

KEMI-TORNION UAS

From Functions to Processes - Creating Added Value to Customers by  
Enhanced MTL-Chain  
Case Outokumpu Tornio Works

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## ABSTRACT

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The focus of this thesis is on investigating the collaboration in the order-supply process at the Outokumpu Tornio Works stainless steel factory. This process is commonly and officially called the MTL-chain (Myynti for commercial department, Tuotannosuunnittelu for production planning department and Logistiset palvelut for logistics services; henceforth MTL-chain). The aim is to find out the possible bottlenecks in the collaboration between the three different functions in order to gain better delivery reliability and added value to the customer.

This research is a qualitative work and it studies a present day situation in the case company. To find out the main issues in the collaboration between the MTL-chain functions, the research was conducted by interviewing the persons who work in these functions. The interviews were conducted as semi structured face-to-face interviews. The theoretical framework draws from the literature that supports the subject and from the previous research made for Outokumpu Tornio works.

Despite the present functionality of MTL-chain, there is still place for improvement. Due to the traditional structure of the organization, with independent functions, the respond times become lengthened inevitably. Information flow does not work seamlessly. Due to the character of the research problem, a comprehensive solution cannot be found exactly. One solution is to minimize the non-value added activities and bring the key people together. There is a clear connection with delivery reliability and improved cross-functional collaboration. However, if the products do not come on time from the production, delivery reliability cannot be increased.

Keywords: Supply chain management, order-supply process, delivery reliability, collaboration

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## 1 INTRODUCTION

In the intensifying business world today it is almost impossible to avoid discussing cost savings, cost efficiency and reducing the work force. The good old times when the exploitation of production capacity was high and the selling of products was easy are past and gone for some time already. New ways to keep up with the competitors and maintaining competitive advantage have to be innovated. Competitive advantage is derived from the way in which enterprises organize and perform these activities within their value chains. To gain competitive advantage over their rivals, companies must deliver added value to their customers by performing these activities more efficiently than their competitors or by performing the activities in a unique way that creates greater differentiation. (Christopher 2005, 14.)

As global markets are growing, increasingly efficient competition no longer takes place between individual businesses, but between entire supply chains. Companies' success comes through their own capabilities and competencies. Basically this means that organizations create superior value for customers by managing their core processes better than the competitors do theirs. By performing the essential activities more cost-effectively than others, organizations will gain the advantage in the marketplace. Collaboration will provide the competitive edge that enables all the business partners in the supply chain to prevail and enhance. Supply Chain Management (SCM) capabilities are already delivering major economic benefits to businesses. However, enhanced SCM capabilities can create efficiencies and cost savings across a wide range of business processes. (Sahay 2003, 1; Christopher 2005, 14.)

According to Hannu Hautala (2010), Senior Vice President of Outokumpu Tornio Works, "everything starts from the delivery performance; we need to be able to deliver on time. Even the most advanced special solution loses its value when it is delivered late. A late delivered special size sheet has most probably lower value for a customer than a late delivered standard size steel sheet". One of the Outokumpu Group's top priorities in the year 2010 is the excellence in delivery reliability. The general objective of this thesis is to support this priority. Properly enhanced SCM is a strategic activity that must be conducted across the company. Products do not have value until they are in

the hands of the customer at the time and place required. The most important factor, which measures supply chain management, is delivery reliability.

## 1.1 Background

Previous research has focused on determining those factors, which revamp the customer focus in the supply chain process (Peltoniemi 2006) and how it is possible to develop the supply chain by changing the strategies of the supply chain (Lämsä 2009). The research found out that there is a clear connection between improved collaboration and the better customer focus. Therefore, the general objective of this research is to investigate collaboration within the order-supply process in the target company. This process includes three different functions: commercial department, production planning and logistics services. Within the case company it is commonly and officially called the MTL-chain (Myynti for commercial function, Tuotannosuunnittelu for production planning function and Logistiset palvelut for logistics services; henceforth MTL-chain). This MTL-chain is responsible for coordinating the supply chain process, or to be more precise, order-supply process in the factory, as the commercial organization does not belong to the SCM organization. The case company launched an internal project with the focus on the delivery reliability and functionality of stainless steel products to the customers already in 2004 within the MTL-chain. The 2004 project worked towards finding out how to improve the delivery reliability by developing collaboration within the MTL-chain in the Tornio Works. However, due to several changes in the organization this development was again laid aside after the year 2006.

Workable collaboration between the different parties is vital for the stainless steel business because the functionality of this whole supply chain process is the key to meet the promises made for the customers. Improving the delivery reliability is also one of the TOP-5 priorities in the whole Outokumpu Group in the year 2010. In the Tornio Works the delivery reliability target has been 80% in the recent years, but the execution has been varying between 60 to 70 % only. Now the management has been given a target to improve it up to 90% as the customers expect to receive orders on time. As Mr Hautala (2010), Senior Vice President of Tornio Works once stated, “those of you who think that a delivery performance of 98% is good enough are requested to tell which 2%

you are going to deliver late”. This research is conducted to make it possible to reach the target set by the management of Outokumpu.

