

Juha Kujala

SUPPLY CHAIN AS A RESOURCE

Thesis
CENTRIA UNIVERSITY OF APPLIED SCIENCES
BUSINESS ADMINISTRATION
November 2017

TIIVISTELMÄ OPINNÄYTETYÖSTÄ

Centria-ammattikorkeakoulu	Aika Marraskuu 2017	Tekijä/tekijät Juha Kujala
Koulutusohjelma Liiketalous		
Työn nimi SUPPLY CHAIN AS A RESOURCE		
Työn ohjaaja Janne Peltoniemi		Sivumäärä 48
Työelämäohjaaja Janne Peltoniemi		
<p>Tämän opinnäytetyön kantavana ajatuksena oli luoda analyttinen kokonaiskuva toimitusketjun määritelmästä. Mitä ovat siihen sisältyvät elementit, ja miten sitä voidaan käyttää voimavarana yritysten ja organisaatioiden toiminnassa. Näihin tekijöihin liittyy oleellisesti opinnäytetyön tietoperusta, jossa käsitellään toimitusketjun mahdollisuutta toimia tärkeänä osana jokaisen yrityksen toimintaa.</p> <p>Opinnäytetyön tavoitteena on käydä läpi toimitusketjun suunnittelu, hallinta, ja analysointi osana jatkuvaa kehitysprosessia yrityksen toiminnan kannattavuuden maksimoimiseksi. Tärkeimpinä painopisteinä ovat toimitusketjun suunnittelun eri osa-alueet, ja miten niillä luodaan paras mahdollinen pohja toimitusketjun hallintaan. Viimeinen huomion kohde oli toiminnan ja prosessin analysointi, missä pyrittiin havaitsemaan parhaat mahdolliset tavat suunnitteluprosessin jatkamiselle osana kokoaikaista kehitysprosessia.</p> <p>Asetettu tavoite saavutettiin ja Finn spring oy:n edustajan haastattelu antoi konkreettisen esimerkin siitä mitä hyvin organisoitu toimitusketju voi olla. Toimitusketjun käsite ja siihen liittyvät työvaiheet saatiin eriteltä helposti ymmärrettävään muotoon. Lisäksi onnistuttiin nostamaan esille toimitusketjun tärkeys osana yrityksen toimintaa, ja sen mahdollisuutta olla merkittävä kilpailuetu alati kasvavilla markkinoilla.</p>		
Asiasanat Toimitusketju, toimitusketjun analysointi, toimitusketjun hallinta, toimitusketjun suunnittelu		

ABSTRACT

Centria University of Applied Sciences	Date November 2017	Author Juha Kujala
Degree programme Business management		
Name of thesis SUPPLY CHAIN AS A RESOURCE		
Instructor Janne Peltoniemi	Pages 48	
Supervisor Janne Peltoniemi		
<p>The main idea behind this thesis was to create an analytical overall picture of the supply chain definition. What are the elements included in it, and how can it be used as a resource for companies and organizations. These factors relate essentially to the basics of the thesis, which discuss the supply chain's ability to act as an important part of each company's business.</p> <p>The aim of the thesis was to go through the design, management and analysis phases of the supply chain as part of a continuous development process to maximize the profitability of the company. The most important priorities are the different aspects of supply chain design and how to create the best possible basis for supply chain management. The last point of attention was to analyze the operations and processes, which sought to find the best ways to continue the planning process as part of a full-time development process.</p> <p>The set target was reached and the interview with a representative of Finn Spring Ltd gave a concrete example of what a well-organized supply chain could be. The concept of supply chain and related work steps were broken down into an easily understandable form. It was also possible to highlight the importance of the supply chain as part of the company's operations and its ability to be a significant competitive advantage in an ever-growing market.</p>		

Key words

Supply chain, supply chain analysis, supply chain design, supply chain management

**TIIVISTELMÄ
ABSTRACT
CONTENTS**

1 INTRODUCTION.....	1
2 SUPPLY CHAIN MANAGEMENT	2
2.1 Elements of the Supply Chain	2
2.2 Logistics	4
3 SUPPLY CHAIN DESIGN	5
4 WORK WEAR INDUSTRY SUPPLY CHAIN DESIGN	8
4.1 Business Models.....	8
4.2 Sourcing	9
5 STEPS OF SUPPLY CHAIN DESIGN PROCESS	12
5.1 Step 1: Strategy and Alignment.....	12
5.2 Step 2: Supply Chain Assets and Routing.....	13
5.3 Step 3: Processes, Procedures and Systems	13
5.4 Planning and Communication	14
5.5 Step 5: Outsourcing.....	15
5.6 Step 6: People and Culture	16
6 MAIN ELEMENTS OF SUPPLY CHAIN DESIGN	17
6.1 Communication.....	17
6.1.1 Collaboration.....	17
6.1.2 Internal Communication.....	20
6.1.3 An Overall Framework of Supply Chain Collaboration.....	22
6.2 Processes	24
6.2.1 Demand management	24
6.2.2 Integration	25
6.3 IT Enablements	27
6.3.1 Electronic Data Interchange	27
6.3.2 Barcodes and Scanners	28
6.3.3 Enterprise Resource Planning (ERP) Systems	28
6.3.4 Warehouse Management Systems	29
6.3.5 Transportation Management Systems	29
6.3.6 Inventory Management Systems	29
6.3.7 Supply Chain Simulation Softwares.....	30
7 MEASURING THE EFFECTIVENESS OF SUPPLY CHAIN	31
7.1 Supply Chain Performance Measures.....	32
7.1.1 Qualitative Performance Measures	32
7.1.2 Quantitative Performance Measures.....	33
8 CASE STUDY.....	35
8.1 Finn Spring Ltd	35
8.2 Interview	36

9 CONCLUSION..... 40

REFERENCES 42

1 INTRODUCTION

In general, the work wear industry is constantly evolving in the business sector, both in terms of technology and business practices. For this reason, companies in the field should constantly strive to develop their own ways of acting, long-term strategies and cooperation with other supply chain companies. The purpose of this study is to open up the supply chain's design, development, and management and to give companies the potential ways to develop their business.

Everyone tries to look for cheaper production methods on a global scale and to consolidate their own brand into a commonly known brand. There are many factors that affect the advancing of the industry. Technological advances, security measurements and trends keep the industry in constant motion and development.

Important factors in the success of today's market are many. Each company seeks to develop its business further and further with the advancing technology and by using different design models. Relocating mass production of products to Asia due to cheaper production costs, companies in the field should strive precisely for the design and management of supply chain to achieve maximum competitive advantage. Consequently, some of the best ways to achieve this in most of the situations are to get reduced production and logistics costs, import times, and accumulating excess inventory.

The aim of the research is to get an overall picture of the importance of the well adjusted supply chains, study comparable supply chain models from the work wear industry and their comparison, to understand the main elements of supply chain design, to find technological solutions and to use IT tools to improve supply chain management, and to provide a framework for analyzing supply chain efficiency. In other words, research is a basis for analyzing the efficiency of the supply chain and designing a generalized supply chain management model to the ever-changing industry.

2 SUPPLY CHAIN MANAGEMENT

The supply chain is a network of organizations, which collaborate to manage and develop material or service streams and associated cash and data flows. Every organization has its own role within the supply chain. The company's products, industry and customers define the structure of the supply chain. The supply chain connects the company and its suppliers to distribution organizations and customers. The supply chain is therefore an entity that emphasizes cost efficiency, customer orientation and added value creation. (Rautauoma 2013.)

2.1 Elements of the Supply Chain

The starting point and the ending point in the supply chains processes is the customer. The first event in the supply chain processes is the decision of the customer to buy product sold by the company. When a customer has made an order, the sales department records the sale and posts the information on the amount of the order and delivery time within the company. This also includes other customer requirements and information on whether the product should be manufactured.

Another event is the procurement department's knowledge of the services and raw materials needed to complete the customer's order. Necessary items and goods are ordered from the suitable supplier to make sure that the items can be acquired in time.

When the supplier has delivered the ordered products, their correct quantity and qualitative requirements are checked. The products are then transferred to the warehouse until they are needed in the production department of the company.

At the production phase, the products are delivered from stock in accordance with the production plan. Next, raw material ordered from the supplier is manufactured to the desired product of the customer. When the product is ready, it will be placed in the intermediate storage waiting for its delivery to the customer.

In the final phase, the logistics department determines the fastest and most cost-effective way of transporting the product from the warehouse to the customer. Once the product has been delivered to the customer by the agreed date, the company sends an invoice to the customer for the delivered products. (Neumann 2016; Cristopher 2016.)

High customer satisfaction and the lowest possible cost are the aim of every supply chain. To achieve them, the best tools available are management processes and associated technical solutions. There are three different supply chain management levels. These levels are strategic, tactical, and operative. (Sarna 2014.)

