

2017

SUPPLY CHAIN MANAGEMENT

Survey of supply chain models in clothing industry



Authors:

Juha Kujala

Jari Ylitalo

(Supervisor and editor: Egidija Rainosalo)

The study is financed by the European Union's European Regional Development Fund,
through the INTERREG BSR Programme, which awarded a grant to the SWW project (#R006)

Table of contents

1 INTRODUCTION	3
2 SUPPLY CHAIN MANAGEMENT	4
3 SUPPLY CHAIN DESIGN	6
4 WORK WEAR INDUSTRY SUPPLY CHAIN DESIGN	9
4.1. Business Models	9
4.2. Sourcing	10
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: Process, procedures and systems	14
5.4 Step 4: Planning and communication	15
5.5 Step 5: Outsourcing	16
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
6.2 Processes	24
6.2.1 Demand management	24
6.2.2 Integration	26
6.3 IT enablements	28
6.3.1 Electronic data interchange	28
6.3.2 Bar codes and scanners	28
6.3.3 Enterprise resource planning (ERP) systems	29
6.3.4 Warehouse management systems	29
6.3.5 Transportation management systems	30
6.3.6 Inventory management systems	30
7 MEASURING THE EFFECTIVENESS OF SUPPLY CHAIN	31
REFERENCES	32

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 produce 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 project partner's supply chain and designing a generalized supply chain management model for the work wear industry.

2 SUPPLY CHAIN MANAGEMENT

If your company makes a product from parts purchased from suppliers, and those products are sold to customers, then you have a supply chain. Some supply chains are simple, while others are rather complicated. The complexity of the supply chain will vary with the size of business and the intricacy and numbers of items that are manufactured. (<http://www.investopedia.com/terms/s/scm.asp>).

Elements of the supply chain

A simple supply chain is made of several elements that are linked by the movements of products along it.

The supply chain starts and ends with the customer.

- **Customer:** The customer starts the chain of events when they decide to purchase a products that has been for chain by a company. The customer contacts the sales department of the company, which enters the sales order for a specific quantity to be delivered on a specific date. If the product has to be manufactured, the sales order will include requirement that needs to be fulfilled by the production facility. (A. Neumann, 2016, M. Cristopher, 2016).
- **Planning:** The requirement triggered by the customer's sales order will be combined with other orders. The planning department will create a production plan to produce the products to fill the customer's orders. To manufacture the products the company will then have to purchase raw materials needed. (A. Neumann, 2016, M. Cristopher, 2016).
- **Purchasing:** The purchasing department receives a list of raw materials and services required by the production department to complete the customer's orders. The purchasing department sends purchasing orders to selected suppliers to deliver the necessary raw materials to the manufacturing site on the required date. (A. Neumann, 2016, M. Cristopher, 2016).
- **Inventory:** The raw materials are received from suppliers, checked for quality and accuracy and moved into warehouse. The supplier will then send an

invoice to the company for the items they delivered. The raw materials are stored until they are required by the production department. (A. Neumann, 2016, M. Cristopher, 2016).

- **Production:** Based on a production plan, the raw materials are moved from inventory to the production area. The finished products ordered by the customer are manufactured using the raw materials purchased from suppliers. After the items have been completed and tested, they are stored back in the warehouse prior to delivery to the customer. (A. Neumann, 2016, M. Cristopher, 2016).
- **Transportation:** When the finished product arrives in the warehouse, the shipping department determines the most efficient method to ship the products so that they are delivered on or before the date specified by the customer, the company will send an invoice for the delivered products. (A. Neumann, 2016, M. Cristopher, 2016).

To ensure that the supply chain is operating as efficient as possible and generating the highest level of customer satisfaction at the lowest cost, companies have adopted supply chain management processes and associated technology. Supply chain management has three levels of activities that different parts of company will focus on: strategic; tactical; and operational. (Sarna, 2014).

