that keep track of characteristics such as quality, while other KPI's help to manage their costs. "Cost management is there to guarantee quality for a reasonable price" is what one of the interviewed persons said.

7.3.2 BARCO

Barco is a Belgian developer and manufacturer of sight, sound and sharing solutions. The mission of the stock listed company is to intertwine its commitment to outcomes with a zeal for innovation and a strong focus on performance. Additionally, they chose for sustainable impact in everything they do. They want to translate innovative ideas into bright outcomes for every stakeholder.
With its innovations, Barco wants to be a technology leader with superior customer outcomes because it focuses on understanding customer needs and giving outcome-based solutions. Barco also focuses on its performance and wants to become more effective, lean, agile and execute value engineering. The company has three core markets: enterprises, healthcare and entertainment (Barco, 2018). Barco counts 3 515 employees, is headquartered in Belgium (Kortrijk) and sales equalled € 1,09 billion in 2017 (4-traders, 2018a).

7.3.2.1 Supply chain

The vertical integration at Barco is quite low. Most of the electronic components are manufactured in Asia. EMS (electronic manufacturing service) suppliers who place the components on electronic boards are other important upstream partners in the supply chain. Sales are most of the time indirect, performed by distributors.

For supply chain decisions, a triangle of costs, cash and service is key and a healthy balance must be maintained. Recently a fourth pillar, sustainability, was added.

According to Barco, more expensive and specialised products have an agile supply chain. There is a small amount of inventory held in stock because the production is rather make-to-order and technical superiority is far more important than cost minimisation. For other products, the supply chain tends to be more lean within the segment of high-quality products as they won't compete with lower quality and low price producers such as Dell. For instance, for their lower-end products, they will produce more on stock, reduce the options, choose for cheaper ways of transportation etc. Sometimes, they offer better features and some possibilities for customisation (e.g. colour, logo of the client on the screen) so that the lean products can differentiate from low cost alternatives.

7.3.2.2 Strategic cost management in the supply chain

Only upstream supply chain partners are involved in strategic cost management in the supply chain. Barco often works together with its suppliers to understand their processes and what drives their costs. They also adapt their product designs accordingly to lower the total supply chain costs. These collaborations are mostly limited to first tier suppliers, they suppose their first tier suppliers to have more power to reduce costs together with second tier suppliers. They do sometimes negotiate with suppliers of key components.

There are only few cases where Barco collaborates with downstream parties to reduce costs since Barco wants to be pro-active and be ahead of the question for discounts. Barco expects the same from its upstream suppliers.

Cost management at Barco is mainly internally focused. A direct cost price (DCP) per product is calculated, this is the sum of material costs, labour costs, direct overhead costs and all direct costs needed to bring the product to Barco (such as transportation costs, import tariffs, warehousing costs). In the product development process, a target is put on this cost. Once a product is being produced and sold, gross margins (sales price vs. DCP) are followed up closely.

When a new product is developed, cost engineers calculate a should cost. They work with cost tools and based on the design, available market prices and prices of internal processes, the should cost is calculated. This cost is also taken into account in negotiation processes, but not in such a cascaded and restrictive way as target costing suggests.

Before a project is released, a business case is developed. In such a case, the future sales prices, DCPs, quantities and indirect costs are estimated. Based on these estimates, an NPV (net present value) is calculated to decide whether the project will be released or not.

Transportation costs (inbound as well as outbound) is a supply chain related cost that is followed up closely.

Not only the asked price is important for the selection of suppliers. Potential suppliers are audited and there must be a strategic fit, but also quality, innovativeness, willingness to collaborate, possibility for consigned inventories etc. are important characteristics. On business review meetings, scorecards for existing suppliers are discussed. Additional costs implications that result from the selection of certain suppliers are thus considered, but they are not quantified into costs like TCO suggests.

In the recent years, Barco is evolving from cost engineering to value engineering to create value for the customers while profitability, serviceability, reliability etc. are kept in mind. This value engineering will be further developed in the future.
The follow-up of the DCPs and margins are the most important cost management techniques for Barco.

Barco adopts these cost management models for value and cost engineering, by doing so it can discover opportunities to reduce costs or increase value. DCPs are important during the product development phase because targets are put on them and during the process development phase by simulating the effects of processes on the DCP and NPV.
The interviewee believes that innovation and strategic cost management in the supply chain are difficult to combine. According to him, suppliers particularly innovate to be able to increase their margins.

In Barco, supply chain has three targets: achieving on time full term (OTIF), having a required cash flow level and keeping costs under control. Additionally, cost management is one of the four pillars of Barco: service, cash, cost and sustainability. Cost management is thus important, but the focus is put more on managing costs internally rather than involving the whole supply chain.
Products are followed when managing costs. For lean products, the supply chain is made as lean as possible, while for agile products quality and service are prioritised over costs. Barco thus thinks that its cost management in the supply chain supports its supply chain strategies.

7.3.2.3 Performance management in the supply chain

KPIs are very important for Barco. There is a responsible employee for every mentioned category. The most important category is measures for customer service and satisfaction. Two individual KPIs that are of immense importance are yield (good overall supply chain management must positively affect yield) and inventory (too low levels lead to missed sales, while too high levels lead to high working capital requirements).
Prioritisation of KPIs for improvement depends on the strategic priorities of the CEO.

The same KPIs are adopted for lean as well as agile products, but the targets are different for both types of products. For agile products, quality and service targets are more important, while for lean products more importance is attached to costs.

Barco confirms that KPIs support its cost management. For example, they have KPIs and reports that support the calculation, follow-up and benchmarking of the DCPs and margins.

7.3.3 COLRUYTGROUP

Colruyt Group is a listed Belgian group of companies that operate in multiple fields: super markets, export, food service, gas stations, baby facilities, toys and energy production. The group is best known for its Colruyt super markets. In these supermarkets, quality at the lowest price is key. Colruyt Group's goal is to deploy resources as efficiently and effectively as possible, not only to realise the lowest prices, but also to conduct business sustainably. In everything they do, they want to ensure a maximum useful economic growth, social and human development with a minimum of raw materials, human effort and energy. In the annual report it is stated that they work intensively with many players across the production and distribution chain and that they build long-term partnerships (Colruyt Group, 2018). The sales in 2017 totalled about € 9,49 billion, the company is headquartered in Belgium (Halle) and 27 633 employees are active at Colruyt Group (4-traders, 2018b).

Because this dissertation focuses on manufacturing companies, Colruyt Group Fine Food was studied in particular. This company produces its own meat, poultry, wine, cheese, coffee, bread and rice. The group can operate more efficiently, guarantee quality, reduce costs and create value through its craftsmanship and continuous improvement approach (Colruyt Group, 2018).

7.3.3.1 Supply chain

Raw materials and other necessities go to Colruyt Group Fine Food, where transformation processes take place. Then, the products go to logistic distribution centres and subsequently to shops or intermediate distribution centres. Finally, customers can buy the products in super markets such as Colruyt, Okay, Spar…

As described in the first paragraph, efficiency and reducing costs are very important for Colruyt Group. Colruyt Group is known for its low prices, the interviewees confirm this reputation by classifying the supply chain as lean. This lean mindset is spread over the whole chain, all employees are involved with it and aware that working cost-efficiently is primordial.

7.3.3.2 Strategic cost management in the supply chain

At Colruyt Group Fine Food, they try to look over the whole chain of processes to work as cost efficiently as possible. A lot of activities are executed in the group itself, this makes it easier to control the costs

and to follow the strategy. The processing, transportation and retail of products, for instance, are executed by members of the group. A big part of the supply chain is thus managed by the group.
They do not collaborate on reducing costs with the first link in the supply chain (e.g. farmers), but they do so with the distributors from whom they buy their raw materials. The collaboration downstream the supply chain goes far, even final customers are involved (e.g. shopping carts without money slots, automatic replenishment based on sales information). At Colruyt Group Fine Food, they always evaluate what is the most efficient and cheapest solution, for instance, they consider whether it is better to do certain activities themselves or to outsource them.

Costs management models at Colruyt Group Fine Food concentrate on the internal operations. ABC is employed to calculate product cost prices. Standard prices and actual prices are followed up and compared closely. Colruyt Group Fine Food does take into account the whole supply chain when making decisions, even though this is not constantly translated into financial data (e.g. a new product can be more expensive compared to competitors when only considering the ABC calculation, while it can be cheaper when the whole supply chain is taken into account).
There is no target costing at Colruyt Group Fine Food, but they do have a sales price in mind and take it into account when negotiating with suppliers. This comes from their desire to produce a correct product at a correct production price.
In the supplier selection process, they take multiple characteristics into account (e.g. price, sustainability, quality). The supply chain food projects coordinator said that they want to move to TCO in the future. For the moment, the purchase staff tries to quantify some elements (e.g. for a supplier with a low service level, they measure what it costs to keep high stocks). They work with a contribution which is based on the purchase price, sales price, waste and distribution cost.
The ABC model is the most important one at Colruyt Group Fine Food.

The described cost management models have multiple functionalities. They are adopted to follow up the costs and to benchmark with competitors, but also to get a correct sales price. Colruyt Group works with internal charging, this means that finally, the cost price plus a mark-up is charged to the shops. This also means that the cost price is a very important determinant for the sales price. A correct cost price thus leads to a correct sales price. Cost information is also employed to optimise processes. A cost price per process is determined for this. During product development, cost data is utilised to predict the costs and thumb rules are followed to come to an optimal cost (e.g. the most cost-efficient way of packaging). The information is also exploited to simulate the effect of decisions on the cost price of products. The

cost information is employed to compare products and to discover some opportunities to change. The interviewees mentioned that the quality of the ABC model and the opportunities that result from it depend on the available data.

As aforementioned, having low costs is very important for Colruyt Group Fine Food to be able to fulfil its role of being a low price provider. Cost management in the supply chain is thus an important aspect for Colruyt Group Fine Food, but by far the most effort is put into having a lean internal supply chain by being a lean group. Because the Colruyt Group is so large and a lot of activities are executed in this internal supply chain, their focus on the internal supply chain makes them cover a substantial part of the entire supply chain.
The supply chain was classified as being lean, but some nuance is necessary. Colruyt Group Fine Food provides food, meeting high quality standards is for them even more important than reducing costs. Costs are reduced as much as possible, but certainly not at the expense of quality.

7.3.3.3 Performance management in the supply chain

The KPI LOTIF (lines on time in full) is followed up very closely. This KPI measures to which extend that suppliers are reliable, timely, complete etc. This KPI supports the category of measures for order planning and the evaluation of delivery link according to the interviewees. Measures at the production level are important as well. Productivity (e.g. kilograms or packages per worked hour) and use of capacity (how full is the warehouse, the trailer…) are some examples of topics that are measured. Measures for supply chain and logistics costs are important as well (e.g. rotation of stock, transportation measures, average cost per colli), but they are observed in a more aggregated way and in a way that is easily interpretable for everyone (not per product category).
KPI's that reflect productivity have a high priority for improvement. In addition, KPIs are also compared to past figures and future targets. Those KPIs that are not on track will get priority.

A lot of the KPIs (that are not per se financial) result in costs (e.g. number of damaged articles does not only lead to higher satisfaction when improved, but also to lower costs). According to Colruyt Group Fine Food, their KPIs support their lean strategy very well. The managing board has a broad variety of KPIs, financial statistics being an integral part. On top of this, the interviewees state that the culture is imbued with cost awareness, which for them is the most important condition to support a lean supply chain.

7.3.4 Brewery

This company, which will be called “Brewery” because of reasons of confidentiality, is a Belgian brewery chain. Brewery wants to continuously have insights in customer preferences and create new experiences. Its broad product portfolio is one of its success factors. The company can be classified as a big company.

7.3.4.1 Supply chain

A lot of activities are executed by Brewery itself (brewing, bottling, packaging). Brewery depends on suppliers of raw materials, such as malt, hops and cereals and suppliers of other necessities, such as cleaning products, bottles, tins, cardboards etc. When the beers are brewed, bottled and packaged, they go straight to clients or to distribution centres.

The interviewed logistics director judges the supply chain as being lean. Everything is organised as efficiently as possible, but this does not have to exclude flexibility, complexity, good service and quality. Everything they do is based on market insights, the task of supply chain is to do this in the most cost-optimal way possible. Brewery is a customer-driven company that wants to minimise costs, but not at the expense of its customers.

7.3.4.2 Strategic cost management in the supply chain

For strategic cost management in the supply chain, the whole supply chain is involved, from start to finish. They, for instance, have programs to help farmers improve their quality, yield and efficiency, the suppliers of cardboards help them to find out how to package with the same strength and appeal but with less input. VMIs are available with some suppliers. They also work together with large clients and distributors to be able to have full trucks, do cross-docking etc.

Brewery has multiple cost management models. For variable costs, ABC is employed. This involves a bottom-up calculation per SKU where costs such as transportation and cleaning kettles are assigned to the products. Fixed costs are managed through ZBB (zero-based budgeting), each expense must be justified and challenged. Again, the cost management models focus on internally generated costs, but this does not mean that Brewery does not care about the costs of its suppliers. For big tenders, they try to imitate the cost structure of such a supplier to have an insight in the margins that the suppliers are allocating and they apply this information in the negotiation process. With supplier with whom they

have long-term relationships, they often have open book models. This means that costs are shared transparently and that there is a predetermined margin. This way, Brewery can help to reduce the costs of these suppliers and do similar analyses as it can do internally.

Design to value is another cost management model at Brewery. They look at what customers want to pay (value) for a certain product and adapt the design to this price. They develop an idea, calculate a cost and compare this cost to the price that the market is willing to pay. When the desired margin is not achieved, the product is not launched. Customers, for example, attach a higher value to a specialty beer, this makes it possible to sell the product in beautiful bottles, make a nice crown cap, pay attention to the sound the beer makes when it is poured etc.

The logistics director recognised that Brewery could make some improvements in its supplier selection practices. Most of the time, they mainly take into account the lowest price. In practice, they do not really take the time to valorise other characteristics, also because it is difficult to do so.

