

TRANSPARENCY AND COLLABORATION IN THE SUPPLY CHAIN



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**TRANSPARENCY AND COLLABORATION IN
THE SUPPLY CHAIN**

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İNTİHAL

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İmza: 

ABSTRACT

TRANSPARENCY AND COOPERATION IN THE SUPPLY CHAIN

A supply chain is a system of organizations, people, activities, information and resources involved in moving a product or service from a supplier to a customer. Supply chain activities include the conversion of natural resources, raw materials and components into a finished product delivered to the end customer. In advanced supply chain systems, used products can re-enter the supply chain at any point where the residual value is recyclable.

Supply chain cooperation plays an important role in a company's ability to respond to changing conditions. The existence of a good supply chain cooperation between independent companies in the supply chain will provide some benefits for both the companies and the end consumer.

Transparency and the traceability of the chain are one of the most important subtopics in the increasing number of collaborations. This study is explains meaning of cooperation and transparency in the supply chain ,how to ensure in firms and benefits.

Key words: Supply chain, transparency, information flow

ÖZET

TEDARİK ZİNCİRİNDE ŞEFFAFLIK VE İŞBİRLİĞİ

Tedarik zinciri, bir ürünü veya hizmeti tedarikçiden müşteriye taşımaya dahil olan organizasyonlar, insanlar, faaliyetler, bilgiler ve kaynaklar sistemidir. Tedarik zinciri faaliyetleri, doğal kaynakların, hammaddelerin ve bileşenlerin nihai müşteriye teslim edilen bitmiş bir ürüne dönüştürülmesini içerir. Gelişmiş tedarik zinciri sistemlerinde, kullanılmış ürünler, artık değerın geri dönüştürülebilir olduđu herhangi bir noktada tedarik zincirine tekrar girebilir.

Tedarik zinciri işbirliđi, bir şirketin deđişen koşullara cevap verebilmesinde önemli bir rol oynamaktadır. Tedarik zincirinde yer alan bağımsız şirketler arasında iyi bir tedarik zinciri işbirliđinin olması hem şirketler hem de son tüketici için bazı faydalar sağlayacaktır.

Günümüzde sayısı gittikçe artmakta olan işbirliklerinde en önemli alt başlıklardan birisi şeffaflık ve zincirin izlenilebilirliđi olmaktadır. Bu çalışma Tedarik zincirinde işbirliđinin ve şeffaflıđının tanımı, nasıl sağlanabileceđi ve sağladıđı yararlar üzerinedir.

Anahtar kelimeler: Tedarik zinciri, şeffaflık, bilgi akışı

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INTRODUCTION

The supply chain, consisting of suppliers, manufacturers, distributors and retailers, is one of the most important systems in the world economy. Supply chain management can be defined as the administrative tasks in which the material and information flow are effectively provided between suppliers, producers, distributors, retailers and customers. In other words, the main business processes in the chain (operations design, planning, operation, control, monitoring, etc.) to ensure the integration of the most accurate way to increase customer satisfaction can be called the creation of business models.

Supply chain management has different main objectives. The main objectives are to regulate logistics processes, to continuously improve all procurement processes, to increase competitiveness in procurement, to keep demand and supply in balance. The concept of supply chain; is a set of relationships and links that ensure the movement of the product between suppliers, manufacturers, wholesalers, distributors, retailers and ultimately customers.

All kinds of resources and components included in all activities carried out in the supply chain process are converted to products and delivered to the customers in the final stage. Within the relationships and links that make up the supply chain, there is a movement that moves from suppliers to producers, distributors, wholesalers, retailers and finally customers.

The length of the relationship is established with the supplier providing the basic requirements can be evaluated in accordance with the supplier's past and present performance, the parties' relations with each other and their future expectations. This evaluation may vary according to the competition in the market. The current price of the supplied product can remain high due to developments and the possibility of being supplied at a much lower cost than the competing suppliers. The term co-operation has become the most controversial term in the business world as well as in quality management issues. It is acknowledged by all that the cooperation is not a new idea and cooperation among the members in the supply chain is important. At the same time, it is clear that companies cannot be successful in the competitive environment without co-operating on

the basis of their strategies. However, the main problem arises when the definition of the concept of cooperation is tried to be made. As in the definition of quality, the cooperation may vary depending on who is using and in which concept it is used. As the concept and content of cooperation is still in the stage of becoming so, companies have become more and more aware of this concept, knowing that the establishment and follow-up of the integrated supply chain partnership is critical to the survival of the business world. Companies have realized that the more efficient and integrated the performance of information and transactions, the lower their costs.

It is no longer possible for companies to stay in an introverted manner based solely on past successful product and service offerings. Collaboration has become a critical element in order for efficient and efficient supply chains to function properly.

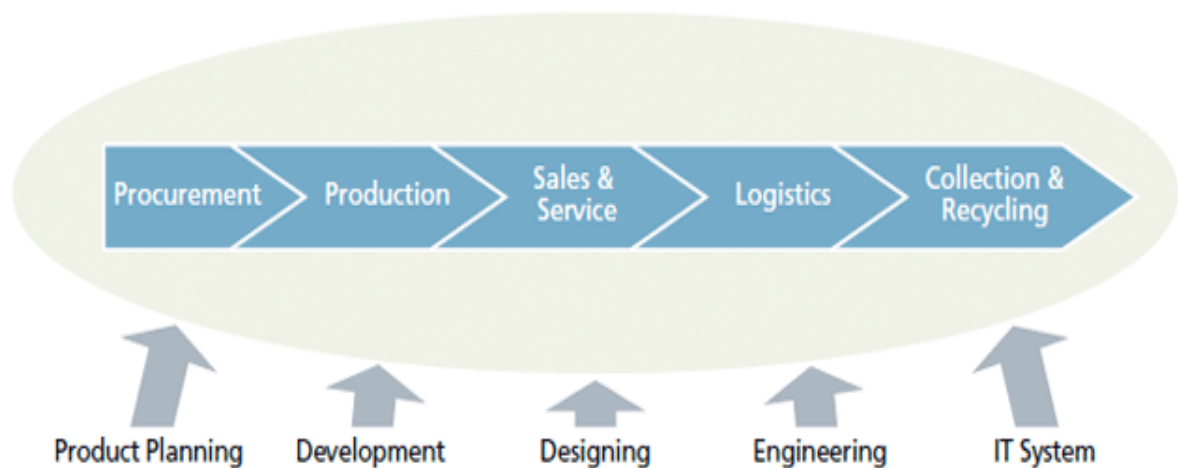
CHAPTER 1 SUPPLY CHAIN

The supply chain, which is closely related to all the working processes of the enterprises, starts all the products and services from the supplier to the customer at the last stage; all activities, human resources, technology, company structures and resources are included in this path.

1.1. Definition of Supply Chain

The concept of supply chain; is a set of relationships and links that ensure the movement of the product between suppliers, manufacturers, wholesalers, distributors, retailers and ultimately customers. The chain systems where raw materials are converted into products or services and delivered to end users are called supply chains. Before defining supply chain management, it would be appropriate to define what the supply chain means. The supply chain is a network of producers and distributors who supply raw materials, convert them into intermediate goods and final products and distribute the final products to customers (Heckmann et al., 2015). Another definition explains the supply chain as a set of elements, including suppliers, logistics service providers, manufacturers, distributors and retailers, with a flow of materials, products and information among them.

Figure 1. Supply Chain



Resource: Ricoh, 2017 <https://www.ricoh.com/sustainability/report/action/supplychain.html>

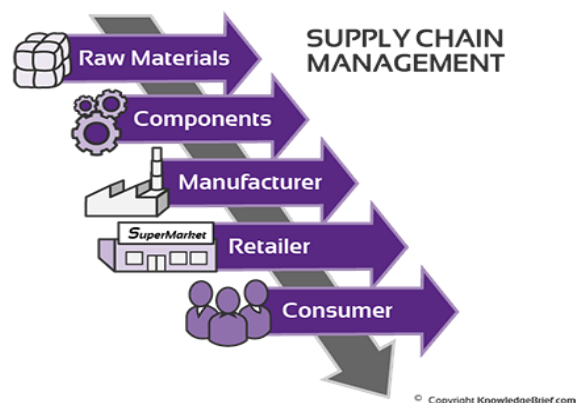
The supply chain is a system that covers the product life cycle processes of products or services, and includes the entire flow of operations, information flow, physical distribution from the raw material to the end customer. Supply Chain, which is closely

related to all the working processes of enterprises, starts the process of all products and services from the supplier to the customer in the final stage; all activities, human resources, technology, company structures and resources in this path can be explained as the name of the concept. For any company that produces in the business, the cycle begins with the purchase of goods and the inventory planning of the entire procurement process is achieved by a good supply chain management. Enterprises who cannot manage the procurement process correctly face a difficult process such as not having to order lines due to lack of input even though they have invoices.

All kinds of resources and components involved in all activities carried out in the supply chain process are converted to products and delivered to the customers in the final stage. It covers all the consecutive rings, from the procurement stage to the supply and production of the goods and services. In terms of business processes, the supply chain; sales, production, inventory management, material supply, distribution, demand forecast and customer service.

Starting from the first item of a product, it is a whole of suppliers, manufacturers, distributors, retailers and logistics companies taking part in all processes including access to and recreating to customers. Within the relationships and links that make up the supply chain, there is a progress that moves from suppliers to producers, distributors, wholesalers, retailers and finally customers. Each ring of this chain follows another one regularly. Similarly, in terms of business processes, we can say that the supply chain has certain stages. Value added processes such as production, inventory management, material supply, distribution, sales, customer relationship management ensure the functioning of the supply chain.

Figure 2. Supply Chain Management



All managerial tasks aimed for ensuring efficient and accurate communication of materials and information between suppliers and customers across supply chains can be defined as supply chain management (Fahimnia et al., 2015). In this context, design, planning, operation, control and monitoring of all supply chain operations can be addressed.

1.2. Definition of Supply Chain Management

Supply chain management; There are many definitions in the literature in terms of management and organization, production and marketing functions. Supply chain management is the implementation, transport, storage, and control service of efficient planning of production and movement within the supply chain from the starting point of the raw material of all kinds of products, services and information flow to the end of the product consumption to meet the needs of customers (Christopher, 2016). It deals with the control of material and information flows and structural-infrastructure processes related to the transformation of material to products and distribution of finished products to customers and markets through appropriate channels in order to increase the value and customer satisfaction.

In the management of the supply chain, all functions of the chain must be integrated. In order for products to reach the end-user from a supplier, a number of functions perform certain tasks in accordance with some basic objectives:

Demand and order management: Organizing business activities to meet customer orders quickly and smoothly.

Procurement: All products and materials required for production are provided in the best quality, fast and healthy way.

Planning: The correct planning of the whole production process along with the cost calculations within the operating activities.

Production: It is the most important process of the supply chain on the business side. It is the conversion of the previously taken material with the right tools to the product in the required performance and time. In the economic literature, production is explained as everything that is intended to increase the quantity or benefits of goods and services.

Inventory management: Determining the stock levels of all the required materials in accordance with the prepared production plans and ensuring efficient management.

Warehouse management: *Designed with inventory management for businesses; managing how stocks and quantities are stored; production of finished products and keeping them ready for shipment.*

Logistics: *It is the management of the process of delivering the finished products from the warehouse to the customer.*

There are some questions that should be managed well :

- 1- What are the products and services the company need to provide to fulfill your business activities?
- 2- What should be the quality and price scale of these product products and services?
- 3- What are the suppliers target products and services?
- 4- How is the market situation, awareness and competitive position of suppliers of products and services?
- 5- Are there any alternatives to the foreign market?
- 6- Are there any advantages in terms of cost difference and given for purchases or in-time purchases?
- 7- What is the level of price changes in the markets where the company will receive products and services?
- 8- Which communication method is best with suppliers?

"Excellence" in supply chain management processes and operational implementation is critical to the sustainable success of corporations in today's competitive conditions. The main objectives for excellence in the supply chain can be listed as follows(Christopher, 2016):

- Increasing the value generated throughout the supply chain
- Procurement to increase competitiveness
- Organization of production and logistics processes
- Ensuring coordination and synchronization to balance supply and demand
- Continuous improvement of all supply chain processes

Measurement and monitoring of supply chain performance of companies will be a guide for determining the activities that will provide comparative advantage in competition.

In short, supply chain management is the management of material / product, money and information among suppliers, producers, distributors, retailers and customers in a value chain for accessing to a product from raw material supply to production and distribution to the end customer.

The main objectives of supply chain management can be expressed as follows:

- Increase customer satisfaction,
- Reduce cycle time,
- To reduce stock and inventory related costs,
- Reduce product errors,
- Reduce activity cost

In order to achieve these objectives, companies need to increase communication and information sharing across the supply chain across suppliers and their suppliers, customers and their customers. Sharing information and plans with suppliers and customers can increase chain effectiveness and competitiveness. In the changing world, there is no mention of competition among firms alone. Competition will now be among the supply chains in which the firms are located (Gathenya&Muturi, 2017).

Nowadays, when global competition reaches its peak point, profit is no longer a purchase process but a process that occurs when buying and producing. Therefore, in order to ensure sustainability of the companies, making the right decisions on the chain rings, making analyzes and improvements, ensuring the coordination and control of all the activity processes will ensure efficiency in the whole chain, and thus ensure the objectives such as profitability and customer satisfaction. At this point, it is a strategic requirement for companies to focus on supply chain management and work with professionals in order to significantly increase the performance of organizations.

1.3. Development of Supply Chain Management

In the period after the 1950s, most manufacturers focused on mass production systems, with very little product variety and process flexibility as the basic operational strategy to minimize unit production costs. During this period, new product development is relatively slow and completely dependent on in-source technology and capacity. Bottleneck activities is met with inventories in order to maintain a balanced line flow, resulting in large investments in semi-finished stocks. In this period, sharing technology and expertise with customers or suppliers is considered too risky and unacceptable. Similarly, there is little interest in the cooperation between the enterprises and the buyer-supplier partnership.

In the period from the 1900s until the 1960s, logistics was seen as an operational function rather than a competitive advantage by firms. This period, in which logistics activities are mostly seen as physical distribution functions such as storage and transportation, is called as storage and transportation phase. At this stage, logistics was given less importance than production, marketing and sales. The companies were responsible for the division of logistics activities into multiple departments because of the technology and management science needed to solve complex problems.

The roots of supply chain management date back to the 1960s. The first emphasis on the physical distribution stage, which is considered to be the first stage of supply chain management, was made by Bowersox. Bowersox argued that, in addition to observing the relevant flows in the body of the physical distribution idea, the distribution function would provide a competitive advantage outside the company with in-channel integration (Bowersox et al, 2002).