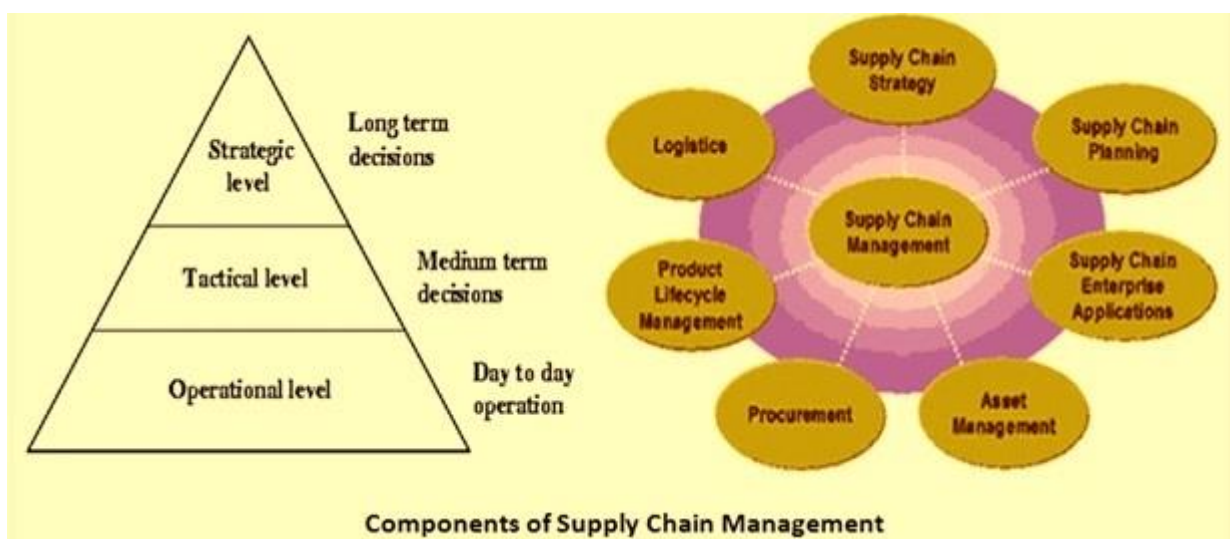


Figure 1: Decision levels and main components of SCM (Sarna, 2014).

- **Strategic**: At this level, company management will be looking to high-level strategic decisions concerning the whole organization, such as the size and location of manufacturing sites, partnerships with suppliers, products to be manufactures, and sales markets (Sarna, 2014).
- **Tactical**: Tactical decisions focus on adopting measures that will produce cost benefits such as using industry best practices, developing a purchasing strategy with favored suppliers, working with logistics companies to develop cost effect transportation, and developing warehouse strategies to reduce the cost of storing inventory (Sarna, 2014).
- **Operational**: Decisions at this level are made each day in businesses that affect how the products move along the supply chain. Operational decisions involve making schedule changes to production, purchasing agreements with suppliers, taking order s from customers, and moving products in the warehouse (Sarna, 2014).

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. Banker, 2012).

Key Elements of Supply Chain



Figure 2 – Specified key elements of supply chain. (Cadden, Leuder, 2013)

Designing company's supply chain to get 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 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 right marketing and sourcing strategies is vital to generate the best possible financial performance. (Banker, 2012).

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 supply chain suited for specific company is to understand the situation. Both internal and external things should be taken to consideration. When to know what is the right amount 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 company is aware of where its customers are, it's possible to understand what products should be manufactured in specific factories to serve customer as efficiently as possible. (Beamon, 1998).

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

4 WORK WEAR INDUSTRY SUPPLY CHAIN DESIGN

4.1. Business Models

The overall objective of business models is to create value for all parties involved, which happens through the value proposition. The main role of the business model construct is to find and design promising business concepts, as well as a being a tool that enables sharing, developing and managing of the business (Hodge, Cagle, 2004).