Their management system is indispensable for Brewery. The system contains several techniques and toolkits that are known as six sigma and lean manufacturing. Their cost management can be split up into two blocks: sustain (SDCA: standard, do check, act) and improve (PDCA: plan, do, check, act). Through SDCA, processes are optimised, standardised and ranked according to their criticality. For the critical processes, PIs are composed and these are followed up very closely to make sure that processes are fully under control. When processes are out of control, initiatives are started to solve the problems. PDCA is adopted to improve processes and to make them more efficient. A gap is opened if certain PIs are not benchmark compared to other affiliates or the best in the market. Subsequently, employees start a project and look for initiatives to achieve a step-change. When the problems are solved, standard operation procedures are captured and the appropriate PIs are developed and followed up. This way of working is applied for all processes in the supply chain.

The cost management models are adopted for more purposes than just managing and lowering costs. All big decisions are made based on a business case. Cost data is adopted to develop this business case and to simulate certain decisions. Also for the development of products and processes, business cases and cost information are employed. Furthermore, cost management models are utilised to discover opportunities and to make financial forecasts. At Brewery, they think that it is very important to share benefits with upstream partners in proportion to the strength of the relationship that they have (suppliers are classified into strategic partners, key suppliers and protect and grow suppliers). They similarly think that it is even more important to share benefits with downstream parties, because they have power with respect to Brewery.

Strategic cost management in the supply chain also helps to achieve sustainability goals. For example the reduction of the amount of kilometres driven. Less driving means less costs, but also less emissions.

The corporate strategy of Brewery is cost, connect and win. Cost management is thus a central topic in the company. They try to reduce as much costs as possible to be able to invest more in growth and connectivity with clients. Cost management in the supply chain is especially important for this because all internal cost reductions are low hanging fruits that have already been picked in the past years.
Brewery's supply chain strategy is to be lean, but they won't cut costs if this negatively influences quality or safety.

7.3.4.3 Performance management in the supply chain

There are a lot of KPIs at Brewery. For every proposed category, there are certainly KPIs present. The category of measures for supply chain and logistics costs is followed up on a high level (e.g. inventory, total distribution costs, service level as an indicator of how good the supply chain works). Measures at the production level are also very important.
On a yearly basis, a criticality analysis is done. An objective method is then applied to determine which KPIs are critical and must be prioritised in the upcoming year.

There is a monthly routine where financials are studied in detail and linked to KPIs, so there certainly is a link between KPIs and strategic cost management. "When all KPIs are okay, financials will be okay as well", said the interviewee.

7.3.5 ROGERS CORPORATION

Rogers Corporation is an American specialty engineered materials company that is listed on the New York Stock Exchange. It delivers high performing, highly reliable advanced connectivity solutions (material solutions), elastomeric material solutions (sealing, impact protection and vibration isolation solutions) and power electronic solutions (solutions for converting, distributing and controlling power) and is a partner for innovative and successful technology companies. The company invests in innovation, new products and always has new technologies in its pipeline. Their competitive advantage lies in the fact that they have a good reputation for innovation, quality, reliability, support and service (Rogers Corporation, 2018). Rogers Corporation is headquartered in the United States (Arizona), counts 3 400 employees and the total global sales of the company in 2017 amounted to about $ 820 million (4-traders, 2018d).

7.3.5.1 Supply chain

The specialty of the company depends particularly on the specialty of the raw materials, few components are bought. Alongside this, necessities such as machines and chemicals are important to the manufacturing process. In general, the supply chain looks as follows. Raw materials go to Rogers Corporation (sometimes through distributors), where they are processed. Rogers Corporation does not know a lot about the downstream supply chain. For them, it stops when a first tier client buys their materials (often OEMs or component manufacturers).

Rogers Corporation wants to make innovative products for the needs of the future in selected markets (double digit growth markets). This results in specialised, high-margin products. Innovations are pushed to the customers, but customer needs are always considered. Rogers Corporation's supply chain is classified as agile. Quality is their number one priority and service is important as well while costs enjoy less priority, yet still being key for sustainable growth.

7.3.5.2 Strategic cost management in the supply chain

Since they do not know a lot about the downstream supply chain, their strategic cost management in the supply chain is limited to their upstream suppliers. Rogers Corporation wants to make its products in a cost-efficient way, so it is important that the suppliers work efficiently too. Rogers Corporation collaborates with raw materials suppliers to help them deliver exactly what they need, to help them improve their yield, to help them in upscaling etc.

Cost measurement is internally focused and leans towards ABC. However, only Rogers Corporation's activities are put to use in the ABC model, not those of partners. They do consider supplier activities as they drive costs to Rogers Corporation. They also consider customer activities for marketing and sales propositions. Commodity management is essential to get familiar with basic costs. Cost drivers of Rogers Corporation and of its key suppliers are mapped. Sand derivatives, for example, are important raw materials and sieving is an important cost driver thereof. Rogers Corporation tries to adapt its specification based on this knowledge. The company attempts to do reverse engineering for its important suppliers, but most of the time not all information is available.
TCO is the most important cost management model for Rogers Corporation. They are aware of the fact that a large fraction of their costs is caused by set specifications and the selection of certain suppliers, they also try to quantitatively measure as many as possible. It is, for example, important to order efficient lot sizes, have the right frequency of delivery etc.

Cost data and models are adopted for multiple purposes, commodity trending and prediction and discovering opportunities to reduce costs are the most obvious ones. When certain components turn out to determine a large share of the cost, second sources are searched (where possible) to spread risks and leverage supply. Sharing benefits and burdens with partners is primordial for Rogers Corporation. They strongly believe that a win-win approach leads to better long-term relationships and advantages in the future. They, for example, participate in investments which their key suppliers have made.
For Rogers Corporation, cost management in the supply chain in combination with mutual benefits and burdens leads to (sustainable) partnerships, which leads to higher quality, innovativeness (e.g. suppliers know that Rogers Corporation wants to be their first client to know if there is a novelty), flexibility (e.g. working together to improve processes, lead time) and joint development.

Strategic cost management in the supply chain is not that important to achieve the agile supply chain strategy, quality and service are more important for this. Nevertheless, Rogers Corporation finds it important to have as few price fluctuations as possible and to be a stable partner towards its customers in the long term. Strategic cost management in the supply chain is certainly an important aspect to achieve this.
As aforementioned, quality and service are key at Rogers Corporation and cost management in the supply chain is supportive. Supply chain management plays an important role in the company. It can even participate, together with operations representatives and business unit VPs, in top level decisions.

The most important enabler according to Rogers Corporation to have a higher performance resulting from strategic cost management in the supply chain is to have a good relationship. Trust and mutual benefits are the most important relational characteristics according to the interviewee. Having a strong partnership also positively influences the sharing of information, which is again an enabler.

7.3.5.3 Performance management in the supply chain

Cost increases or decreases, stock-outs (due to Rogers Corporation or suppliers) and percentage of consignment (this can lead to shorter lead times and less stock-outs) are some important individual KPIs. The category of measures for supply chain and logistics costs is very important. A lot of raw materials come from countries across the globe and Rogers Corporation has branches in multiple countries thus enabling a lot of intercompany trading. Logistics costs are measured and targeted. Two other important categories are measures for supply link and measures for delivery link.
KPIs that contribute to dual sourcing, risk management and sustainable relationships are prioritised. This prioritisation is fuelled by cost management.

There are no KPIs to directly manage costs, but some KPIs have cost implications (e.g. KPIs for inventory, KPI to measure the number of single sources). Sensitivity analyses on commodities are done on a regular basis instead of having KPIs that constantly track financials. On top of this, there are also KPIs that serve other supply chain goals (such as innovativeness). The supply chain director thinks that the KPIs sufficiently support cost management and the determination of the right strategy and goals. KPIs won't make Rogers Corporation cut costs where it is inappropriate.

7.3.6 

Daikin is a Japanese multinational company that is listed on the Tokyo Stock Exchange. The company is best known for its air conditioning and refrigeration products, but it produces other products such as fluorochemicals and oil hydraulics as well. The Daikin products are recognised for its high comfort, high quality, energy efficiency and intelligent regulation.

Daikin wants to offer solutions for every air conditioning need. Innovation also means continuous improvement for them, not only big breakthroughs but also small improvements in the production process are important. Daikin's strategic management plan is called "Fusion 20" and encompasses that they want to meet expectations and contribute to the sustainable development of global society through co-created value. The company wants to create new value, contribute to society with their world-leading technologies and be dynamic and flexible (Daikin, 2018). Daikin counts 56 240 employees, is headquartered in Japan (Osaka) and sales equalled 2,29 trillion JPY in 2017 (4-traders, 2018c).

The Belgian plant works based on make-to-stock. More expensive and high-end products are manufactured in Belgium because the plant cannot compete with the lowest price compared to other countries. They want the production to be stable and predictable, but they also want to be flexible and have short lead times.

Mainfreight, which is located about 100 meters away from Daikin, is a very important partner. They take care of Daikin's transportation and the warehousing of parts and finished goods. Daikin also has hubs, these make it possible to consolidate larger volumes, negotiate lower prices and get more flexibility.

7.3.6.1 Supply chain

The supply chain generally works as follows: parts go from suppliers (who often have their own suppliers) to hubs and then to Mainfreight (sometimes no intermediate hub is used). Daikin uses these parts in the manufacturing process and finished goods are again stocked at Mainfreight. Afterwards, they are brought to velvet warehouses (the goods are still managed by Daikin, this means that Daikin can easily move the goods between the warehouses) and subsequently they go to affiliates. The goods go to installers before they are placed in offices, shops, houses etc.

Daikin's supply chain is categorised as lean. The company wants to be lean within its segment where quality, cost and delivery are key. Everything is produced as cheaply as possible and the products are made in mass and on stock. New products are often innovative and meet customer needs and local

regulations, but the supply chain is treated as being lean. The products are market specific, not customer specific.

7.3.6.2 Strategic cost management in the supply chain

Multiple parties are involved in strategic cost management in the supply chain.
Daikin has a very close partnership with Mainfreight. Mainfreight is a logistic services provider and is very important for the warehousing of Daikin's parts and finished goods. Daikin does not have enough space on its site to keep a lot on stock, parts that are stocked at Daikin are used within two to four hours. A Kanban system is adopted between Daikin and Mainfreight and they continuously collaborate to find ways to work more efficiently (e.g. one touch principle).
Suppliers deliver the parts packed in a way that Daikin desires (quantity, sizes, weight…) to simplify the production process. Sometimes, suppliers already do some production steps (e.g. making connections, painting). Daikin often organises workshops, where they invite their key suppliers to discuss about how products can be improved.
The supply chain is also shortened where possible. A local supplier can, for instance, deliver all its products to Mainfreight instead of partly to Mainfreight and to a hub. This way, the supplier has less transportation costs and Daikin can easily combine this transportation with another transportation they had to do anyway.
Daikin also does cost management within the supply chain in collaboration with suppliers of suppliers. For example, they buy large volumes of steel and distribute them to local suppliers.
The interviewed members of staff are most familiar with the production and procurement at Daikin. They say that similar cost-reduction initiatives are undertaken with downstream partners in the supply chain. Affiliates, for example, make forecasts that are employed to plan the production as cost-efficiently as possible.

Target costing is very important at Daikin, the corporate variant is called standard costing. The sales department determines what kind of unit will be produced and what it is allowed to cost. The manufacturing department investigates how they will execute this, what needs to be changed etc. Costs are divided into cost categories: material, direct labour and overhead (such as depreciations, logistics costs, indirect labour: percentages are used to allocate the costs). The targeted cost is cascaded and employed in negotiation processes with suppliers. Daikin is aware of the fact that the suppliers own a lot of knowledge. They can do suggestions based on what Daikin wants to produce, this can even lead to an

adaptation of the final design. During the design phase, engineers would have already contacted their suppliers, thus knowing what is possible and how.
The costs of products are also followed up using this standard costing model. The actual cost is continuously compared to the target, budget, revised budget, forecast and touchdown.
Suppliers are selected based on a supplier evaluation where multiple criteria are scored (delivery, quality, cost, compliance). These criteria are not translated into costs, like TCO suggests.
Daikin tries to obtain a cost breakdown from its key suppliers to see what their biggest cost components are. This information is also employed to help suppliers reduce their costs.

The cost management models are adopted to follow up costs, do the bookkeeping and to report back to Japan. The data is also used to simulate decisions (e.g. what are the cost implications of a project) and to discover cost-reduction opportunities (e.g. observe whether logistic costs are high for a certain product and investigate the reason for it). Product development and process development are also facilitated by the cost management models. In several development stadia, costs are estimated and compared to the target and later on, there is a continuous evaluation of how processes can be improved and which cost implications these have.
When reducing costs, they always keep in mind that they want to improve or at least preserve their quality, delivery, flexibility and customer responsiveness. Working together with suppliers for cost reasons in the design phase and improvement phases often positively influences their innovativeness.

Japan imposes cost down targets, but the affiliates can autonomously decide how they want to attain these targets. Strategic cost management in the supply chain can be important for this, but it is not the only way to reduce costs. Lean management at Daikin starts as closely as possible to the client, because there are always upstream consequences. They start internally and search how their external supply chain can support them to reduce costs (e.g. package parts in an optimal way).
Their lean strategy is very important for Daikin. On a long-term basis, they reduce costs where possible. A nuance is necessary: timeliness, quality and customer responsiveness are very important for the company. These aspects can cause some extra costs in the short term, but Daikin does not want to keep on carrying them in the long term.

7.3.6.3 Performance management in the supply chain

Measures for the evaluation of supply link are important, suppliers are, for instance, evaluated on multiple criteria on a monthly basis. Alongside this, measures at the production level are closely followed up. By displaying the planning and progress, workers either on the floor or in the office can constantly follow up these KPIs.
Year after year, focus is put on reducing costs. This translates itself particularly in KPIs aimed at the production to be prioritised.

KPIs do not only focus on measuring and reducing costs. This is not surprising given the fact that Daikin focuses on more than merely reducing costs.

7.3.7 Gondella

Gondella is a Belgian SME that is specialised in the production of metal shopfitting systems. It creates, together with its customers, innovative solutions for an optimal shopping experience (Gondella, 2018a). The company's strengths are its competitive prices (offering the lowest price is not possible), flexible delivery times (an order must be delivered and mounted within three to five weeks) and great service. The sales in 2017 totalled about € 19 million, the company is headquartered in Belgium (De Pinte) and 43 employees are active at Gondella (Gondella, 2018b).