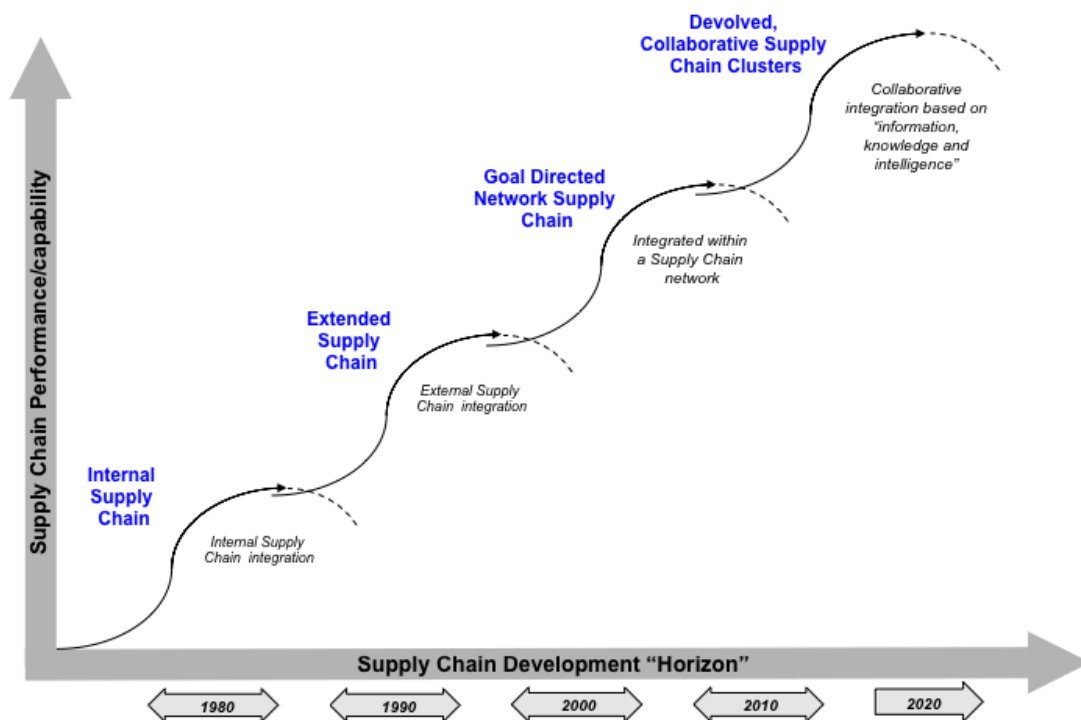
In the 1970s, after the introduction of the material requirement planning (MRP) system, the firms; have realized that in-process work has great importance on production cost and quality, new product development and delivery times in delivery. Worldwide purchasing activity has become an important issue since the 1970s. In the 1980s, with the accelerating concern of competitive pressure, it was necessary to produce high quality products with low cost. During this period, companies have established a central physical distribution department that will carry out distribution, marketing, production and financing related activities, and it is necessary to combine the logistics management of the whole system, rather than maximizing the logistics of each activity separately. Thus, instead of reducing the cost of each operation, a whole cost of logistics services approach

has been developed that treats the whole system as a one (p. 66). In the fourth stage, firms have found that even logistics activities are no longer sufficient to compete. Demands for improving service quality, restructuring of organizations, increasing globalization and developments in information technologies have led firms to seek new strategies. As a result of these searches, the new strategy has become supply chain management. This period is also called the integrated supply chain management stage.

In the 1980s, the importance of global competition forced world-class firms to offer reliable products with lower cost, high quality and more design flexibility. In this period, the logistics phase, which is the second stage of supply chain management, has been introduced. This step is expressed as the integration of logistics by Ross. By combining the strategic decisions of the company with logistic orientation, Houlihan has developed a strong case that deals with the supply chain as a single phenomenon. Thus, Houlihan was the first to use the term supply chain for this system in the literature (Touboulic & Walker, 2015).

In the mid-1990s, supply chain teams were created in order to increase supply chain efficiency and the importance of cooperation and communication in supply chain management was felt. In this period, as the importance of information systems on supply chain management increased, enterprise resource planning (ERP) information sharing system was developed. As approaches such as just-in-time production (JIT) and total quality management (TQM) gained importance, the integration of these approaches with the supply chain has come to the agenda. New concepts such as closed loop supply chain and reverse logistics have emerged. Then, the concept of green supply chain has been introduced (Rajeev et al., 2017).

Figure 3. Supply Chain Development



Reosource: Johnson, 2016 https://www.researchgate.net/figure/Phases-in-Supply-Chain-Management-Development_fig4_290429204

After the mid-1990s, managers realized that goods and services from suppliers had a significant impact on the ability of their customers to meet their needs. Executives also realize that the production of quality goods itself is not enough. It has been the new achievement to deliver products to the customer when, where, how and in the desired amount by a cost-effective method. As a result of all these developments, company managers realized that it was not enough to manage old-fashioned management mentality.

In the 2000s, it was transformed into a dynamic area where a large number of studies were carried out on supply chain management. The basis of supply chain management lies in the ability to meet the different demands and needs of each customer. In this period, it was realized that the change of the customer structure would lead to changes in the structure of the supply chain. We focused on supply chain structures that can be changed according to different customer needs (Rajeev et al., 2017).

With the development of internet and new information technologies since 2000s; facilitating applications such as e-commerce, e-procurement, e-logistics, internet-based monitoring on the chain, demand forecasting stock management based on real-time data. This period, which is the fifth and last stage of supply chain management, is called the E-

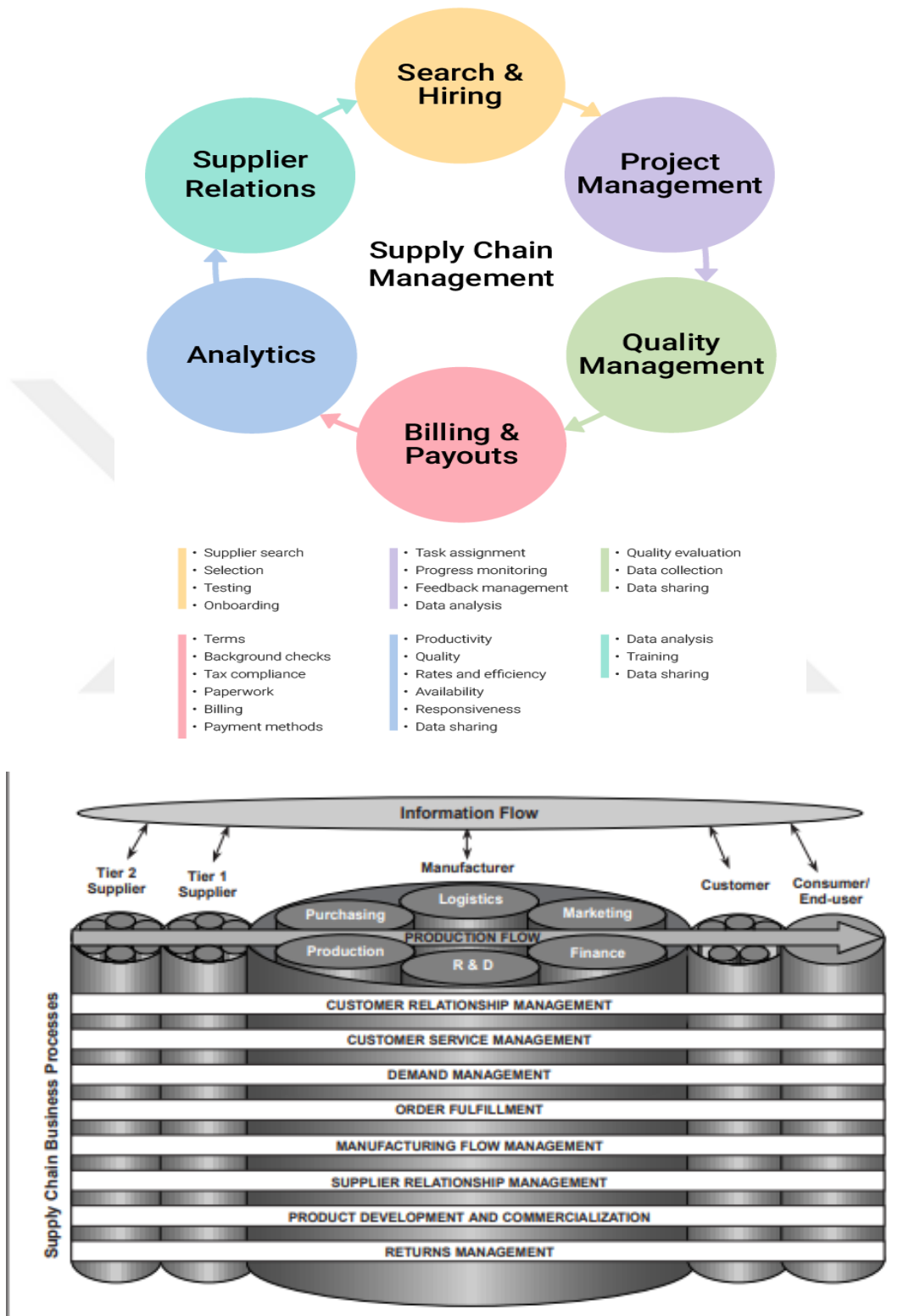
supply chain management stage. Businesses include e-supply chain management; can use effectively in areas such as ordering, logistics, customer relations, purchasing and stock management.

1.4. Supply Chain Management Process

Supply chain management activities can be examined at different levels on the basis of corporate governance functions and departments. In line with the corporate performance criteria, there are a large number of supply chain management and planning decisions that are required to be taken by the institutions and the supply chain period, which ensures that these decisions are taken correctly and effectively. The supply chain, consisting of suppliers, manufacturers, distributors and retailers, is one of the most important systems in the world economy. Supply chain management can be defined as the administrative tasks in which the material and information flow is effectively provided between suppliers, producers, distributors, retailers and customers in this logistic system, where the raw materials are delivered to the end user by converting them into products or services. In other words, the main business processes in the chain (operations design, planning, operation, control, monitoring, etc.) to provide the most accurate way of integration of business models that increase customer satisfaction can be called.

Supply chain management has different main objectives. The main objectives are to regulate logistics processes, to continuously improve all procurement processes, to increase competitiveness in procurement, and to keep demand and supply in balance. The fact that the enterprises focusing on quality understand the supply chain management processes well and these processes depend on their design. The quality of the production and the fails in production are usually caused by the processes. Supply chain management is a process-oriented strategy and targets high quality at low cost. Therefore, the processes that constitute the supply chain management are critical for the success of the enterprise (Ho et al., 2015).

Figure 4. Supply Chain Management&Process



Resource: Rogers, 2001 <http://ecsocman.hse.ru/data/474/089/1217/article4.pdf>

Supply chain management processes are considered as eight processes defined by members of the Global Supply Chain Forum. The procurement process, which constitutes the 6th process of the supply chain management, is referred to as the supplier relationship management (SRM) process since it is related to the relations with the suppliers.

The main supply chain management processes can be listed at that table.

1.4.1. Customer Relations Management

Customer relationship management (CRM); It can be seen as a strategy aiming profitability of the enterprise by establishing the concept of customer to the whole enterprise and establishing long-term customer relations. Because the companies that do not work with customer focus in the modern business world are losing their market share rapidly.

It is important for an enterprise to maintain existing customers in order to ensure continuous success and to make them loyal customers. Because loyal customers can buy more products or services and can attract new customers quickly. However, many companies may prefer to make more sales rather than developing long-term customer relations. Therefore, the cost of winning a new customer is greater than the cost of retaining the old customer. Businesses need to improve their relationships with their customers. In this process, the enterprise cooperates closely with a group it deems important from its suppliers and maintains a more ordinary commercial relationship with others. A product and service agreement is made with each supplier to define the rules of the relationship. Suppliers must comply with this agreement. The supplier relationship management that manages this process is responsible for the definition and execution of this product and service agreement.

Businesses have always aimed to establish a loyal customer portfolio by establishing long-term and profitable relationships with their customers. However, the developments in information technologies have led to important developments in the strategies to be followed and the determination of these strategies. In this context, customer relations management, which is the first business process to be integrated from business processes, is all the management activities necessary for an enterprise to better understand its customers, provide better service and consequently reach the wider customer base of the enterprise.

In Customer Relationship Management, the system requires sales monitoring, previous sales, pricing management, incentive management, product mix management and product category management.

Customer relationship management provides a structure based on how to develop and maintain relationships with customers. Business management identifies key customers and customer groups and targets them as part of the business's mission. The purpose of doing this is to segment customers according to their values over time and thus increase customer loyalty by offering customized products and services. This market strategy is also called customer segmentation. Customer-specific investments and designs that are classified as value for the business can be planned. (Bowersox et al., 2002).

In the process of CRM, management determines the target audience within the framework of the business mission. In line with this aim, product and service agreements are prepared in order to meet the needs of selected customers. Customer relationship managers can work together with key customers to develop processes, determine the variability in demand and reduce non-value-added activities in this way. As customers are aware of the importance that businesses give to customer relationship management, businesses address customer relationship management more comprehensively. The company aims to reach new customers by meeting the demands of existing customers by integrating all points (internet, call centers, stores, etc.) that they have been in contact with the customer (Christopher, 2016).

1.4.2. Customer Service Management

Businesses with the spread of internet; information, products and services are more easily accessible to attract customers. Under these circumstances, it is important to protect the customer and to engage the new customer. customer service management (CSM); is a process that includes the elements such as learning the interests of the customer, estimating the demands, expectations and needs of the customers and ensuring the necessary customer satisfaction by meeting them. If an enterprise's strategy is to enter a market segment where customer service is prioritized, then it would be better for the enterprise to have a supply chain structure based on optimization of time to respond to customer needs. Nowadays, customers not only want to buy high level of quality products, but also expect trust, respect, interest and smiling face. All of these features are customer service, but differentiate a company from its competitors. Business customers face their

customer service management process. With CSM, businesses directly provide their customers with information about product availability, time of loading goods on board and other conditions. In addition, information about the functions such as production and logistics are provided to the customers.

Looking at businesses that can be described as flawless in the world, each one appears to have excellent customer service goals. Customer service management is very important for businesses and adopts the customer as a philosophy in order to create a loyal customer and offers different levels of service to cover many customer segments as they can. Customer service management is the process in which the firm is faced with the customer. This process provides the service of being the primary source of data to inform customers about issues such as product availability, loading time and status of the order. Real-time dynamic information provided to the customer is ensured by means of interfaces created by common connections with the company's manufacturing and logistics processes. At the same time, customer service management is responsible for the execution of the product and service agreement with customers (Swink et al, 2017).

1.4.3. Demand Management

Businesses commit themselves to the planning of production activities in order to be able to determine the production quantities that should be produced in the future. However, planning cannot be made without knowing how many quantity of product is expected to be produced. Demand management (DM) is the ability of the enterprise to understand customer demand and maintain the balance between this customer demand and the supply chain capacity of the enterprise. In other words, trying to balance the production opportunities of the enterprise and customer needs. In this way, it is planned to take necessary measurements against the sudden changes in demand in the future. With good demand management, businesses will be able to avoid high inventory costs and maintain their reputation in the market.

With demand management, enterprises carry out estimation and variability reduction studies in order to meet the needs of the consumers continuously and prevent the customers from shifting to competitors in case of a lack of demand. In this way, it is possible to meet the demands of the customers, whose demands and needs change rapidly, effectively (Şişman et. all, 2015).

1.4.4. Order Fulfillment

It is an important element to meet customer needs in order to fulfill orders in supply chain management. An effective order processing consists of; the acceptance of the order, the delivery and the transactions. In addition, the order process requires customer orders to be answered by an integrated process of manufacturing, logistics and marketing plans of the firm. In order to meet customer needs, the company needs to know the customer information very well and to process the orders quickly. From customer service management; orders from sales representatives, telephone, mail, or computer networks such as electronic data interchange (EDI) are processed. A member of the order processing team enters and arranges these orders in the system. Then, it transmits to customer service management and demand management processes. Then the inventory and the customer's credit are checked and the information about the orders is transferred to the production flow process. The operation of the process as fast and healthy as possible will be beneficial for the business and the customer (Swink et al, 2017).