As I, as an author, have been working in the harbour of Tornio from the year 2002, I feel that my knowledge from this subject is sufficient. The harbour of Tornio is the place where from most of the material produced in Tornio Works is shipped to the customers. However, my own experience from the MTL-chain is not strong, and it is basically restricted only to the end part of this chain - to the delivery process. Therefore, I also decided to start studying the MTL-chain from the end to the beginning, meaning that I studied first the logistic services department, which is closest to my own position. The step to follow the previous ones was to continue to the production planning, and in the end to the commercial department. This way I could get a clear picture of the whole process.

## 1.2 Research objective and research questions

The main objective of this research is to investigate how the collaboration is now working between the MTL-chain functions in order to find out how the collaboration can be improved and how to gain better delivery reliability. Also the intention is to find out if there is a possibility or a need to contemplate the different functions of the MTL-chain into a more suitable organization model. In the other words, this research sets out to find out if it is possible to implement those functions to processes. Drawing from the objectives of this research, the following research questions are addressed in this work:

1. What are the main interfaces between the different functions that need to be investigated in order to improve the collaboration in the order-supply chain?
2. How can the collaboration between the different functions within the same organization be developed?
3. How can the different order-supply functions be changed into processes that create added value for the customers?
  - What is the role of management in this change?
  - What is the role of Group Sales & Marketing (GS&M) organization in this change?

Answers to the first two questions are needed to specify the possible bottlenecks in the collaboration between the commercial department, the production-planning department and the logistic services department. To answer these two questions, employee and managerial interviews are held within every three departments. The focus of the interviews is on clarifying each department's tasks and responsibilities. Additionally, the focus is on getting the interviewees' experiences and perspectives in use to find out what is going wrong and what could be done differently in the collaboration.

The third question will be answered on the basis of the literature review. The literature review will gain sufficient background knowledge to the topic. The literature is also used to gain insights to make it possible to question the present organization model and to suggest a more functional way to operate in the order-supply process.

### 1.3 Research methods

This thesis studies the case company Outokumpu Tornio Works and its order-supply chain called the MTL-chain. This thesis is a qualitative research and as this study required good background information about the present day position from the selected topic, the case study method was selected. More specifically, the approach is a single-case study concerning the target company. I am doing a versatile and detailed analysis of by drawing from the gathered material. The empirical data comprise the interviews of managers and employees in the case company Outokumpu Tornio Works. All the interviewees are working closely in the different functions of the MTL-chain. In the empirical part I will also exploit earlier research conducted to Tornio Works. Additionally I will familiarize into SCM and value chains generally in order to get background information on order-supply chains and how those are generally build up.



## 2 LITERATURE REVIEW

In this part, the intention is to build up the knowledge concerning the supply chain management and order-supply process. This part also studies functional organization structures in business today and reviews earlier research conducted into for the case company Outokumpu in order to get background information to this research subject.

### 2.1 Supply Chain Management

The definition of supply chain management suggested by Christopher (2005, 6) is “A network of connected and interdependent organisations mutually and cooperatively working together to control, manage and improve the flow of materials and information from suppliers to end users.” This previous definition clearly shows that the MTL-chain is part of the SCM process.

The focus of supply chain management is on the management of relationships in order to achieve a more profitable outcome for all the parties within the chain, or within the network, as there will normally be multiple suppliers and customers to be included in the total system. Supply chain is a process that integrates, coordinates and controls the movement of goods, materials and information from a supplier through series of intermediate customers to the final consumer. Following from the customer demand, the supply chain is then what takes care of the rest of the process. However, nothing happens until there is an order as the order is what drives the whole process. (Christopher 2005, 5; Emmett & Crocker 2006, 2; Ellinger 2000, 85.)

Supply chain management is both inter-functional and inter-organizational. It is inter-functional because the effective production and supply of goods require close coordination among marketing, operations, procurement, sales and logistics. It is inter-organizational because the systems and processes among all supply-chain participants – raw materials provider, manufacturer, distributor, and retailer – must be integrated and coordinated for optimal performance along entire chain. (Kaplan & Norton 2006, 221.) Supply chain is also a network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services for the final consumer (Christopher 2005, 17).