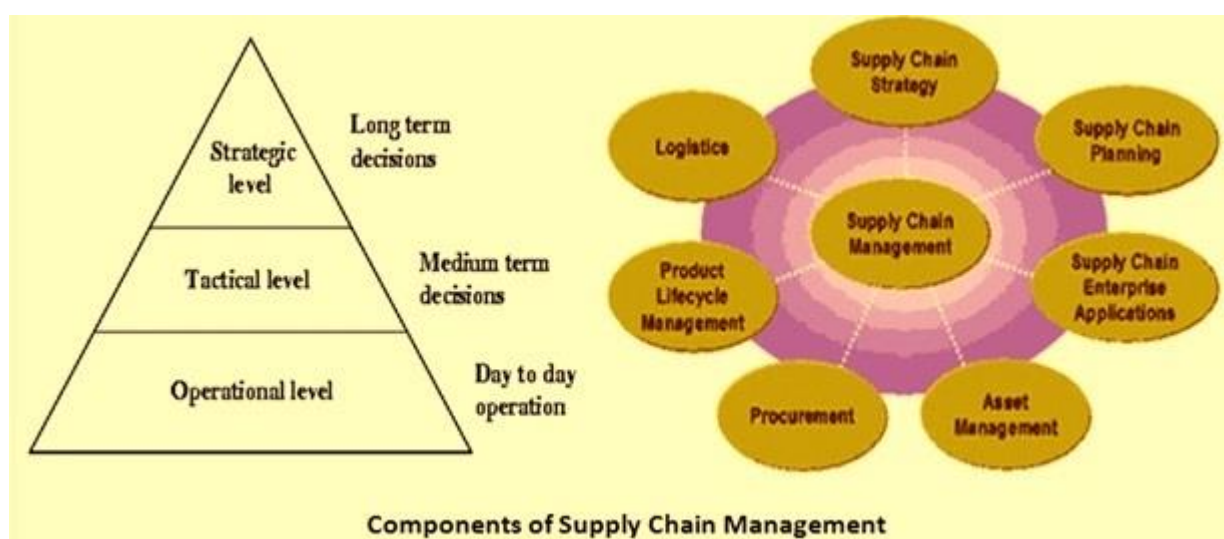


FIGURE 1. Decision levels and main components of SCM. (Sarna 2014)

At the strategic level, the management of the company looks for and drafts strategic decisions on a long-term to benefit the supply chain as much as possible. Such decisions include, for example, new partners, locations of factories, offices and stores, products manufactured and areas of operation in the market. (Sarna 2014.)

The tactical level focuses on finding new and more efficient solutions the overall level, for example in cost efficiency or process speed. Tactical levels also include logistical solutions, finding best practices and finding the lowest possible purchase contracts. (Sarna 2014.)

The operational level instead focuses on everyday decisions and solutions. These may include scheduling, moving goods in the supply chain, receiving orders, and maintaining stocks. (Sarna 2014.)

2.2 Logistics

In the supply chain management, a well throughout thought logistics strategy helps to plan and align the operations over a several-year time to future. It includes the design, implementation, monitoring, and control of systems and processes. The logistics strategy aims to maximize profitability and cost-effectiveness. At the same time, you will be relieved of the unnecessary steps and activities to save time and money. The purpose of the logistics strategy is to reduce costs, reduce committed capital and improve service. When discussing the forms of logistics, they can be divided into two main groups, compiling and diversifying logistics. (Rautauoma 2013.)

Compiling logistics is about project work or individual preparation. Production is initiated when a customer's order is received. An enterprise will make the necessary material purchases and begin production as quickly as possible. The aim is to provide the fastest and most flexible alternative to the production process. In compiling logistics, the need for storage is generally lower, although some of the materials needed for production can be stored for future orders. In this case, the production planning and the forecasting demand play a very important role. (Battilana & Luukkola 2012.)

The operating principle of diversifying logistics is the opposite, the products are standard products that are intended to be made available to customers as efficiently as possible. Diversifying logistics is usually specified as a distribution. In this model, transport and storage are particularly important. The size of the stocks should be evaluated as accurately as possible in order to ensure optimum stock clearance and thus minimize losses. (Battilana & Luukkola 2012.)

3 SUPPLY CHAIN DESIGN

The task of the supply chain is to ensure the availability of products in the best possible way, but at the lowest possible cost. The supply chain should be guided and developed as a whole. However, measuring the performance is difficult because logistic processes can often be poorly designed or even defined, and data from information systems may not support reporting. If the vision of a procurement or whole supply chain management is poor or the strategy is poorly designed, systematic measurement is also very challenging. Measuring logistics is important because it can take into account the shortcomings of other businesses. The most effective measurement of logistics means better communication, better decision-making ability, higher motivation for staff and transparency in supplier management. (Kauffman & Crimi 2017.)

The supply chain plays an important role in defining the company's competitiveness and performance on the market. In most companies, this has only been noticed in recent years. However, companies may still have difficulties in defining the supply chain management and how it connects with other businesses and this complicates supply chain optimization. When defining the supply chain, it is important to be able to answer the following questions: What does the supply chain look like? What elements in the supply chain should produce rather than buy from other services? What are the most typical cycles in the different supply chain phases? And how long is the typical cash flow cycle? (Kauffman & Crimi 2017.)

Designing a company's supply chain to get the best possible results in processing time, product quality and customer friendliness is the best way to make business as financially profitable as possible. This is also the way for a company to gain significant competitive advantage regarding its competitors in always advancing field of markets, locally and in the global level. If a company wishes to deploy their assets in ways that enhance profitability and shareholder value, they have to make their supply chain design as successful as possible. Optimized supply chain results in lower costs and faster production cycle. This is why choosing the right marketing and sourcing strategies is vital to generate the best possible financial performance. (Banker 2012.)



FIGURE 2. Specified key elements of supply chain. (Cadden & Leuder 2013)

The optimal financial and operational performance is achieved through the understanding of the exact way how and where to deploy available assets. To achieve the best possible long-term profit, companies need to identify the optimal number of fixed assets like plants, warehouses and distribution centers. (Banker 2012.)

The key to design a supply chain suited for a specific company is to understand the situation. Both internal and external things should be taken into consideration. When to know what is the right number of plants, their location and necessary capacity of production and warehousing facilities, company is able to form an effective supply chain. Another important thing is to know where customers are. Then it's possible to support certain areas with particular warehouses to serve customers faster and more efficiently. When a company is aware of where

its customers are, it's possible to understand what products should be manufactured in specific factories to serve the customer as efficiently as possible. (Beamon 1998.)

Product flow through a supply chain is a very important matter that must be taken into consideration. It includes essential questions like should a product be completely manufactured and packaged in a single plant. On the other hand, would it be possible to heighten both delivery time and cost effectiveness by finishing the products in smaller facilities such as shipping point. (Beamon 1998.)

4 WORK WEAR INDUSTRY SUPPLY CHAIN DESIGN

In this part of the research, I take the work wear industry as an example for supply chain design. I used the industry in question as a model for its easily separable and varied business models. Designing the supply chain is a process that every company should not take lightly. The design of the supply chain serves as a basis for the company's operational capability and efficiency. Depending on the industry, business models may vary, which is important to take into consideration when a company starts to design its supply chain. For this reason, more importantly, it is important to invest in the supply chain planning phase as much time and effort that as is needed to make it work.

4.1 Business Models

Bringing value to all involved parties through the value proposition is a general objective of the business models. A key role in the structure of the business models is to find and design promising business concepts, as well as to act as a business sharing, development and management tool. (Hodge & Cagle 2004.)

Work wear companies can increase their business and bring products to the market by adopting different business models. Outsourcing, strategically sourcing, brand extension, retail expansion, multi-sourcing, and customer relationship management are essential and important factors in the construction of the new business model. (Hodge & Cagle 2004.)

One way to achieve a competitive advantage in the textile and apparel industry is to create and design innovative business models. In the most cases, a textile and apparel company's business model has core competencies embedded within it which are very difficult to copy. It is recommended, therefore, that all apparel and textile companies should review their business models at regular basis, seek and develop business models which differentiate their offering, and evaluate their use of technology and information systems. The key business models for the work wear companies are:

- B2B sales projects to companies and institutions.

- Retail store sales to small businesses and consumers.
- Internet sales to small businesses and consumers.
- Work wear leasing to companies. (Mattila 2017.)

4.2 Sourcing

The main idea of a supply chain in a manufacturing organization can be defined as an overall picture, which is created by operational processes. It is a chain because it combines the actions needed to achieve the ultimate goal of delivering goods or services to a final customer. These activities vary from organizations that acquire raw materials, resources and the information necessary for starting work. (Lottersberger 2012.)