Nowadays, since all the documents and work processes are done in computer environment, it is most ideal for the personnel to enter the order that they have received on a daily basis and to communicate them to the company. When information technology is used in supply chain management; businesses will be aware of any changes that may occur in the products to be manufactured on order or in the delivery processes of the products .

Order completion is an important process. This process requires the integration of production, distribution and transportation plans. It is the development of partnerships with key members in the supply chain to meet customer needs on the one hand and to reduce the total delivery cost of the customer. When all this is done, it is possible to talk about an effective order processing in the supply chain.

1.4.5. Manufacturing Flow Management

Manufacturing flow management (MFM) deals with the management, implementation and manufacturing flexibility of the product flow throughout the production resources in order to provide the products that are intended to be produced in the best way to the target market. The purpose of the production flow is to review the functions of the enterprise such as production, marketing, logistics, purchasing and to decide on the production structure. Then the production possibilities are determined and these are transformed into elements that can be offered to customers. The effective

implementation of manufacturing flow management will increase both the production and the efficiency of the enterprise (Tao et. all, 2015).

For example, in a situation where there is insufficient information flow in the enterprise for future demand estimation, the flexibility of production will increase with the intervention made by the production flow management and the enterprise can be saved from the difficult situation (Stevens&Johnson, 2016).

The manufacturing flow management process is concerned with establishing the manufacturing flexibility required to produce the necessary products to provide the best service to the target market. The manufacturing flow management process encompasses all of the activities required for the production of the product and the management.

1.4.6. Supplier Relationship Management

Supplier relationship management is a process that expresses how the relations with the suppliers of the enterprise will be established and improved. In this process, which is a reflection of customer relationship management, businesses need to develop their relations with their suppliers as well as their relationships with their customers. In this process, the enterprise must classify its suppliers and establish a high degree of close relationship with what they consider important, while the relationship with others should be at a simpler level.

For successful supply chain management, strategic partnerships with suppliers has great importance. Businesses strive to minimize the number of suppliers they work for finding suppliers that have the qualifications to provide them with the best service. With this trend, there is a need to learn about the financial situation, risk and profit sharing strategies, common design plans of the suppliers to be selected by the enterprises. In line with this information, the implementation of compatible demand forecasting and information technology systems will be started. For this reason, it is necessary to establish electronic systems that will enable the supply of transport details, production schedules and other necessary information between the suppliers and the buyer (Genovese, 2017). An effective supplier relationship management will positively impact the business activities; providing a more efficient and efficient business; Together with lower costs and higher profits will pave the way for stable growth.

Supplier relationship management (SRM) helps companies to provide the products with which prices they purchase from their suppliers, changes in purchasing practices over time, the risks arising from the supplier, the quality of the products purchased and their compliance with the company's quality objectives and the suitability of the purchasing activities to the overall objectives of the company. A successful manufacturer; it seeks to engage closely with its supplier by allowing both upstream and downstream flow of information simultaneously within the supply chain. As a result of this relationship, it is ensured that the order is delivered to the customer at the desired place and time and the performance of the enterprise is improved.

The SAP SRM solution enables relationships with suppliers to be managed effectively and in the interests of the business. Strategic procurement, operational procurement and supplier cooperation etc. The SAP SRM solution is integrated with the existing SAP ECC (ERP core components) system. A company needs to interact with hundreds of suppliers, from production to service procurement, and even office needs. When working with a part of these suppliers operationally, strategic and sustainable relations should be established with the suppliers that affect the main business lines. In this respect, purchasing departments should strengthen their category-based supplier network in coordination with other departments (Cocca et. all, 2018). It is also important that the information and documents about the supplier companies are up-to-date. In addition to the existing suppliers, it is important that the companies reach the new potential suppliers and operate an efficient process that involves the evaluation and commissioning of these firms.

1.4.7. Product Development and Commercialization

In today's competitive conditions, this process flows are have critical importance in order to maintain the continuity of the enterprise and to be successful in the target market. Product design in business can be affected from ; economic, social, demographic, political, competitive, technological factors. One of the most important elements here is technology, because many product design requirements arise from technological advances and are made possible by these developments.

Product development is critical in maintaining business success. In this context, the success of the enterprise is to rapidly develop new products and to enter the market on time. This process requires customers and suppliers to take part in the product development process in order to reduce the delivery time of the new product. Due to the short product

life curves, enterprises need to develop the right products in a short time and offer them to the market in order to maintain their competitive position. The product development process is critical for the company to continue its success. Developing new products quickly and offering them to the market in an efficient way is the most important component of business success (Lambert &Enz, 2017). The critical aim of this process is to enter the market in a timely manner. Supply chain management involves the inclusion of customers and suppliers in the product development process in order to reduce the time to market of new products. Due to the short product life curves, companies need to develop the right products and offer them to the market in short time periods in order to remain competitive.

1.4.8. Returns Management

Although the return management process is deemed unimportant by many managers, it can help provide a sustainable competitive advantage to the business. With an effective return management, businesses can find ways to increase their activities and carry out their projects. Although the return management process is deemed unimportant by many managers, it can help provide a sustainable competitive advantage to the business. With an effective return management, businesses can find ways to increase their activities and carry out their projects. An effective return management is a critical part of supply chain management. This process can help the company achieve a sustainable competitive advantage, although it neglects the return process of many companies because its managers believe in the insignificance of this process (Shaharudin, 2018). An effective return management process can help companies find ways to increase their productivity and realize their projects.

Returns management (RM) is the process of collecting returns, performing test and sorting, evaluating reuse and recovery facilities and waste disposal. For any reason, it is important for the product to be returned to the company by the customer, and the necessary sensitivity of both the manufacturer and the shipping company in terms of customer satisfaction. Successful results can be achieved as the business can quickly share information between the manufacturer, carrier and customer triangle. In addition, effective management of returns can create an opportunity for the enterprise to be efficient and ensure the sustainability of the competitive advantage.

1.5.Benefits of Supply Chain Management for Business

It is possible to talk about the benefits of supply chain management with the help of the information sharing that is provided as a result of the cooperation between the enterprises. Some of these benefits are expressed as follows:

- 1) Delivery performance improvement
- 2) Reduction of stocks
- 3) Shortening cycle time
- 4) Increasing accuracy
- 5) Increased efficiency throughout the chain
- 6) Reduction of costs along the chain
- 7) Increase in capacity realization rate

These benefits and more fully establish the communication between the companies (suppliers, producers, distributors, retailers, etc.) in the same chain, reduce the costs in the whole chain as a common goal, together with the coordination and control of the activities along the chain, increase productivity, profitability and customer satisfaction can be achieved as;

- Increases customer satisfaction.
- Improves the performance of deliveries.
- Provides continuity in production.
- Helps to reduce stocks.
- Provides efficiency and capacity increase.
- Accurate management by reducing costs.
- Reduces logistics costs.
- Shorten cycle time.
- Provides durability to sudden changes in the market.

Coordination and sharing of information among firms within the supply chain reduces the uncertainties in demand planning, so firms do not have to invest much in stocks. This will lead to a reduction in costs and ease in planning. In addition, as a result of the trust and cooperation to be established between the companies, the advantages of new product development can be achieved by reducing risks, reducing barriers between firms and increasing flexibility. In this way, customer satisfaction levels can be increased by meeting customer needs. As a monetary equivalent of all these, cash flows along the chain become stable and firms' costs decrease and their profitability increases. At this point, it is a strategic requirement for companies to focus on supply chain management and work with professionals to significantly increase the performance of organizations.

1.6.Factors Affecting Supply Chain Management

Recent developments such as the difficulty in competitive conditions, globalization, the rapid development of technology, the complexity of networks in the supply chain, and the shortening of the product life cycle require enterprises to reconsider their supply chain strategies. When the procurement, production, distribution and marketing departments, which are part of the supply chain, operate independently of one another, the objectives of these departments may overlap. Under these circumstances, companies trying to compete should be able to effectively manage their supply chains so that their objectives do not overlap (Govindan, 2015).

Customer Expectations and Competition Factor

Today, businesses have an understanding that accepts that customer demand is the main issue. With this understanding, it is expected that the customer products will be ready immediately without cost too much and packaged with a high service network.

Nowadays, in the increasing competitive conditions of consumers' buying habits and the ever increasing competition conditions of the business rivals, the enterprises have been pushed to be flexible as a process and this brings more responsibility to the suppliers. While enterprises reduce the number of suppliers they cooperate with, they also emphasized the confidence element among their suppliers. While long-term relations between businesses and their suppliers have gained importance, sharing information

among enterprises and their suppliers has been an important condition (Christopher, 2016).

Globalization

The increase in the world population and the change in the economic forces caused the emergence of new markets in the world. According to Toulmin, people and societies are more and more integrated with each other and they have entered activities that exceed even the borders of countries. Travel, communication, finance, trade, sports, sports and even popular music can no longer be limited to the borders of a single country.

With the world population and changes in economic balances, many new markets emerged in the world. As a result of the removal of geographical borders parallel to the developing technology, the whole world has become a local market. In this context, the internet has enabled many businesses to increase their sales significantly by marketing their products worldwide in this way as an important opportunity for the companies that are trying to adapt to the globalization process. These processes affect supply chain management considerably (Rousseu et. all, 2015).

Information technologies

Together with the advances in technology, information sharing has increased the possibilities of communication among enterprises. According to Cazla and Piassaro, by eliminating the time and space constraints as a result of the advances in technology, it facilitated and accelerated the flow of products and information between enterprises. Information technologies and product demands can be obtained from direct sales points. Thus, businesses can access market information more quickly. In the light of these developments, it is difficult for enterprises to operate on their own and thus the supply chain becomes more important (Govindan, 2015).

Legal regulations

One of the factors that influence the way of purchasing and distribution of products is the legal regulations made by the political authorities. While the future situation of commercial barriers is a very important issue for enterprises, the supply chain managers of enterprises that have the opportunity to open up to the world markets via the internet have understood the importance of governments to remove restrictive barriers to free

trade. The arrangements of political and economic unions and political powers in the world will affect the development of supply chain management (Fischer, 2017).

Environment

The predisposition to environmental problems has been increasing rapidly in enterprises and society in recent years. Recycling, environmental efficiency and minimization of waste will affect the supply chain design that will be established in the future periods. Companies that have taken into consideration the environmental issues throughout the supply chain should also design and plan the backward logistics activities so that they can continue their recycling programs successfully (Afolayan et. all, 2016).



CHAPTER 2

2. Cooperation in the Supply Chain

According to Simatupang and others; supply-chain collaboration is the joint work of two or more independent firms, making their supply chain processes more orderly to enable end-customers and firm profit-holders to offer more value than they can on their own. Collaborating firms share a number of degrees of cooperation between each other to create a competitive advantage and share the benefits. When all members of the chain are integrated and act as a homogeneous entity, performance and profitability will increase throughout the whole chain, as demand and supply are aligned. Supply chain cooperation defines as a process that is spread among companies and thus provides the opportunity to work in cooperation to provide better planning, execution or sharing of information. The supply chain relationship can be created by (Wang et. all, 2016):

Confidence: *This element forms the basis of supply chain management. Confidence is hard to measure. The fact that channel members are in mutual belief in each other's actions or intentions means that individual company strategies are shaped in line with the development and well-being of the entire supply chain network and that companies do not use their power against other members of the chain who are more dependent on them.*

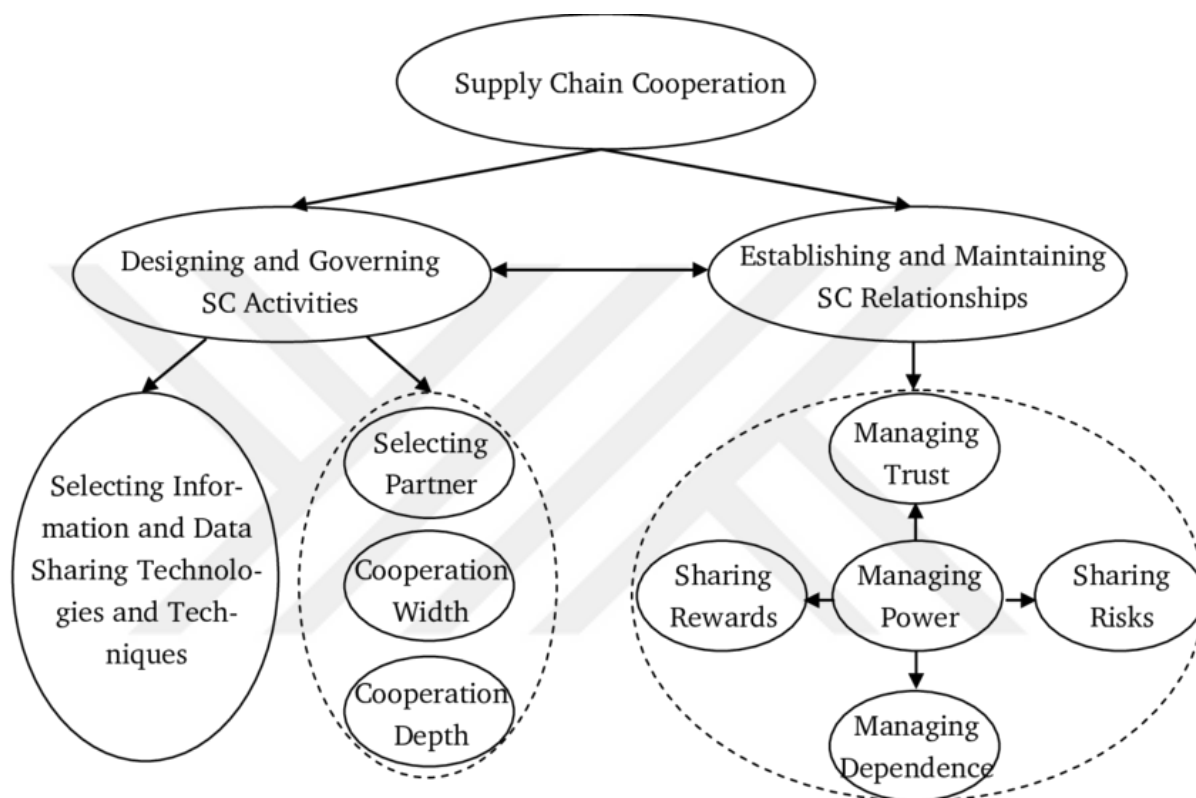
Reliability: *Being trustworthy means that other companies in which a company works together show consistent, predictable and honest behavior in the long term. Lack of compliance in commitments and conduct will lead to deterioration in supply chain relationships.*

Competence: *This element is related to the ability of the partner in the supply chain to support the performance and support promised at the beginning of the supply chain relationship. Qualification also means the ability of the partner company within the chain to ensure that the relationship in the chain is guaranteed to provide people, processes, knowledge, experience, technology and resources.*

Risk-sharing: *Risk is part of every business's efforts. However, the risk in the supply chain relationship is beyond the normal uncertainties. The reason for this is; it is the external fragility caused by the interdependence on the actions agreed by the partners forming the supply chain. On the other hand, the partnership relationship that will not be developed without a certain form of risk.*

Loyalty: Trust, reliability and willingness to take risks contribute to loyalty among the channel members. Loyalty is mutual dual relationship between the actors ; not only do each partner execute their performances in a predictable manner, but are also willing to assist the other partners in correcting the negative effects of the risk and solving the problems.