7.3.7.1 Supply chain

The company buys raw materials such as steel and other necessities such as paint powder and screws. Some components are bought and directly resold (e.g. wooden walls, price tags, hooks). Gondella has direct clients, but its products are also sold by distributors. The installations are mounted for direct clients, this is done by subcontractors.
The company has a plant in Belgium and in the Czech Republic and acquired the enterprise 'De Kimpe', a company specialised in sheet steel and selling its expertise to other companies.

Gondella has a hybrid supply chain. They have multiple basic rack systems that are completed with accessories that customers desire. Often, new components are developed based on the composition that a customer requires. The make-to-stock products are produced in the factory in the Czech Republic and the supply chain approach is lean (e.g. big quantities, production based on forecasting, as cheaply as possible), while the more special make-to-order products are made in Belgium and are treated with an agile supply chain approach (e.g. quick delivery, fulfil customer needs precisely).

7.3.7.2 Strategic cost management in the supply chain

Strategic cost management initiatives in the supply chain are limited to the first tier suppliers. They, for instance, have a partnership with the supplier of paint powder to make it custom-made and cheaper. A supplier of steel coils keeps stock for Gondella for six months, this means that Gondella can anticipate on expected price fluctuations and has to keep less stock itself. The supplier also cuts the coils for Gondella. Gondella has some partnerships with suppliers of components that are resold. Gondella, for example, bought a mold for price tags. This can be deducted as an investment and allows Gondella to recalculate the price. Gondella already performs some pre-assembly, the efficiency gain for later assembly outweighs the extra costs (such as transportation). For a certain production step, Gondella

shortened the supply chain. In the past, something was lasered at Gondella, welded at De Kimpe and then brought back to Gondella. Now, a supplier does the laser work instead of Gondella. Transportation costs are eliminated (the parts are very expensive to transport) and Gondella has more capacity available on its own laser. The supplier is paid for this extra activity. One thing that Gondella always does, is to consult multiple suppliers to force them to offer competitive prices. The interviewed plant manager believes that it is important not to go too far in partnerships because this does not lead to the lowest price. Every company's main goal is to make profit. He thinks that it is important to keep in mind that there is a buyer-supplier relationship.

Gondella does not do anything in terms of cost price calculation. They try to predict their sales price by taking the price of raw materials (which makes up about 50% of the cost price), adding 30% and finally adding a sales price that they estimated for some activities (e.g. sales price per meter of paint powder, sales price of a welder per hour).
For the selection of suppliers, the price is the most important aspect. Other aspects are also checked, e.g. quality, delivery reliability and credit conditions.
The company keeps an eye on how the prices of materials and components evolve and has some cost elements in mind when developing products. However, the aforementioned are not formally calculated. When Gondella invests in new or improved processes, a return on investment is calculated based on cost information they have gathered.

The fact that cost management in the supply chain is not highly developed and not calculated also means that it is not very important from a strategic point of view. The price that Gondella offers is very important at biddings. Once an order has been attained, service and timeliness are the only standards that matter for the client.
Costs by themselves are not the most important objective at Gondella, but they are not ignored when making decisions.
Gondella operates in a competitive market and does not try to be the cheapest producer because they know they cannot achieve this. They offer high quality and excellent service and they are successful in doing so. Nevertheless, their opinion is that they reduce costs where it is possible without reducing the quality of their products.

7.3.7.3 Performance management in the supply chain

Gondella does not have any KPI. The interviewee nuanced this, having said that management certainly do have their indicators on managing the company. The order book is crucial for them to know what will be produced where, when etc. and to understand the occupation of posts. Because service is very important to them, the order lead time that customers expect is followed and they also have some thumb rules for it.

Priority is given to squeezing lead times and addressing problems where they arise.

7.3.8 Within-case analysis in a nutshell

Seven companies with different supply chain and business strategies provided me with a lot of information for the research. All companies set up initiatives with supply chain partners, have multiple cost management models and possess a broad range of KPIs. All of these subjects are more or less developed in some companies compared to others. Also the application modes of models and the importance of cost management in the supply chain differ between companies. One SME, Gondella, was included in the within-case study. The company does not have formal cost management models and also performance management is something that is rather in the minds of the managers, but it is not possible to reliably conclude that all SMEs have less formal management practices concerning strategic cost and performance management in the supply chain and that strategic cost management in the supply chain is less important for SMEs.

This within-case analysis provides the reader with sufficient information on the practical working and points of view of companies concerning the studied subjects. This information is used in the cross-case analysis, which is worked out on the following pages.

7.4 Cross-case analysis

In this section, an analysis of and a comparison between the studied cases are made. Differences between supply chain types and links between the studied topics will be evaluated. To give an overview of what the respondents have answered during the interviews, a summary table is provided on the following pages.

Topic	Samsonite	Barco	Colruyt Group
Type of supply chain	Hybrid	Hybrid	Lean
Extent of cost management in the supply chain	Upstream (until 2nd tier) Downstream (limited)	Upstream (1st tier)	Upstream (1st tier) Downstream (until end consumer)
Cost management models (most important ones are displayed in *Italic*)	*Final landed cost* = finished goods price + transportation costs + handling costs Budget for fixed costs Bills of materials from suppliers Target costing	*Direct cost price* = material costs + labour costs + direct overhead costs + direct costs to bring products to Barco *Gross margin* Should cost Business case Value engineering	*ABC* Contribution of suppliers (based on purchase price, sales price, waste and distribution cost)
Application modes of cost management models	Simulate decisions Discover cost-reduction opportunities Product development	Discover cost-reduction opportunities Product development Process development	Benchmarking Internal charging Process development Product development Simulate decisions Discover cost-reduction opportunities
Importance and alignment of cost management in the supply chain with the supply chain strategy	Important to achieve hybrid strategy Reduce as much costs as possible, but sometimes prioritise other standards above costs	Cost is one of the supply chain goals Internal cost reductions more important Conform with supply chain strategy of product	Important for low cost strategy Cost reductions in internal supply chain more important Reduce as much costs as possible, but not at the expense of quality
Most important KPI (categories)	Service level Measures for supply link Measures for delivery link Measures for customer service & satisfaction Measures for supply chain and logistics costs	Yield Inventory Measures for customer service & satisfaction	LOTIF (lines on time in full) Measures for order planning Measures for delivery link Measures at the production level Measures for supply chain and logistics costs
Improvement prioritisation of KPIs	Board meetings decide	Strategic priorities CEO	KPIs that reflect productivity KPIs that are not on track (past, targets)
Supportiveness of KPIs for strategic cost management in the supply chain	Support hybrid strategy KPIs for costs and other characteristics	Targets depend on supply chain type Support cost management	Support lean strategy A lot of KPIs result in costs
Enablers	Mutual benefits – collaboration Accuracy – quality – IT – timeliness Management support – constructive leadership – supply chain measures	Collaboration – commitment – trust Accuracy – timeliness – transparency – willingness Management support – maturity	Mutual benefits – commitment Accuracy – quality – transparency – willingness Management support – resources – empowerment

Table 2. Cross-case table (1)

Topic	Brewery	Rogers Corporation	Daikin
Type of supply chain	Lean	Agile	Lean
Extent of cost management in the supply chain	Whole supply chain (upstream & downstream, all tiers)	Upstream (1st tier)	Upstream (until raw materials providers) Downstream (until affiliates)
Cost management models (most important ones are displayed in *Italic*)	ABC for variable costs ZBB (zero-based budgeting) for fixed costs Imitate cost structures of suppliers Open book models with suppliers Design to value *SDCA* (sustain) & *PDCA* (improve)	ABC Commodity management (map cost drivers) Reverse engineering *TCO*	*Standard costing* (~ target costing) = material costs + direct labour costs + overhead costs Cost breakdowns from suppliers
Application modes of cost management models	Simulate decisions Product development Process development Discover cost-reduction opportunities Making financial forecasts Sharing benefits	Commodity trending and prediction Discover cost-reduction opportunities Sharing benefits and burdens Identifying where second sources are desirable	Bookkeeping and reporting to Japan Simulate decisions Discover cost-reduction opportunities Product development Process development
Importance and alignment of cost management in the supply chain with the supply chain strategy	Corporate strategy: cost – connect – win Cost management in the supply chain even more important than internally No cost reductions when negative influence on quality or safety	Strategic cost management in the supply chain is not that important to achieve their agile supply chain strategy (this does not mean that strategic cost management in the supply chain is totally unimportant)	Strategic cost management in the supply chain is not the only & most important way to reduce costs No cost reductions at the expense of timeliness, quality and customer responsiveness
Most important KPI (categories)	Measures at the production level Measures for supply chain and logistics costs	Cost increases and decreases Stock-outs Percentage of consignment Measures for supply chain and logistics costs Measures for supply link Measures for delivery link	Measures for supply link Measures at the production level
Improvement prioritisation of KPIs	Yearly criticality analysis	KPIs that contribute to sourcing, risk management and sustainable relationships	Focus on reducing costs → especially measures at the production level
Supportiveness of KPIs for strategic cost management in the supply chain	Link between KPIs and financials	No KPIs to directly manage costs, but some KPIs with cost implications Also KPIs that serve other supply chain goals	KPIs do not only focus on measuring and reducing costs
Enablers	All proposed enablers (buyer-supplier relation-ship, SC information and organisational factors) Choice between contracts, dependence and mutual benefits is necessary Empowerment is another enabler	Having a good relationship (especially trust and mutual benefits) is the most important enabler that also enables information sharing. Being global and international is another enabler	Mutual benefits – collaboration Accuracy – timeliness Resources – joint decision making

Table 3. Cross-case table (2)

Three out of six companies (Colruyt Group, Brewery and Daikin) reported that they have a lean supply chain strategy. Samsonite has a hybrid supply chain and also Barco opted for a hybrid supply chain, but not for the same reason as specified in the literature review. This choice resulted from the fact that the company has more lean as well as more agile products. Only one company, Rogers Corporation, has an agile supply chain.
The lean companies stress that it is important for them to work as efficiently as possible, to have low costs and to continuously improve, but all of them admit that attaining the lowest cost possible needs to occur without negatively influencing other aspects such as quality, flexibility, service, safety and meeting customer expectations. They want to be lean within their specific segments. The company with an agile supply chain admitted that having low costs is not its number one priority, but it does want to work cost-efficiently and have stable prices.

All companies had examples of how they collaborate with supply chain partners and set up initiatives to reduce costs for the partner and company itself with the help of the partner. Nevertheless, Brewery is the only company that involves the whole supply chain, from raw material until end customer. Other companies limit their actions to upstream or downstream partners or stop at a certain level. It is remarkable that the majority of examples given involve collaborations with upstream partners and less so with downstream partners. A lot of companies also consider price negotiations as an example of cost management in the supply chain.

There is a remarkable gap between theory and practice. All companies have cost calculation models, but none of them involve all costs encountered throughout the whole supply chain, as was proposed by some models related to ABC that were described in the literature review. This does not mean that none of the companies do not try to obtain insights into the cost structures of its partners. Samsonite employs bills of materials to keep track of the costs of suppliers, Brewery imitates costs structures and even has some open book models with suppliers, Rogers Corporation tries to do commodity management and reverse engineering to have better insights into the costs of suppliers and Daikin asks its suppliers for cost breakdowns. Notice that the companies only gain these insights in upstream partner's costs. Colruyt Group does take into account the whole supply chain when making decisions, they recognise that a comparison between the calculated activity-based cost and the cost of competitors will not necessarily be representative since other supply chain costs can be compensating. Samsonite and Daikin execute target costing, other companies such as Barco, Colruyt Group and

Brewery predict costs when developing new products and keep these costs in mind during negotiation processes with suppliers.
For the selection of suppliers, most companies particularly make their choices based on costs and the score a supplier gets on other aspects such as quality, skills, capacity, delivery, innovativeness, willingness to collaborate, sustainability etc. Most of the time, the price plays a decisive role. At Rogers Corporation, TCO is applied and Colruyt Group is evolving towards it.
The companies were also questioned about which cost management model they consider as the most important one. Four out of six companies selected the model that is adopted to follow up their internal costs (final landed cost, direct cost price, ABC and standard costing). Rogers Corporation opted for TCO and Brewery prioritised its SDCA and PDCA models, which are applied for all processes in the supply chain.

Cost management models are adopted for a lot of different purposes. Discovering cost-reduction opportunities is an application mode that was cited by all interviewees. Also product development (5/6), process development (4/6) and the simulation of decisions (4/6) were prominent answers.

Five out of six companies said that strategic cost management in the supply chain is very important to achieve their supply chain strategy. After going more in depth, Colruyt Group nuanced this by saying that cost reductions in the group are more important. Similarly at Barco and Daikin, cost management in the supply chain seemed to be subordinate compared to internal cost-efficiency. Brewery is the only company that clearly recognised that nowadays, most cost-reduction opportunities lie beyond the borders of the company and that internal cost reductions have been hollowed out more or less.
All companies that classified their supply chain strategy as being lean, confessed that they would not reduce costs were this to have an impact on other standards that the company values (e.g. quality, safety, timeliness). For hybrid supply chains, this is obviously the case as well, agility is taken into account while trying to be lean. In Rogers Corporation's agile supply chain, cost management is not very important to attain this agility, but it is for other business goals. However, cost management in the supply chain will never harm its agility.

Enablers that were premised the most are mutual benefits, collaboration, accuracy, timeliness and management support. Brewery did not make a selection of enablers because all proposed enablers in the categories of buyer-supplier relationship, cost and performance information across the supply chain and organisational factors are important for them. The interviewee remarked that contracts, mutual

benefits and mutual dependence cannot be combined. Also Rogers Corporation did not really pick enablers, but believes that having a good relationship is key. According to Brewery, empowerment from employees is an enabler that should be included. For Barco, maturity is an important additional enabler, employees should do more than what is in their job description. Rogers Corporation added that being global is important. Enablers that were not selected by any of the companies are contracts, mutual dependence, availability and communication lines.