Sourcing focuses on the efficiency and development of strategic distribution channels, as well as the search for lower purchase costs and hence the lowest total cost. It is a strategic level that covers purchasing decisions in the long run and affects the organization's position on the market. Some of these decisions include the creation of long-term contracts, investment decisions and procurement strategies, such as the acquisition of a source of material. It is a joint effort of the supply chain for a cross-border working group, including procurement, procurement, design, quality, design, manufacture and logistics. (Lottersberger 2012.)

Sourcing is often described in a few different terms. These terms are purchasing, procurement and sourcing, as an example. However, these terms have significant different meanings and levels. Purchasing means buying or acquiring goods or services as part of a business process. It controls the flow of materials and data as an operational process by looking for lower purchase costs. Procurement includes purchasing orders, expediting delivery of materials, tracking deliveries, and handling daily problems with the quality and quantity of materials received, monitoring of suppliers' payments and evaluating supplier performance. (Lottersberger 2012.)

The purchasing habits often change with the time of purchase but procurement includes additional purchasing activities, such as material management, including goods and services, and ensures that purchasing is at the required, appropriate level of service. It operates at the tactical level and deals with contracts with suppliers, carries out inspections and certifications,

improves the quality of materials and programs that are an excellent way to improve supplier performance. On the other hand, the sourcing focuses on the strategic development of delivery channels and the search for lower purchase costs and total costs. (Lottersberger 2012.)

In the work wear industry the sourcing can be conceptualized as follows:



FIGURE 3. Work wear industry sourcing. (Mattila 2017)

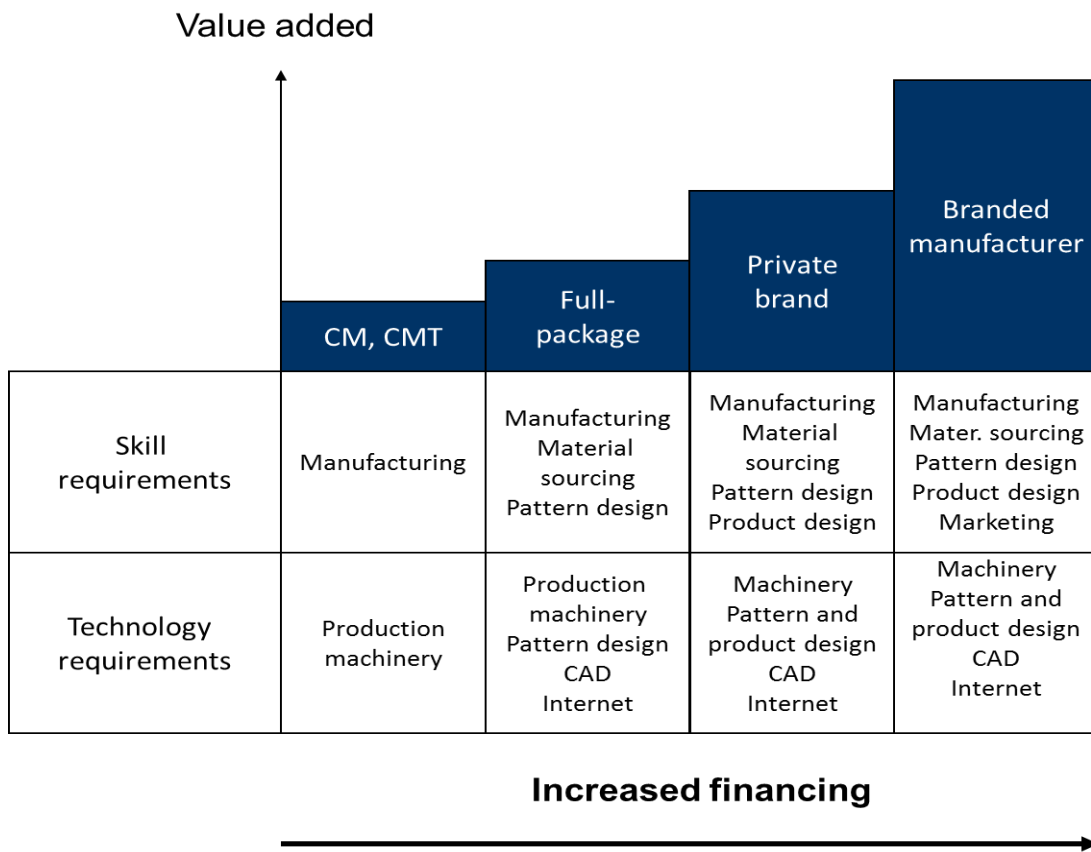


FIGURE 4. Work wear industry sourcing. (Mattila 2017)

5 STEPS OF SUPPLY CHAIN DESIGN PROCESS

Supply chain design is a complicated process, which can be divided to many different steps and parts. These steps are very important to think and accomplish carefully to ensure the best possible solution for the company. There are many different points of view how to see and divide the steps. In this research I have divided them to five parts that I thought to be the most comprehensive solution to any company in any field of work.

5.1 Step 1: Strategy and Alignment

Supply chain as a concept is a rather new and constantly evolving area. Supply chains have changed perspective of considering successful strategies in the last few years. IT tools and data analyses have developed to allow and support this. (Moon 2016.)

With the development of technology and thinking, the strategy that has been created a few years ago may not be competitive for today's supply chain. Although operational excellence has always been an important part of the supply chain, risk management, customer service, sustainability and many other business challenges are also required along with the strict cost control. (Moon 2016.)

Supply chains usually grow along with the business, and so that heritage often defines the strategy. In many cases, new business challenges have appeared and business strategies have changed direction and the supply chain is struggling to evolve and keep pace. (Moon 2016.)

Is your supply chain aligned with your business strategy? Is it an integral part of this strategy? Is it properly represented in your board room? Do supply chain opportunities and capability feed into the development of your strategy? (Moon 2016.)

5.2 Step 2: Supply Chain Assets and Routing

If a company provides a physical product, then it can be assumed that only the manufacturing itself is only a larger investment than the assets and routes through your supply chain. Investments and resources are required in the actual establishment of them and the cost of possible mistakes and changes can also be significant. (Moon 2016.)

It is essential to invest in the design and optimization of these assets. Given a clear business strategy, a map of your existing assets and contracts will allow you to model your supply chain. Selecting the right model that reflects your supply chain constraints is essential. The model may therefore be physical flow, financial, communication & data or combinations of these and others. (Moon 2016.)

The aforementioned models allow for the review and comparison of alternative scenarios. The development and comparison of alternatives will speed up significantly by investing in the right model. This enhances the operation and reduces costs much faster than the supply chain evolution over time. The model should be able to test the options in detail so that it does not become too complicated. (Moon 2016.)

Do you have a complete picture of your supply chain in the right level of detail? Do you know where your supply chain constraints lie and how they impact upon your business? Do you consider alternative options and solutions objectively in your supply chain development? (Moon 2016.)

5.3 Step 3: Processes, Procedures and Systems

Processes, operating methods and systems are the basis of every effective supply chain. It is really important to start generating these components through processes and not through systems. (Moon 2016.)

All too often companies invest in an extensive ERP system which has configurable elements for many of the supply chain processes. Many companies then end up with supply chain processes that are compromised, which is driven by the limitations of the ERP configuration. These compromises are rarely quantified and costed and so the lost value is not known. In large organizations the uniformity driven by the ERP system does bring benefits but with a potential cost of lost local adaptation. (Moon 2016.)

There is no solution that suits the situation of every supply chain comprehensively. When developing a legal solution, four sub-areas should be taken into account, enabling us to identify the border with the least negative impacts and the actions to be combined. The following sub-areas are: common technology used interactively, Information flow, error identification and correction, and parallel or consecutive processes. (Moon 2016.)

Do your processes reflect your business needs or your IT systems functionality? Do different activities understand their responsibility to dependant activities? Do your organizational boundaries reflect the best transition in your processes and procedures? (Moon 2016.)

5.4 Planning and Communication

For good supply chain management visibility is very important, even necessary. However, visibility must be applied to the supply chain in the best possible way. Planning and communication components that define visibility are plan, decision making authority, deployment and reporting. (Moon 2016.)

There can be only one correct plan. All others are wrong. Although, it is possible to have different perspectives of the same plan with different levels of detail and appearance, relevant to the user. The plan must contain only one verified source for each element of data. (Moon 2016.)

A good plan has a structure that begins with a strategic vision, continues to the tactical and ultimately operational view. Today's larger technological possibilities allow for a long-term plan without the need to invest in a specialized software system. (Moon 2016.)

The authority to change the plan has to be very carefully defined. A centralized and hierarchical structure will allow more optimal decisions. However, a large and complex supply chain may require a more decentralized decision authority to be responsive. This is essential if operating in a volatile market or across time zones. Limits can be applied to local decisions to ensure integrity of the whole plan and a process of decision escalation when they exceed these limits. (Moon 2016.)