Work wear companies can adopt a number of different business models to grow their businesses and differentiate their products in the market place. Key elements to consider when building a new business model or evolving an existing one include: outsourcing production; sourcing strategically or opportunistically; increasing the number of collections in a year and having shorter product life cycles; extending the brand; expanding into retail; multichannel selling; vertical integration; increasing control of the supply chain and agility in reacting to changes; multi-sourcing; and building customer intimacy (Hodge, Cagle, 2014).

Innovative business models can offer textile and apparel companies a competitive advantage. Often a textile and apparel company's business model has core competencies embedded within it which are hard to copy. It is recommended, therefore, that all apparel and textile companies should regularly review their business models, 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 (22):

- 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

4.2. Sourcing

The concept of supply chain in a manufacturing organization can be defined as the interrelation of activities. It is a chain because it links together the activities that are needed in order to accomplish the final goal, which is the final delivery of the goods or services. These activities vary between organizations that obtain the raw materials, resources and information necessary for starting work (Lottersberger, 2012).

Sourcing in other hand concentrates in the development of supply channels in a strategic way and it searches not only to the lowest purchasing cost, but for the lowest total cost. It has a strategic level, that covers the purchasing decisions on a long term and influence the organization's position in the industry. Some of these decisions include establishing long term contracts, investment decisions and sourcing strategies to use such as where to source the materials. It is a joint effort of a cross functional team that includes sourcing, procurement, engineering, quality, design, manufacturing, and logistics, among others (Lottersberger, 2012).

The increased importance of the supply chain is forcing the organizations to evaluate the purchasing and sourcing strategies, as they are the first link to accomplish the supply chain goals. Therefore, this research is focused mainly on the first key dimension of the supply chain strategy which is the sourcing strategy within the procurement functions, which are a main driver for performance indicators and takes a leadership role in the design and implementation of the supply chain (Hodge, Cagle, 2004).

The terms purchasing, procurement and sourcing are often found to be used with the same meaning in discussions about the buying activities, however the three of them have different meanings and different levels. Purchasing refers to the function of buying or acquiring goods and services as a transactional activity, and it manages the flow of materials and information as an operational process, searching for the lower purchasing cost. This operational level include placing purchase orders, expediting materials, monitoring the deliveries, and dealing with daily problems on quality and quantity of the materials received, follow up on the payment to the suppliers and evaluate the suppliers performance. The purchasing term is often interchanged with

the procurement term, however procurement involves additional activities to the purchasing transactions, such as the materials" management including goods and services and secures that the purchasing activities achieve the appropriate service. This activity has a tactical level, and deals with the agreements with suppliers, conducting audits and certifications, quality improvement on materials, and programs dedicated to the improvement on suppliers' performance. On the other hand, sourcing concentrates in the development of supply channels in a strategic way and it searches not only to the lowest purchasing cost, but for the lowest total cost. It has a strategic level, that covers the purchasing decisions on a long term and influence the organization's position in the industry. Some of these decisions include establishing long term contracts, investment decisions and sourcing strategies to use such as where to source the materials. It is a joint effort of a cross functional team that includes sourcing, procurement, engineering, quality, design, manufacturing, and logistics, among others (Lottersberger, 2012). In the work wear industry the sourcing can be conceptualized as follows:



Figure 3 – Work wear industry sourcing. (Mattila, 2017)