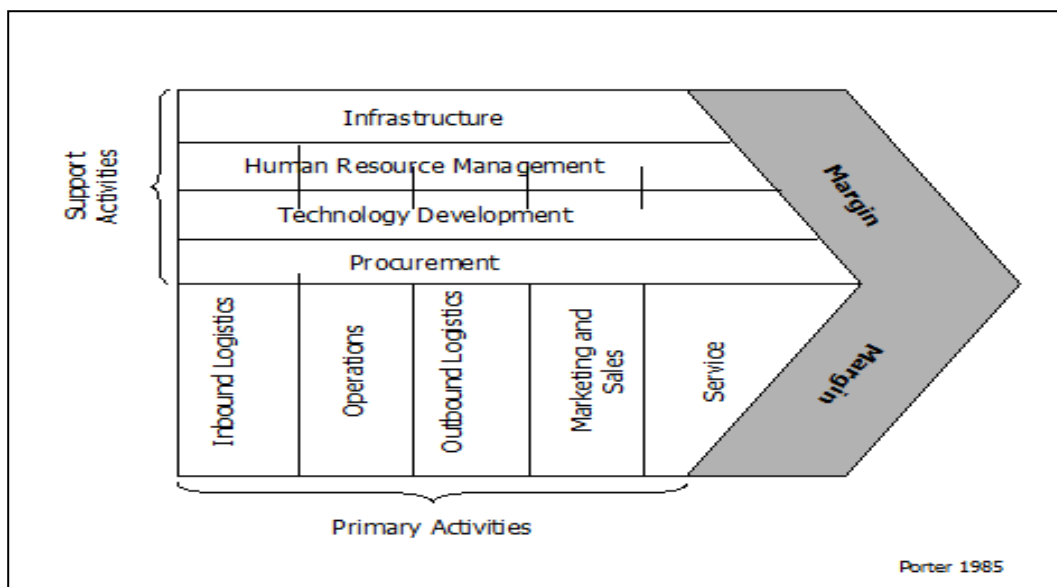
As the competitive context of business continues to change, it also has to be recognized that the impact of logistics and supply chain management of these changes can be considerable. As the customers have adopted just-in-time practises and as seller's markets become buyer's markets, the ability of the organization to respond rapidly and flexibly to demand can provide a powerful competitive edge. Christopher (2005, 29) argues that a new era of supply chain competition is now beginning. Supply chain organizations can no longer act as an isolated and independent entity in a competition with other similar organizations. Competition in business is not just concerned with companies against each other, but also from competing supply chains. Nowadays companies' success comes through their own capabilities and competencies that they compete with. Basically this means that organizations create superior value for customers by managing their core processes better than competitors do their owns. By performing the essential activities more cost-effectively than others, organizations will gain the advantage in the marketplace. (Emmett & Crocker 2006, 13.)

The importance of logistics process excellence has become even more essential than earlier as it seems that the product or the technical features are of less importance in winning orders than issues such as delivery lead times and flexibility. The customer is the reason for the business continually working; to serve the customer is critical. Thinking has to start from the customers' end and must work back into companies. It is the customers' demand that drives the whole supply chain. By seeing the customer as the next person or process in the chain, there may well be hundreds of relationships in a single supply chain. (Emmett & Crocker 2006, 21.) Customers are also reliant on the material ordered and if they cannot get that on time, they will turn into someone who can deliver it on time. Products simply do not have value until they are in the hands of the customer at the time and place required. As the customer in today's marketplace is more demanding then ever, it is not only about the product-quality anymore, but also the service counts. The order-winning criteria are more likely to be service-based than product-based. The achievement of competitive advantage through service comes from a combination of a carefully throughout strategy for service, the development of appropriate delivery systems and commitment from people, from the chief executive down. (Christopher 2005, 30 – 37.)

In logistics, networking in business is often examined in the shape of supply chains. The functionality of the chains is enhanced by quicker deliveries, reducing stocks and by focusing the resources. From the strategic point of view, operational efficiency can be also improved.

## 2.2 Value Chain

Competitive advantage originates from the way the companies' organize and perform their operational activities within the value chain. To gain competitive advantage over rivals, companies' must deliver value to its customers by performing these activities more efficiently than its competitors or by performing the activities in a unique way that creates greater differentiation. Porter (1985) distinguishes between primary activities and support activities in his Value chain (Figure 1). (Christopher 2005, 14.)



**FIGURE 1.** The Value chain by Porter (1985)

In the value chain the primary activities are directly concerned with the creation or delivery of a product or service. Each of the primary activities is linked to support activities, which help to improve their effectiveness or efficiency. Value chain analysis describes the activities within and around an organization, and relates them to an analysis of the competitive strength of the organization. Therefore, it evaluates which value each particular activity adds to the organizations products or services. This idea was built upon the insight that an organization is more than a random compilation of

machinery, equipment, people and money. Only if these things are arranged into systems and systematic activates it will become possible to produce something for which customers' are willing to pay a price. Porter argues that the ability to perform particular activities and to manage the linkages between these activities is a source of competitive advantage. (Haapalainen & Vepsäläinen & Lindeman 2005, 25-26.)

From the value chain, can be seen many implications for supply chain. In the value chain way of thinking, the intention is to develop new and effective structures and procedures in order to eliminate the overlapping processes within the chain from the raw-material sources to the customer. By doing this, the joining value chains create a supply chain. According to Porter (1985), the place where the value actually is depends on the way customers' uses the product and not just on the costs incurred in buying, making and moving it. These costs including all the raw material and activities that create the product then represents its value. However, it is not until the product is at the final customer before the real value is to be found. (Emmett & Crocker 2006, 27.) Also when the lead-times are shorter, the information flow is playing a much more important role because when the process is successful, company can gain more value where the customers are willing to pay for (Haapalainen & Vepsäläinen & Lindeman 2005, 24).