Rapid communication and general emphasis on changes are requirements for the effectiveness of the plan. It is important to monitor and report the implementation of the plan in order to detect possible deviations quickly and to react if necessary. Any external factors that may affect the abilities and constraints of the system must be taken into account and to be reported on whenever they occur. Faulty information and lack of system change are common reasons for failing otherwise good plans. (Moon 2016.)

Do you have multiple, disconnected plans? Is it clear who has authority to make which decisions and how to escalate issues? Do you report compliance to the plan, capabilities and constraints effectively? (Moon 2016.)

5.5 Step 5: Outsourcing

There are very few organizations with the range of skills and resources to be able to own and operate their entire supply chain. The decision which to retain in house and which to outsource is a critical and strategic issue. A few critical questions should be asked when deciding upon which elements to outsource: How significant is the process to your operational performance? How strategically important is the process to your business? How specialized are the skills and resources required? (Moon 2016.)

Finding the right partner for a service after the outsourcing decision is very important. It is too common for a company to find the partner based solely on cost efficiency. Although important, it can often lead to a decrease in value, larger risks and a smaller common denominator. The most important thing in choosing outsourcing partners should be the ability to increase the value of business over time, besides cost-effectiveness. Benefits and rewards must be adapted to bring about common objectives and approaches. Because of this, the values and behaviors of you and your partners should face each other. (Moon 2016.)

Have you the right balance of outsourced and in-house activities within your supply chain? Do your partners have common interests and culture? Do you share and collaborate on supply chain improvement? (Moon 2016.)

5.6 Step 6: People and Culture

All too often we are so focused on process, procedures and systems to improve our supply chains that we forget that they only function because of the people employed to operate them. We assume; everyone is the same and constant, that they act predictably and repeatedly in the same way and that their personal objectives and rewards are aligned with the business. In reality every one of these assumptions is wrong in part at some time. (Moon 2016.)

Larger companies and organizations have an opportunity to create a dominant and continuous culture and working environment. In such circumstances, it is possible to train, understand and encourage workers consistently. This allows workers greater opportunities to influence their working environment. Small businesses have the advantage of better chances of adaptation and flexibility. However, the problem faced by small companies is overall smaller resources, limited opportunities and generally less control than larger companies. (Moon 2016.)

Different cultural differences and local environmental factors, especially those globally operating, can differ significantly. Therefore, it is important to take into account any unintended problem situations in cultural differences as early as possible to avoid them. Otherwise, the theoretically ideal supply chain performance may be less effective unless they are taken care of appropriately. (Moon 2016.)

Is your supply chain culturally aware? How dependent is your supply chain performance on uniformity? Do you recognize and adapt processes and systems to accommodate local differences? (Moon 2016.)

6 MAIN ELEMENTS OF SUPPLY CHAIN DESIGN

The main elements of the supply chain represent the general operating methods of supply chain of the company or organization. This includes communication and co-operation with its business partners and the processes involved. Functions controlled and enhanced by IT programs and systems are also a major part of the activity. The main elements within the design must be taken into account throughout the process. One of the major parts of the work included in SCD is to get the supply chain's main elements to fit and work with each other in the best possible way.

6.1 Communication

There are two kinds of communication within the company's operations, internal and external communication. Both of them are an important part of the whole organization's success. Communication also serves as basis for the entire supply chain's ability to cooperate. Communication enables successful operations and collaboration with the business partners, in the way, which is profitable for all the parties included. If communication does not work within the company, overall performance cannot be at its best. Functional external communication is also an important part of the company's public image for its suppliers, customers, and other business partners.

6.1.1 Collaboration

Collaboration is the key to improve business processes of all members of the supply chain, both parties have the ability to change and shape its form and future direction. Equal power in relationship and mutual commitment to the future are vital parts of supply chains success as a whole. While collaboration between companies may sometimes be hard to manage, it can be even more rewarding in the long run. In the best cases, companies across the supply chain can have huge reductions in inventories and costs, improvements in production efficiency and customer satisfaction. (Linton 2013.)

There can be many factors that make collaboration between companies problematic. Lacks of commitment from other side of the supply chain and failing to understand the importance of collaboration are two major issues that may come across. It is also possible for companies to fail at providing enough resources and effort to make collaboration work within the supply chain. These problems are not easy to overcome, but the fact remains that there are always at least two separate organizations in collaboration initiative. The best way to make collaboration between companies work is to understand the opportunities of its success in the future and find the best possible solution to all parties included according to the situation. (Linton 2013.)

There are many things that must be taken into consideration to make the best of a company's supply chain through collaboration:

The first thing is to start improving collaboration in areas where company already have a solid footing. The best result from collaboration comes from the fields that are already successful. It should be used as a tool to build up strengths rather than weaknesses. Collaboration always includes at least two separate organizations. If company's focus point is in something that it's not good at, it is not beneficial to other parties of your supply chain. That is why it is better to focus to improve company's strengths though collaboration to make it beneficial as possible to all included parties. (Benavides, De Eskinazis, & Swan 2012.)

The second thing that must be taken into consideration is to make sure that collaboration is a win-win situation for both organizations. Even if in most cases it is made sure that collaboration benefits both sides equally, there may occur some situations where collaboration creates a great value overall but benefits other side much more than the other. Rather than ignoring this kind of facts, it is important to either find the way to split the benefits more equally or compensate the other party in another business operation. (Benavides, De Eskinazis & Swan 2012.)

It is best not to choose business partners without first making sure that they are suitable for specific company. Companies need to focus on their overall capability and make sure that their strategic goals and values match with all participants. When selecting a right partner the biggest company might not be always the best one. Although, largest suppliers or customers may have lots of potential, collaboration might be more interesting to a smaller partner. A

smaller partner may be interested to spend more time and effort promoting collaboration. (Benavides, De Eskinazis & Swan 2012.)

The next thing to consider is how to invest in the right infrastructure and people. It is easy to underestimate resources needed to make collaboration profitable. The lack of devoted people is one of the biggest issues that may occur in collaboration of business partners. However, when people understand the possibilities that making it work may reward them with all the differences in culture, organization and terminology can be solved. (Benavides, De Eskinazis & Swan 2012.)

The right infrastructure for successful collaboration starts from the top of the organization. The first thing to do is creating the definition of vision for the collaboration. Allocation of resources to support the initiative must also be planned carefully. These are the main factors which defines the very basis of collaboration between organizations. If enough time or effort is not given to the planning part of the operation, it can escalate to bigger problems or inconveniences in the long run. (Benavides, De Eskinazis, & Swan 2012.)

To ensure that information runs fluently trough all business partners it is important for all members to have matching performance management systems. This enables all included organizations to easily monitor the situation and avoid misunderstandings that may damage the collaboration efforts. (Benavides, De Eskinazis, & Swan 2012.)

The last thing what must be taken into consideration is the long-term plan for the collaboration. It can take much time and effort to create a good and profitable collaboration. All of the partners must acknowledge this to create appropriate long-term plans, mutual goals and expectations for the collaboration. A preparation like these gives companies a chance to rid themselves from the idea of short-term project and focus on larger scale operation. With the long-term perspective companies efforts can become fluently flowing collaboration, which gives partners a better understanding of each other's capabilities and how to maximize the profitability of the supply chain through collaboration. (Benavides, De Eskinazis & Swan 2012.)

6.1.2 Internal Communication

Communication is crucial to all supply chain success. However, it's almost always one of the areas in need of improvement. Efficiency and productivity of the whole supply chain can be improved simply by creating more effective communication. It enables possibility to share all the same demand and operational information between all the members of the supply chain. Communication keeps all the members informed of developments that affect their contribution to supply chain. This gives them possibility to quickly adjust their operations in the line by changing demand conditions.

Responding to new business opportunities is also enabled by effective communication. With it, members of the supply chain can react more rapidly to changes in business market. This helps with getting new products to market faster or by increasing supply levels after successful marketing campaign. (Linton 2013.)

Overall better managed process can be achieved through communication between people from different perspectives inside the supply chain. The firsthand experience from specific part of the process gives each individual a different point of view from the overall process. This is the main reason why effective communication inside the supply chain gives the best ways to improve the main business processes inside the supply chain. If communication is limited, so is the ability of the procurement department to influence the end-to-end procurement process. (Oxford professional education group 2016.)

Everything comes around to the simple fact that with good communication between stakeholders and external suppliers, more creative ideas can be brought to the table to improve the process. If communication is limited, so is the ability of the procurement department to influence the end-to-end procurement process. (Oxford professional education group 2016.)

Steps to improve communication within the supply chain:

- Prioritizing business partners. Stakeholders as business partners needs to be assessed how supportive they are and what is their importance to the organization. It is also needed to assess the strategic value of suppliers, considering how it would impact business if they stopped supplying by some reason.