All companies share the same opinion that their KPIs are supportive for their supply chain strategy and cost management in the supply chain. At Brewery, the links between KPIs and financials are even checked on a monthly basis.
One would expect a company with a lean supply chain to particularly have financial KPIs, a company with an agile supply chain to particularly have non-financial KPIs and a company with a hybrid supply chain to have a healthy combination of both. All of the companies selected financial as well as non-financial KPIs as being important for the company. As expected for hybrid supply chains, it is important to keep track of other characteristics besides costs. But also companies with a lean supply chain selected non-financial KPIs (e.g. produced kilograms per worked hour). Some of the companies justified this by saying that a lot of non-financial KPIs have important cost implications (e.g. more produced kilograms per hour means higher productivity and lower costs). Since the companies that opted for a lean supply chain are lean within their segment and have a business strategy that also valorises other characteristics, this can also explain the fact that not all KPIs serve cost management in the supply chain. In the agile supply chain of Rogers Corporation, KPIs are not directly meant to manage costs, but then again multiple KPIs have cost implications (e.g. KPI for inventories) or are of a financial nature (e.g. KPIs for cost increases or decreases).

The purpose of this study is also to assess whether there are links between the studied topics (displayed with numbered arrows on the summary framework).
All companies, regardless of the supply chain strategy, have multiple cost management models. These models are more developed and advanced and focus more on the supply chain in some companies compared to others, but this is not necessarily related to whether the supply chain is lean, hybrid or agile (1). The difference in the relationship between the type of supply chain and strategic cost management in the supply chain (1) lies within the degree of importance that is attached to cost management in the supply chain to achieve the supply chain strategy. For Rogers Corporation (agile),

strategic cost management in the supply chain is, for example, less important compared to companies with a lean or even hybrid supply chain strategy.

The relationship between performance management and strategic cost management in the supply chain (2) and the type of supply chain (3) is not easily verifiable based on the answers that were provided on the question about which KPIs (categories) are most important. It is, as described more thoroughly in the previous paragraph, not the case that companies with a lean supply chain only select financial KPIs as the most occurring ones and that companies with an agile supply chain did not pick out financial KPIs. Some findings that are remarkable are pointed out. All companies with a lean supply chain selected measures at the production level, this confirms that internal efficiency remains important for all lean companies. The companies that opted for a hybrid supply chain all selected the category of measures for customer service and satisfaction, which is justifiable because a hybrid supply chain is partly agile and wants to understand and satisfy customer requirements. Surprisingly, Rogers Corporation selected the category of supply chain and logistics costs and not of customer service and satisfaction, which is quite unexpected for an agile supply chain. It is surprising that a lot of KPIs and KPI categories that Rogers Corporation selected and prioritised are cost related even though cost management is not the most important ideal for the company (but certainly not unimportant). When looking at the reasons why companies select certain KPIs and seeing which KPIs are classified under some categories for them, one can see conformity with the extensive supply chain strategy (the supply chain can have more goals than only being lean, agile or hybrid) and especially the business strategy. A general trend is that KPIs support the business strategy of companies (e.g. low costs, but also high quality). However, the companies themselves reported that these links ((2) and (3)) are present (their KPIs support the supply chain strategy and the cost management models) but not always perfect. Especially lean companies attach a lot of importance to other standards besides only focusing on costs.

The choice of enablers was very subjective and cannot be related to strategic cost management in the supply chain (4). Some enablers could be pushed forward, others could be seen as less important and the companies also suggested some new enablers: empowerment, maturity and being global. No pattern can be found between the supply chain being lean, agile or hybrid and the selection of certain enablers as well.

8 CONCLUSION

This dissertation contributes to the research domain because it combines strategic cost management in the supply chain with performance management in the supply chain and provides insights into the interactions between the domains and the importance of them in practice. The focus lies on strategic cost management in the supply chain and how performance management supports it. For the research in this dissertation, extensive case studies at multiple companies were executed. This made it possible to make valuable comparisons between theory and practice and to learn about how companies approach the topics in different ways.

A literature review and empirical research were executed in this dissertation, the latter being based on the former. The central topics were supply chains, strategic cost management in the supply chain, performance management in the supply chain and enablers of cost and performance initiatives in the supply chain.

There are three types of supply chains. A lean supply chain focuses on internal efficiencies to reduce costs and increase profitability and flexibility. In companies with an agile supply chain, understanding and fulfilling customer needs are key. Hybrid supply chains combine lean as well as agile supply chain techniques to produce components with differing characteristics.

Several cost management models were described in the literature review. Direct product profitability (DPP) calculates the profit contribution of products, taking related handling and space costs into account. Activity-based costing (ABC) assigns direct and indirect costs to activities that consume an organisation's resources. Subsequently, the activity costs are attributed to products in order to calculate the cost price of products. Total cost of ownership (TCO) calculates the cost that is associated with the collaboration with a certain supplier. An extended ABC model incorporates all costs and activities over the supply chain, which makes it possible to calculate the landed marketplace cost of products. A model that combines ABC with economic value added (EVA) considers that actions do not only influence costs but also the created value. For target costing, customer requirements are key. Firstly, companies investigate the price that customers are willing to pay for products with specific characteristics. Subsequently, the required profit margin is deducted. The target cost is thus calculated, taking customers requirements, market conditions and the target profit into account. The determined target cost is broken down to the component level as requirements for the suppliers to deliver the components at that price while still creating sufficient returns for themselves.

Performance management consists of multiple processes and performance measurement was studied in particular. It is important that measurement and analysis tools are balanced and capture performance across multiple firms simultaneously. Performance measures can be classified in six categories; measures for order planning, for the evaluation of supply link, at the production level, for the evaluation of delivery link, for customer service and satisfaction and for supply chain and logistics costs.
Enablers that influence the effect of cost and performance management initiatives on performance were summarised in three classes; the buyer-supplier relationship, cost and performance information across the supply chain and organisational factors.

In the literature review was disclosed multiple times that it is nowadays important to cross the borders of the company when managing costs. Nevertheless, the majority of companies admitted that internal cost reductions remain most important and the cost management models have a more internal focus. In the literature review, cost management models that integrate activities and costs of all parties in the supply chain were proposed, but these kind of advanced models are not yet applied in practice. However, this does not mean that there is no cost collaboration with supply chain partners. Numerous examples were given, especially about collaborations with upstream partners. Only one out of six companies works together with all of its supply chain partners to reduce costs, the remaining companies limit their actions to upstream or downstream partners or do not include all tiers. Four companies also try to obtain insights into the costs of its suppliers (bills of materials, open book models, imitation of cost structures, commodity management, reverse engineering, cost breakdowns), two companies adopt target costing and one company applies TCO. All companies adopt the cost management models to discover cost-reduction opportunities, while five out of six think they are important for product development and four out of six for process development and the simulation of decisions. Alongside these, a lot of other purposes were mentioned as well.
In general, the respondents often deviated from the subject of cost management in the supply chain to cost management in general. Likewise, a lot of assertions that apply to cost management in general also apply to cost management in the supply chain.

The purpose of studying performance management in the empirical research was to examine whether it is supportive for strategic cost management in the supply chain. A very important conclusion that can be drawn is that KPIs do not strictly support the supply chain strategy, but rather the business strategy as a whole. Companies often opted for a certain supply chain strategy such as lean or agile, while their business strategy also values less self-evident elements such as respectively high quality or flexibility and

cost-efficiency. This has its effects on the KPIs (categories) that the companies selected as the most important. This is consistent with the fact that companies with a lean supply chain would not reduce costs when this has a negative impact on other important characteristics and that costs are certainly reduced in the company with an agile supply chain. All companies said that their KPIs provide them sufficient input for their cost management models.

It is not possible to, based on the executed case studies, validate the links proposed on the summary framework. The different supply chain types do not have consistently different cost management models or launch certain initiatives with certain supply chain parties. The companies themselves report that performance management is linked with the supply chain type and cost management in the supply chain, but the KPIs and KPI categories that were considered as the most important do not strictly support the supply chain strategy. The relationship can thus not be formally validated. Two findings are remarkable in this context: all companies with a lean supply chain premise measures at the production level, while all hybrid supply chains selected measures for customer service and satisfaction.
The sample size was small and disproportional based on the supply chain type. The relationships could be very subtle, so a quantitative research is recommended to discover more about the relationships and to draw a more generalised conclusion.

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10 ATTACHMENTS

10.1 List of questions

Supply chain

1) Type of supply chain: where is the focus put on?
   - Lean: focus on efficiency, minimising costs
   - Agile: focus on responsiveness to customer needs, mass customisation
   - Hybrid: lean approach to certain product components or processes, agile approach to others

2) Which partners are integrated in strategic cost management in the supply chain?
   - Upstream (e.g. suppliers of raw materials, producers of components) or downstream (e.g. retailers, end customers) partners
   - First tier, second tier…

     → is the whole supply chain (from raw material until end customer) or only a part taken into account?

Strategic cost management in the supply chain

3) Which cost management methods (concerning the supply chain) does the firm use?
   E.g. Direct product profitability, ABC, target costing, lean management methods…

   When multiple methods are used, which one is considered as the most important one?

4) Where are the cost management methods used for? This can differ from method to method.
   E.g. discovering cost-reduction opportunities, selecting suppliers, product development…

5) How important is cost management in the supply chain from a strategic point of view?

   To which extend are the strategic cost management initiatives aligned with the supply chain objectives and strategy? (in accordance with question 1)

6) In which way does strategic cost management in the supply chain increase performance?
   E.g. lower costs, higher productivity

7) Which factors are important enablers of performance improvement resulting from strategic cost management initiatives?

- Relationship
  - Trust
  - Commitment to the partnership
  - Collaboration
  - Mutual benefits
  - Contracts
  - Mutual dependence

- Information
  - Accuracy
  - Timeliness
  - Availability
  - Transparency
  - Quality
  - Communication lines to obtain/give information
  - Use of IT
  - Willingness to share information

- Organisational factors
  - (Management) support
  - (Constructive) leadership
    (Is it important that one of the partners takes the leadership role)
  - Resources
  - Supply chain measures
    (KPI's functional to the supply chain (see next question))
  - Joint decision making

Performance management in the supply chain

8) Which categories of KPIs are most important, most used?

- Measures for order planning

  E.g. order lead time (time between receipt and delivery of order)…
- Measures for the evaluation of supply links

  Evaluation of suppliers as well as relationships with these suppliers
- Measures at the production level

  E.g. measures for capacity utilisation, measures for the effectiveness of scheduling techniques (such as JIT, MRP)…
- Measures for the evaluation of the delivery link

  E.g. measures for on time order fill, flexibility of delivery systems, total distribution costs…
- Measures for customer service and satisfaction

  E.g. flexibility to meet customers' individual demands, post transaction service…
- Measures for supply chain and logistics costs

  Measuring of the financial performance of the supply chain, there is a flow of goods, information etc. in the supply chain.

  E.g. return on supply chain assets (such as stocks, fixed assets), measures that evaluate the effectiveness of supply chain stock management, measures concerning information processing costs…

9) Which KPI categories are prioritised for improvement?

   How is determined what will be prioritised?

10) To which extend do KPIs support strategic cost management in the supply chain?

10.2 Request to participate e-mail

Dear Mr./Mrs. *name of the person*,

I received your e-mail address via your colleague at *name of the company*, *name of the person who gave the e-mail address*.

I am a master student in business economics at Ghent University and I am doing research on "strategic cost and performance management in the supply chain" in collaboration with professor Regine Slagmulder from the Vlerick Business School.
The goal of the research is to find out which strategic cost management methods (such as ABC, target costing…) are accompanied with your type of supply chain, which performance measures are supporting this and which factors are important to achieve a higher performance resulting from the strategic cost management in the supply chain.

I searched for some background information on *name of the company* and it would be very interesting in the context of this research to talk about how you approach and experience these supply chain elements. The gathered information will be treated confidentially and with respect for the preferences of your company.

In concrete terms, I would like to ask you whether and when you are willing to make the time for about one to two hours to discuss this. I can be very flexible with regard to the timing, your agenda decides. I already attach the list of questions so that you know which information I would like to collect and the interview can proceed fluently an efficiently.

You can always contact me on this e-mail address or call 0497/70.44.91 should you have any further questions and to arrange an appointment.

Thank you in advance, I already look forward to meeting you.

Kind regards,
Julie Lateur

10.3 Interview data

Company	Interviewee(s)	Location	Date	Duration
Samsonite	Planning manager VP supply chain Europe	Oudenaarde	26/03/18 12/04/18	3 h 1 h
Gondella	Plant manager	De Pinte	26/03/18	2 h
Barco	Supply chain manager	Kortrijk	3/04/18	1 h 45 min
Colruyt Group	Financial controller Financial controller Supply chain food project coordinator	Halle	09/04/18	1 h
Brewery	Logistics director BNL and South Europe	Rijsel	09/04/18	1 h
Rogers Corporation	Supply chain director	Gent	11/04/18	1 h
Daikin	Production improvement engineer Purchase officer Manufacturing planning officer	Oostende	16/04/18	2 h 15 min
ArcelorMittal	Head of performance steering	Gent	03/05/18	1 h 30 min

Table 4. Interview data

10.4 Interviews

10.4.1 Samsonite

Introductory and additional information

Samsonite Europe is headquartered in Oudenaarde.

There are production sited for hard-side luggage in Belgium and Hungary. Made-in-Europe is important for certain customers, even though this involves a higher price of about 10% (only for high-end products, this would not work for low-end products). There is outsourcing from production to Asia (mainly China, Vietnam, Thailand and India).

Suppliers that are employed in Europe are mainly employed in Asia and the US as well.

Supply chain operation

1) Product development
   a) Particularly replacement of existing collections.
   b) Look on the market in which price points they already have products.
   c) When not represented in the price point: develop a new product that fits in the segment (features) in collaboration with the design department.

      ➔ they want to be active in every price point, but they do not want to compete with their own brands (e.g. American Tourister with same functionalities as Samsonite for half of the price).
2) Which suppliers meet the complexity of the design?

   Which suppliers meet the wanted price?

   Most of the time, only a limited number of suppliers is conform → samples are demanded → benchmarking: who is the best with respect to price-quality → multi-sourcing: multiple suppliers to spread the risks, some suppliers are specialised in certain applications (e.g. from one design family, there are rollers, beauty cases, different colours etc.), big quantities are needed.
3) When suppliers give the feedback that they cannot meet the wanted cost, Samsonite negotiates about what can be adapted to lower costs, what margins are charged etc. to come as close as possible to the target.

Links in the supply chain

They buy polypropylene and make hard-sided luggage from it.

Samsonite factories only exist in Europe. Asian factories are independent suppliers that also deliver to other luggage brands next to Samsonite. They are not Samsonite's property.