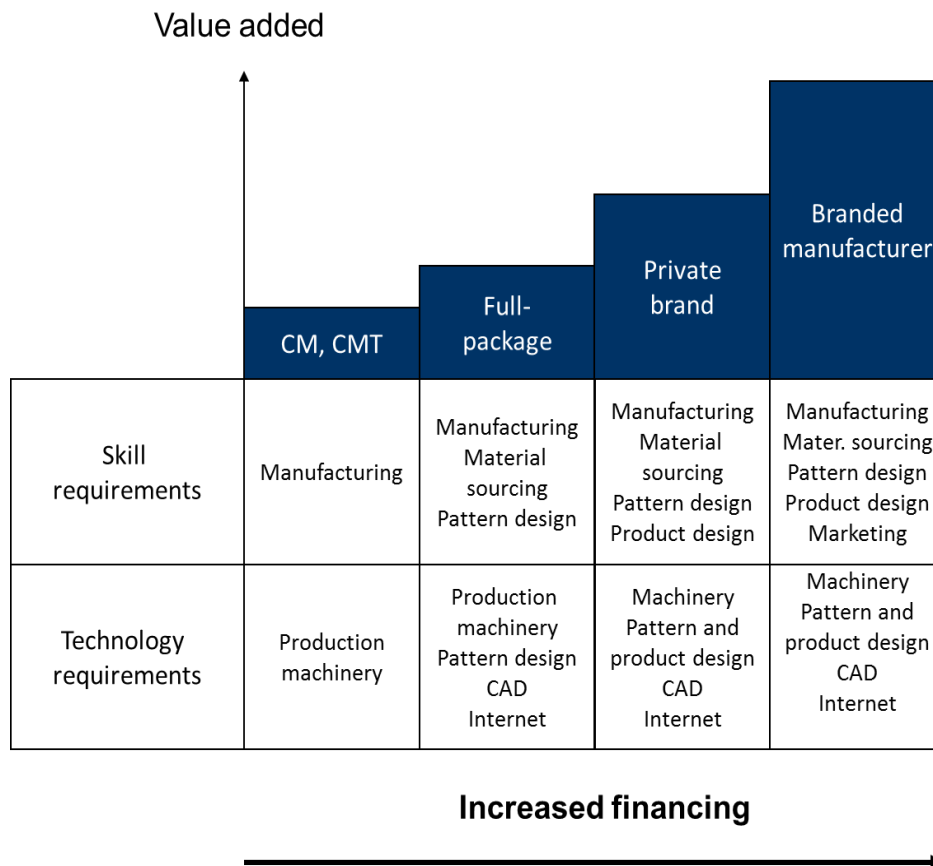


Figure 4 - Work wear industry sourcing. (Mattila, 2017)

5 STEPS OF SUPPLY CHAIN DESIGN PROCESS

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 thinking considered of successful strategies in the last few years. IT tools and data analysis has developed to allow and support this. (Moon, 2017).

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,17).

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.

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,17).

5.2 Step 2: Supply chain assets and routing.

If company provides a physical product, then it can be assumed that only the manufacturing itself is only 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,17).

“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,17).

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,17).

“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,17).

5.3 Step 3: Process, 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,17).

“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,17).

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:

- Common technology used interactively
- Information flow
- Error identification and correction
- Parallel or consecutive processes (Moon,17).

“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,17).

5.4 Step 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.

“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,17).

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 allows for a long-term plan without the need to invest in a specialized software system. (Moon,17).

“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,17).

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,17).

“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,17).

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 specialised are the skills and resources required?” (Moon,17).*

Finding the right partner for a service after the outsourcing decision is very important. It is too common for 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 you and your partners should face each other. (Moon,17).

“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,17).

5.6 Step 6: People and culture

“All too often we are so focussed 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,17).

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,17).

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,17).

“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,17).

6 MAIN ELEMENTS OF SUPPLY CHAIN DESIGN

6.1 Communication

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. Lack 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 the situation. (Linton 2013).

There are many things that must be taken to consideration to make the best of company's supply chain trough collaboration.

The first thing is to start improve 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 to 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 to 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 a 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. (Oxford professional education 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 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. (Oxford professional education 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.