Porter's (1985) implication is that the organizations should look at each activity in their value chain and assess whether they have a real competitive advantage in the activity. If there is not any advantage, the argument goes and then perhaps they should consider outsourcing that activity to someone who can provide that cost or value advantage. The effect of outsourcing is to extend the value chain beyond the boundaries of the business. In other words, the supply chain becomes the value chain. Value is created not just by the focal firm in a network, but also by all the entities that connect to each other (Christopher 2005, 14). As a result of a successful process company gets more added value, which the customers are willing to pay for. Value chain begins when the customer's needs are recognized and it ends when those needs are satisfied. (Haapalainen & Vepsäläinen & Lindeman 2005, 26.) However, each individual organization in supply chain will attempt to define their value by looking at their own profitability. Each company will in turn carry on this definition to their suppliers and as the value definition moves back up again to the chain, then it will be distorted. One important reason for companies to try to work together more closely with suppliers and

customers is to have a constant view of value throughout the supply/value chain. (Emmett & Crocker 2006, 27.)

### 2.3 Organizations in change

As today's markets are volatile and demand uncertain, it is necessary that the organizations become increasingly responsive. Responsiveness is characterized by the ability to change increasingly quickly. Agility lies at the heart of the responsive organization. Agile businesses have a number of distinguishing features: they are market sensitive; they are information based and they share the information across their supply network; and their processes also connect easily with their supply chain partners. (Christopher 2005, 142.)

Traditionally organizations have followed logic whereby activities take place within functions or departments, just like in the case company Outokumpu. Whilst this functionally based organizational concept may ensure the efficient use of resources, it is actually inwardly focused and tends to lead to a "silo" type mentality. It also seems to be the case that these functionally based organizations are slow to respond to changes in the market or business environment. Because there is often multiple middlemen as information for example get passed from one function to another, there is inevitable lengthening in the time to respond. However, companies' who are able to respond rapidly to changing customer requirements tend to focus more upon managing the processes. The processes are horizontal, market-facing sequences of activities that create value for customers. They are cross-functional by definition and are usually best managed through the means of interdisciplinary teams. In the supply chain the cross-functional teams can be very helpful and fundamental to the integration of both the internal supply chain and also of the internal/external supply chains of the organizations. (Emmett & Crocker 2006, 78; Christopher 2005, 135.)

In conventional supply chains, each stage in the chain tends to be disconnected from the others. Even within the same company, the tendency is for separate functions to seek to optimize their own performance. As a result, the interfaces between the organizations and between functions within those organizations need to be buffered with inventories and time lags. The effect of this is that end-to-end pipeline times are long, the

responsiveness is low and total costs are high. To overcome these problems, it is clear that the supply chain needs to act as a synchronized network, not as a series of separate functions. Synchronization implies that each stage in the chain is connected to the other and that they all aim for the same goal. The way in which entities in a supply chain become connected is through shared information. To enable this degree of visibility and transparency, synchronization requires a high level of process alignment, which itself demand a higher level of collaborative working. (Christopher 2005, 177.)

The way businesses are organized can have a significant impact upon their agility. Companies with cumbersome, multilevel decision-making processes tend to be far slower to respond to market changes than competitors who give autonomy to self-managed process teams. Another reason why process management is critical to agility across the wider supply chain is that process alignment between entities in that chain is clearly facilitated if organizational structures are horizontal rather than vertical. (Christopher 2005, 135.)

Developing of organizations should be action, which aims to improve the performance and efficiency of organizations, and also it aims to improve its regeneration and learning as well as its innovativeness and readiness of change. Additionally, the development should target on improving the personnel's well-being and ability to understand objectives and consequences of their own actions. (Honkanen 2006, 18.) The basic principle of synchronization is to ensure that all elements of the chain act as one and there must be the highest level of planning discipline (Christopher 2005, 187). None of the benefits of synchronous supply can be achieved without high levels of collaboration across the network. Important is also that all the parties in the network share the same information. According to Doz & Korhonen (2008, 118) every leader in the integrated enterprise considers him to be responsible for other units and also seeks for new ways how the others can also improve their performance. The understanding of the integrated strategy is challenging and the implementation is difficult. There has to be a significant change in the overall thinking and ground rules. Multidimensionality increases the strategic sensitiveness in organizations.

Doz & Korhonen (2008, 32) also argues that the seeking of efficiency decreases the flexibility and success stultifies the strategic sensitiveness. The mobility of resources decreases over time, allocation to main activities, subsidiaries, and business units and to

different product sections naturally shackles the resources. Business operation models and processes are optimized and adjusted to the current circumstances and therefore those become strictly defined and structured. Efficiency basically walks over the agility. Growth, success and formalization of structures conduct to specialization. Different functions, regions and product groups with their experts shift the responsibilities and decision making to each other's. Changes and reformations become more difficult when those are pursued only every now and then. Strategic agility means an ability to make continuously real time explicit observations, collective commitment and re-allocation of resources quickly and widely enough. The real challenges are the ways of thinking within the companies. Main problem is therefore mainly power political (Doz & Korhonen 2008, 64).