Figure 5. Supply Chain Cooperation



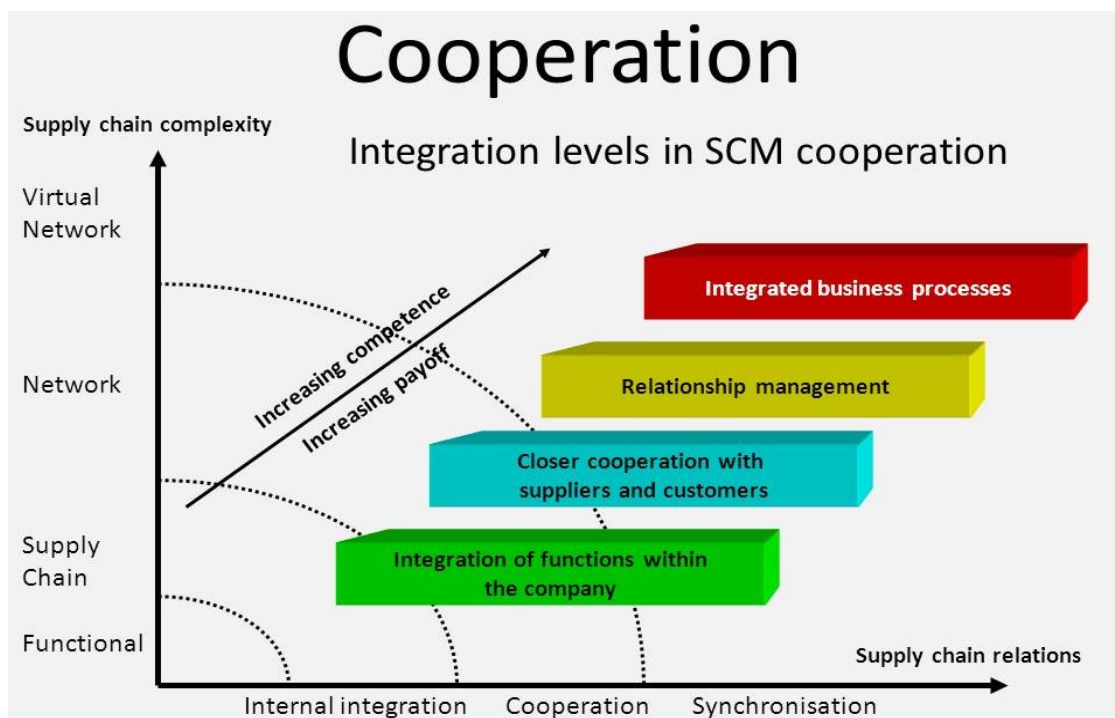
Resource: Gavrilă, 2014 https://www.researchgate.net/figure/Framework-for-Supply-Chain-Cooperation-Source-own-representation-after-Matopoulos-et_fig1_318110611

The first part of the framework of cooperation in the supply chain, in the model they offer the design and management of supply chain actions consisting of three elements. The first element is the decision on the selection of the appropriate partner. In the real business world, companies interact with a number of suppliers and customers. Obviously, not all of these suppliers and customers can be treated as close partners; A selection should be made based on expectations, perceived benefits and disadvantages, and compliance of companies. The second element is the choice of which actions to co-operate. The multiplicity of actions constitutes the breadth of cooperation. Since not all actions require the same amount of interest and close relationships, companies have to choose which specific actions to cooperate.

Companies rarely cooperate at all decision-making levels and therefore have to decide which of the three basic levels of strategic, tactical, operational-cooperation to be. These three levels represent the depth of cooperation in the supply chain. The combination of these three elements indicates the intensity of cooperation. Collaboration becomes more intense as the number of inputs (from operational to tactical and strategic), breadth (from simple supply chain actions to more complex actions such as new product development) and the number of inputs increases. The last element in the design and management of supply chain actions is the decision to choose the appropriate technique and technology to facilitate information sharing. It is a very complex and difficult decision to implement this decision, since all the companies in the chain of potential cooperation cannot have the ability to fulfill the requirements for cooperation in technology and technical sense.

According to Matopoulos et al. (2015), the second part of cooperation in the supply chain is related to the establishment and maintenance of supply chain relationships. It includes less touchable but equally important elements of the relationship. Mutual benefits, risk and reward sharing are critical elements. The most important factor to guide companies in their close relationship is the balance in risk and reward sharing. Interactions between other elements such as trust, power and commitment also play an effective role in the company's decision to enter into cooperation. Cooperation between firms involved in the same supply chain should be viewed as a strong competitive advantage. Such companies do not transfer costs throughout the supply chain. These companies collaborate to increase sales and reduce costs, rather than competing for a larger share of the already significant profit. It is impossible for companies to achieve significant integration in the supply chain unless they develop close and upward relations with their partners in both directions in the supply chain. Being a partner; It can be defined as the business relationship based on mutual trust, transparency, shared risk and reward, which will result in companies performing more than their performance in order to achieve competitive advantage.

Figure 6. Supply Chain Integration



Resouce: Larissa, 2012 <https://slideplayer.com/slide/10526585/>

Three types of partnership are mentioned in the supply chain. These;

1. Transactional partnership refers to the transactions between companies without interruption in a long-term relationship.
2. The strategic partnership is the result of the desire of the purchasing partner to create new value by directing some operational parameters to the supplier in the provision of goods and services in return for customers providing high profitability or sales references. Improvement in quality or distribution activities and cost reduction are examples of operational improvement.
3. In a private partnership, the customer requires special rights over certain possibilities of the supplier, for example; production capacity, such as product and product lines. it is important to decide which type of partnership is best suited for a particular relationship in supply chain design.

2.1. Benefits of Cooperation and Models in Supply Chains

The partnership relationship in the supply chain is not always successful and sometimes there are failures. Hoyt and Hug list the general causes of these failures as follows (Goździewska-Nowicka, 2016) :

1. Partners do not direct their attention to the relationship
2. Lack of continuity and mutual trust
3. Changes in the market
4. Recognizing the partner as potential competitor
5. Legal and ethical issues
6. Time and energy required to support cooperation efforts
7. Decrease in the value of the customer-supplier in the following period.

Intensive cooperation; complex, demanding, costly, resources, processes and systems require significant investment. In addition, it might not all customers are equally profitable, not all suppliers may have equal value and at the same time possible partners may have or may not have the ability to fulfill the desired level of cooperation. Therefore, before the partners to collaborate in the supply chain to create a cooperation program, the segmentation of marketing managers in a way similar to the segmentation of their customers will give better results. The division of partners in the supply chain is important to ensure effective cooperation. No matter how many or less the partners will be involved in the cooperation, all possible partners should be in a suitable place in the supply chain cooperation range. It would be best to establish a weighted common selection criterion that will determine the cooperation of the company which will be in cooperation with its specific needs. According to Cohen and Roussel it is possible to list these criteria as follows (Puffan &Kuhl, 2018):

1. Strategic importance: How important is the capacity, volume, technological structure, expertise or market position of the potential partner?
2. Cultural conformity: How competitive are the staff and values of the company to cooperate and how well can it be worked with other companies or companies? Even if the conditions of the business change, will the partnership be able to maintain an equal commitment in relations with the company? Is there mutual trust?
3. Organizational compliance: Can the partner company respond quickly and fully to the requested information and material flow? Is the partner flexible enough to adapt itself to changes in demand or supply? Are roles and responsibilities defined in order to manage long-term relationships?

4. Technological suitability: Is the system of the company compatible and easily integrated? Does it have the same technical capacity as other companies in the chain? Are companies equally willing to share technology and innovations? Can partners provide each other with accessible and integrated data?

The most important expected benefit when supply chain cooperation is effectively achieved is financially. These benefits will be in the following areas in general terms.

- Reduction of inventories
- Improvement in customer service
- The most effective use of human resources
- Reduce distribution cycle to ensure better and efficient delivery system.

The main purpose of the cooperation between the companies that constitute the supply chain is; to respond to customer demands in the most effective and efficient way. In addition to this purpose, sales losses are reduced and production times are reduced by cooperation activities between supply chain companies; As a result of the decrease in the cost of goods sold, an increase in the supply chain profitability can be achieved.

The strategic, operational decisions and practices that firms receive by focusing only on their own organizations can cause additional costs and operational inefficiencies in terms of supply chain; As a result of this situation, the ongoing commercial relationship between the firms is affected negatively.

It should be ensured that the decisions taken for the purpose of providing operational benefit or cost reduction and the improvement projects are implemented throughout the supply chain instead of their own organizational boundaries. As a result of the successful completion and sustainable implementation of projects carried out jointly across the supply chain, it is possible to meet customer demands effectively and efficiently (Christopher, 2016).

The cooperation between the firms will be strengthened as a result of the projects carried out jointly with the participation of the stakeholder companies under the leadership of the supply chain main firm. However; The culture of doing business together will be adopted by all functions of the organization beyond the purchasing and sales functions of the companies. The supply chain cross-functional project teams should be formed with the

gathering of expert, middle and senior managers working in the different functions of the companies within the supply chain, and these teams should be responsible for the management of the projects to be realized jointly (Laudon &Laudon, 2016).

Projects carried out throughout the supply chain should be managed in an efficient and co-ordinated manner using a generally accepted project methodology under the roof of a program office consisting of program managers and project managers, independent of company organizations.

Senior management of the company should emphasize the culture of cooperation continuously, make decisions that support this culture in the applications, and be included as project sponsor in the projects carried out during the procurement.

It is strategically important for the projects to be jointly carried out throughout the supply chain that there is a high level of support from the senior management in order to ensure a strong cooperation between the firms and the establishment of a cooperation culture.

Supply chain project teams, according to their expertise; Product, information and money flow related to the processes associated with the reduction of the lead time, stock levels, sales losses and the cost of goods sold to reduce the cost of different projects should be carried out in a coordinated manner.

Projects that will be carried out jointly across the supply chain beyond the boundaries of the company; In the supply chain scale acquisition, it should jointly cover the warehouse and distribution center management, supply chain and 3.PL logistics company cooperation, stock optimization, jointly used supply chain software and B2B supply chain portals (p. 366).

2.1.1. Procurement on Supply Chain Scale

Supply chain companies use raw materials, materials, indirect materials, equipment and services (security, subcontractor personnel, service, etc.), central purchasing activities and the cost economy of the scale economy can be supplied to companies.

Supply chain procurement teams consisting of procurement of supply chain companies can collect demand requirements from companies by identifying the needs determined according to their specialization areas. It can realize the purchasing activity

under the electronic tender, at the purchase price under the market conditions and at the more appropriate payment terms. Purchasing project teams can save the purchasing costs of the firms by supplying the common requirements of the supply chain companies in the quality standards specified in the purchase specifications and the purchase price and payment terms of the companies in accordance with the existing purchase conditions (Christopher, 2016).

Supply chain purchasing teams; should be responsible for determining the purchasing conditions periodically as a result of the preparation of the procurement specifications, opening and finalizing the procurement tender. In the joint procurement process of supply chain companies, the purchase order management will be owned by the firms' own purchasing organizations and will enable the purchasing process to be realized efficiently and quickly.

2.1.2. 3PL Cooperation with Supply Chains

A long-term, comprehensive logistics contract should be established between the third-party logistics companies and supply chain companies, including the central and regional warehouses, the management of distribution centers, the raw material, materials and finished goods services. Logistics project teams consisting of top, middle level managers and logistics experts who work in the logistics organization of supply chain companies; In order to meet the logistic requirements of the supply chain, it should prepare the integrated logistics tender specifications including warehouse, distribution center management and transport ~~services~~ services, manage the tender process and complete the contract process.

Management services for supply chain companies, central warehouse, regional warehouse and distribution centers and the required transport services should be taken from 3.PL logistics companies and has to be reduced to the minimum number. Collaborating with the third party logistics companies in supply chain scale; warehouse, distribution center and transport costs will be reduced radically according to current costs (Rantanen et. all, 2017).

Supply chain companies use the same warehouses, the incoming and outgoing logistics needs are met by contracted 3.PL logistics companies; It shall ensure that the transportation and return loads of the transportation vehicles shall be organized and the transportation costs shall be reduced. A vehicle sent from the manufacturer's factory to the

central warehouse can be returned to the store in the city where the manufacturer's factory is located, after it has been emptied in the central warehouse and included in the store referral vehicle plan.

2.1.3. Joint Storage and Distribution Activities Across the Supply Chain

The combined use of the central and regional warehouses and distribution centers used by the companies along the supply chain will result in significant savings in warehouse and distribution costs. It is important to have an efficient flow of stock management and a lean product flow.

The combination of warehouse and distribution centers serving at different scales across the supply chain allows for a lean warehouse and distribution network. A lean warehouse and distribution network will reduce storage and transportation costs, shorten supply times due to decreased product movement. Reducing product storage activities along the supply chain to a minimum level due to the fact that it does not create value for the customer but is an operational cost will increase the profitability of the supply chain if it is eliminated.

2.1.4. Inventory Optimization Through Supply Chain

Minimum stock levels of products in the central warehouse and regional warehouses along the supply chain; planning, sales operations, supply chain experts and managers should be determined as a result of the decisions taken jointly by the project team. It should be ensured that the products that have high impact on supply chain turnover and that are strategically important and that are included in the scope of the project works. However; it should be targeted to cooperate between firms to identify stocks not moving along the chain and to sell these stocks. Achieving this goal will not only provide a positive impact on inventory retention costs and supply chain profitability, but will also enable efficient storage management in central and regional warehouses (Korkmaz, 2015).

To ensure inventory optimization throughout the supply chain; Most often, the traditional push method applied between stock management and factories, regional warehouses and sales points should be abandoned. Instead of; It should be applied combinations of push and pull methods, which are mainly formed by the method of withdrawal, by the point of sale of the stockpiles, the regional warehouses and the central warehouses and the factory warehouses.

2.1.5. Jointly Used Supply Chain Software

The flow of information defined as one of the main flows in the supply chain after the product and cash flow which directly interacts with each other; The relationship between the members of the chain, which extends to the customer, vendor, main supplier, sub-supplier, and even the supplier of the sub-supplier, directly affects every aspect and size. The power of this direct interaction is so high that it can shape the strategic, operational and financial decisions that supply chain members receive at each level of management. It is for this reason that the information produced within the supply chain must be transmitted to the right chain member precisely and without error. This is critical in order to create customer satisfaction, which is the main objective of the supply chain, and to ensure the continuous cooperation between supply chain members.

Within the scope of the supply chain process, information is produced at all levels within the third party firms providing services within or outside of the organizations within the supply chain process. These decisions directly affect the production, sales, stock and purchasing processes of the chain members. If this interaction is ignored and limited information is shared, many activities do not create value within the supply chain and the natural result of this is a decrease in profitability. Therefore, systematic and simultaneous provision of information sharing between the supply chain members is vital for the supply chains to be able to survive and be successful (Özkan et. all, 2015).