- Meeting with business partners regularly. Do not worry about over-communicating, meeting with stakeholders and suppliers allow companies to take care of their concerns as they occur. Business partners should be regularly updated with timely information of the situation. With suppliers, it is important to assess how to improve relationships from both sides. Constructive feedback from both sides is a great way to improve the effectiveness of business processes.
- Offering options. Carefully prepare list of options which back up each others to give to company's stakeholders. With this, it is possible to make them feel that they have status by giving them some influence and not take the decision out of their hands. (Group 2016.)

When selecting the actual way of communication, the first thing needed to do is to think what the optimum results which are to be aimed at are and what suits best for certain situation.

- Being clear. Use a short headline which gives the main point, and then focus on benefits of topic/proposal and how to achieve them. It may sound obvious but companies must ensure that the narrative is easy to understand and get excited to.
- Tailoring it. When companies are proposing something to their business partners, they need to make sure that they don't focus entirely on general benefits and costs. It is important to tailor the topic to answer company's business partner's individual concerns to make it easier to accept and approved.
- Being personal and pragmatic. Instead of just sending an email to business partners, it's more beneficial to actually give them a call or quickly visit them personally. It leaves more personal and pragmatic image and will get faster and better results, especially when it is needed to implement change. (Group 2016.)

The importance of communication within all business partners in the supply chain cannot be overlooked. With good communication, it is easy to improve the procurement process as a whole.

6.1.3 An Overall Framework of Supply Chain Collaboration

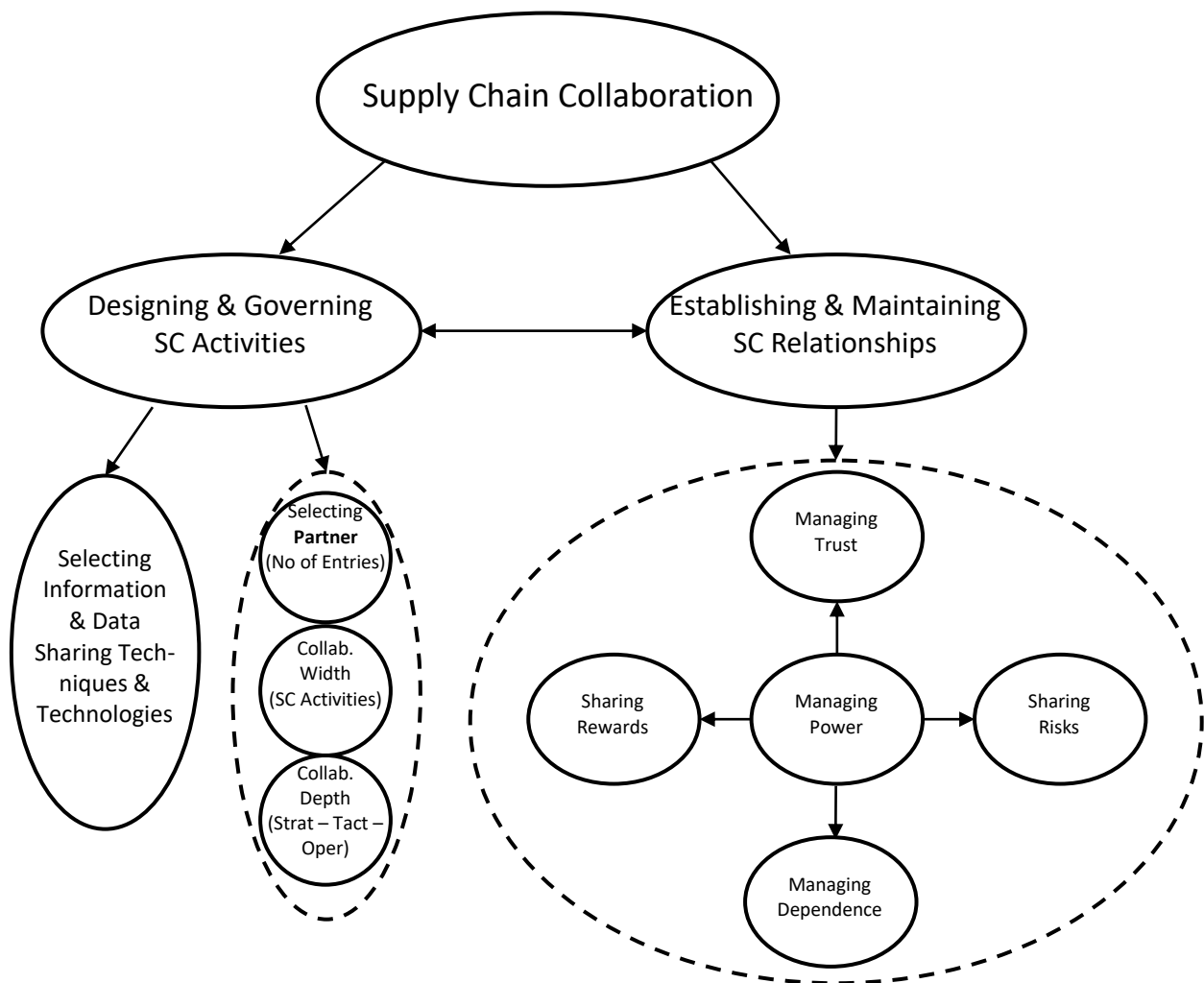


FIGURE 5. Linking supply chain activities. (Matopoulos, Vlachopoulou, Manthou & Manos 2007)

Linking Supply Chain Activities to Specific Collaboration Benefits/Supply Chain Activity:

Procurement:

- Less time searching for new suppliers and tendering.
- Easier management of a reduced supply base.
- More stable prices

Inventory management:

- Less time searching for new suppliers and tendering.

- Easier management of a reduced supply base.
- More stable prices.

Product Design & New Product Development:

- Faster product development.
- Knowledge sharing & increased innovation capacity.
- Better quality following from involvement of supplier in design.

Manufacturing (Planning):

- Increased product quality.
- Minimize supply disruptions.

Order Processing:

- Increased responsiveness.

Distribution:

- Faster delivery.
- Flexible delivery.

Sales:

- Rapid access to markets.
- Increased market share.
- Improved promotional events.

Demand Management:

- More accurate forecasts.
- Joint resolution of forecast exceptions.

Customer Service:

- Improved product availability.
- Improvements in lead times.

6.2 Processes

Designing of the supply chain involves a variety of processes. These processes are concrete ways in which the supply chain can be developed to be as effective as possible and to serve company in the way it's needed. For example, processes include integrating activities with other companies, and forecasting demand for the best possible result.

6.2.1 Demand management

By definition, demand management includes combined methods to control and track requirements for business units and internal purchasing operations. Demand management is used by organizations to indicate external cost factors, arrange purchase orders, and to waste disposal. The focus of demand management is on meeting the needs of the customers, and on the volume of products purchased. Production itself including individual pricing of the products is not the main priority in demand management. Other commonly used terms for demand management are consumption management and strategic spend management. (Linton 2013.)

Demand management is a function where all the demands for goods and services are recognized to support the market place. It involves prioritizing demand when supply is lacking. Proper demand management facilitates the planning and use of resources for profitable business results. (Linton 2013.)

Demand planning is a combined process that consists of forecasting and managing demand. It basically controls all other areas of ERP. Its purpose is to create a planned demand pattern that matches the company's operational and strategic goals. The design of good demand makes it possible to design more efficiently the production capacity and other resources needed in both the short and the long term. Demand planning also helps to understand who should serve the customers and what service level. Demand planning is harder, the more varied and uncertain demand is. It is therefore possible to achieve a great competitive advantage through the successful design of demand. It is possible to develop demand planning with the correctness and timing of information, shortening lead times and cooperation between the supply chain partners and sharing information. (Barve 2002.)

Demand management is a proactive approach that seeks to influence demand, for example through price changes or marketing. Forecasting demand is a reactive termination process that predicts demand and makes an action plan accordingly. Forecasting demand is often based on history. Realized demand, past demand forecasts and errors in them, market research, economic indicators and expert estimates of demand, affect prediction. In addition, forecasts take into account the demand management plans for price strategies and marketing. By combining these, new demand forecasts can be made. (Barve 2002.)

A few of the larger problems in order and delivery process may occur, if the demand and supply do not meet. Most of the issues can be prevented by securing transparency of operations. On the other hand, benefits of successful demand management can be a great competitive advantage to any company. Demand management enables organizations to streamline approval procedures while ensuring that IT priorities are tailored to broader business goals and that approved initiatives provide the highest business value. Other notable benefits are the company's control over product availability, confidence of sales force in the ability to deliver the product, smoother product instructions, and greatly improved ability to respond to change. (Rautauoma 2013.)