### 2.3.1 Cross-functional integration

Collaboration is a very broad and encompassing term and when it is put in the context of the supply chain it needs yet further clarification. Each organization in a supply chain has its own plan for its activities, and within each organization many more often unrelated plans exist, such as replenishment, forecasting, schedules for production etc. Many organizations make their own plans even though those are doomed to failure because they fail to take into account other internal plans and activities that will undoubtedly impact the outcome of a particular plan. (Barratt 2004, 30.)

Stank (2001), have research the relationship between collaboration and service improvement in supply chains. Collaboration is a process of decision making among interdependent parties. It involves joint ownership of decisions and collective responsibility for outcomes. Key dimensions are a cross department scope, a commitment to work together and a common bond or goal. Higher levels of internal and external collaboration are expected to result in improved logistical service performance. Additionally, that collaboration has a positive influence on each other. The internal collaboration between the different departments in the same firm is essential and it facilitates close interactions that bring greater expertise to day-to-day operations, focussing on efforts and targeting resources as needed. (Kleverlaan 2008, 11.) Internal collaboration must be engaged with external collaboration, in terms of developing closer relationships, integrating processes and sharing information with customers and

suppliers. Internal integration must be aligned with the drivers and constraints of the rest of the supply chain. (Barratt 2004, 33.)

In order to fully capitalize on potential service improvements, it is necessary to integrate the collaboration between company's marketing and logistics functions. Collaborative integration is how well departments work together when their jobs require them to do so and it involves prevailing informal processes based on trust, mutual respect and information sharing, the joint ownership of decisions, and collective responsibility for outcomes. Collaboration is often needed to ensure delivery of high quality services to the customers and involves the ability to work seamlessly across the characterized organizational barriers. Collaborative behaviour is based on cooperation or willingness, rather than on requirement. Its success is contingent upon the ability of individuals from interdependent departments to build meaningful relationships. The essential challenge for managers in the supply chain is to gain a better understanding of the antecedents and consequences of cross-functional collaboration. To promote interdepartmental collaboration, marketing and logistics personnel must be encouraged to think proactively about processes rather than discrete job functions. Evaluation and reward systems are mechanisms that a firm can use to stimulate or foster cooperation between functional areas. (Ellinger 2000, 86.)

Cross-functional integration is also important because it affects cycle time reduction, perceptions of customer value, and customer service. It is also anticipated that cross-functional collaboration and effective interdepartmental relations will be associated with better distribution service performance. The ability to notify customers in advance of delivery delays, or similarities is identified as key distribution service performance areas. Successful distribution service performance is often dependent on the level of collaboration that exists between the firm's marketing and logistics functions. The absence of cross-functional collaboration may result in failures to respond to the promises made to the customers by company's sales force with delivery schedules or product formats. (Ellinger 2000, 87.)

Every enterprise can benefit from the knowledge sharing throughout the organisation. Even highly diverse business units, having different targeted customers and diverse value propositions, still conduct many similar or identical processes. By sharing information about common processes, the enterprise has more opportunities to identify



the best practise that can be implemented quickly across all business units. For knowledge sharing, the larger and more diverse the corporation, the greater the chance that a process innovation will occur that can be leveraged into benefits throughout the corporate units. (Kaplan & Norton 2006, 95.) Finding the mutual way to generate added value between the different functions creates more interaction and reliance to each other. It is important to get the functions to support one another and this way to utilize their core competencies. When making the decisions, more than one level of analysis has to be taken into account. (Doz & Korhonen 2008, 55.)

Alignment, like the other strategy execution processes, crosses organization boundaries. To be executed effectively, alignment requires the integration and collaboration of individuals from different organizational units. This poses a dilemma because most organizations have no natural home for cross-business processes. (Kaplan & Norton 2008, 140.) But why would organizations want to collaborate with everyone. Some relationships may be optimal but do not create any added value or benefit (Barratt 2004, 33). Effective strategy execution requires that employees be personally committed to helping their company and unit achieve strategic objectives. Kaplan & Norton (2008) also argues that companies' communication of mission, values, vision, and strategies is the first step in creating motivation among employees. Employees should understand how the success of their organization creates benefits not only to the shareholders but also to customers, suppliers and the communities it operates. Employees also should feel that their organization works both efficiently and effectively. Poorly working organizations built with bureaucracies that hamper the decision-making are visible to everyone and discouraging to all. (Kaplan & Norton 2008, 141) People are also often hampered by their own place in the organization and stagnant persons like that, there is no need to expect any strategic agility. Recognized elements like defined work tasks, roles and responsibilities and additionally personal competencies and external indicators are part of that. (Doz & Korhonen 2008, 26.)