Supply chain companies give importance in terms of demand estimation, production planning, inventory management, vehicle and route optimization through the chain, determination of supply chain software, joint use of these software, system integrity and efficient inventory management. In case of joint purchase of these software by supply chain companies; significant savings from initial investment, installation, integration and software development costs will be achieved.

With supply chain IT project teams consist of executives and experts involved in IT organizations of supply chain companies; planning, inventory management and distribution optimization should be carried out. After this activity, it should be ensured that the software firms are interviewed for the selection of supply chain software, the design of the installation and development process, the approval of the project and the installation and development habits of the project according to the project time plan.

2.1.6. Cloud and Portal

It is seen that labor force is used inefficiently to share information in the supply chains using traditional knowledge sharing methods, communication costs are high, information sharing is delayed, incomplete and intermittent in response to high communication costs. In this way, the result of the information sharing naturally results in fail to deliver the order to the other party in time, the order is not met on time or the desired quantity of products cannot be supplied, the value-creating and cost-creating activities such as the backup shipment plan has to be carried out urgently in order to be able to supply the part shipment and order in a timely manner. The supply chain tries to eliminate the status of an information resulting from incomplete information sharing or to eliminate the non-compliance by performing corrective actions. The consolidation activities are often implemented for activities that do not create value, and this poses a negative impact on the supply chain profitability due to the additional cost to supply chains. In order to eliminate these situations, there is a need for information sharing environments where systematic information sharing is carried out within the supply chain. Providing systematic and concurrent information sharing is possible by using internet (web) platforms that include operational and financial information of the chain members and distributing this information to the relevant chain members.

In the supply chain, the systematic sharing of the information flow with the flow of products between the companies should be provided via the B2B internet portal. B2B internet portals; the information flow should be shared between the supply chain companies and the 3.PL logistics companies serving the supply chain in the processable data formats and the processing of the data. Systematic sharing of purchase and customer orders, systematic processing of order confirmation information, dispatch and invoice information, delivery information, systematic sharing of sales and stock information, and monitoring of product movement along the chain can be realized through the B2B internet portal. The main purpose of B2B website portal; to make the product flow through the supply chain traceable, to share the information formed as a result of the product movement between the companies and to transfer this information to the ERP systems of the stakeholder companies in the processable data formats (Dündar et al, 2016).

Cooperation methods in supply chains; The table below shows the effects on traceability, operational cost, operational efficiency, inventory management and profitability throughout the supply chain.

Nowadays, there are significant developments in electronic commerce, mobile technology, personalized production of 3D printer technology and internet of things (IoT) applications. These developments; In the design, production and distribution processes, the presence of a new commercial eco-system, which is formed by the integration of online and offline business models, is more determinative than ever before. Companies operating in this eco-system have to realize the transformation and change that will make the supply chains that respond to their customers' needs fast, efficient and effective. This requirement can only be met by focusing on the supply chains of the companies beyond their own organizational boundaries, cooperating with the supply chain companies and carrying out joint projects (Yıldız, 2018).

In the case of cooperation models that continue without eliminating the hidden obstacles between supply chain members, the result is based on information generated from prediction or past statistics, resulting in the absence of excessive stock or hand-to-hand products and loss of sales, reduced profitability and customer dissatisfaction. In this context, the usage of a web platform that will be implemented will save the communication and labor costs between the members of the chain. More important than that, through the elimination of the obstacles within the supply chain, efficiency and operational efficiency will be increased throughout the entire chain by implementing preventive activities instead of corrective actions as a result of the transition from a product-based product movement to demand-driven product movement. The most important meaning of this for the chain is that many non value adding activities shall be reduced to minimum level and even might has to be removed. Any gains in this context will provide a competitive advantage against companies' rivals.

In today's competitive conditions, the supply chain improvement and development projects carried out by the companies within their organizational boundaries; The positive effects on inventory levels, stock turnover, storage and distribution costs, lead times, customer service level and supply chain profitability along the supply chain remain very limited.

On the other hand, the improvement and development projects carried out jointly by the companies throughout the supply chain exceeding the organizational boundaries of the companies, make a significant contribution to the supply chain profitability and meet the customer expectations and requirements more efficiently and effectively.

CHAPTER 3

3. Transparency and Cooperation in the Supply Chain

Integrating and managing information throughout the supply chain has a direct impact on the performance of the procurement staff. In addition to information sharing, it can be said that the level of trust between the supply chain members also affects the supply performance from the first element in the system to the last element. Wu et al. (2004), while showing the trust between supply chain management behavioral dimensions, supply chain performance has tend to increase. In order to ensure effective supply chain management, the trust bound must be established between the supply chain elements. Guven (2006) said that an important asset that enhances the performance of firms that are in favor of reducing the transaction costs in order to increase cooperation, facilitating the activities of enterprises in the market and developing their ability to keep up with complex and uncertain environments. Ethical rules used by corporate firms as observers considering their social, environmental and moral factors are critical for supplier relationships in order to create more sustainable production conditions (Ryals&Humphiries).

Ryals&Humphiries (p.314) summarizes the benefits that supply chain cooperation plays an important role in supplying supply chain performance and this can provide a variety of strategic values for companies:

- Fast financial reimbursement in the short term
- Productivity and profit improvement
- Improvements in customer positioning and product quality
- Increasing long-term relationships with suppliers

For an enterprise to remain profitable, the supply chain should be monitored in terms of variables such as supply and demand, raw material costs, labor costs, production delays, product storage costs, and distribution costs. Supply chain management helps businesses identify inadequacies in managing costs and increasing profits.

While supply chain management is always an important part of the business, it has recently become an inevitable risk management component and is under increasing scrutiny from consumers, investors and regulators.

Supply chain transparency is aimed at creating a more closely monitored and unobstructed view of a company's supply chain practices, which, if managed well, it

provides benefit to business. Supply chain transparency is designed to make every step of the production process visible - from the acquisition of raw materials to the distribution of the final product - to maintain integrity at every stage of the process. For cooperations, it is hard to keep saving transparency but that models are developed to share informations.

3.1. Cooperative Supply Chain Management Models

In order to examine the effects of the use of CPFR approach in supply chain activities on the supply chain performance of supply chain members, a simulation model has been established in this study to illustrate three different scenarios. As a result of analyzing the results obtained from the simulation model in these different scenarios, it will be possible to examine the effects of CPFR approach on supply chain performance in detail. It is possible to sort these scenarios in the simulation model as follows:

- TSS-managed supply chain,
- Supply chain managed through a VMI approach,
- CPFR approach managed supply chain,

For the three scenarios outlined above, the simulation model is constructed on the total supply chain cost, customer service level and so on. In terms of performance criteria, the effects of the CPFR approach on supply chain performance will be examined and it will be investigated which terms and conditions are more beneficial for the supply chain. In addition, thanks to the simulation model, the possibility of comparing the VMI approaches with the CPFR approach under different conditions has been introduced.

Thanks to the simulation model, the analysis of various supply chain management styles will provide a clearer and more detailed understanding of the impact of the CPFR approach, which is popular today and attracting the attention of many companies, on the performance of supply chain.

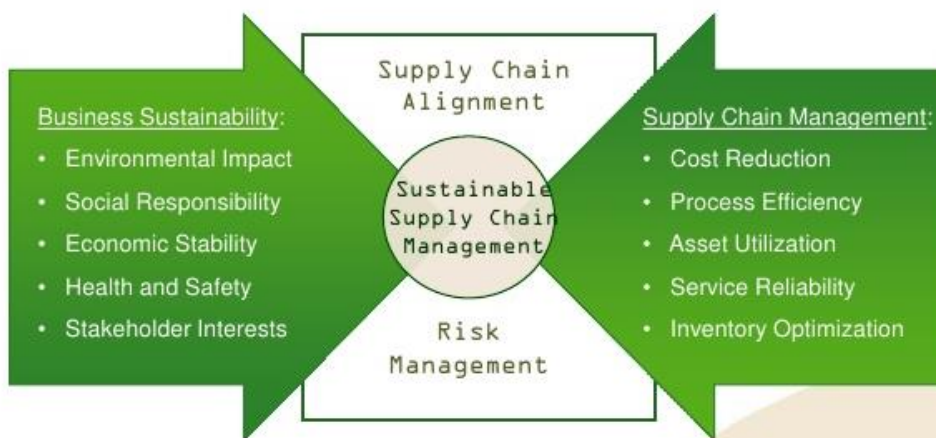
3.1.1. The Sustainable Supply Chain Model

In the traditional sense, when it comes to the way of doing business between supply chain members, point of sale information, inventory levels, etc. among the supply chain members.

Furthermore, within the framework of this structure, all supply chain members perform production / inventory and demand forecasting processes independently. Therefore, within

the framework of traditional supply chain understanding, only supply information is communicated between supply chain members. In other words, the only information used by supply chain members in demand forecasting and inventory planning is the order quantities from the member in the supply chain. Within this structure, all enterprises in the supply chain inspect the order information from a member on the chain and make the demand estimation and place an order to the enterprise that is on top of them according to their production / inventory control policy. For example, the retailer makes the demand forecast using the sales information and the order passes to the wholesaler, the wholesaler makes the inventory planning using the past retailer orders and passes the order to the distributor. Under this strategy, the supply chain members develop strategies to optimize the performance of their business. Then, they implement these strategies without considering whether they can create positive or negative effects on other businesses in the supply chain (Yılmaz&Tümtürk, 2016). Therefore, within the framework of traditional supply chain understanding, all supply chain members act individually.

Figure 7. Value drivers



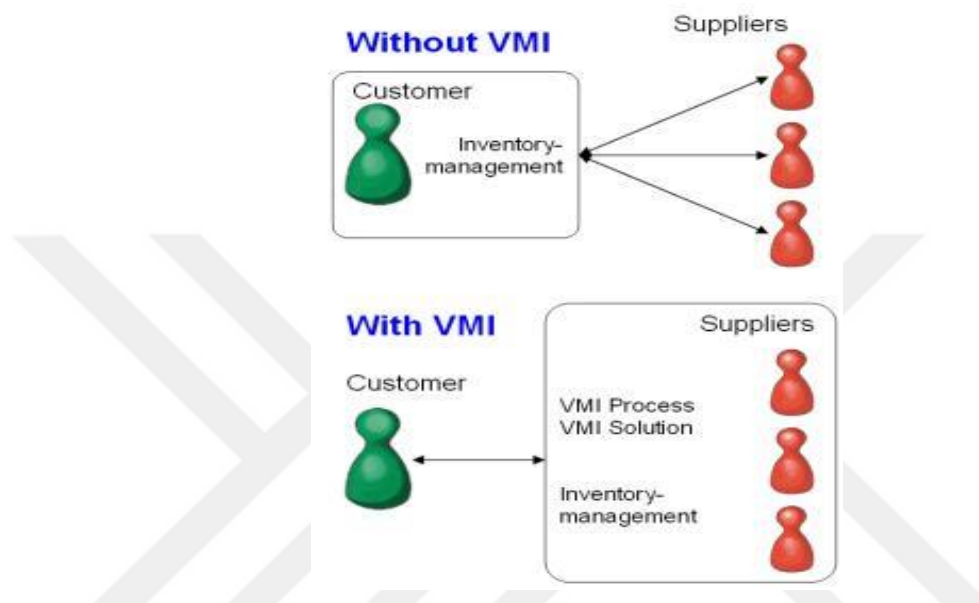
Resource: Taiga, 2009 <https://www.slideshare.net/taigacompany/sustainable-supply-chain-management-presentation>

Within the framework of the supply chain structure managed by the TSS approach, it is assumed that all supply chain members use the exponential correction demand estimation method to estimate the demand they will encounter during the supply period. As it is known, although exponential correction and moving average demand estimation methods are quite simple methods, they are widely used by enterprises and because of the ease of implementation, the majority of enterprises are satisfied (Şişman et. al, 2016).

3.1.2. Vendor-Managed Inventory

The VMI approach uses the point-of-sale (POS) and inventory information of another member of the member who is in the upper tier of the supply chain; It is a system in which the member decides what quantity of product should be in his stock and accordingly makes the production and distribution plans.

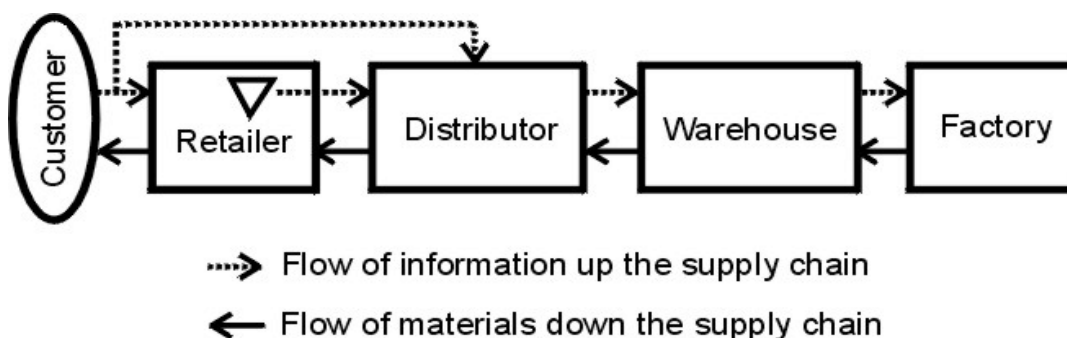
Figure 8. Vendor-Managed Inventory



Resource: Christopher, 2016

The key point in the VMI approach is to share the sales point information and inventory levels with the supplier and to make the distribution plans by the supplier. Therefore, in the framework of the VMI approach, the retailer does not assume any role regarding inventory decisions; the supplier identifies when and how many products are delivered to the retailer. With this approach, the whip effect of the traditional supply chain structure is reduced and the production company is able to make a more efficient production planning. In addition, thanks to this approach, it is possible to reduce the lead times by providing more efficient coordination in distribution planning (Taleizadeh et. all, 2015).

Figure 9. Supply Chain Flow



Resource: Disney, 2003 https://www.researchgate.net/figure/A-VMI-supply-chain_fig1_227427157

Within the given supply chain structure, a VMI approach is applied between the retailer and the wholesaler. In this context, the retailer shares sales point information and real-time inventory information with the wholesaler. Wholesaler has inventory levels in the retailer, point of sale information etc. as it has information, it implements the inventory and distribution strategies itself. By using this information shared with the wholesaler, it makes a sales forecast and tries to determine the most appropriate inventory and distribution plans.

The main objective in the VMI method is to optimize the total cost of both members as opposed to the traditional supply chain approach. The echelon stock system is a stock control system that aims to minimize the total cost in systems where central inventory control is performed, but in order to implement the progressive inventory system, the inventory levels of the members in which the stepped inventory management is applied must be known as the center of the inventory. In the case of sharing of time inventory information, it gives better results than local inventory systems (Taleizadeh et al, 2015).

Since the retailer's inventory decisions should be made by the wholesaler within the framework of the VMI approach, it is assumed that the wholesale inventory system is used by the wholesaler in the simulation model. Inventory control between the wholesaler and the retailer to which the VMI approach is applied is done by the wholesaler and by using a graded inventory control policy. Within the framework of the VMI approach, since the wholesaler manages both its and the retailer's inventory, he will be willing to minimize the costs of the retailer at his own costs.