Asian suppliers make luggage, but Samsonite imposes from which suppliers they need to buy components (wheels, fabrics, zippers…).

The design department from Samsonite designs the products and components, gives them to suppliers so they can make a design, samples… When approved, Asian suppliers get instructions of where they need to buy what.

Sometimes, finished goods suppliers develop their own products (so they select their own suppliers etc.) and these are commercialised by Samsonite. Finished goods suppliers sometimes have some innovation suggestions (e.g. luggage with GPS, driving luggage…)

Samsonite also gives instruction to components suppliers about which materials they need to use (e.g. what do wheels suppliers need to do)

Samsonite Oudenaarde stocks a lot of products. Most of the time, products are sold as they are stocked. Sometimes, clients want a price or alarm on it.

When developing products, future storage and transportation costs are already taken into account. This information is used to minimise costs.

Samsonite has retail shops because direct sales mean more profits. They want to continue on growing on this. Samsonite also works with distributors.

Transportation happens through multiple subcontractors that have certain specialties (e.g. specialised in certain countries).

Supply chain

1) Type of supply chain: where is the focus put on?

- Hybrid

They want to be flexible (agile) but lean in the same time and combine the best of both worlds.

They have standard components that are used for multiple collections and that are always available. There are also smart features that are added later on in the process.

For certain things, they want to save as much costs as possible, while for others quality is key and costs subordinate. E.g. standardise wheels and handlers to optimise costs and offer more choice for interiors.

Customer service is very important (target = 95%). They have a lot in stock, transport frequently to meet customer needs quickly.

2) Which partners are integrated in strategic cost management in the supply chain?

Suppliers

They for instance integrate logos, Samsonite goes to suppliers to learn them how to do certain things but also learns from them.

The same labels can be scanned by Samsonite as well as the suppliers.

Suppliers package as compact and efficiently as possible.

Samsonite gives an indication to its suppliers of how much they will take off so the suppliers can better plan their capacity, personnel, models etc., which positively influences costs. This also gives more certainty to Samsonite that they will get what they need.

Suppliers of suppliers

They are appointed for Asian suppliers and Samsonite negotiates about the price because they contact multiple suppliers and order big quantities. Sometimes, they deviate from this when a supplier suggests a supplier that can deliver qualitative products at a lower price.

Samsonite also works together with these suppliers to adapt the design in order to get lower costs (e.g. develop wheels in collaboration to come to an optimal cost, quality and design). Samsonite is not purely a client that gets to choose from an existing product range.

Customers

Limited collaboration with clients.

They for instance package articles in sets (e.g. 3 in one) if the client wants to sell them like this so they can save on transportation and packaging costs.

Sometimes, also direct transportation to clients happens. Asia → Antwerp → Oudenaarde → client is not always necessary and saves a lot of transportation costs.

➔ rather upstream and multiple links

Strategic cost management in the supply chain

3) Which cost management methods (concerning the supply chain) does the firm use?

Target costing

The marketing department looks at what retail price Samsonite can ask for a product. Then, a FOB (free on board) price that is necessary to meet the retail price and desired margin is calculated. Based on the

retail price, they thus determine how much the products can cost and these are given as a target to suppliers. “Here is a design, product and target price”. There is interaction with suppliers about what can be adapted, but this needs to be as limited as possible. They want suppliers who can do it or that give feedback on what is difficult. Components are sometimes adapted slightly, not significantly. Suppliers can do suggestions, but everything needs to be approved by Samonite.
Samsonite gets a BOM (bill of materials) from its suppliers. This is a cost breakdown (materials, labour, overhead and profit) that is analysed and compared to similar products to see whether it is correct. This information is also used in negotiations (norm: 80% materials).
Once the product design is fixed, continuous improvement remains important.

Cost price calculation

Final landed cost = purchase price + transportation cost + handling cost
For overhead costs, budgets are made. This is split up between overheads for production and others. They always look at what can be improved and sometimes, the budget is reduced.

Supplier selection

Classification of supplier based on the levels on which they produce

- High-end: are able to do some developments etc. themselves → more expensive
- Medium-end
- Low-end: team of Samsonite is necessary to support (technical development, optimisation) → cheaper

Some things are taken into account (e.g. capacity, quality, import duties) but are not quantified.

When multiple methods are used, which one is considered as the most important one?

The final landed cost because it provides details per product, transportation and handling. This cost is decisive and is often used to compare.

4) Where are the cost management methods used for? This can differ from method to method.

- Follow up costs
- Simulate decisions
  e.g. where are we going to produce?
- Discover cost-reduction opportunities
  Continuously look for opportunities to improve the cost of a product

Look per product, not per activity

e.g. make something new with a new product construct → consider to do the same on other products

- Product development

  Developers know the cost of certain operations and take this into account

5) How important is cost management in the supply chain from a strategic point of view?

Vey important. Samsonite works with a margin and this margin is holy. When a margin is premised, it needs to be attained or the product won't be brought to the market. Also managing costs over the supply chain is important for this.

To which extend are the strategic cost management initiatives aligned with the supply chain objectives and strategy? (in accordance with question 1)

Samsonite wants to save as much costs as possible, but sometimes quality, design and service level are prioritised. Cost is not the only driver of Samsonite. Cost reductions must support the product, there can be no contradictions. This sometimes leads to a cost that is not completely minimised, but customers are at least satisfied.

6) In which way does strategic cost management in the supply chain increase performance?

- Lower costs and higher productivity
- Ecology

  e.g. better method for packaging → lower costs & smaller footprint
- Quality

  e.g. simplify a product for cost reasons and also get a higher quality because there is more focus on less things and complexity is lower
- Shared learning

  It is important to be open for suggestions of suppliers. Everybody has his own experience

7) Which factors are important enablers of performance improvement resulting from strategic cost management initiatives?

- Relationship
  - Collaboration
  - Mutual benefits

They ask suppliers to think with them about reducing costs, but this could not continue in the long term if Samsonite gets all the benefits.

- Information
    - Accuracy
    - Quality
    - IT
    - Timeliness

      IT can support this
- Organisational factors
    - Constructive leadership
    - Supply chain measures
    - Management support

Performance management in the supply chain

8) Which categories of KPIs are mostly used?

Service level is a very important KPI. Samsonite delivers on stock, customers basically do not need to keep stocks because they are supplied very quickly. This is calculated as follows: (sales+missales)/missales. The target is put on 95% because one extra percentage causes disproportionate extra costs and 95% is acceptable compared to costs.

- Measures for the evaluation of supply links

  Delivery reliability, quality reliability, time to develop products are examples of KPIs that belong to this category. The bills of materials are checked as well by Samsonite.
- Measures for the evaluation of the delivery link

  It is important that orders are delivered timely
- Measures for customer service and satisfaction

  The KPI for service level is classified under this category
- Measures for supply chain and logistics costs

  The effectiveness of inventory management is followed up and stock levels in general are very important

9) Which KPI categories are prioritised for improvement?

How is determined what will be prioritised?

The prioritised KPIs depend on the situation. When cash is for instance doing well, the service level can be pulled up.

This is decided in board meeting where discussions about the strategy happen.

10) To which extend do KPIs support strategic cost management in the supply chain?

Some KPIs measure things such as quality, but there are also KPIs to discover opportunities to save on costs. E.g. the KPI ”returns from field” measures the returns by clients because something is wrong.

(for instance a wheel that is missing). This information is used to improve products and to avoid incidents like these.

Within the hybrid strategy, KPIs are supportive enough.

10.4.2 Barco

Introductory and additional information

Barco is a technology company and works strongly based on the product life cycle. In the beginning, it is important to win clients and Barco does not pay too much attention to costs. Having the customers is more important than achieving the absolute lowest cost. Later on, when there is more price competition, cost and value engineering become very important to retain margins and earn back the efforts from the previous phase. When the product is faded, something new comes up etc.

Supply chain in Barco

Barco makes electronic products. Most electronic components are made in Asia. The vertical integration at Barco is quite low, a lot is outsourced. For more expensive products, end assembly is done by Barco. The components that are made in Asia, need to come on an electronic board before Barco uses it and joints connectors. Another player is thus in between.

Supply chain: producers components → distributors → EMS suppliers → Barco → distributors → end customer.

Barco does not often sell directly to clients, this happens especially in the entertainment sector (direct collaboration with cinema chains).

For more mechanical components, they collaborate directly with suppliers.

Suppliers of course buy their own raw material (like steel plate) but Barco does not collaborate with them.

Barco works with a four dimensional model to make supply chain decisions: service – cash – cost and sustainability. It is important to find a balance.

Supply chain

1) Type of supply chain: where is the focus put on?

- Hybrid

High-end products: agile. These products are very expensive so there is not a lot of production on stock. They are made when an order comes. Customisation is possible.

High-end products: lean. Lean within the segment. They won't chose for minimal quality and compete with Dell. They do limit the number of options, chose for cheaper transportation and produce more to stock. Often, they cannot follow the price of cheaper producers (e.g. Dell). Nevertheless, they deliver

better quality, extra features (e.g. better lcd, glass on monitor, sensor, easy to clean) to compete better. They sometimes step away a bit from the lean principle by bringing some customisation (e.g. logo of client on screen, different colour).

2) Which partners are integrated in strategic cost management in the supply chain?

Suppliers

A lot of collaboration with them. Collaboration is needed to see what leads to extra costs in the process. Benefits do not necessary have to be shared. When Barco understands the processes, it can enact the necessary adaptations to the design in order to save costs. The advantage of suppliers lies in the fact that they can sell to Barco. Additionally, they are supposed to make the same exercise.

Limited to the first tier. If they go further, it involves mostly the selection of components (design in the products what suppliers have available). Barco is not large enough to work on costs with earlier tiers. A first tier supplier does have more power to do this. With key components suppliers, negotiations happen.

Downstream

No collaborations with clients or the like.

Strategic cost management in the supply chain

3) Which cost management methods (concerning the supply chain) does the firm use?

Cost management is internally focused.

Most important thing concerning costing at Barco: DCP (direct cost price). This is the materials cost + all direct costs to get a product to Barco (transportation, import, warehouse handling etc.) + labour costs + direct overhead costs. This is how a product is followed up. During the development, a target is put on this. Logistic costs are not included in this price, but they are calculated

Once in mass production, gross margins are followed up. This means that the DCP and sales price are compared to one another

Transportation costs are followed up inbound (% transportation costs compared to purchases) as well as outbound (% transportation costs compared to sales).

Transportation calculations are done at hoc to see how costs can be further optimised.

When there is a new product introduction, the following happens. Cost engineers use cost tools and look at the design (e.g. how many folds, holes are needed) and market prices to estimate a should cost. This is what a product can cost. This is used as a tool in the negotiation process.
Before a project gets released, a business case is made. They estimate how much and for what price they will be able to sell in the future and what the DCP is. They will evaluate whether the NPV of the project is sufficient or not. Indirect costs are included in the NPV. These are managed on the level of profit plans. Finance challenges divisions against one another ("this other division does better than you, how comes that you do not manage to do this?").

Selection of suppliers

Barco keeps a lot in mind: suppliers need to work for multiple divisions so that multiple suppliers can be played out against each other to squeeze prices and ask for bigger volumes (find balance between volume and risk spreading), suppliers are audited (e.g. no child labour), there must be a strategic fit, transportation, easiness of collaboration, quality, consigned inventory (inventory is at Barco, but still on the books of the supplier. When Barco uses it, it comes on their books).
Some things are measured on scorecards for existing suppliers during BRMs (business review meetings): quality, innovativeness, extend to which they want to collaborate in the cost-down story.
There is no TCO, they do not go that far. Concerning transportation costs, they tend more to ABC. Incoterms are translated to costs and assigned to products with a right key).
Barco does not switch a lot between suppliers once production is started.
Sometimes, they work together with suppliers on design, especially when they are the only ones who can deliver it. This happens when the standard design of suppliers does not match the one of Barco. E.g. sensor in the corner of the screen: metal board was in the way and adapted. This is purely from a technical point of view. When costs do not work out, they look for alternatives or the project is stopped.

Barco started three years with value engineering. In the past, it was rather cost engineering. The should cost is very important for this: what can something cost? They are working on a conjoint analysis, where the value if features is determined. Barco is advanced in cost engineering, but not really yet in value engineering.

When multiple methods are used, which one is considered as the most important one?

DCP and margins.
There are also margins per region, country…

4) Where are the cost management methods used for? This can differ from method to method.

- Value and cost engineering

  This contributes to discovering cost-reduction opportunities
- Simulations (ad hoc)

  e.g. look at the cost implications of a new product through additions on existing products
- Product development

  Project manager has a DCP target during the development of products
- Process development

  Simulations of DCPs. What does it cost right now and what will it cost after a change? What is the impact in the DCP and NPV?

5) How important is cost management in the supply chain from a strategic point of view?

Cost management is one of the four pillars: service, cash cost and sustainability

There are three targets in supply chain

- OTIF (on time full term): deliver on time
- Achieve cash flow: good inventory
- Keep costs under control concerning depreciations (not buying too much components so that things have to be thrown away) and transportation

To which extend are the strategic cost management initiatives aligned with the supply chain objectives and strategy? (in accordance with question 1)

The product is followed.

When the product is lean, the supply chain is made as lean as possible (save as much costs as possible).

When the product is agile, quality and service are premised and costs are saved where they do not substitute important things.

6) In which way does strategic cost management in the supply chain increase performance?

- Lower costs
- Higher productivity

  Is not measured, but reflects itself in the lower costs. DCPs and margins are measured
- Quality

Even if it is the case, it is not measured. In every optimisation, they assume that they want to maintain service and quality

- NOT innovativeness

  Cost management and innovativeness do not really go together. Suppliers make innovations to pull up margins

- Shared learning

  Only works when there is only one supplier for something. For key components, there are opportunities

7) Which factors are important enablers of performance improvement resulting from strategic cost management initiatives?

- Relationship
  - Collaboration
  - Trust

    Results from collaboration
  - Commitment

    Results from collaboration

  ➔ know each other and know who gets to do what
- Information
  - Accuracy
  - Transparency
- Organisational factors
  - Management support

    Priority setting is very important
  - Maturity

    This means that employees do more than is in their job description. They perform their job like the company is of their own. They grab opportunities when they see them.