6.2.2 Integration

Supply chain integration can be defined as a close alignment and coordination within a supply chain. If all of the parties involved in the supply chain can be integrated properly, inventory costs of all members of the supply chain are reduced considerably. The best levels of integration are achieved by developing single information system available for all members to access and share supply and demand data securely. (Linton 2013.)

All supply chains combine to some extent. One of the key goals in increasing integration is to concentrate and coordinate the resources of each participant in supply chain needs to optimize the overall performance of the chain. The integration process requires rigorous management of management skills, processes and techniques to combine the core functions and capabilities of the chain and utilize available business opportunities. The goals typically include higher profits and small risks for all participants. (Linton 2013.)

No matter the industry, there are three main components needed in order to be as efficient as possible: supply chain, functioning logistics and product innovation strategies. It is not enough simply to have these components, they all are needed to work together. This way the real fluency and efficiency can be achieved.

Here are some of the biggest benefits of a well-integrated supply chain:

- **Staying on top of demand:** Integrated supply chain, logistics and product innovation strategies enable companies to predict demand more effectively and with it, make better and more profitable decisions. Globalization of businesses is made easier every year and the ability to stay on top of demand is more vital than ever. The supply chains need to be able to react swiftly and accommodate shorter life cycles, emerging markets and fluctuating economies. Working combination of innovation, logistics and effective supply chain management is a great way to ensure businesses are relevantly responding to changes in demand. This ensures the best possible change to stay on top of the demand.
- **Flexibility:** Well-integrated supply chain enables increased flexibility, which is one of the most important benefits that company can have. Proper integration of supply chain gives management operational flexibility to respond swiftly to external events like changes in customer demand and actions of competitors.
- **Eliminate waste:** Leaning supply chains can be great to identify and eliminate waste in process. Downside to that is often the lack of ability to react to different events at the market field. Therefore, the best way to maximize supply chains profitability is to also make it agile as well as leaning. An agile supply chain allows organizations to respond effectively to unexpected events in the market. This is why a combination of agile and lean supply chain practices is the best option. A sustainable and a successful supply chain can be accomplished by integrating data from across the operations.
- **Higher profit margins:** Lastly, as the result of previous three benefits the supply chain should now be a fluently running well integrated unit. This allows companies to maintain and even increase their revenue, resulting and higher profit margins. Managing a supply chain can be a very demanding task but with the right tools and methods it can be made very profitable to all companies included in supply chain. (Woods 2015.)

It is critical for business success to maintain an integrated supply chain. However, it's not an easy task to integrate the whole supply chain to work as one and for each other's benefit. But when it's done successfully it greatly benefits all the companies in the whole supply chain process. Integrating the supply chain into a continuous process that can be optimized only when all members of the supply chain work together to improve their relationships and when all participants are aware of the key factors at all chain levels. First-level journalists can play a key role in promoting integration by guiding and assisting lower-level journalists. (Khurana 2016.)

6.3 IT Enablements

IT enablements are tools which can be used to enhance supply chain's overall effectiveness. Those tools can also be used to keep track on company's assets. This includes everything from inventory and warehouse management to logistics in general. In a constantly evolving current situation, it is important to choose the best IT tools to suit your company's needs. This greatly increases the overall performance of the supply chain and hence the overall competitiveness of each company in their field of business.

6.3.1 Electronic Data Interchange

Electronic Data Interchange (EDI) technology has been widely used by firms in supply chains to facilitate transactions and information exchanges. EDI is defined as computer-to-computer exchange of structured data for automatic processing. EDI is used by supply chain partners to exchange essential information necessary for the effective running of their businesses. These structural links are usually set up between organizations that have a long-term trading relationship. (Jadhav 2015.)

The introduction of EDI has numerous opportunities to promote the company's operations. Its automation enables you to get information about your customers' sales well in advance. In addition, automation enables very accurate and efficient operation. Confirmation of submissions, sending invoices, bills of lading, and any information that linked organizations want to change are all possibilities of the use of EDI. EDI's partners in the supply chain can improve

the technologies that help make the demand for delivery and delivery realities easier. This is to avoid the distortions and exaggerations of demand and supply information. (Jadhav 2015.)

6.3.2 Barcodes and Scanners

Bar Codes are the representation of a number or code in a form suitable for reading by machines. Bar codes are used to identify and track goods at all stages throughout the supply chain. Bar codes are a series of different width lines that may be presented in a horizontal order, called ladder orientation, or a vertical order, called picket fence orientation. (Jadhav 2015.)

The warehouse management system enables identification and addition of coded products to stock held in the warehouse. By using barcodes, it is possible to speed up the company's operations significantly. When put away, the bar-code acts as a detector to connect a storage location to bar-coded equipment. (Jadhav 2015.)

6.3.3 Enterprise Resource Planning (ERP) Systems

Enterprise Resource Planning (ERP) Systems are Enterprise-wide Information Systems used for automating all activities and functions of a business. These are transaction-based information systems that are integrated across the whole business. (Jadhav 2015.)

The purpose of ERP systems is to collect all of the company's internal information into a single entity that enables centralization of all key business information functions to one source. Such functions include customer orders and financial information as example. Acquiring and integrating an ERP application into an organization can be a great financial investment and can lead to large internal changes within the organization. (Jadhav 2015.)

It will have implications in terms of Business Process Reengineering (BPR), changes in organizational structure, people and change management. Many companies have benefited from using this system whilst some have experienced severe problems with their application. Generally, they also require a lot of customization and training for each user. (Jadhav 2015.)

6.3.4 Warehouse Management Systems

Warehouse management systems are systems that control all the traditional activities of warehouse operations. Areas covered usually include receipt of goods, allocation or recording of storage locations, replenishment of picking locations, production of picking instructions or lists, order picking, order assembly and stock rotation.). For example, when picking that it will provide the tasks for the operative to carry out. Once the task is complete, the operative updates the system and is directed to the next task.”(Jadhav 2015.)

One of the biggest benefits in warehouse management system is to update the stock content in real time. Full automation of warehouses is possible with the most sophisticated systems. There are also very complicated 3D simulation models that have been developed to assist in warehouse design and configuration. These models give you a moving and graphical look at the illustration of your inventory and thus provide you with the best possible options in warehouse management. (Jadhav 2015.)

6.3.5 Transportation Management Systems

Transportation Management Systems provide more visibility into shipments and orders. Scheduling issues are also addressed on time. Multiple transportation options can be explored as a result of earlier visibility into the supply chain. Timely communication and status reports can also be obtained. (Jadhav 2015.)

Supply chain management enables more efficient and generally more profitable routing decisions. A new transportation management system will enable companies to have a faster and more efficient ability to send relevant freight information. Better planning for labor, lower administrative costs and their management are also the benefits of the new transportation management system. (Jadhav 2015.)

6.3.6 Inventory Management Systems

Inventory management systems are the rule for such enterprises, but smaller vendors and businesses use them, too. The systems ascertain customers always have enough of what they want and balance that goal against a retailer's financial need to maintain as little stock as possible. (Jadhav 2015.)

Weak management of inventory leads to many negative things affecting the company's business. Such things include dissatisfied customers, less efficient sales, and too much money tied to the warehouses. Fast production cycles, globalization of businesses, growing number of products, and the nature of large stores make inventory management systems virtually mandatory for the company's success. Real-time communication with the suppliers of the available storage and the ability to receive it, alongside monitoring sales, is essential for modern inventory management system. Intuition-enabled flexibility is mandatory for the system in use. The system should also be able to tell how much should be bought and when it is time to make a reorder. (Jadhav 2015.)

6.3.7 Supply Chain Simulation Software

Supply chain simulation is the imitation of the real life processes or systems to perfect organizations performance. The behavior of the system over time can be viewed with a simulation model, which usually consists of a set of rules related to the behavior of the system. Rules are usually expressed in mathematical, logical or symbolic relationships between system entities or objects. Once the simulation model has been developed and verified, it can make large size "what if" analyzes based on information from the real world. Potential behavioral changes can first be simulated in order to see their effects on the performance of the system. Simulation can also be used at system design stages to examine their behavior before construction, which gives the organization a great benefit in the supply chains design phase. All in all, supply chain simulation is an excellent way to minimize risks and maximize profitability. This gives a great competitive advantage to any company or organization in general. (Luomanmäki 2017.)

7 MEASURING THE EFFECTIVENESS OF SUPPLY CHAIN

Measuring the efficiency of the supply chain is a very important part of supply chain development work. Measuring and analyzing the efficiency of operations is the basis for the supply chain design, from which it is possible to start the work to develop the whole activity. An excellent tool for analyzing the results can be a variety of simulation programs that can be used to find alternative approaches to maximize operational productivity.