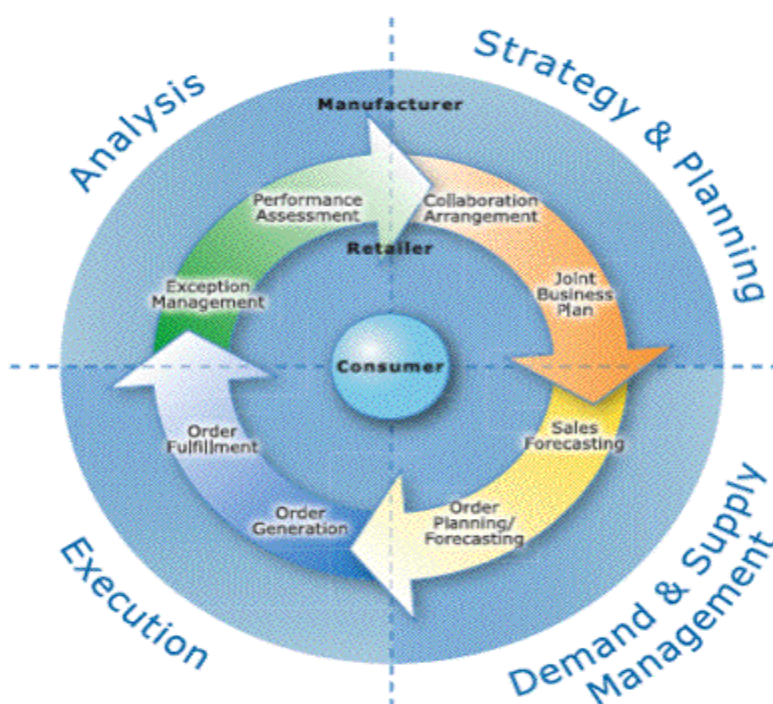
Within the framework of the VMI approach, there is no difference in the decision making process of the manufacturer and distributor according to the TSS approach. By

using the orders received from the wholesaler, the distributor establishes the demand estimate and passes the order to the manufacturer. The manufacturer, without having any idea about the inventory level of the distributor, makes the production planning by using the orders received.

3.1.3. CPFR

In the traditional sense, from the raw material of the product to the end customer, the manufacturing companies organize production planning and design activities while the other members communicate with each other at a very low level while distributing. Retailers, who lack retail sales tendency, focus more on their own production activities and internal productivity, while distributors concentrate on distribution activities. The lack of communication between the supply chain members and the focus on the ultimate customer; High inventory costs, low capacity usage, low customer service level etc. causes problems. The CPFR approach requires the supply chain members to work together in order to meet the final customer requirements by combining different competencies in the core processes (Stevens & Johnson, 2016). In the CPFR approach, the goal is to create a single customer demand estimate model that all supply chain members agree on, and then make the basic planning activities jointly using this estimate.

Figure 10. Structure of CPFR approach



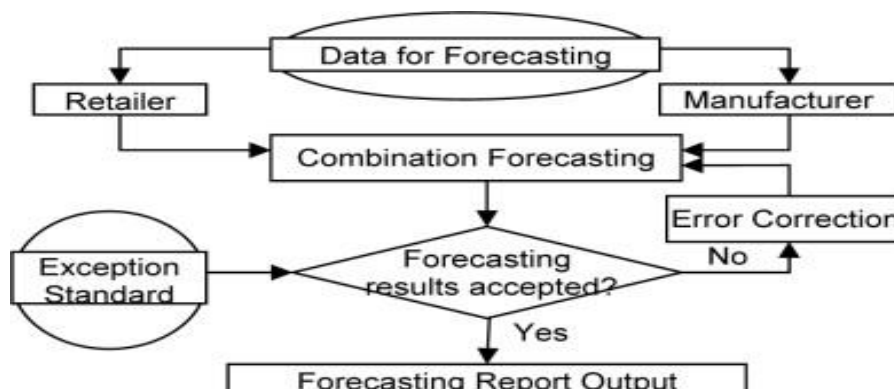
Within the framework of the CPFR approach, sales point information in the retailer, inventory levels of the members and demand forecasts are shared with all supply chain members. In addition, manufacturers, distributors, wholesalers and retailers share with each other the factors that are belong to them and may affect the demand in the market. In this way, a single demand estimate model is made by the supply chain members and all the members will agreed on. The distribution plan is then centrally planned to optimize the aggregated demand forecast and the total performance of all members by taking into account the cost structures of the members' inventory levels. By sharing information on point of sale information and other factors that may affect demand, it is possible to achieve better demand estimation and planning.

Although there are many differences between the CPFR approach and VMI approaches in the supply chain structures consisting of two stages, the most significant difference which may affect performance is observed to be in the stage of demand estimation. In the VMI approach, demand estimation and accordingly production / distribution plans are made by the supplier company, while demand estimation and production / distribution plans are jointly established with the participation of both the supplier company and the customer in the CPFR approach. In the demand forecasting process, participation of all members in the supply chain reduces errors in demand forecasting, and ensures that production and distribution planning is made more effectively (Panahifar et al, 2015).

In the CPFR method, point-of-sale information, inventory levels of supply chain members, information on factors that affect the customer demand structure of the members, and inventory cost structures of the enterprises are shared instantly in a way that all enterprises on the supply chain can reach. In this way, a single demand forecast is created, which is accepted by all members, because the information they have about the product request structure is shared.

Within the framework of the CPFR approach, this demand estimate, which was formed by the cooperation of all supply chain members, yields better results than a single member. In the simulation model, this feature, which is unique to the CPFR approach, is provided by assuming that the parameters of the customer demand structure are known to the enterprises.

Figure 11. CPFR Flow Chart



Resource: Wang, 2014 https://www.researchgate.net/figure/CPFR-Combination-Forecasting-Process-Flowchart_fig1_273897188

Types of supply chain management in the simulation model; CPFR, VMI and TSS approaches. In this chapter, firstly, the basic features of these forms of management which are animated in the simulation model are emphasized. These basic features; The main objectives of each of the members are the to design processes of production / inventory decisions and the creation of demand forecasts. Then, flow diagrams are given which explain how CPFR, VMI and TSS approaches are animated in the simulation model.

3.2. Transparency and Cooperation

Supply chains; Due to the strong competition experienced in the global and local markets, the product life cycle, the increasing frequency of promotional activities and the mass production and services result in competition in an eco-system with complex and high levels of uncertainty. As a result of this situation; more products, shorter lead times, more complex supply and demand relations, production and delivery processes are presented to the customer. As customers purchase products other than high-tech products due to the increase in the supply of similar function products and the decrease in brand dependency in the sales channels, they tend to rapidly commodify the products. As a natural result of this trend; In terms of customers, price is becoming the main determinant criterion of purchase. In the eco-systems where competition takes place in the price-oriented way, the increase in profitability is only possible by reducing the supply chain costs due to the price pressure on the product sales price (Gardner et. all, 2018). Reducing supply chain costs; In the production, storage, distribution and delivery processes, a transparent and traceable product flow is achieved by minimizing the uncertainty and

applying the system approach. Through the supply chain decision makers are directly affected by the increasing uncertainty level and they have to increase the security stocks and purchase order quantities due to the increase in uncertainty. This causes additional operational and financial costs. Minimizing uncertainty across the supply chain; transparency is achieved by ensuring product traceability and sharing of information simultaneously (Stevens & Johnson, 2016).

The main purpose of the system approach in supply chain cooperation is; the elimination of uncertainty and interruptions in supply, production and delivery processes. The uncertainties that companies face throughout the supply chain cause financial and operational losses. Some of these losses; loss of production, customer complaints as a result of uncompleted customer orders, turnover losses, increased inventory levels and delivery times. These losses have a negative impact on the cost of goods sold, profitability of the companies and customer satisfaction.

System design of cooperation and transparency in supply chain; The main business processes of the firms and the customers, manufacturers and suppliers, distributors and wholesalers of the companies involved in the strategic and operational information needs should be taken into account. The aim of the system design is to make the company's business processes efficient throughout the supply chain, to meet the information requirements systematically, to provide end-to-end traceability and to minimize the uncertainty (Formentini & Romano, 2016).

Targeted operational objective through supply chain system approach; is the simultaneous sharing of the information generated in the ERP systems of the manufacturers, distributors, wholesalers and retailers and sales points along the B2B platform. However; Another objective is to provide demand forecasting and supply process management based on real-time data rather than target data foreseen in firms' sales budgets. It should be kept in mind that uncertainty can be reduced to minimum levels by sharing information systematically, concurrently and sustainably (p.741).

The effective use of these systems in operations throughout the supply chain is important in terms of ensuring interactions with each other and system integrity. Nevertheless, it is important because of the fact that strategic and operational decisions that directly affect profitability, which provide an increase in customer satisfaction with an end-to-end traceable supply chain, enable high accuracy.

It is not possible for firms to manage their products with complex supply and demand relations solely on the basis of annual sales targets within the organizational boundaries and based on the limited sales and stock data for the previous periods. Instead, the use of supply forecasting systems and supply planning systems deployed on the cloud should be ensured in order to ensure joint use, centralized data sharing and easy access of supply chain companies. With demand forecasting and supply planning system, real-time sales and inventory data obtained from the ERP systems of the stakeholder companies will include the data of the past period in the analysis, and the company will perform a high accuracy demand estimation and supply planning activity for the companies throughout the chain. Rather than just historical data of sales and stock data, demand forecasting and supply planning activity based on real-time data will be highly accurate and efficient. It should be taken into consideration that planning activities carried out jointly throughout the supply chain will directly contribute to the inventory levels and supply chain profitability (Zhao, 2015).

The integration competencies of the enterprise resource planning systems used by the companies along the supply chain are important for the effective implementation of the supply chain system approach. Integration of the function as a separate module in ERP systems; As a priority, the B2B platform enables efficient data exchange between demand forecasting and supply planning systems and other systems in a short time. Effective and sustainable data exchange between supply chain companies is only possible with the competencies of ERP systems. New generation ERP systems; The fact that it includes warehousing and distribution processes, demand forecasting and supply planning functions together with finance and accounting, sales, purchasing and human resources functions are important for the implementation of the system approach in supply chains.

Warehouse management systems improve procurement, customer order management, inventory management, warehouse operations and workforce management. However, working with the enterprise resource planning system (ERP), transportation management system (TMS) and delivery management systems (DMS) is the basic requirements expected from the warehouse management system. Today, warehouse management systems (WMS) can be found as a module within ERP systems and can be used as a completely independent software system. Regardless of the ERP systems, the warehouse management systems in the market can be preferred by the companies because they have more operational features (Helo et. all, 2017).

The delivery of the goods shipped from the supply chain warehouses by the vehicle drivers at the place of delivery by using smart phones and delivery to ERP and warehouse management systems through integration are carried out by delivery management systems. Delivery management systems allow the vehicle to be tracked with the load instead of providing vehicle tracking with traditional methods. In addition to this, it can produce delivery information that is of strategic importance in terms of supply chain traceability and can share it with stakeholders through integration. Delivery management systems, delivery performance of the distribution team are measured, waiting times at delivery points are determined and distribution process can be managed based on data.

The existence of delivery management systems and transparency are critical for supply chains in order to eliminate uncertainty in the supply chain cooperation and to ensure traceability in outbound and outbound logistics processes (Vendouw et. all, 2018). However; delivery management systems contribute to supply chain profitability by reducing distribution finance.

CHAPTER 4

CASE STUDIES



4.1. Supply Chain Transparency and Collaboration at IBM

Being one of the leading information and technology companies, IBM has directly or indirectly operations in most of the countries worldwide. IBM's fields of activities include not only technological production but also R & D activities. Additionally, IBM is also one of the most patented companies in the world. Its patents mostly include ATMs and computer hardware and softwares.¹ IBM was founded in 1911 by Thomas J. Watson to process and develop patents for Herman Hollerith, the inventor of card-piercing machines. In a short period of time, the company expanded its business and became the pioneer in the computer and technology industry. Providing hardware, software and service solutions to companies of different sizes from various industries, the company has undersigned many revolutionary innovations over its 100-year history.²

IBM ranked second in Interbrand's World's Most Valuable Brands of 2010' list. According to the 2010 annual report, IBM's worldwide revenue is USD 99,870 billion and its net profit is USD 14,833 billion. In 2018, IBM's net revenue was \$ 8,728 billion.³

¹ IBM. (n.d.). Retrieved November 28, 2019, from <https://www.ibm.com/ibm/us/en/>.

² IBM. (n.d.). Retrieved November 28, 2019, from <https://www.ibm.com/ibm/us/en/>.

³ IBM. (n.d.). Retrieved November 28, 2019, from <https://www.ibm.com/ibm/us/en/>.

4.1.2. Supply Chain Management of IBM

Supply chain of IBM provides enterprise-wide supply chain planning and execution capabilities and enables the company to operate the changes in demand and supply as well as have a flexible supply chain management. The amount of inventory that is needed in order to deliver the order and the planning and implementation of shipments to meet customer commitments are the core principles of supply chain management of the company in question. IBM is committed to understanding, managing and directing the supply chain in order to have a smart supply chain system. In this context, IBM makes use of artificial intelligence to solve problems and problems in the supply chain.⁴ In this way:

- Providing faster decision-making by experts in the supply chain,
- Intelligent warning systems to be informed on time of distortion and complexity,
- Acceleration of the solution period of the problems in the supply process,
- Increases agility and flexibility in responding to customer demands and market opportunities.

The main responsibility of supply chain managers of IBM is to verify the supply and to monitor the costs. The events such as weather conditions and carrier problems, political problems and activities and problems related with the quality of the product that may affect the delivery are monitored and their risk coefficients are tried to be minimized. Additionally, supply chain managers of IBM are responsible for the protection of the brand and fulfilling the expectation of the consumers about the brands. Thus, in order to realize above purposes, the supply chain system of IBM should be transparent and collaborative.⁵

IBM plans to achieve faster transparency in its supply chain system with artificial intelligence-driven insights to move faster, more securely and resolve disruptions within minutes, using transparent and collaborative supply chain management.