Performance management in the supply chain

8) Which categories of KPIs are mostly used?

For every category, KPIs exist and someone is responsible.

- Measures for customer service and satisfaction
- Yield

  If the supply chain does not work well, this will have a negative impact on the yield
- Inventory

  It is important to be on a healthy level: too few is bad, too much is bad as well (working capital)

9) Which KPI categories are prioritised for improvement?

How is determined what will be prioritised?

Strategic priorities of the CEO

10) To which extend do KPIs support strategic cost management in the supply chain?

The same KPIs are used for lean as well as agile products, but the targets are set differently. For the DCP and margin, segmentation happens.

There are measures and reports to support important cost management methods such as DCP. DCP is constantly compared to a target. Later on, a margin is measured and followed up.

10.4.3 Colruyt Group

Introductory and additional information

Raw materials and help materials arrive at CGFF (meat, coffee, wine, cheese). Then, a transformation process takes place. Then, the products go to logistic distribution centre (sometimes, repackaging is done by them, sometimes by "maatwerkbedrijven") or to butcheries when we talk about meat. After that, they go to shops (75%) or intermediate distribution centres.

CGFF limits itself to the core activities, other activities are given off (e.g. packaging). There is a strong focus on logistics when things are outsourced.

Cost savings resulting from collaborations between CGFF and partners are not shared. There of course are negotiations.

Supply chain

1) Type of supply chain: where is the focus put on?

- Lean

2) Which partners are integrated in strategic cost management in the supply chain?

They look over the whole process to work as cost-efficiently as possible. They evaluate what is most efficient and cheap: doing things themselves or somewhere else in the supply chain. It is more difficult to work with the end customer. It is done, but in a more limited way (e.g. conditioned goods).

What concerns upstream partners, they go back until the raw materials suppliers (e.g. farmers) with respect to sustainability, but not really with respect to costs. A step further in the supply chain, they do get involved with respect to costs.

They also work with downstream partners. E.g. no money in shopping carts, how things must be stocked, integrated logistic system (sales of the day are processed with algorithms to do replenishment)

Strategic cost management in the supply chain

3) Which cost management methods (concerning the supply chain) does the firm use?

Internally within production: ABC. Standard prices are compared with actual costs on a monthly basis. This is followed up closely. The purchase price from suppliers is used, not the cost price.

They look at costs over the whole chain. E.g. a new product can be more expensive than a competitor's according to ABC, but when looking over the whole supply chain it can be more efficient and cost reductive to produce internally. They thus check with all parties.
There is no real target costing. During negotiations, they do have a sales price in mind and they know how far they want to go in terms of purchase price. For own production they never want to reason in a way that they put a maximum cost limit. They want a correct product for a correct production price.

Supplier selection

Multiple characteristics are checked (costs, sustainability, quality) but are not quantified. It is rather a kind of gut feeling that is followed.
In retail, they work with a contribution, where the purchase price, sales price, waste and distribution cost are taken into account. This is a variant of supply chain cost.
In the future, they want to evolve towards TCO. Purchasers try to quantify some things without really having TCO.

When multiple methods are used, which one is considered as the most important one?

ABC

4) Where are the cost management methods used for? This can differ from method to method.

- Internal charging
  A correct cost price leads to a correct sales price
  Internal production is charged at a cost price + margin to the shops. The cost price co-decides on the sales price
  Internal charging also happens between business units as well. Logistics tariffs are for instance charged based on ABC
- Following up costs
- Benchmarking with competitors
- Process optimisation
  Determine a cost per process and optimise and set targets
  e.g. automatic picking, sequence retrieval circuit
- Simulate decisions
  e.g. influence of higher production volumes on cost price of existing articles
  e.g. supplier has a suggestion and use costs to check whether they want to agree

- Discover opportunities

  They can look at the supply chain cost of different products and learn from it. At the moment, they can not handle too much with only their excel sheets, they would also need to use big data
- Product development

  Cost input is used. Some thumb rules exist to come to an optimal logistic cost

  e.g. best way of packaging to get the best cost

5) How important is cost management in the supply chain from a strategic point of view?

They particularly want to have a lean internal supply chain, which is more important. The group must be lean.

To which extend are the strategic cost management initiatives aligned with the supply chain objectives and strategy? (in accordance with question 1)

Costs are saved everywhere where possible, but not at the expense of quality. There must be equilibrium. Quality norms have to be respected before they turn to costs.

6) In which way does strategic cost management in the supply chain increase performance?

- Lower costs & higher productivity
- Productivity
- Players within the group and supply chain trigger each other
- Shared learning

  Doing company visits and pick up ideas

7) Which factors are important enablers of performance improvement resulting from strategic cost management initiatives?

- Relationship
  - Commitment

    Delivery and quality are very important to get articles into the shop
  - Mutual benefits

    There must be a win-win for all parties
- Information
  - Accuracy

- Quality
- Willingness to share information
- Transparency

  They won't agree when they don't know where a number consists of

- Organisational factors
  - Resources
  - Management support

Performance management in the supply chain

8) Which categories of KPIs are mostly used?

- Measures for order planning

  Measures for the evaluation of the delivery link

  LOTIF (lines on time and full) is very important. A supplier must be reliable concerning completeness, timeliness etc. so less safety stock is needed

- Measures at the production level

  E.g. productivity: number of packages per worked hour…, capacity use: how full is warehouse, carts…

- Measures for supply chain and logistics costs

  Have such KPIs, but approached in another way. They are measured on a higher level, not per product group. The indicators are more simple and really show how performance goes and everybody gets them. E.g. rotation of stocks, transportation

9) Which KPI categories are prioritised for improvement?

KPIs concerning productivity are always very important

How is determined what will be prioritised?

The results of KPIs are compared to history and targets (perspective and objective). When they are not on track, priority is placed. Processes that are under control get less priority.

10) To which extend do KPIs support strategic cost management in the supply chain?

A lot of KPIs result in costs. E.g. number of damaged articles.

The direction gets a broad range of indicators and financial are certainly one of them. The culture at Colruyt Group is pierced with cost awareness.

10.4.4 Brewery

Introductory and additional information

Raw materials: e.g. malts, cereals, hop

Byproduct: e.g. cleaning products

Packaging: bottle caps, tins, bottles, cardboards

Almost everything is done by Brewery. Everything is self brewed and bottled. Sometimes, there is co-filling or co-brewing but that is rare (only for special beers, there is a separate supply chain). in 95% of the cases, everything is done by Brewery.

Supply chain

Raw material suppliers → Brewery → direct distribution (local market where Brewery is)

→ first tier distribution centres (markets without breweries) → big supermarkets and distributors

→ second tier distribution channel (directly to pubs)

Supply chain

1) Type of supply chain: where is the focus put on?

- Lean

Brewery organises itself as efficiently as possible, but this does not exclude that they cannot deliver a good service to clients.

They do not optimise if it has a negative influence on the customers.

Brewery is a customer-driven company. If customers want more customisation and personalisation, they will adapt to this. Everything they do start with market insights (where is the focus of the market? What does the market want?)

But they will always make sure that costs remain limited. Supply chain wants to make sure that they can do things at an optimal cost. Supply chain looks at how they will tackle things, but they never chance anything to the wishes of customers. If a customer e.g. wants a 3-pack, they will not refuse to make it because it is not cost-efficient. They will look at how they can produce this 3-pack in a cost-efficient way.

Insights into the market happen by other departments in the company and supply chain adapts to this. The chalk lines and borders are fixed in a strategic plan (based on the market demand) and are executed

in the most cost-optimal way. They also want to make the supply chain flexible and react to demand for efficiency and customisation. They do not focus on minimising complexity.

2) Which partners are integrated in strategic cost management in the supply chain?

The whole supply chain is involved, upstream as well as downstream links.

Upstream

There is a project where they help improve yield and efficiency of suppliers.

They search for raw materials that deliver the right quality at the best price.

e.g. help farmers to work more efficiently, to save water

e.g. supplier of cleaning products: they deliver the products, but they are also a consultant that helps them to reduce the use

e.g. supplier of cardboards: help to use less cardboard for a package with the same strength and visual appearance

e.g. supplier of tins: make it thinner by adapting the internal production process (less shocks etc.) and maintaining quality

e.g. sometimes VMI with linked systems

Downstream

Especially working together with big retailers to set up projects

e.g. full trucks, multimodal applications, combine full and empty drives

They think that optimisation in the internal supply chain is low hanging fruit and that they have passed this since some years. They think one needs to look further, at the whole chain because one would risk to do suboptimisation

Strategic cost management in the supply chain

3) Which cost management methods (concerning the supply chain) does the firm use?

They have a lot of different techniques. Everything starts from their management system, VPO. This system contains multiple techniques and toolkits that are known as six sigma and lean manufacturing. They divide cost management into two blocks, being sustain (SDCA) and improve (PDCA).

With the sustain block, they standardise and optimise processes and rank them according to criticality. For the critical processes, they subsequently set up PI's and measure them frequently and precisely to

make sure that the processes are under control for 100%. Per process, they look at what is the most optimal way to run it. They document this and follow up the indicators to see whether they are under control. If something is not under control, projects are started to get it under control.

The improve block is used to improve processes and to make them more efficient, multiple levels are possible for this (ITF, Yellow Belt, Green Belt, Black Belt etc.). It always comes down to the same thing: they open a gap on a PI (e.g. weight per shipment, return of a production line) that is not benchmark compared to their own breweries or the best in the market and look for what they can do to achieve a step change. A project is set up to see how the situation happened and what they are going to do. They solve it and fix it in a standard operation procedure and set up the right PIs to follow up. In this way, a step change is rooted in everything they do for the long term.

Every year, gaps are opened and other things are maintained sustainable. Processes over the whole supply chain are involved in this.

ABC is used for variable costs. Per SKU, a bottom-up cost calculation is done. The purchase prices of raw materials are included, but also the costs of for instance the cleaning of kettles, transportation etc. are assigned in the right way to the products

ZBB (zero-based budgeting) is employed for fixed costs. They look from a zero base to see which overheads will be needed next year. They challenge every line of the overhead. E.g. do you really need this much laptops, paper. Also for business services (such as administration), there are improvement cycles with targets to reduce.

Brewery tries to (especially for big tenders) imitate the cost structure of suppliers so they get an idea of the applied margins and to have a better negotiation position.

They also have open book models where cost information is shared in transparency and where there is a predetermined margin. In this way, they thus influence costs, it becomes like an internal exercise. Whether it is interesting to work like this, depends on the relationship they want with suppliers (long or short term)

- Long term: total optimisation and sharing benefits
- Short term: challenge as far as possible concerning price. E.g. Brewery thinks X euros per pallet is okay because they cannot do better themselves. It could be that a supplier needs to do a lot of efforts to make it for that price. Then, Brewery knows that the relationship cannot be sustainable and that the supplier will not keep working for them

Selection of suppliers

In theory, a lot of things are taken into account when doing tenders (making SLAs etc.). In practice, Brewery could do much more. It is often difficult to valorise things and the time is not really taken to do so. It is easier to just go for the lowest price. Also, the purchase department does not always get targets for certain elements and often, costs are difficult to track down (e.g. difficult administration could lead to frustrated employees and higher costs in the long term)

Design to value

They look at the market price for a certain product and adapt the lay-out to the price setting.
e.g. A lager beer has a low market value, so the packaging is cheap, the look is simple etc. vs. a speciality beer has a higher value in the market, so the bottle can be more beautiful, there can be a nice bottle cap, box, noise when poring etc.
They start from an idea, consider the cost and think about what the price must be to get a desired margin. When the customer is not willing to pay this, the product will not be launched

When multiple methods are used, which one is considered as the most important one?

SDCA and PDCA
They are busy with this in a very disciplined, structured way. Everybody is trained in this.

4) Where are the cost management methods used for? This can differ from method to method.

- Manage and lower costs
- Simulate decisions

  All big decisions are made based on a business case. This is worked out in detail and based on this, decisions are made
- Discover opportunities
- Financial forecasting

  Every month, they forecast what would be the total cost on the end of the year based on the most recent information. They eventually need to make adjustments to achieve goals
- Selection of suppliers
- Process development

  Everything starts with the cost and a business case around it
- Product development

Business case is used for this

- Sharing of benefits

  Suppliers are clustered as strategic partner, key supplier or protect & grow supplier

  Depending on the cluster where a supplier is classified in, he will get a larger / smaller part of the gains. Cost information is used to know how large the gain is. They always get something.

  Long-term relationships are very important for brewery.

  They also shared benefits with clients. This is even more important because it is possible to switch suppliers, not to switch clients.

5) How important is cost management in the supply chain from a strategic point of view?

Cost management is key in the corporate strategy. The strategy is cost, connect, win. They try to save as much costs as possible in the supply chain to free up funds to invest in their brands and growth to connect better with customers and eventually win their hearts. It is a model for cash generation.

Cost management is especially important in the supply chain (<-> only internally). It is one of the biggest competitive advantages for a big company.

To which extend are the strategic cost management initiatives aligned with the supply chain objectives and strategy? (in accordance with question 1)

There are some aspects that they do not touch when saving costs: quality and safety. For every cost reducing initiative, they first look at what will be the impact on the quality of the product and the safety of people. From the moment that there could be an impact, they stop.

6) In which way does strategic cost management in the supply chain increase performance?

- Higher productivity and lower costs
- Sustainability goals

  Cost management helps to achieve sustainability goals. Cost management ant the achievement of sustainability goals go hand in hand

  e.g. kilometre reduction means less costs and more sustainability
- Value creation

  They do not only want to reduce the naked costs, but also want to create more value

  e.g. design to value

7) Which factors are important enablers of performance improvement resulting from strategic cost management initiatives?

All of them were indicated. One remark is in place: mutual benefits, mutual dependence and contracts do not go together. One of the three must be chosen, a strict contract or trust.

- Relationship
  - Trust
  - Commitment to the partnership
  - Collaboration
  - Mutual benefits
  - Contracts
  - Mutual dependence

- Information
  - Accuracy
  - Timeliness
  - Availability
  - Transparency
  - Quality
  - Communication lines to obtain/give information
  - Use of IT **is less important**
  - Willingness to share information

- Organisational factors
  - (Management) support
  - (Constructive) leadership
    (Is it important that one of the partners takes the leadership role)
  - Resources
  - Supply chain measures
    (KPI's functional to the supply chain (see next question))
  - Joint decision making

Another enabler is empowerment. Employees must get a lot of responsibility. Brewery is less top-driven.