### 2.3.2 Order fulfilment groups – From functions to processes

According to Christopher (2005, 272 - 274), several companies have experimented with the idea of a cross-functional, cross-departmental team, termed as the order-fulfilment group, to take responsibility for the management of orders. The idea behind such a

group is that rather than having an organizational structure for order management, these activities should be grouped together both organizationally and physically. Instead of seeing each step in the process as a discrete activity, those steps are clustered together and the people involved are brought together as well. The effect that such groups can have is often dramatic. Because all the key people in the order fulfilment process are brought together and linked around a common entity, they are better able to sort out problems and eliminate bottlenecks. Order cycle times can be reduced as teamwork prevails over inter-departmental rivalry. New ways of dealing with problems emerge, more non-value-added activities are eliminated and customer service problems can quickly be resolved, since all the key people are in close connection with each other. In a manufacturing context the customer order management system must be closely linked to production planning and the materials requirements plan. Ideally all the planning and scheduling activities in the organization relating to the order and its satisfaction should be brought together organizationally.

#### 2.4 Reviews of findings from the previous research and projects

There have been several studies from the MTL-chain in the Tornio Works during the past years. After the delivery reliability bended down first time in a year 2001 the case company launched an internal project with the focus on improving the delivery reliability. The aim of this project was to find out, with the help of all the functions, the factors that are affecting to the delivery reliability and also the factors that should be improved. According to Peltoniemi (2006), the preliminary target was the improvement of the cooperation between the different functions. This project started in the year 2004 within the MTL-chain. The 2004 project worked towards finding out how to improve the delivery reliability by developing collaboration in the MTL-chain at the Tornio Works. During this project the essential development targets detected were for example creating the basic working methods and rules for everyone in the chain, the increase of customer orientation within the different parties, and the order and process management follow-up and control. Also the lack of team spirit and the lacking knowledge from the other functions were pointed out. Improvement of communication and information flow was perceived also as an important task, as the missing team spirit seemed to be slowing down the everyday processes.

Peltoniemi (2006) researched the improvement of customer focus within the MTL-chain and found out that development of collaboration between the different functions is essential as there are large amounts of customer information flowing between the employees. To collect all this information and to process that information into action would benefit the company, and the customer, if there were no extra boundaries between the different functions restricting the information flow. Peltoniemi (2006, 77-80) also argues that the smooth cooperation between the different functions is extremely important in order to build common working methods. The relations between the boundaries should be improved as those have a clear connection to the amount of communication exchanged between the participants.

Lämsä (2009) found out in her research on developing the supply chain by changing the strategies of the supply chain, that it was possible to increase the delivery reliability by moving the order point closer to the customer. This new model would include a buffer in the middle of the production process. However, Lämsä (2009) also came into the conclusion that this development cannot be done in too short period of time and it also requires certain basic rules, which the customers also have to agree on. Lämsä (2009) argues that the demand within the regular products is always stable and those are always available in the production process and, therefore, there is no need for any extra buffer. However, within the special products, which have more volatile demand there could be use for a larger buffer. This way the lead times would be shorter and delivery reliability also improves. Lämsä (2009) adds that first the quality problems in the production have to be solved where after the shorter delivery times can be reached more frequently.

Bomström (2005) researched the factors, which are impacting on the functionality of teams in Outokumpu Tornio Works. Bomström's (2005) findings suggest that at Outokumpu there are several conventions in use concerning the team setups and developments. It would be more helpful if there were some common rules in this area especially for those who are shifting between the different functions. Bomström (2005) also argues that the teamwork requires everyone's input to be successful, as the participant's own activity is playing a big role in developing the cooperation. Another finding of Bomström (2005) was that the managers should coordinate the cooperation between the different functions and teams and especially coordinate the use of their resources. Managers should also motivate the teams more and to encourage them to benefit their own targets to the common good.

According to Bomström's (2005) research, the interruptions in the information flow between the different functions slow down the everyday operations and they cause some bad blood for those who the information does not reach at all. The openness of the information flow and the openness of communication are important as it presumably enhances the confidence to the others.

## 2.5 Mi6 – project

Mi6 is a test project, which enables shorter delivery times for the Outokumpu Groups own pipe factories and service centres. The object of this project is to raise the delivery reliability level for good. The principle of Mi6 is that a certain product range is available for delivery within moderate time range. This arrangement requires that a fixed amount of material is produced already in advantage and stored nearby the cutting lines. When the order comes approximately two weeks before the delivery time, the material is available for further procedure when in normal conditions this would take some months. This means, that the agreed delivery time can be reached and the customer receives its products in time. This project is ongoing at Tornio Works and according to the interviewed production planners the project has worked really well. Delivery reliability has increased close to the maximum, being around 98 percent during the whole time with the orders among this project. Naturally this arrangement requires a customer who orders similar kind of material constantly; otherwise the stocks in the factory will increase substantially. Mi6 is so called joint operation model, which requires actions from the customer, and from the producer. (Kostiander 2010, 7.)

Only disadvantage is that the whole procedure is rather arduous from the employees' point of view, and it differs quite a lot from their normal work. This working procedure requires constant contact with the other persons in the chain, so that the cooperation between the order, production and transportation proceeds seamlessly. Therefore the process also demands much more working time than the regular orders, which means that the total workload increases.