⁴ The Evolution of the Transparent and Cognitive Supply Chain. (n.d.). Retrieved November 8, 2019, from <https://www.ibm.com/watson/supply-chain/resources/evolution-transparent/desktop/index.html>

⁵ The Evolution of the Transparent and Cognitive Supply Chain. (n.d.). Retrieved November 8, 2019, from <https://www.ibm.com/watson/supply-chain/resources/evolution-transparent/desktop/index.html>

4.1.3. Transparency and Collaboration in IBM's Supply Chain

In order to have a sensitive supply chain system, it is necessary to have a transparent and collaborative supply chain system. The main aim of IBM is to increase the value of the products and in order to realize this aim, IBM needs to increase the value of its supply chain. The development of technology and the Internet has increased and improved the product range. As a result, many technological infrastructures that can be utilized in supply chain management have emerged. With the help of these technological infrastructures, IBM has established a more transparent supply chain infrastructure. As a result of his research and studies, IBM realized that some points should be taken into consideration in order to ensure transparency in the supply chain. These points can be summarized as follows:⁶

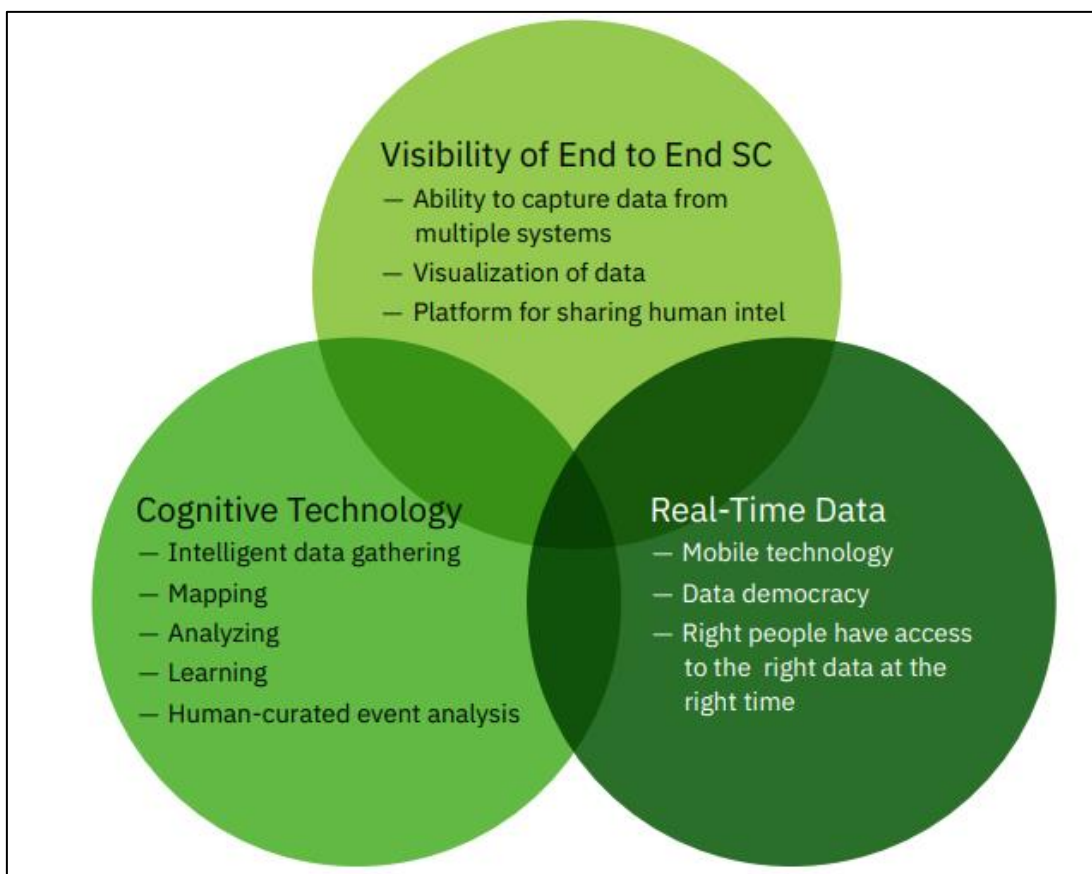
- Reacting to Interruptions: The reasons of an interruption is usually obvious. However, IBM's data is incapable of detecting these interruptions. The speed of information and team response were also insufficient.
- Real-Time Information - Employees of the company's risk department warned of the need for real-time information. Nonetheless, they did not provide technical information about the nature of the problem and its solution. However, IBM recognized the importance of identifying the factors causing the problem. As a result, the company has developed a system that provides the right information at the right time.
- Collaboration and Teamwork: It is of utmost importance that the decision-making process in the supply chain runs quickly. In this context, IBM aims to accelerate the decision-making process by promoting teamwork and collaboration between teams.

As a result of all these developments, IBM has taken steps to make the supply chain transparent with the help of information technology. IBM called this system as the Transparent Supply Chain System. IBM's transparent supply chain system can interact at high speeds. IBM's transparent supply chain system use machine learning to analyze data.

⁶ The Smarter Supply Chain of the Future. (2010). Retrieved November 8, 2019, from <https://www.ibm.com/downloads/cas/AN4AE4QB>

The system, which is able to understand and learn from all types of data, is being further developed by IBM.⁷

The elements of the above-mentioned transparent system are shown in the table below. The following table underlines that the system is based on cognitive systems and processes with real-time data.



The system developed by IBM exposes potential risks in the supply chain:

- Risks related to the factory where the product parts will be produced,
- Risks that may be encountered during procurement of raw materials and delivery of products,
- Risks that may be encountered during the packaging of the products,

⁷ The Smarter Supply Chain of the Future. (2010). Retrieved November 8, 2019, from <https://www.ibm.com/downloads/cas/AN4AE4QB>

- Risks that may be encountered during the delivery of products to customers.

4.1.4. Benefits for Inventory Management of Transparency and Collaboration in IBM's Supply Chain

The main purpose of the developed transparent and cooperative supply chain method system is to increase the accuracy of the planning process, to reduce the costs encountered in this process and to solve the problems encountered. To overcome these problems, computer technologies, detailed analysis techniques, collaboration technologies and automatic reporting systems have been used. In this way, information sharing has been made more transparent. As a result, the duration taken to solve the problems that arise during supply chain management has decreased from 18-21 days to 1 day. In addition, there has been a 52 percent reduction in costs for solving problems.⁸

As a result of the transparent and collaborative supply chain system developed, real-time monitoring was possible and the company's ability to solve problems arising in the supply chain process has improved greatly. IBM's data provisioning process has almost doubled. In addition, the time spent on solving these problems has decreased to only hours.⁹

As a result of the transparent and collaborative supply chain system, the problems caused by the lack of products have been reduced. Product lead time has been reduced from 50 days to 15 days. In this way, income losses resulting from inability to supply orders were eliminated. IBM's revenue in this process is increased around \$ 60 million.¹⁰

The transparent and collaborative supply chain system has also enabled IBM to reduce its structural costs. IBM has achieved this reduction by improving the accuracy of

⁸ IBM Transparent Supply Chain Case Study. (2017). Retrieved November 8, 2019, from <https://www.ibm.com/downloads/cas/EL2QZ7N3>, p.3.

⁹ IBM Transparent Supply Chain Case Study. (2017). Retrieved November 8, 2019, from <https://www.ibm.com/downloads/cas/EL2QZ7N3>, p.3.

¹⁰ IBM Transparent Supply Chain Case Study. (2017). Retrieved November 8, 2019, from <https://www.ibm.com/downloads/cas/EL2QZ7N3>, p.3.

data and developing collaboration with suppliers. As a result, the duration for receiving and responding to orders has almost doubled.¹¹

4.1.5. Benefits for Cost Expenses and Profitability of Transparency and Collaboration in IBM's Supply Chain

The most important reason for IBM to use a transparent and collaborative supply chain system is to reduce its costs. IBM has gone to cost reduction by providing a real-time data sharing environment between the raw material team and the sales team. Based on this real-time information provided by the raw materials team, the IBM sales team has resolved ordering processes much faster.¹²

IBM executives have realized that transparency is the most important element in supply chain management to reduce costs and communicate quickly with raw material suppliers. As a result, IBM has developed a system that allows accurate time-sharing of information between teams and suppliers. As a result, IBM has witnessed a faster ordering process.

Another reason for IBM to develop a transparent supply chain is to better understand demand and supply. To overcome this, it has developed a system that enables real-time information sharing between the sales team and the supply team with the help of computer technology. In this way, there was a significant increase in the speed of data sharing between teams and the accuracy rate of these data. In addition, IBM has reduced the cost of time it spends on testing the accuracy of data through a transparent supply chain.

As a result of its transparent and collaborative supply chain, IBM has managed to obtain order, raw material and sales data 90 percent faster than in the past. As a result, IBM

¹¹ IBM Transparent Supply Chain Case Study. (2017). Retrieved November 8, 2019, from <https://www.ibm.com/downloads/cas/EL2QZ7N3>, p.5.

¹² IBM Transparent Supply Chain Case Study. (2017). Retrieved November 8, 2019, from <https://www.ibm.com/downloads/cas/EL2QZ7N3>, p. 6.

reduced its late order rate by 75 percent. This decrease in late order rate also led to a drop in delivery costs. In 2016, IBM witnessed a 2.5 percent drop in its product supply prices.¹³

In 2016, IBM also experienced a half-cut reduction in the extra costs it faces in its order delivery process. In addition, IBM has not faced any serious problems in the delivering process in the last 3 years.

4.1.6. Other Benefits of Transparency and Collaboration in IBM's Supply Chain

The other benefits that IBM's collaborative and transparent supply chain provide can be listed as follows:

- Taking action faster in solving the problems encountered in the delivery process,
- Increased accuracy of the data obtained,
- Increased transparency in the supply chain process,
- Increased speed of sharing the data among the teams,
- Increased knowledge of teams about supply chain process,
- Possibility to make faster and more precise decisions in case of problems.



¹³ IBM Transparent Supply Chain Case Study. (2017). Retrieved November 8, 2019, from <https://www.ibm.com/downloads/cas/EL2QZ7N3>, p. 6.

4.2. Supply Chain Transparency and Collaboration at Unilever

Unilever was founded in 1930 as a result of the merger of the Dutch margarine producer Margarine Unie and the British soap company Lever Brothers. What makes Unilever interesting is that the company is a completely public company. The company has hundreds of shareholders in different parts of the world, which encourages Unilever to be more transparent. Although the company focused on margarine and soap production in its early years, it started to produce different products in different parts of the world. The company started to reach its current product range after 1950s.¹⁴

Today, Unilever serves with around 40 different products. Dove as soap, Omo as detergent, Knorr as soup, Lipton as tea, Algida as ice cream and Rexona as deodorant are among the most popular products of the company. Today, Unilever operates in almost all countries of the world and manufactures its products in 20 different countries. The company has different product combinations in the fields of food, beverage, cosmetics, ice cream and personal care.¹⁵

4.2.1. Supply Chain Management of Unilever

The supply chain department of Unilever controls the entire process from the beginning to the end of every product purchased in the market. The control process includes the purchase of raw materials contained in any product seen in the market, negotiations during this purchase process, transporting the materials to the factory, planning and managing the production itself, then forwarding this production to the customers and monitoring this continuously. From raw material procurement to final

¹⁴ Unilever Hakkında. (n.d.). Retrieved November 28, 2019, from <https://www.unilever.com.tr/about/who-we-are/introduction-to-unilever/>.

¹⁵ Unilever Hakkında. (n.d.). Retrieved November 28, 2019, from <https://www.unilever.com.tr/about/who-we-are/introduction-to-unilever/>.

product delivery, supply chain practices of Unilever focus on the customer to support the growth.¹⁶

As Unilever is an international company, it is seen that the supply chain system has a regular operation. One of the most important reasons for this is the very detailed explanation of the company's mission and vision. Unilever's mission is to increase the company's profits and increase the product range. In order to achieve its goals, the Company establishes and develops relations with its environment. Unilever aims to ensure that its products are of high quality, delivered to the consumer in the fastest way and that their prices remain as low as possible. In this context, Unilever intends to achieve its goals by cooperating closely with local suppliers.¹⁷

The main objective of Unilever's supply chain system is to provide accurate and true information to the relevant departments of the company. One of the goals of Unilever is to create a synergy between the team members of the supply chain system, which encourages teamwork in particular. In this context, Unilever continuously takes measures to increase the performance of the supply chain system and innovates based on technology.

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4.2.2. Transparency and Collaboration in Unilever's Supply Chain

Unilever's products are in demand in almost all countries of the world. In this context, Unilever has concentrated its product production facilities in regions with high demand. Products are exported to countries where production is not carried out. In this context, Unilever's supply chain system desires to have a transparent and collaborative

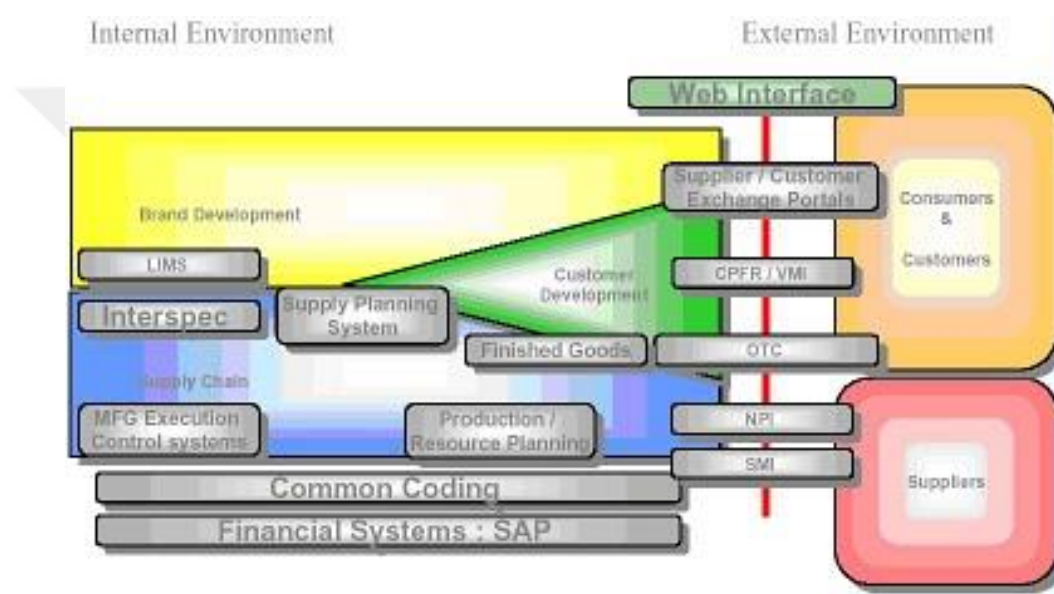
¹⁶ Partner to Win. (n.d.). Retrieved November 19, 2019, from <https://www.unilever.com/about/suppliers-centre/working-together/partner-to-win/>

¹⁷ Partner to Win. (n.d.). Retrieved November 19, 2019, from <https://www.unilever.com/about/suppliers-centre/working-together/partner-to-win/>

¹⁸ Partner to Win. (n.d.). Retrieved November 19, 2019, from <https://www.unilever.com/about/suppliers-centre/working-together/partner-to-win/>

structure. In this way, it is clear that Unilever can establish a closer relationship with its customers and access the data they want more easily.¹⁹

Unilever's supply chain management system is based on real-time communication between raw material purchasing team and sales team. By using information systems and supply chain management systems, Unilever strives to make supply chain management more transparent and collaborative. It is possible to see Unilever's transparent and collaborative supply chain management as follows.²⁰



Unilever's Responsible Procurement Policy (RPP), which was put into practice in this context, was updated in 2017 in order to strengthen the determination to work with suppliers towards a long-term, sustainable and successful way. While RPP helps Unilever achieve its business goals, it creates a positive social impact on millions of people working in supply chains and decreases the effects on the environment. In addition, Unilever has

¹⁹ Unilever Sorumlu Tedarik Politikası. (2017). Retrieved November 19, 2019, from https://www.unilever.com/Images/unilever-rsp-2017-turkish_tcm244-509012_en.pdf

²⁰ SCM Case Study UNILEVER. (n.d.). Retrieved November 15, 2019, from <https://www.scribd.com/document/48312651/SCM-Case-Study-UNILEVER>

developed some rules that must be followed for suppliers who wish to cooperate with them.²¹

In addition, Unilever recognizes the importance of its suppliers to achieve the objectives mentioned in the previous sections. Therefore, Unilever attaches importance to cooperating with its suppliers. This is the most important reason behind the creation of a transparent and collaborative environment in the supply chain management system.