Performance management in the supply chain

8) Which categories of KPIs are mostly used?

Brewery has a lot of KPIs, so every category is represented.

- Measures at the production level

  Efficiency of the production units, losses in processes etc.
- Measures for supply chain and logistics costs

  Logistics are followed up on a high level. The service level for them means that there is timeliness, good delivery to customers, stock on the right moment, reasonable total distribution costs etc. when the supply chain works perfect, the service level would equal 100%

9) Which KPI categories are prioritised for improvement?

How is determined what will be prioritised?

On a yearly basis, a criticality analysis is done. The criticality of all KPIs per operational unit is determined using an objective method. This is used to determine the critical KPIs for the upcoming year where the focus must be put on.

The analysis starts on the VP level and is cascaded down to the lowest levels. The operational is linked with the strategic.

10) To which extend do KPIs support strategic cost management in the supply chain?

When all KPIs are good, the financials will be good as well.

There are links between KPIs and the financial and these are measured. On a monthly basis, there is a routine where financials are studied in detail and linked to KPIs. They look at the variance between actuals and projections and try to explain them. If there is no match with KPIs, this means that the KPIs are not right or that something unknown happened. The system must remain connected.

e.g. when there are less bottle losses, less raw material “bottles” must be used

e.g. when the weight per shipment increases, transportation costs must increase as well

10.4.5 Rogers Corporation

Introductive and additional information

They see the supply chain as follows: purchase, customer service, logistics.

Rogers Corporation is a speciality materials company. They make high margin products.

The company needs a lot of special raw materials and also help materials such as machines, solvents, safety shoes etc. The company does not buy a lot of components. They make special materials that clients cannot buy somewhere else. They use "special flour, pepper and salt" to make something special. When there are components, they always are special.

In general: raw material (→ distributor) → Rogers Corporation → customers.

They do not know a lot about customers. For them, the supply chain stops once products leave the company.

Supply chain

1) Type of supply chain: where is the focus put on?

- Agile

Rogers Corporation is driven by customer needs. On the one hand, they push products to customers because they want to innovate. On the other hand, they listen to customer needs and they make solutions for that. They want to make products for the needs of the future.

There are big margins on the products because they are that specialised.

There is customisation, but not really mass customisation. They make a lot of customer specific products in big volumes.

Three elements are important for purchase (in order of importance)

1. Quality
2. Service
3. Cost

Cost is important, but certainly subordinate to quality. Making special products does not work with standard raw materials.

2) Which partners are integrated in strategic cost management in the supply chain?

They mainly collaborate with suppliers of raw materials. They collaborate to improve things so that they can buy exactly what they need. Rogers Corporation wants to produce special products in the most cost-

efficient way. Suppliers need to produce with a good yield so that prices do not mount up too high and Rogers Corporation helps them for that. Rogers Corporation helps to look for solutions for problems, helps in upscaling, helps to expand capacity etc.

They thus partner with suppliers of raw materials, less with suppliers of components and there is more or less no collaboration with downstream parties.

Strategic cost management in the supply chain is limited to upstream and the first tier.

Strategic cost management in the supply chain

3) Which cost management methods (concerning the supply chain) does the firm use?

Commodity management

Cost drivers are mapped, they try to get a feeling with the basic cost. E.g. sand derivatives are help materials, they look at how much sieving is necessary because that is a cost driver.

They try to demand specifications jointly so that everything can work out more efficiently. E.g. for a special product, they want to make sure that the supplier can sell everything so that Rogers Corporation does not have to pay for this.

If costs are measured, ABC is used for this.

Only the activities of Rogers Corporation are included. They are aware from the fact that a big part of the costs results from the choice for certain raw materials and suppliers. E.g. when they chose a Japanese supplier, there will be a lot of logistics costs.

They try to do reversed engineering for supplier with whom they have a good relationship. Bit they do not have enough information to really calculate everything.

Selection of suppliers

TCO is applied by Rogers Corporation. They for instance want to make sure that they have efficient lot sizes, the right delivery frequency.

They try to measure as much things quantitatively as possible. For the one, it works better than for the other but they try to improve as much as possible.

When multiple methods are used, which one is considered as the most important one?

TCO

4) Where are the cost management methods used for? This can differ from method to method.

- Following up costs
- Discover cost-reduction opportunities

  Based on ABC

  e.g. making things themselves or outsourcing?
- Determine where to use second sources

  They want to get the best conditions on the market

  Since they do not buy a lot of standard commodities, this is not always possible

  E.g. for something that determines a big fraction of the cost, second sources might be good to limit risks and leverage supply
- Supplier selection

  Not at the expense of quality, costs within a certain window. They buy performance
- NOT product development

  During product development, costs are not taken into account. When adaptations happen closer to the operational side, supply chain is involved and they steer towards costs
- Share benefits

  Very important for Rogers Corporation. Win-win situations lead to long-term collaborations

  e.g. participate in investments

5) How important is cost management in the supply chain from a strategic point of view?

Rogers Corporation thinks that controlling costs and making sure that there are few price fluctuations are very important. They want to have flat prices and be a stable partner for customers.

They are less focused on low costs, more on profitability. Cost management is used to keep prices flat and obtain long-term contracts by sharing benefits.

Cost management is not very critical to attain the agility. Quality with low variation is priority. (n°1: quality, n°2: service, n°3: cost)

To which extend are the strategic cost management initiatives aligned with the supply chain objectives and strategy? (in accordance with question 1)

They never do the one at the expense of the other. Development and quality are the heart of Rogers Corporation. They do not make choices or propose new products with a worse quality or service.

They think that where they save costs, supports their agility. Supply chain takes part in decisions on a top level within the company, next to operations and business unit VPs. Supply chain has an equal vote and is not subordinate.

6) In which way does strategic cost management in the supply chain increase performance?

- Profitability

  They try to work with the right partners and engage in long-term relationships

  Some competitors lose a supplier, which does not happen very frequently at Rogers Corporation. If it happens, they expect it.
- Quality

  Win on costs elsewhere so more effort can be put into quality.

  They do evaluations on several level, they look at quality, service and costs
- Innovativeness

  e.g. suppliers know that Rogers Corporation wants to be the first firm to know it when there is something new and suppliers can also ask a higher price for this
- Flexibility

  e.g. look for ways to improve the process of suppliers so that less production steps are needed later on and there can be more flexibility
- Shared learning

  Learning in two directions.

  e.g. seeing other ways of manipulation

  e.g. send black belt teams to partners to audit processes and production steps
- Cost management in the supply chain leads to a better relationship, which leads to higher quality and innovativeness.

7) Which factors are important enablers of performance improvement resulting from strategic cost management initiatives?

Relationships are very important for Rogers Corporation. Mutual benefits is one of the key things, win-win. Trust is very important as well.

Having a good relationship is also an enabler to get and share information. E.g. suppliers of commodities deliver to a lot of companies, but having a good relationship will make you get certain information first.

Another organisational factor that is very important, is being global, international. They produce in a region, for that region.

Performance management in the supply chain

8) Which categories of KPIs are mostly used?

Cost savings or cost increases are very important

Stock-outs are also important regardless of the reason (a supplier did not deliver on time or Rogers Corporation has got unexpected demand)

Percentage of consignment means that Rogers Corporation has the raw materials, but did not pay them yet. This is an enabler for shorter lead times and less stock-outs.

- Measures for the evaluation of supply links

  Quality and on-time delivery are measured monthly. For core raw materials, quality, costs, innovativeness are measured every quarter
- Measures for the evaluation of the delivery link

  On time delivery to order and to request
- Measures for supply chain and logistics costs

  Supply chain costs are measured, but they don't steer based on them.

  Logistics costs are followed up. Rogers Corporation is very global and they trade a lot of products and semi-finished products intercompany (e.g. core processes first in the EU or US, independent of where the products will be sold). There is a target percentage on the logistics costs.

9) Which KPI categories are prioritised for improvement?

Rogers Corporation attaches importance to dual sourcing

- More leverage
- Lower costs
- More insights into the cost structure so they can better negotiate
- Spreading risks

Priority lies on risk management, cost improvement and being a sustainable partner

➔ KPIs that contribute to dual sourcing, risk management and dispersion and sustainability are prioritised, but they are fed by cost management

How is determined what will be prioritised?

10) To which extend do KPIs support strategic cost management in the supply chain?

They think that they have good KPIs. The KPIs support well in determining the right strategy or the adaptation of strategic goals (by for instance knowing risks and anticipating on them).

e.g. KPI for single source. If this says 80%, there is a problem

e.g. KPIs for inventory, consignment have important cost implications

There are no KPIs for managing costs, the core source of information is commodity management. Sensitivity analyses are done for commodities (e.g. what if the price of oil rises above X euros per barrel?), there is no KPI that would colour red.

KPIs support cost management enough. There are also KPIs that support other supply chain goals (such as innovation), where costs often are not that important (they for example will not limit innovations to products until a certain cost). KPIs do not make them save costs where it is inappropriate.

10.4.6 Daikin

Introductive and additional information

In the past, there was a supply chain team with people from different departments so that actions were tuned with several departments. Because of other priorities, the team is currently not very active anymore.

Daikin Belgium performs make-to-stock. Warehouse pulls the production. They want stability in the production, a stable planning over some months, but they also want to be flexible and anticipate on different demands. The lead time must be as short as possible. A lot of automation has happened and is still happening. The company cannot compete based on prices. They produce high-end and more expensive devises. In the past few years, they design and develop their own devices. In the past, Japan did the development and the affiliates had to adapt that to the local market.

R2, an outdoor A/C for residential and industrial use is the cash cow for Daikin.

Daikin has warehouses (e.g. in Ostend for local suppliers) and hubs (e.g. in Poland for suppliers that deliver for multiple Daikin affiliates) to consolidate volumes and to be more flexible (because they do not have to wait to place an order until the truck can be filled). Internally, there only is a picking warehouse. The rest of the inventory (parts and finished goods) is stocked outside the factory, in bulk at Mainfreight. Parts go from Mainfreight to Daikin, where picking and production happen. Finished goods are again warehoused at Mainfreight before they go to Velvet warehouses.

Mainfreight is the partner for parts supply. All local suppliers deliver over there and Mainfreight does Kanban supply. Mainfreight is also responsible for the finished units flow.

Mainfreight is in the supply chain as an upstream as well as a downstream partner, especially because Daikin does not have enough space, they are located so near to Daikin and because of their specialty. They are currently working on a project, where a part of the picking process is done by Mainfreight (it is suboptimal if an item is touched multiple times). Parts that are stocked at Daikin are used within two to four hours. This is possible with the help of the Kanban system. Daikin and Mainfreight are seen as one block. They are only 100 meters apart from each other. Also parts that come from another hub, go to Mainfreight first

There is a diverse mix of components that are integrated in a product. Employees can see which components that need to be added based on lights. From one product, there are multiple versions; a core model and variances.

Supply chain

(supplier →) supplier → hub → Daikin → warehouse (Mainfreight) → Velvet warehouses (managed by Daikin, stock can be moved between warehouses without Daikin having to rebuy the stocks) → affiliates (per country or group of countries, these are not managed by Daikin anymore) →installers → customers.

Supply chain

1) Type of supply chain: where is the focus put on?

- Lean

Daikin has standard devices. Only for one range, customers have some options, but that is an exception. Everything is produced as cheaply possible. They are lean on the short term. They get a range of products and these are made in mass. The devices are modified to regulations. A lot of new devises are made due to regulations, customer needs etc. They have an innovative product, but supply chain is treated lean. The company is rather market specific than client specific. Competition plays on quality. They are certainly not the cheapest, but they are the best. They are the Rolls Royce of air conditioning, they do not want to be the cheapest, they want to have a good device. They are lean within their segment. Being lean also means quality and delivery for them.

They compare themselves to Toyota. Quality, cost and delivery are key!

2) Which partners are integrated in strategic cost management in the supply chain?

Suppliers

They deliver components, packaged in a way Daikin prefers (quantity, dimensions, weight etc.).

When a local supplier also delivers to a foreign Daikin, they can drop it off at Mainfreight. The transportation to a hub is than free for them and Daikin gets more volume to fill its trucks. Thanks to the hubs, suppliers can save on transportation costs and Daikin can consolidate the volumes.

Sometimes, suppliers enact some process steps. E.g. drilling a hole, painting, connecting components etc.

Suppliers of suppliers

Daikin for instance buys in mass (e.g. from ArcelorMittal) so they can distribute it to local suppliers.

They also collaborate on logistics, materials cost, do audits on the production processes etc.

Affiliates

They give forecasts to Daikin about what they expect to be sold in the future. Based on this, supply chain makes a long and short term planning.

Mainfreight is seen as a supplier of logistics services, but Daikin still coordinates chat goes where. Mainfreight is an executor of services, Daikin does not buy goods from them. Things that Daikin cannot do logistically, are the specialty of Mainfreight.

Strategic cost management in the supply chain

3) Which cost management methods (concerning the supply chain) does the firm use?

Standard costing (target costing)

Sales determines which unit they want and what it is allowed to cost. Manufacturing looks at how they will execute it, where they will make adaptations, what everything costs etc.

Costs are split up into blocks of

- Materials
- Labour: direct internal labour. How long will everything take?
- Overhead: depreciation, logistics costs, indirect labour

  A percentage per year that every product gets assigned is calculated. They do not keep track of how long is worked on what (activities)

  Mainfreight does keep track of how long they work on things, logistics cost are thus allocated in multiple ways

Costs are calculated until the products go to Mainfreight

These make up a total cost and this is compared to a target. They need to be as close as possible.

They often follow up what they have produced and what the costs were. This is used for some comparisons: are costs within the target, budget, revised budget, forecast, touchdown?

The target cost is cascaded and they go to their portfolio of suppliers to negotiate so that they can deliver components to that price. Suppliers can do proposals, a lot of knowledge is with the suppliers. Daikin explains what it wants and suppliers make suggestions. Sometimes, the design of Daikin is even adapted. Designing works in collaboration with suppliers, there is a continuous communication.

Sometimes, there are workshops where important suppliers come together to discuss who is able to perform what and what can be changed. During these workshops, there is thus strong interaction between suppliers and Daikin. These workshops are organised for existing products.