An Overall Framework of Supply Chain Collaboration

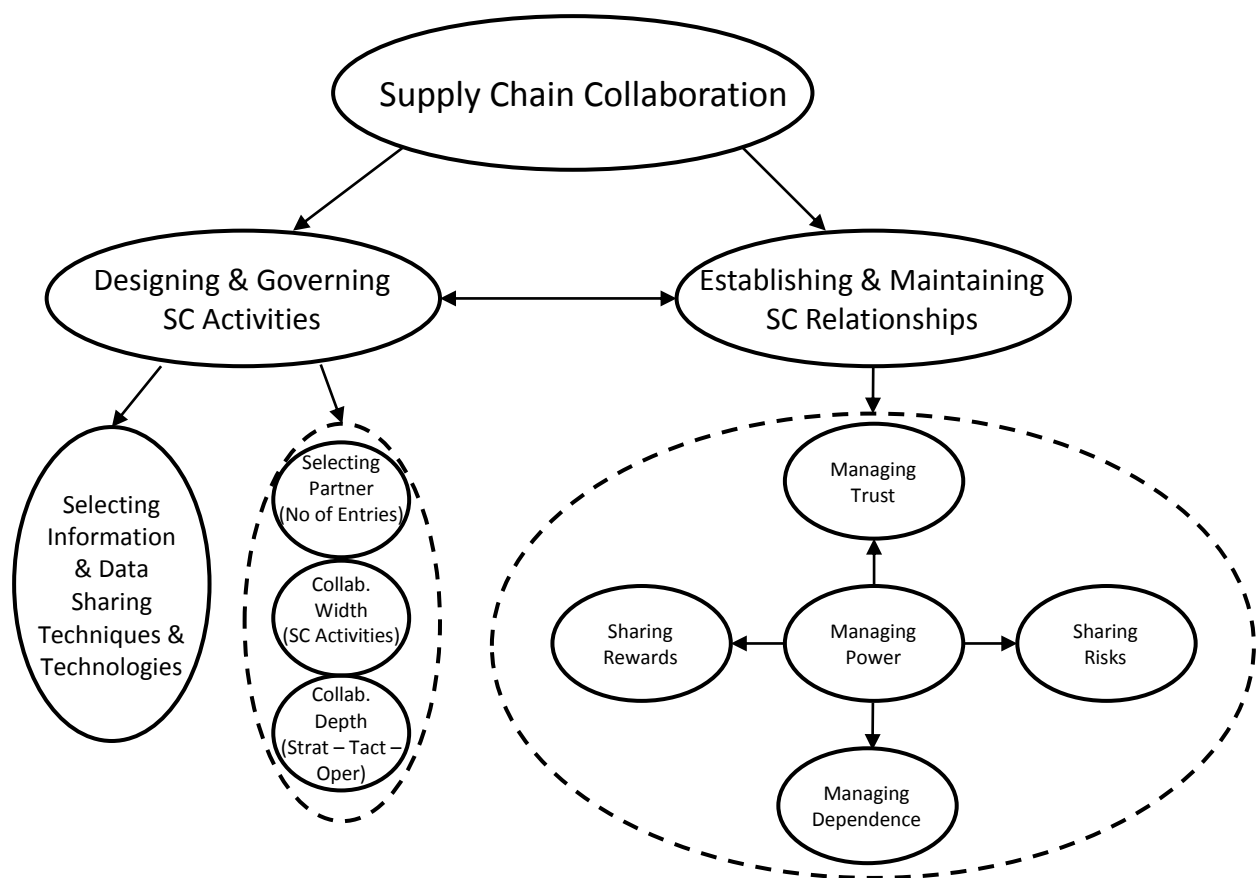


Figure 5 – Linking supply chain activities. (A. Matopoulos, M. Vlachopoulou, V. Manthou, B. Manos, 2007)

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

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 does 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 company's control over product availability, confidence of sales force in ability deliver product, smoother product instructions, and greatly improved ability to respond 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 have these components, they all are needed to work together. This way the real fluency and efficiency can be achieved.

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

- **1-Staying on top of demand**

Integrated supply chain, logistics and product innovation strategies enables 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. (Woods, 2015).

- **2 –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. (Woods, 2015).

- **3 – 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. Sustainable and successful supply chain can be accomplished by integrating data from across the operations. (Woods, 2015).

- **4 – 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 very demanding task but with right tools and methods it can be made very profitable to all companies included in supply chain. (Woods 2015).

It is critical to 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

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 Bar codes 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 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 amount 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).