### 3 METHODOLOGY

This thesis is a qualitative research work concerning the case company Outokumpu Tornio Works and its MTL-chain. The approach of this thesis is a single-case study concerning the target company. A case study method was selected as this study required good background information about the selected topic. The research object required studying the present day position and situation in the case company. A case study in this context refers to the empirical research, where the present-day phenomenon will be investigated in its real context (Yin 1989, 23). The nature of this research is a qualitative research, which refers to a research where the data is collected comprehensively from real life situations (Hirsjärvi & Remes & Sajavaara 2008, 160). According to Marschan-Piekkari & Welch (2004, 512), qualitative methods are suitable for finding causal relationships, looking directly and longitudinally at processes and to showing how certain states and events lead to specific outcomes. Also, whenever a holistic, dynamic and contextual explanation of the phenomenon is required, qualitative methods would be the most appropriate methodological choice. They also argue that qualitative methods are most effective when studying organizational changes and the method also offers unique advantage when researcher is trying to observe, describe and explain dynamic processes. Qualitative research method also gives the opportunity to collect voluptuous material from limited number of observations that were accumulated for the purposes of this work.

Comparing both supporting and opposing literature will increase the validity of the case study. In this way the generalizability will also improve and the quality of the theory will be lifted. (Eisenhard 1989, 533.) In this research I did not test any theories or hypothesis, but I made a versatile and detailed analysis of by drawing from the gathered material. The empirical data comprises the interviews of managers and employees in the case company Outokumpu Tornio Works.

The research method in this research is inductive. The research process starts with subjective observations and it will end up by discussion of the common implications (Hirsjärvi & Remes & Sajavaara 2008, 260). The empirical research is carried out into the topic and in order to find out answers to the research questions. This research was carried out by studying the commercial department, the production planning department and the logistics services, that belong to the MTL-chain, with the

documented material from the Tornio Works management and by validating the information with managerial and employee interviews. To find out the main issues in the collaboration between the three functions, the working methods of each of the functions had to be studied separately, to detect and observe the possible overlaps and missing links. In addition, the working methods were investigated through interviews. In this research my intention was to favour people as a tool for collecting the information. Therefore, this research was conducted by interviewing people who are working in the MTL-chain and by studying earlier research dealing with the topic.

### 3.1 Interviews

Interviews were held in order to find out what each of the three departments does and what the interviewees' tasks are. A total of nine persons were interviewed, the managers from each departments and totally six of their employees (Appendix 3). The employees in this context are logistics coordinators, commercial coordinators and production planners. All interviews were held as a semi structured face-to-face interviews, or alternatively via email and phone interviews. Interview framework (Appendix 1) was the same for all the interviewees. To gain the best possible outcome from the interviews, those were conducted in Finnish, as all the interviewees were native Finnish speakers. This way the interviewees did not have to concentrate on speaking a non-native language and they could freely use their own expressions and overall they seemed to be more at ease when using Finnish. Also another reason for using Finnish to Finnish speakers is that the interviewees' English skills were unknown. According to Marschan-Piekkari & Welch (2004, 521), researcher should take special attention in explicating the extent of transferability of research finding to other language. They also state that it is not uncommon to use different language in interviews as the use of non-native language may be uncomfortable and therefore it either could restrict the answers to short, or even deprive valuable information from the interview.

Two of the interviews were held as two-person group interviews and one was made as a phone interview. All interviews but one interview were recorded with an Olympus VN-3100PC digital voice recorder. The permission for recording was asked before starting the interview and only one pair declined that. Additionally the phone interview

recording failed due to technical difficulties. Afterwards all the recordings have been transferred to the computer from where the material was easy to analyze.

The interviewees were chosen on the basis of their working experience and by recommendation of the previous interviewee. I interviewed only those employees who have been working in the company for at least from the year 2004, to ensure that they do have the relevant experience from their field of specialty. This selection also ensured that the selected interviewees have experienced the possible changes from the previous project, which was active in 2004.

The interviews of the management made it possible to find out their views and insights into the topic under scrutiny, how they think the collaboration is working, and what could be done differently in their view. At the same time, my aim was to reflect the managers' ideas to the employees' ideas for comparison in order to find out if there are any divergent views to be found between the different parties and functions.

### 3.2 Data collection

In this research I am doing a versatile and detailed analysis of by drawing from the gathered material. The empirical data will comprises the interviews of managers and employees in the case company Outokumpu Tornio Works. Additionally, corporate internal documents, such as internal handbooks and memos are used as sources of research data. Further, earlier research made for Outokumpu during the recent years will be taken advantage of. The data will be analyzed by using secondary data. Data collection and interviews were started from the end of the chain, meaning that interviews began from the Logistic department and ended to the Commercial department.

### 3.3 Limitations

In this research I concentrate only on investigating the collaboration between the different functions in the MTL-chain and to be more precise, especially to the

cooperation between the logistics coordinators, commercial coordinators and production planners. However, the managers' voice is also taken into account.