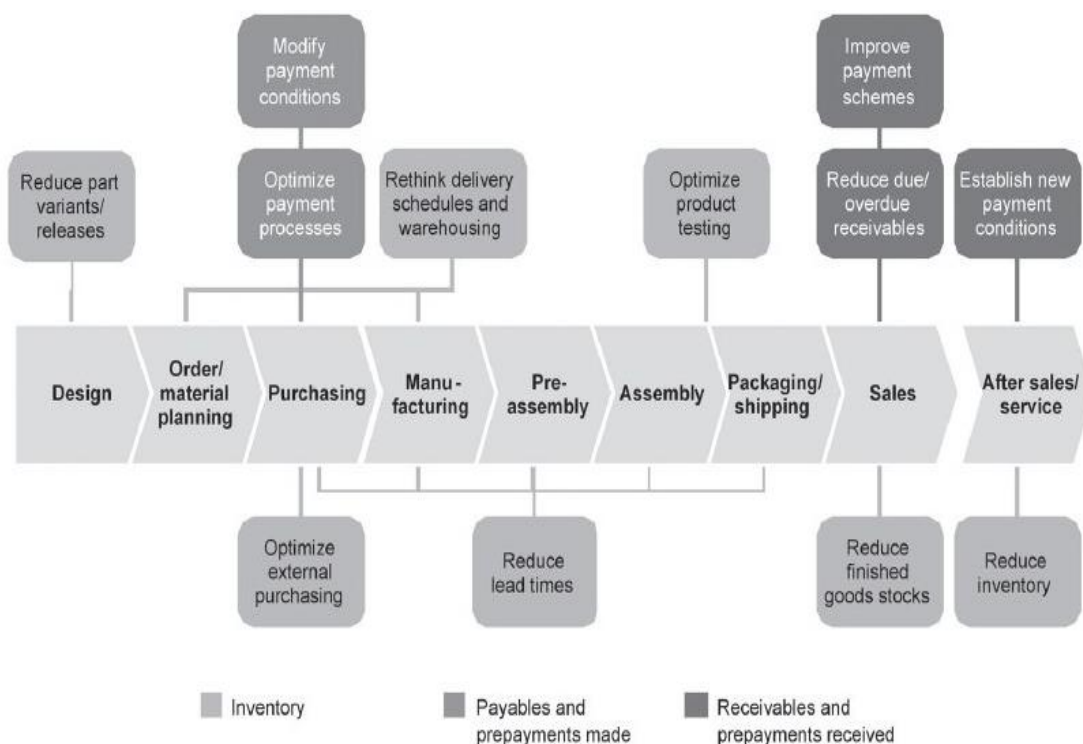


FIGURE 6. Measuring effectiveness of the supply chain. (Matopoulos, Vlachopoulou, Manthou & Manos 2007)

For the measurement of supply chain performance the efficiency or the effectiveness of an outcome of a supply chain activity need to be analyzed. Efficiency describes an input/output relation while effectiveness shows how well supply chain goals have been achieved. In this sense, supply chain performance can be seen as a function of the utilization of supply chain resources or as a function of supply chain results as compared to supply chain targets. There are basically three functions attributed to supply chain performance indicators:

- Information function in order to inform management, support decision making and to identify problem areas.
- Steering function in order to set targets and give directions to desired outcomes.
- Controlling function in order to supervise process execution. (Sillanpää 2010.)

7.1 Supply Chain Performance Measures

Creating appropriate performance measures is an essential part of good supply chain planning and analysis. Performance measurement or set of performance measures are used to determine the efficiency of an existing system. It also serves as a tool for comparing competing alternative systems. Performance measures can also be used to design planned systems by defining the values of their decision variables that produce a desirable performance level. The efficiency of the supply chain can be estimated in two different categories, qualitative or quantitative. (Beamon 1998.)

7.1.1 Qualitative Performance Measures

Qualitative performance measures are measures for which there is no direct numerical measurement, although some of them can be quantified. These definitions include the following elements:

Customer Satisfaction: Customer Satisfaction with a Received Product or Service and may be relevant to internal customers or external customers. Customer Satisfaction consists of three factors. The first factor is pre-transaction satisfaction, which includes service elements that occur before the purchase. Transaction satisfaction is the second factor. This factor is associated with service elements which are directly involved in the physical distribution of merchandise. The third and final factor is post-transaction satisfaction. This is a customer support provided during the actual use of the product.

Flexibility: the supply chain's ability to respond to the random variation in demand in the market.

Information and material flow integration: The extent to which all functions within the supply chain communicate information and transport materials.

Effective risk management: Risk is an integral part of all supply chain relationships. Effective risk management is about how to minimize the effects of these risks.'

Supplier performance: By what consistency suppliers deliver raw materials to production facilities. Essential factors include whether the goods are in time and in good condition. (Beamon 1998.)

7.1.2 Quantitative Performance Measures

Quantitative performance measures are those measures that may be directly described numerically. There are two categories that quantitative supply chain performance measures may be divided. The first category is objectives that are based directly on cost or profit. And the second category is objectives that are based on some measure of customer responsiveness. (Beamon 1998.)

Measures based on cost:

- Cost minimization: One of the most commonly used objective in any business environment. It can be specified to entire supply chain or for particular business unit.
- Sales maximization: Maximization of sold units.
- Profit maximization: Maximize your revenue with smaller expenses.
- Inventory investment minimization: decrease your inventory costs including product costs and holding costs.
- Return on investment maximization: Maximize the ratio of net profit to capital, which was used to produce that profit. (Beamon 1998.)

Measures based on customer responsiveness:

- Fill rate maximization: maximize the amount of customers' orders filled on time.
- Product lateness minimization: minimize delivery time between the promised date and actual products delivery time.

- Customer response time minimization: decrease the amount of time between when order is placed and when customer receives it. Considers in the most cases only external customers.
- Lead time minimization: minimize the overall manufacturing time of the products from start to finish.
- Function duplication minimization: Minimize the amount of business functions which are provided by multiple business entities. (Beamon 1998.)

8 CASE STUDY

In this study Finn Spring Oy serves as an example of a well-organized company in supply chain solutions. I have interviewed Finn Spring Ltd.'s representative about their supply chain arrangements to illustrate the previous content of my research. The purpose of this case study is to create a perspective for the planning, management and analysis of supply chain as part of the company's operations and development.

In my research, I am getting acquainted with the company's solutions regarding the design of their supply chain, what kind of tools and methods are included in the processes, and to create as comprehensive picture as possible of their role within their business chain.

8.1 Finn Spring Ltd

Finn Spring Oy is a Finnish family company established in 1991, which produces spring water and soft drinks in Toholampi. The company also has a production plant in Lestijärvi. Finn Spring is Finland's largest bottler of spring water and its market share in Finland is about 80 per cent. Finn Spring employs about 80 people. The basis of the company's products is pure and fresh Finnish spring water, which comes from Syrinharju, Multila's natural spring. Finn Spring bottles various spring water-based beverages over 60 million liters a year. (Finder.)

The main business idea of the Finns Spring Oy is to develop and produce different spring water based drinks for company's own SPRING brand and for customers' own brands. The main goal is to make Finnish fresh water-based products according to customers' wishes and requirements. Showing respect for the environment and appreciation of the customer are also very important values for the company. (Finn Spring Oy.)

The mission of the company is to meet the customer's wishes and demands. In addition, the company strives to bring added value to the customers by providing high quality, cost-effective and profitable products and information on the origin and ecology of the product. (Finn Spring Oy.)

8.2 Interview

In this part of the study, I interviewed a representative of Finns Spring Oy from their point of view in supply chain management and development. The purpose of the interview is to provide a concrete example of how supply chain issues can be handled in a well-organized company.

Question 1 - How would you describe your supply chain?

Our supply chain starts from the information we get from sales and marketing. That specifies the material needs to production.

Product developing and planning gives instructions of needed raw materials. Purchasing find out suppliers and tenders them to all materials we need in our production. Together with our quality department all suppliers will be audited. We check that they fill all our quality standards and ethical norms. With these criterions we choose our vendors. We make contract with them principally to 12 months period. In contract is for example prices, minimum order quantities and terms of delivery.

We have built product structure of all items we produce to our ERP system. There we can find all materials and amounts we need to make a product. To every material has been a defined minimum stock limit and with those we can make orders. Logistics and stock handling take care, that raw material to production is always at the right time in a right place.

Supply chain can be described:

- Order
- Order confirmation
- Delivery control
- Handling of possible claim
- Checking the stock amount
- Inspection of the invoice

Question 2 - What is your position in it?

Purchaser.

Question 3 - What are the strengths of your supply chain?

Seamless cooperation within our organization.

Question 4 - What are the weaknesses of your supply chain?

To build the product structure concerning certain materials, that the stock values keeps right at all times.

Question 5 - What kind of major challenges and problems have you faced and how have you solved them?

Big unexpected orders may cause problems, if the delivery time is short. Some of our raw material cannot be stored long time what means that we can't keep large stock. Good relationships with our supplier have given flexibility regarding delivery times and they have prepared to possible fast deliveries.