7 MEASURING THE EFFECTIVENESS OF SUPPLY CHAIN

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).

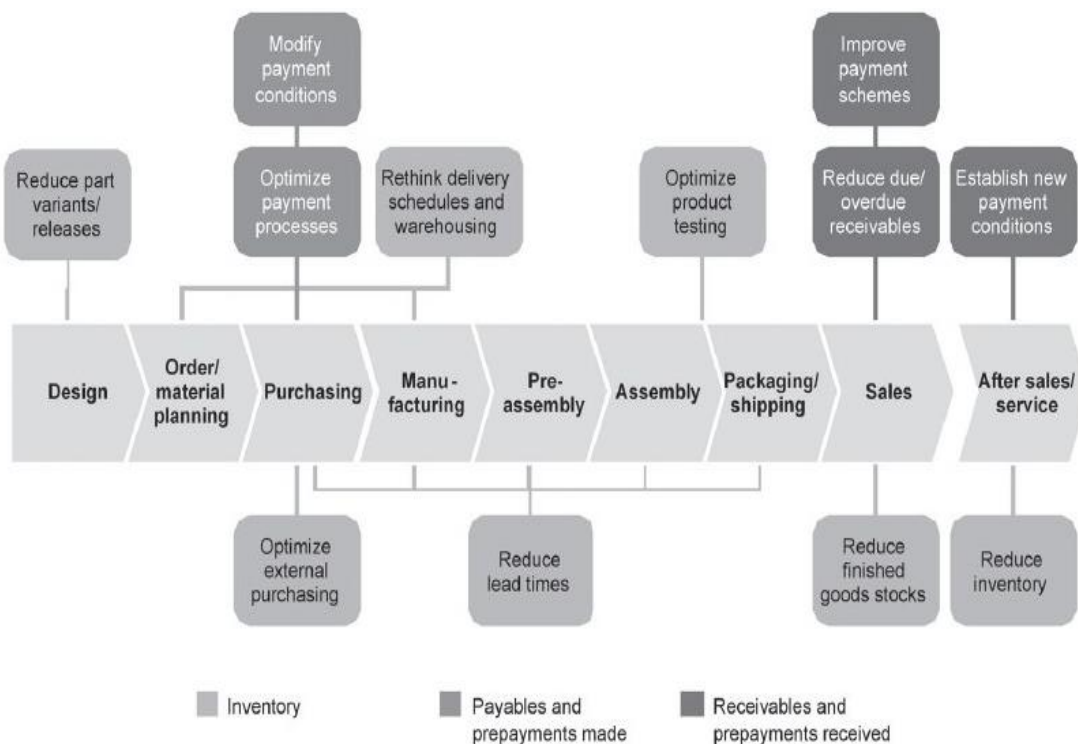


Figure 6 – Measuring effectiveness of the supply chain. (A. Matopoulos, M. Vlachopoulou, V. Manthou, B. Manos, 2007)