Suppliers

There is not really TCO. Suppliers are screened, they need to deliver at specifications that Daikin wants. Suppliers get a supplier evaluation on delivery, quality, cost and compliancy and get a number. This is not translated into costs.

They try to get a cost breakdown (materials, logistics, overhead, profit) from suppliers of important parts. They try to track down where the biggest cost components are. The information is also used to help suppliers. E.g. take over their transportation if it turns out to be costly, buy raw materials in bigger volumes.

When multiple methods are used, which one is considered as the most important one?

Standard cost. They always strive to get under it

4) Where are the cost management methods used for? This can differ from method to method.

- Follow up costs
- Maintain the bookkeeping
- Reporting to Japan
- Simulate decisions

  e.g. what would a cost-down project recoup
- Discover opportunities

  e.g. notice that there are a lot of logistics costs and go look for the reason
- Selection of suppliers

  Suppliers are screened, also on costs. There are also audits before they are accepted
- Product development

  They continuously estimate costs in multiple stadia. Eventually, a standard cost is fixed as well
- Process development

  Look at how they can work more cheaply based on the cost information that they follow up
- Sharing benefits

  Suppliers are compensated for the extra activities that they perform, but the gains are from Daikin. E.g. drilling a hole costs one euro for the supplier, 2 euros for Daikin. The gain of 1 euro goes to Daikin. The advantage for the supplier lays in the fact that it can deliver for Daikin

5) How important is cost management in the supply chain from a strategic point of view?

They get cost-down targets from Japan. They can decide themselves how they fill it in (e.g. change design, discussing with suppliers).

Cost management is important, but it is not the only thing. Flexibility is for instance important as well.

Lean means that they try to save costs as close as possible to the client, because there are always upstream consequences. For the moment, they press a lot of costs internally and they are looking with suppliers and Mainfreight to how they can contribute (e.g. how can a supplier package in an ideal way). They do not start with partners, but rather look internally to how external partners can support them. This is an important component to attain cost reductions for them.

To which extend are the strategic cost management initiatives aligned with the supply chain objectives and strategy? (in accordance with question 1)

The lean strategy is very important. Before something is introduced, it is discussed on a management level where multiple departments that defend multiple parties are represented.

They think that they save costs everywhere possible, at least in the long term. In the short term, some efficiencies are possible. Then, they nuance. Customers, timeliness and quality are important. This sometimes brings higher costs with it, but they do not want to keep on carrying them in the long term. On the short term, focus is on delivery, certainly in Belgium.

6) In which way does strategic cost management in the supply chain increase performance?

- Lower costs and higher productivity
- Delivery
- Quality
- Flexibility

→ they have these ones in mind when reducing costs

- Innovativeness

  e.g. during the workshops with suppliers, a lot of cost-down initiatives flow. They start from the knowledge of suppliers and a lot of innovativeness flows from it
- Customer responsiveness

  During cost management, they take into account what customers want. When there are adaptations (e.g. design adaptations, they depart from what the market wants

7) Which factors are important enablers of performance improvement resulting from strategic cost management initiatives?

All of them are important, but some of them jump out

- Relationship
    - Collaboration
    - Mutual benefits

      Not per se sharing profits, but they want to compensate partners for their extra activities
- Information
    - Accuracy
    - Timeliness

      e.g. parts are at Mainfreight, but need to be delivered in time
- Organisational factors
    - Resources

      Costs-benefits need to be weighted. They look at the return of projects
    - Joint decision making

      Consensus is a very important word in the company. During developments and improvements, a lot of parties are involved

Performance management in the supply chain

8) Which categories of KPIs are mostly used?

Each department has its own KPIs and is evaluated on them. For production, lead time might for instance be most important, while this are costs for purchase.

Adaptations and improvements must be measured

- Measures for the evaluation of supply links

  On a monthly basis, suppliers are evaluated on multiple criteria
- Measures at the production level

  Production is followed up closely. On the floor, KPIs are displayed so workers can always follow them up. Also at the offices, screens show the planning and progress of every line

9) Which KPI categories are prioritised for improvement?

The focus is on costs year after year. The target cost of units is kept as low as possible.

This goal translates itself particularly into measures from the category at the production level.

They also try to differentiate themselves more as a development centre

How is determined what will be prioritised?

10) To which extend do KPIs support strategic cost management in the supply chain?

KPIs do not only focus on measuring costs. Costs are not continued over the whole line.

e.g. KPIs concerning design will not always support their lean principle

There are department twists between KPIs (e.g. production, procurement, design)

10.4.7 Gondella

Introductory and additional information

Gondella produces metal shop racks. They have about 25 000 articles, 1/3 is developed by them while the rest is bought or developed on demand of the client. Because of customer needs, a lot of new articles arise, at least 10 000 articles are sleeping because of this. These articles are not produced anymore, but can be reproduced on demand of customers. There is thus a big diversity of articles in the company. They respond to customer needs because the design of an architect is translated to new articles. There are multiple basic rack systems, but they are complemented with accessories.

Retail is their most important customer. In this way, they can create a bit more repetitiveness. The concept of a retail chain lasts about three to four years and they need multiple pieces of one special unit (a client orders multiple racks, has multiple affiliates).

Gondella is characterised by

- Competitive prices
- Short delivery times

  Three to five weeks between ordering and placement of an order
- Quick response to problems of customers

  E.g. customer wants some things differently during the placement

Gondella has a production site of standard components in Czech Republic because of geographical spread, lower wages and the hope that there would be a local market. The production site in Belgium is used for the production of special articles, different colours, short delivery times etc.

Some years ago, Gondella bought De Kimpe. This company makes specialties out of steel plate, 50% of the yield comes from Gondella, 50% comes from other assignments.

<u>Supply chain</u>

They have raw materials such as steel, help materials such as paint powder, screws, bolts and articles that are directly resold such as wooden walls, price tags, hooks.

Components are first made in steel and are painted afterwards.

In Belgium, 95% of sales happens directly and there are thee distributors that use the products creatively and also work together with other suppliers. In France, they have a distributor that only buys the parts that Gondella produces itself. They buy the components that Gondella resells directly

elsewhere. In the UK, there is a distributor as well and they have a DIY-chain as client in Portugal and Spain.

They do not take care of transportation themselves and also the assembly is done by subcontractors because a lot of chains have their own assemblers.

Supply chain

1) Type of supply chain: where is the focus put on?

- Hybrid

Gondella has make-to-stock products. These are produced particularly in the Czech Republic, only the vertical walls are produced in Belgium. The approach to these products is lean: a basic rack is produced as cheaply as possible, the series numbers are big, production is based on forecasts etc.

Gondella also makes make-to-order and make-to-batch products. The supply chain is agile because they want to be flexible and deliver quickly. Gondella has a disadvantage with respect to cost structure because there are cheaper countries and bigger producers, but it delivers a very good service and flexibility.

The price is important at biddings. Once a client is won, service (quality, on time delivery, quick response) becomes the most important thing.

2) Which partners are integrated in strategic cost management in the supply chain?

Some products that Gondella resells directly are coloured by the supplier.

They often sit together with the supplier of paint powder. They partner to make powders custom-made and obtain cheaper solutions. Prices are negotiated in Belgium, the powders are used in Czech Republic as well

For steel, it is not very useful to engage in partnerships because you pay the market price. It is difficult for these producers to create added value next to a low price. In Belgium, they work with one steel supplier for the line of walls because the supplier stocks coils for six months. They can buy steel before prices rise. The supplier also cuts the coils according to the wanted measures. They work with three to four suppliers of steel, but ask prices at twelve to thirteen suppliers to get the best price from these three to four suppliers.

With some suppliers of components, they have close partnerships. Gondella has for instance paid a mold for the supplier of price tags. In this way, the supplier will not sell to others (Gondella wants to

avoid that their clients buy the directly resold products from the supplier), the price that suppliers ask can be easily calculated and the mold can be deducted as an investment.
In the past, tubes were lasered at Gondella, welded at De Kimpe and then paint powdered at Gondella. Transportation was very expensive for these parts. The supplier already has a laser so he does the lasering instead of Gondella. Gondella pays a higher price for the products. The supplier is certain of the contract, their laser is operational, Gondella has more capacity available on its laser and saves on transportation costs.
The Czech Republican site and De Kimpe receive the MRP of Gondella. In this way, different parties can anticipate quickly on the demand of customers and deliver rapidly.
The French distributor sends its orders in a way that it immediately comes in the systems of Gondella.
Cross-docking happens.
Transportation is selected based on price.
There are multiple price classes of subcontractors for assembly. For more difficult tasks, the more expensive ones will be hired.
They use multiple suppliers to make sure that prices do not grow disproportionally, they force suppliers to offer competitive prices. Some elements are already pre-assembled at Gondella. The extra efficiency overcompensates the higher transportation costs. They want to arrive with a client and leave as quickly as possible.

The interviewee thinks it is important to not go too far in collaborations, partnerships. Companies want to make profits and partnerships do not always support the lowest prices. You should not forget that there is a buyer-supplier relationship.
If collaborations lead to advantages, Gondella keeps them for itself. Suppliers get the certainty that they can deliver to Gondella in exchange

➔ only upstream and first tier collaboration

Strategic cost management in the supply chain

3) Which cost management methods (concerning the supply chain) does the firm use?

They do not do a lot with respect cost management, they do nothing with respect to cost price calculation.

They rather directly work with sales prices. The sales price is the raw material price plus 30%, combined with a price for some activities. They for instance calculate a sales price for paint powder per meter of the chain, the sales price of a welder per hour. 50% of the cost price consists of steel and this price fluctuates.

If a competitor has a very low price against which they cannot compete, they will first consider whether it is strategically important for them to get the project. The production must keep running and clients can come back in the future. In the mean time, they look for ways to reduce cost price (e.g. are certain components necessary? Are there cheaper variants?) and to increase the sales price (e.g. do additional proposes).

Rotating articles are continuously studied and Gondella tries to make products cheaper while they stay functionally and visually equivalent.

Things like TCO are not explicitly calculated, but for the selection of suppliers they do look at quality, delivery reliability, credit conditions etc.

When multiple methods are used, which one is considered as the most important one?

Not really applicable.

4) Where are the cost management methods used for? This can differ from method to method.

- Price evolutions

  They want to keep track of how prices evolve

- Product development

  The cost price is taken into account when developing products, but this one is again not calculated officially

  e.g. how can something be produced, paint powdered, packaged, stacked most efficiently

  e.g. a component is very expensive and competitors do not need it, can we not produce differently?

- Consider investments

  For investments in processes, cost information is taken into account

  e.g. before buying a tube welder, they calculated how much making products has cost in the past and how much it would cost after the investment. The rule is that investments need to be earned back within three years

5) How important is cost management in the supply chain from a strategic point of view?

The fact that it is not worked out also means that they do not pay a lot of attention to it. Primordial is that everything is made in time and that they do not lose but win clients.

Only when investments need to be made, costs are considered thoroughly for a while. Once a decision is made and the project is running, costs play a less important role.

Costs are not that important, but they are kept in mind when making decisions.

To which extend are the strategic cost management initiatives aligned with the supply chain objectives and strategy? (in accordance with question 1)

Gondella is in a competitive market, they know that they are not able to offer the lowest price. Quality needs to be high and they are very successful in it. In France and the UK, they have a better quality than the cheaper competitors. In Germany, competitors are cheaper and have a comparable quality, which is why Gondella is not very active in Germany.

Concerning the price, they want to get everything out of it. They will accomplish the cost-reductions that are possible to accomplish. They save costs without touching quality. Their biggest cost saving in the past was bringing production to Czech Republic, but they do not always have the right machines, specialised labour, quality structure, inventiveness and flexibility. They keep on producing in Belgium for flexibility and transportation cost reasons.

6) In which way does strategic cost management in the supply chain increase performance?

- Discovering other opportunities

  By doing things for cost management reasons, they bump into other advantages as well.

  They for instance bought a tube welder and discovered that this also leads to higher capacity and the ability to make new products. Developers now develop in another, cheaper way (e.g. clicking instead of welding)
- Shared learning

  e.g. supplier of laser welder helps them to implement the robot
- Flexibility

  They play out suppliers against each other for cost management reasons and this leads to suppliers coming up with better prices and other services

7) Which factors are important enablers of performance improvement resulting from strategic cost management initiatives?

- Relationship
  - Certainly NOT contracts
  - Mutual benefits
  - Commitment
- Information
  - Accuracy
  - Timeliness
  - Willingness
  - Transparency

    Nothing is withheld
- Organisational factors
  - Management support

    If management does not support something it has zero percentage chance of success
  - Joint decision making

Performance management in the supply chain

8) Which categories of KPIs are mostly used?

"We do not have any KPIs, isn't that remarkable? We do have some things in our minds"

Crucial is their following-up of the order book. E.g. how is the occupation doing?

- Measures for order planning

  They follow the client with respect to lead time. If the customer wants quick delivery, they do so. When more time is given, this is okay as well. Gondella refuses to do capacity planning. They want to decide themselves when a product must be finished. A computer does not have to tell them what they can or cannot do, management wants to make decisions. They cannot effort themselves to refuse clients, because if you refuse them multiple times, they will let you drop.

  Lead time is a key success factor for Gondella. Lead time is followed up, but not tracked in statistics etc.
- Measures for the evaluation of supply links

Multiple criteria are kept in mind, also relational ones (e.g. is supplier thinking along?).

- Measures at the production level

  Not very busy involved this. Limited space is something that influences production and planning.

  The customer primes.

- Measures for the evaluation of the delivery link

  They do not check this very much

  Delivery reliability is very good (more or less 95%)

  Because timeliness is that important, transportation costs often explode

- Measures for customer service and satisfaction

  There are some “rules”.

  e.g. new product must be developed within two days

  e.g. tender must be made within five days

- Measures for supply chain and logistics costs

  For production, they look at return etc. but not for supply chain.

  They rather start from common sense: it seems good to do it so we do it.

Measures for order planning and production are most important, especially order planning.

9) Which KPI categories are prioritised for improvement?

Lead time. They want to continue on squeezing it

Priority is placed where problems arise.

How is determined what will be prioritised?

10) To which extend do KPIs support strategic cost management in the supply chain?

No measured KPIs so few importance.