Question 6 - How would you describe the overall effectiveness of your supply chain?

Very efficient organization in our company gives reliability and safety to all our supply chain. We have no problem with too large stock and we don't have to concentrate on "extinguishing fires".

Question 7 - How important role does the logistics planning have in your company?

We don't have to arrange much the logistics of incoming material, but the logistics of outgoing products have very important role in our operations. The product flow to our customers is very large and needs careful planning and good cooperation between our sales, production and logistics.

Question 8 - How are you planning to improve your logistics in the future?

The improving of logistics happens basically in our internal actions. That means the tracking of our finished products with RFID tags. With those we can follow products within our production and stocking chain.

RFID system is also used, when we load trailers to our customers. We can follow all items and be sure that there are right products in lorry. This reduces possible mistakes to minimum. This improvement saves a lot of money and work and makes our supply chain flexible.

Question 9 - What kind of IT tools are used within your supply chain? (ERP, EDI, warehouse management systems, etc)

We use Visma Nova financial and enterprise resource planning software.

Question 10 - How much time do you spend designing, managing and analyzing your supply chain?

It is difficult to specify the time used to that because it is an essential part of the daily work with our supply chain.

Question 11 - How do you communicate within your supply chain? (do you prefer phone, email, meeting or so)

Mainly the order will be made via email, but I am very often in contact with our suppliers using phone. At least once in a year I meet them at the table.

Question 12 - Do you have any ethical requirements from your business partners?

Yes, we have ethical requirements for example regarding the child labor. We require sedex number from our suppliers, who are from so called risk countries, specified by BSCI.

Question 13 - Are there any ongoing projects to improve your supply chain?

Currently this time there aren't any new projects, but all the time we try to develop our working in our organization, which has an influence on our work in the supply chain.

Question 14 - How much value have you given to your work to improving your supply chain?

Improving the supply chain is one of the most important things in all activities in companies with producing own products.

9 CONCLUSION

Supply Chain is a complex entity with many variables and problems to be taken into consideration. However, a well-planned and designed supply chain is really a great resource to every company and organization's business. If the design phase is handled thoroughly and carefully enough, a starting point will be created that will enable cost-effective operation and the best possible position in the company's own market.

During the design phase, it is important to understand the overall picture of the whole process in order to find the best possible solutions. There are many essential questions, which should be answered as thoroughly as possible. Who do I want to be part of my supply chain? What kind of features should I find from my partners? What is the best logistical solution for my situation? How do I get the best possible level of communication? What kind of IT tools do you need to acquire? There are numerous issues related to planning and implementation, and everybody needs to find a solution to make the business as profitable as possible.

When the supply chain is carefully designed, the company can start the implementation process. This step requires a lot of cooperation with business partners, which highlights the value of good communication and the automated information flow within the supply chain. The integration of the operating processes of the partners into a single functional entity must be done, with a lot of time and effort to maximize the profitability of the supply chain. Integrating the operational processes of all the members of the supply chain is assignment, which should be given enough time and effort to maximize the profitability of the whole supply chain.

It is easy to notice that the importance of IT tools in the organization's work is growing more and more to be one of the most essential parts of the designing process. The right tools can minimize costs, manage resources more efficiently, and find the right logistical solutions from the production process to the supply of goods. For example, the supply chain simulation program can be used to help you find the best solutions by trying every possibility in riskless environment.

Controlling and monitoring the entire activity can be done, for example, with an ERP system that can integrate the supply chain with each company so that all the required information is

passed on to all parties in real time. ERP systems also make controlling your assets much easier.

One of the conditions for continuous development is the analysis of results and performance. Analyzing results can measure the strengths and weaknesses of the activity. Thus, it is also possible to find the potential problems of the activity and how to best influence them. Supply chain design, management, and analysis are ongoing processes that will be able to achieve a significant competitive advantage regardless of the company's field of business.

REFERENCES

Banker, S. 2012. To Understand a Supply Chain, You Need to Model It With Supply Chain Design Tools. Available: <https://logisticsviewpoints.com/2012/11/12/to-understand-a-supply-chain-you-need-to-model-it-with-supply-chain-design-tools/>. Accessed 15.7.2017

Barve, A. 2002. Lessons in Demand Management . Available: <https://scm.ncsu.edu/scm-articles/article/lessons-in-demand-management>. Accessed: 15.7.2017.

Battilana, R. & Luukkola, J. 2012. Toimitusketjun hallinta - Case Oy Transmeri Ab. Leppävaara: Laurea ammattikorkeakoulu.

Beamon, B. 1998. Supply chain design and analysis: Models and methods. Available: <http://www.sciencedirect.com/science/article/pii/S0925527398000796>. Accessed: 2.8.2017.

Benavides, L. De Eskinazis, V. & Swan, D. 2012. Six Steps to Successful Supply Chain Collaboration. Available: <http://www.supplychainquarterly.com/topics/Strategy/20120622-six-steps-to-successful-supply-chain-collaboration/>. Accessed: 2.8.2017.

Cadden, D. & Leuder, S. 2013). The Supply Chain and a Firm's Role in It. Available: https://saylordotorg.github.io/text_small-business-management-in-the-21st-century/s15-01-the-supply-chain-and-a-firm-s-.html. Accessed: 5.8.2017.

Cristopher, M. (2016). Logistics and supply chain management, fifth edition. FT publishing international.

Finder.fi. n.d. Finn Spring Oy. Available: <https://www.finder.fi/Juomateollisuutta+panimoteollisuutta/Finn+Spring+Oy/Syk%C3%A4r%C3%A4inen/yhteystiedot/133476>. Accessed: 15.7.2017.

Finn Spring Oy. (n.d.). Finn Spring Oy. Available: <https://finnspring.fi/>. Accessed: 28.10.2017.

Oxford professional education group. 2016. Why the Communication Is the Key to Supply Chain Success. Available: <https://www.oxfordcollegeofprocurementandsupply.com/why-communication-is-key-to-supply-chain-success/>. Accessed: 5.8.2017.

Hodge, G. & Cagle, C. 2004. AUTEX research journalm Vol 4, No 4. Business-to-Business Models: Classification and Textile Industry Implications. Lodz University of Technology, Faculty of Material Technologies and Textile Design.

Jadhav, V. 2015. International Journal of Management Research & Review.

Kauffman, R. & Crimi, T. 2017. Supply Chain Design: A Necessary Core Competency to Build Sustainable Competitive Advantage. Available: <https://www.instituteforsupplymanagement.org/pubs/Proceedings/confproceedingsdetail.cfm?ItemNumber=11813&SSO=1>. Accessed: 15.7.2017.

Khurana, M. 2016. Top 4 Benefits of Integrated Supply Chain. Available: <http://www.inspirage.com/2016/09/top-4-benefits-integrated-supply-chain/>. Accessed: 15.7.2017.

Linton, I. 2013. What Are the Four Elements of Supply Chain Management? Available: <http://smallbusiness.chron.com/four-elements-supply-chain-management-52355.html>. Accessed: 2.8.2017.

Lottersberger, A. 2012. Design, innovation and competitiveness in the textile industry. Milano: Politecnico di Milano.

Luomanmäki, T. 2017. Teknologiaosaamisen johtaminen. Seinäjoki: SeAMK tekniikka.

Matopoulos, A. Vlachopoulou, M. Manthou, V. & Manos, B. 2007. Supply Chain Management: An International Journal. Scopus. Available: <http://www.emeraldinsight.com/doi/full/10.1108/13598540710742491>. Accessed: 2.8.2017.

Mattila, H. 2017. SWW-Project. Presentation in Riga, Latvia. Riga: Centria UAS.

Moon, N. 2016. Six essential components of good supply chain design. Available: <https://www.linkedin.com/pulse/six-essential-components-good-supply-chain-design-36-neil-moon>. Accessed: 11.9.2017.

Neumann, A. 2016. 7 Areas of Supply Chain. Available: <https://www.supplychain4me.com/7-areas-of-supply-chain>. Accessed: 12.9.2017.

Rautauoma, R. 2013. Kysynnän ja tarjonnan hallinta. Available: <http://www.logistiikanmaailma.fi/logistiikka/logistiikka-ja-toimitusketju/kysynnan-ja-tarjonnan-hallinta/>. Accessed: 20.10.2017.

Sarna, S. K. 2014. Supply Chain Management. Available: <https://ispatguru.com/supply-chain-management/>. Accessed: 20.10.2017.

Sillanpää, I. 2010. Supply Chain Performance Measurement in the Manufacturing Industry. Oulu: University of Oulu.

Woods, C. 2015. What Is Supply Chain Integration? - Definition & Overview. Available: <http://study.com/academy/lesson/what-is-supply-chain-integration-definition-lesson-quiz.html>. Accessed: 12.9.2017.