REFERENCES

- 1- <http://www.investopedia.com/terms/s/scm.asp>
- 2- Satyendra Kumar Sarna, 2014 <http://ispatguru.com/supply-chain-management/>
- 3- Ann Neumann, 2016, <https://www.supplychain4me.com/7-areas-of-supply-chain>
- 4- Martin Cristopher, Logistics and supply chain management, fifth edition, 2016
- 5- Ralph G. Kauffman, Assistant Professor, University of Houston-Downtown, Houston. Thomas A. Crimi, Supply Chain Team Coordinator, Texaco, Inc., Bellaire, 2017
<https://www.instituteforsupplymanagement.org/pubs/Proceedings/confproceedingsdetail.cfm?ItemNumber=11813&SSO=1>
- 6- Steve Banker 2012, <https://logisticsviewpoints.com/2012/11/12/to-understand-a-supply-chain-you-need-to-model-it-with-supply-chain-design-tools/>
- 7- Benita M. Beamon Department of Mechanical, Supply chain design and analysis: Models and methods - Industrial, and Nuclear Engineering, University of Cincinnati, Cincinnati, OH 45221-0116, USA Received 24 April 1997; accepted 15 April 1998
- 8- Ian Linton ,2013 <http://smallbusiness.chron.com/four-elements-supply-chain-management-52355.html>
- 9- Asmita Barve, 2002 <https://scm.ncsu.edu/scm-articles/article/lessons-in-demand-management>
- 10- <https://www.techopedia.com/definition/28072/demand-management>
- 11- Reijo Rautauoma, 2013, <http://www.logistiikanmaailma.fi/logistiikka/logistiikka-ja-toimitusketju/kysynnan-ja-tarjonnan-hallinta/>
- 12- Oxford Professional Education Group, 2016
<https://www.oxfordcollegeofprocurementandsupply.com/why-communication-is-key-to-supply-chain-success/>
- 13- Carol Woods, 2015
<http://study.com/academy/lesson/what-is-supply-chain-integration-definition-lesson-quiz.html>
- 14- Mo Khurana, 2016 <http://www.inspirage.com/2016/09/top-4-benefits-integrated-supply-chain/>
- 15- Luis Benavides, Verda De Eskinazis, Daniel Swan, 2012
<http://www.supplychainquarterly.com/topics/Strategy/20120622-six-steps-to-successful-supply-chain-collaboration/>
- 16- Neil Moon, 2016 <http://www.thinkglobalgrowth.com/general-blogs/six-components-supply-chain-design/>
- 17- Neil Moon, 2016 <https://www.linkedin.com/pulse/six-essential-components-good-supply-chain-design-36-neil-moon>
- 18- Vishal Jadhav June 2015/ Volume 5/Issue 6/Article No-4/369-379, / International Journal of Management Research & Review
- 19- Albayrakoglu M, Koprulu, A. 2007. Supply Chain Management in the Textile Industry: A Supplier Selection Model with the Analytical Hierarchy Process. Istanbul Bilgi University, Istanbul, Turkey.
- 20- Hodge, G., Cagle, C. 2004. Business-to-Business Models: Classification and Textile Industry Implications. AUTEX Research Journal, Vol 4, No 4. North Carolina University, USA

- 21- Lottersberger, A. 2012. Design, Innovation and Competitiveness in the Textile Industry. Ph.D. Thesis, Politecnico di Milano, Milano, Italy.
- 22- Mattila, H. 2017. SWW –Project, Presentation in Riga, Latvia, Centria UAS, Kokkola, Finland.
- 23- Sillanpää, I. 2010. Supply Chain Performance Measurement in the Manufacturing Industry. University of Oulu, Oulu, Finland

Figure 1 - Satyendra Kumar Sarna, 2014 <http://ispatguru.com/supply-chain-management/>

Figure 2 – David cadden, Sandra Leuder, Small Business Management in the 21st Century, 2013 https://saylordotorg.github.io/text_small-business-management-in-the-21st-century/s15-01-the-supply-chain-and-a-firm-s-.html

Figure 3 - Mattila, H. 2017. SWW –Project, Presentation in Riga, Latvia, Centria UAS, Kokkola, Finland.

Figure 4 - Mattila, H. 2017. SWW –Project, Presentation in Riga, Latvia, Centria UAS, Kokkola, Finland.

Figure 5 -A. Matopoulos, M. Vlachopoulou, V. Manthou, B. Manos, (2007) "A conceptual framework for supply chain collaboration: empirical evidence from the agrifood industry", Supply Chain Management: An International Journal, Vol. 12 Iss: 3, pp.177 – 186A conceptual framework for supply chain collaboration: Empirical evidence from the agri-food industry.

Figure 6 - A. Matopoulos, M. Vlachopoulou, V. Manthou, B. Manos, (2007) "A conceptual framework for supply chain collaboration: empirical evidence from the agrifood industry", Supply Chain Management: An International Journal, Vol. 12 Iss: 3, pp.177 – 186A conceptual framework for supply chain collaboration: Empirical evidence from the agri-food industry.