Unilever has 380 different production facilities and 150 factories in the world. As a result of all these developments, Unilever has made significant changes and updates to its supply chain system. The reasons behind these changes are summarized as follows:²²

- Conducting the purchasing process more accurately,
- Bringing the supply chain process to world standards,
- Making the supply of product raw materials more professional,
- Digitizing the raw material procurement process,
- Making the supply chain process simpler,
- Accelerating the data acquisition process and ensuring the accuracy of the data provided.

Unilever has developed two internet-based communication systems to ensure transparency and collaboration in the supply chain. The main purpose of these systems is to collect, report and present all the data in the supply chain process. In this way, related managers and units can access real-time, accurate data and thus solve the problems that may arise.

²¹ SCM Case Study UNILEVER. (n.d.). Retrieved November 15, 2019, from <https://www.scribd.com/document/48312651/SCM-Case-Study-UNILEVER>

²² SCM Case Study UNILEVER. (n.d.). Retrieved November 15, 2019, from <https://www.scribd.com/document/48312651/SCM-Case-Study-UNILEVER>

4.2.3. Benefits for Inventory Management of Transparency and Collaboration in Unilever's Supply Chain

Unilever has been following the distribution of products with the supply management system it has developed in 2001. In this way, Unilever can determine where products are located in real time and ensure that products reach their markets on time.²³

This initiative by Unilever is one of the most important steps to achieve the company's goals, because one of the company's goals is to deliver products to consumers on time. The company reduced its 30 warehouses to 5. However, the company can deliver its products to any part of the world within a day.²⁴

Unilever has set a zero stock policy with its transparent and collaborative supply management system. In this way, the optimum use of the products in the warehouse is provided. The most important reason behind this success is undoubtedly the company's transparent and collaborative supply management system. As a result of all these initiatives, Unilever's inventory costs decreased by 10 percent. In addition, the firm increased the accuracy of its stock forecast by 10 percent. This development was also reflected in sales and company's profit increased by 5 percent.²⁵

²³ Unilever Supply Chain Management. (n.d.). Retrieved November 19, 2019, from <https://www.slideshare.net/RahulAuddya/unilever-supply-chain-management>

²⁴ Unilever Supply Chain Management. (n.d.). Retrieved November 19, 2019, from <https://www.slideshare.net/RahulAuddya/unilever-supply-chain-management>

²⁵ Unilever Supply Chain Management. (n.d.). Retrieved November 19, 2019, from <https://www.slideshare.net/RahulAuddya/unilever-supply-chain-management>

4.2.4. Benefits for Cost Expenses and Profitability of Transparency and Collaboration in Unilever's Supply Chain

Unilever's process of developing a world-class supply chain is a policy consistent with the company's objectives. As a result of the change in the strategy of the company after 2000, the company attached more importance to supply chain management. This resulted with a 15 percent savings in the company's expenses.²⁶

4.2.5. Other Benefits of Transparency and Collaboration in Unilever's Supply Chain

Unilever uses the system provided by Ariba in supply chain management and has succeeded in bringing supply chain management to world standards thanks to this system. As a result, the company's storage costs have declined. The company's ultimate goal is to reduce the number of warehouses to three.



4.3. Supply Chain and Transparency and Collaboration at Samsung

Founded in 1938 by Lee Byung-Chul, Samsung is a South Korea-based technology company. Samsung is a group of companies, the most important of which is Samsung Electronics. The company was originally established to sell dried fish, vegetables and fruits to nearby countries. The company started to operate flour mills and sugar machines

²⁶ Unilever Supply Chain Management. (n.d.). Retrieved November 19, 2019, from <https://www.slideshare.net/RahulAuddya/unilever-supply-chain-management>

in the following years and expanded its production areas and started to invest in the heavy industry in the 70s.²⁷

Samsung is one of the pioneers in the telecommunication industry in the production and sales of mobile phones. The reason for making this output in the telecommunication industry in a short time is the fact that the R & D investment of Samsung is high and Samsung regulates its production and models according to the user's wishes and produces high-tech devices at an affordable price.²⁸

4.3.1. Supply Chain Management of Samsung

Samsung has around 2,500 suppliers worldwide, supplying raw materials to the company for its products. Samsung has imposed a number of obligations on its suppliers. The most important is that each supplier must have an Eco-Partner certificate.²⁹

Samsung also requires its suppliers to certify that the raw material to be supplied does not harmful for the environment. In addition, Samsung requests all suppliers' information and inspects its suppliers every two years and terminates the partnership with suppliers who fail to pass this inspection.³⁰

Samsung's supply chain is built on five criteria. These are cost savings, optimum labor utilization, delivery on time, risk prevention and competitive advantage in the supply

²⁷ Samsung. (n.d.). Retrieved November 30, 2019, from <https://www.samsung.com/tr/aboutsamsung/company/history/>.

²⁸ Samsung. (n.d.). Retrieved November 30, 2019, from <https://www.samsung.com/tr/aboutsamsung/company/history/>.

²⁹ Sürdürülebilir Tedarik Zinciri. (n.d.). Retrieved November 20, 2019, from <https://www.samsung.com/tr/aboutsamsung/sustainability/environment/sustainable-supply-chain/>

³⁰ Sürdürülebilir Tedarik Zinciri. (n.d.). Retrieved November 20, 2019, from <https://www.samsung.com/tr/aboutsamsung/sustainability/environment/sustainable-supply-chain/>

chain. Taking these five criteria into consideration, Samsung tries to build synergy with its suppliers and aims to achieve sustainable development.³¹

Samsung puts the mutual trust relationship at the center of its cooperation with the companies in the supply chain. In this context, the company uses a transparent and collaborative supply chain management system, meets with its suppliers at regular intervals and thus have the advantage of preventing problems that may arise in advance.³²

4.3.2. Transparency and Collaboration in Samsung's Supply Chain

Samsung supplies battery equipment, pack materials and mainly electronic materials, from its suppliers. In this context, Samsung intends to establish a long-term and cooperative relationship with its suppliers.³³

4.3.3. Impact and Benefits of Transparency and Collaboration in Samsung's Supply Chain

Samsung started attaching importance to transparency and collaboration in the supply chain system in 2008. In this context, Samsung has tried to obtain external services in order to ensure transparency and collaboration in its supply chain. These systems are currently used in 14 different Samsung stores. As a result of its transparent and collaborative supply chain, Samsung has been able to analyze and control costs and monitor the entire distribution process instantly. The success of the booking and planning

³¹ Samsung Tedarik Zinciri. (n.d.). Retrieved November 20, 2019, from <https://www.samsung.com/tr/aboutsamsung/sustainability/supply-chain/>

³² Samsung Tedarik Zinciri. (n.d.). Retrieved November 20, 2019, from <https://www.samsung.com/tr/aboutsamsung/sustainability/supply-chain/>

³³ Sustainable Supply Chain Support and Management. (2017). Retrieved November 20, 2019, from https://www.samsungsdi.com/upload/download/sustainable-management/2016_SR_Sustainable_Supply_Chain_Support_and_Management_English.pdf

processes has increased by 60 percent. In addition, the system has provided Samsung with a cost savings of between 10 percent and 25 percent.³⁴



4.4. Supply Chain and Transparency and Collaboration at P&G

Procter & Gamble is an international company based in the USA that produces consumer products. It has a wide product range including cleaning products, personal care products and hygiene products. In addition, the company was involved in the food sector with Pringles product, but in 2012, Pringles was sold to Kellogg and the company terminated its activities in the food sector.³⁵

Procter & Gamble was established in 1980 as a small company in the western part of America and has become one of the leading companies in the world. Today, Procter & Gamble operates in 140 countries and produces in its factories and plants in 80 countries. The total number of employees in these facilities is 138 thousand. Procter & Gamble

³⁴ Sustainable Supply Chain Support and Management. (2017). Retrieved November 20, 2019, from https://www.samsungsdi.com/upload/download/sustainable-management/2016_SR_Sustainable_Supply_Chain_Support_and_Management_English.pdf

³⁵ P&G. Ürünleri ve Markaları (n.d.). Retrieved November 30, 2019, from <https://www.pg.com.tr/urunleri-ve-markalari/>.

manufactures beauty products, women's care products, men's care products and small household appliances.³⁶

4.4.1. Supply Chain Management of P&G

Procter and Gamble for a little while prior used supply chain power to gain a competitive advantage. The company's key focus to supply chain-based organization modernization changed both the buyer things and retail business ventures. This channel course of action enabled Procter and Gamble to make an exceptionally significant level of customer sureness and on-going rounds of supply chain modernization in these records. In this way, the essential wholesalers had become enough volume to keep up prompt worth included relationship with Procter and Gamble.³⁷

There was a huge necessity for reaching the customer at once. In this manner, Procter and Gamble decided to use agent based exhibiting complicated, adaptable structures in the wake of doing a lot of assessment.

Supply chain techniques of Procter and Gamble can be listed as follows³⁸:

- Accessing the right data at the right time,
- Developing supply chain management infrastructure with the help of experts in this field,
- Increasing the sales volume and the profitability level,
- Being a leader in the market with supply chain management infrastructure.

4.4.2. Impact and Benefits of Transparency and Collaboration in P&G 's Supply Chain

³⁶ P&G. Ürünleri ve Markaları (n.d.). Retrieved November 30, 2019, from <https://www.pg.com.tr/urunleri-ve-markalari/>.

³⁷ Supply Chain Leader Procter and Gamble (n.d.). Retrieved November 30, 2019, from <https://www.clearspider.com/blog-supply-chain-leader-proctor-gamble/>.

³⁸ Supply Chain Leader Procter and Gamble (n.d.). Retrieved November 30, 2019, from <https://www.clearspider.com/blog-supply-chain-leader-proctor-gamble/>.

Although Procter & Gamble has one of the best supply chain infrastructures in the industry, it invests in its supply chain management. The most important reason for this investment is that its supply chain is not transparent and collaborative. Within this scope, the company started to invest in order to improve transparency and collaboration in the supply chain. The company then began to use a control tower system called “Business Sphere” after a search for a fully interconnected platform that provides holistic optimization.³⁹

The result was a 1-2 % increase in P&G sales, a 2-5% increase in profits and a 5-10% improvement in asset utilization. In addition, P&G says they can use supply chain competency models to combine multiple data points, analytics, and visualizations, resulting in inventory

CHAPTER 5

5.Method

5.1. Methodology

My research adopted a case study approach which belongs to qualitative method. I analyze the four supply chain companies in order to measure the effects of implemented strategies of their own in relating to transparency and collaboration.

5.2. Research Questions

RQ-1-) What are the benefits of having collaboration in supply chain management of companies in relation with key performance indicators?

³⁹ Procter & Gamble’s Supply Chain Control Tower (2015). Retrieved November 30, 2019, from <https://logisticsviewpoints.com/2015/07/14/procter-gambles-supply-chain-control-tower/>.

RQ-2-) What are the benefits of having transparency in supply chain management of companies due to key performance indicators?

GENERAL EVALUATION

Today, transparency and cooperation in supply chain management have been preferred and implemented by many brands. In this context, IBM, Samsung, Unilever and P&G have been examined and it is seen that the system makes it easier to keep track of products and reduce inventory costs.

IBM's product lead-time has been reduced from 50 days to 15 days. At the end of this process, IBM received orders 90 percent faster than before. IBM also had a profit increase of 2.5 percent.

Unilever, on the other hand, recorded a 10 percent drop in stocks and a 5 percent increase in sales. Unilever also had a cost profit of 15 percent.

Samsung, on the other hand, made more realistic analyzes of demand collection, planning and forecasting activities with the transparency and collobaration system in supply chain management and increased the success rate of these analyzes by 59 percent. Parallel to this, Samsung has saved transportation costs between 10% and 25% depending on the regions.

P&G, on the other hand, experienced an increase of 1-2 percent in sales with transparency and collobaration in supply chain management and increased its profitability by 2-5 percent.

RESULTS

Figure 12. Impacts of Transparency & Collaboration

Cases/Criterias	Sales Margin Improvement	Gross Profit Percentage Improvement	Inventory Turnover Improvement	Delivery Time Improvement	Lead Time Improvement	Customer Service Improvement
IBM	✓	✓	✓	✓	✓	✓
Unilever	✓	✓	✓	✓	✓	✓
Samsung	✓	✓	✓	✓	✓	✓
P&G	✓	✓	✓	✓	✓	✓

CONCLUSION

The importance of the supply chain management may vary from company to company, but it is one of the crucial points for all companies, whether small or medium. That's why chain management with the right tools and a healthy way to increase the company's growth, profit rate increases.

In order to ensure the continuity of the companies, making the right decisions on the chain rings, making the analyzes and improvements, ensuring the coordination and control of all the operational processes, will ensure the efficiency in the whole chain and thus ensure the objectives such as profitability and customer satisfaction. At this point, it is a strategic requirement for companies to focus on supply chain management and work with professionals to significantly increase the performance of organizations.

Businesses, suppliers, mutual trust, integration and information-sharing is based on a benefit to work more effectively. Businesses can provide competitive advantage by establishing cooperation and strategic partnerships with suppliers. By means of this principle, it can be ensured that reliable and accurate input can be purchased at any time by establishing good relations with suppliers.

The length of the relationship established with the supplier providing the basic requirements can be evaluated in accordance with the supplier's past and present performance, the parties' relations with each other and their future expectations. This evaluation may vary according to the competition in the market. The current price of the supplied product can remain high due to developments and the possibility of being supplied at a much lower cost than the competing suppliers.

The enterprises have an effective supplier network to deliver the raw materials they use to produce goods or services and to deliver the goods or services they produce to the final consumers, they can take a step forward against their competitors in the market they operate. In this respect, the importance of the enterprises given to the supplier selection will cause their place in the market to play a decisive role.

Today, continuous changes in technological, economic and social life affect enterprises in many ways. In parallel with the technological developments, the development of new business and processes continues. For enterprises that are trying to

keep up with this development, studies are being made to measure and improve their performance. The new processes that emerged in the process of globalization force enterprises to be competitive and require a flexible organizational structure that adapts to changes. In order for companies to adapt to these changes in their environment, they must develop their institutional capacities, establish an organizational structure that can respond to changes and continuously measure their corporate performance.

Integrating and managing information throughout the supply chain has a direct impact on the performance of the procurement staff. In addition to information sharing, it can be said that the level of trust between the supply chain members also affects the supply performance from the first element in the system to the last element. In order to ensure an effective supply chain management, a trust bond must be established between the supply chain elements. Transparency is an important asset that enhances the performance of companies that are in favor of reducing the transaction costs in order to increase cooperation, facilitating the activities of enterprises in the market and developing their ability to adapt to complex and uncertain environments. Ethical rules used by corporate firms as observers considering their social, environmental and moral factors are critical for supplier relationships in order to create more sustainable production conditions.

It is obvious that there is a clear relationship between the scope of trust and information exchange between supply chain partners. There is an effective exchange of information and transparency among supply chain partners who have a trust relationship. In today's business world, firms have to have competitive advantage. Elements such as cost, quality and efficiency have become more important than ever. While the companies develop policies that support these elements, they also advise the members of the chain in which they operate to adopt these policies. While improving intra-business activities, the mutual trust relationship with the seller, retailer or customer throughout the chain is very important in terms of achieving competitive advantage. The establishment of such a relationship is possible by sharing information among the members of the chain.

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