The interviews were held in interviewees' native language and the results then were then translated into English. The translations of the interviews into English are done in my best practice, in order to collect all the information received into this research. However, direct translations from Finnish into English might cause some changes in expressions, but the content should remain as in the original material as it will be reviewed by the interviewees before publishing. Other limitation is researcher's bias, as I am working in the same supply-chain organization. Marschan-Piekkari & Welch (2004, 521) argues that particularly those qualitative researchers who pursue direct, prolonged and reflexive engagement with informants, are encouraged to disclose how their personal interest among others might have influence to the results in the study. However, in this study my intention is to give a bias-free outcome, as I am not exactly working in any of these three departments.



#### 4 CASE COMPANY OUTOKUMPU STAINLESS OY TORNIO WORKS

Outokumpu Tornio Works is a part of the international Outokumpu Group that specializes in stainless steel and technology. Outokumpu is one of the world's largest producers of stainless steel with main production facilities located in Finland, Sweden, the United Kingdom, and in the USA. Outokumpu Groups annual sales were 2,6 billion euros in 2009 (2008: EUR 5,5 billion) and the company employs today approximately 7500 people in some 30 countries. (Outokumpu 2009, 20-28)

Tornio Works is the Outokumpu Groups biggest site and which employs some 2400 people and it has production units in Tornio and Keminmaa in Finland and in Terneuzen in the Netherlands. Tornio Works production capacity today is around 1.2 million tons of coil products, 1.65 million tons of slab products and 0.27 million tons of ferrochrome. Most of the material produced, comprising stainless steel coil and plate, is dispatched from Tornio and delivered to the customers in over 60 countries by road, rail and sea. (Outokumpu 2005, 3.)

##### 4.1 MTL-chain

MTL-chain is responsible for coordinating the supply chain process, or to be more precise, order-supply process in the factory. MTL-chain consists from the commercial function, from the production-planning function, and from the logistics services department. Additionally the chain also includes the Technical support function, but in this research it has been left out. The MTL-chain is working as a normal order-supply function and it is based on the use of the information flow, which basically begins from the customer. After customer inquiries for some certain product delivery, the information flow commences from the sales companies and GS&M organization to the Tornio Works and its commercial department. From the commercial department, the inquiry continues its journey to the production planning department, and returns to same way back to the customer. If the response is positive for the customer, and the order goes through, process begins as per the customer instructions. Delivery should begin on the agreed date and terms.

In the MTL-chain, there are three separated functions with their own management and employees. This is standard arrangement as every function is so deviant from each other. Each of the function also has their own working methods, even though few similarities can be identified. First similarity is that every function has built own teams. The commercial department is organized by clusters, the production planning department is organized by products, and the logistics department is organized by countries. Each of the functions is also working towards the same target, which basically is to satisfy the customers' expectations by delivering the ordered material to the right place on the right time.

#### 4.1.1 Commercial department

The commercial organization at Tornio Works is a matrix organization, which comprises about 35 people. The commercial organization is basically divided into four sections. In the first section there are the senior managers who are responsible for running the department. In the second section, there are the so-called Product Experts possessing in-depth knowledge about the material and the products. The third section comprises the Business Units Product Managers, who are organized into Clusters. The Cluster teams in this section are the same as within the whole Outokumpu Group's every production unit: Distributors, Processors, ABC (Architectural, Building & Construction) and End Users. According to the Manager of the Commercial department Mr Hannu Lähteenmäki (2009), these product managers are acting as an "umbilical cord" between Tornio Works and Group Sales & Marketing organization, which is coordinating basically what is sold and where. As a fourth section in the commercial organization, there is the Sales back office, which is organized by geographical areas. This Sales back office consists of 15 commercial coordinators and they are divided into to three teams who report to the three BU Product Managers. These coordinators are basically doing the practical work and they also follow up the order supply process from the beginning until the end.

#### 4.1.2 Production planning department

The production-planning department consists of about 25 people, of which 18 are production planners. This department is basically responsible for material handlings, which includes capacity planning and drive programs. The department is the link between the sales and production, and it consist of two sections, i.e. production planning and production control. These two sections in turn, are divided into three different teams. These three teams are responsible for the stainless steel, special products, and weekly deliveries from the Tornio Works to the plant in Terneuzen in the Netherlands. Additionally one team is coordinating the process with the production department.

The production planner's responsibility is to revise the orders, which are submitted the commercial department, and adjust the orders so that they are possible to produce. The production of the material ordered by the customer is produced by ensuring the maximum cost efficiency and customer benefits. Order management is done in the MTS2000 system, and the guiding lines in the process are measurements, tolerances and marking information, which are all available through the systems.

#### 4.1.3 Logistic services department

The logistics services department is responsible for arranging and ensuring the stainless steel deliveries to the customers without delays. The internal material deliveries are also included to the responsibilities of this department. This department also assures that the accounts receivables are secured by finalizing the needed cargo documents and invoices.

The Logistic services department consists of about 20 people. The Logistics manager coordinates the whole department, the Harbour manager is responsible for the harbour administration, and the Department manager is responsible for the overall day-to-day shipping procedures and invoicing. Besides the managers, there are about 18 logistic coordinators, who are responsible for shipment planning, coordination, invoicing and documentation. Coordinators are also responsible for the custom formalities and possible sales correction procedures. The logistic coordinators work in teams, which are

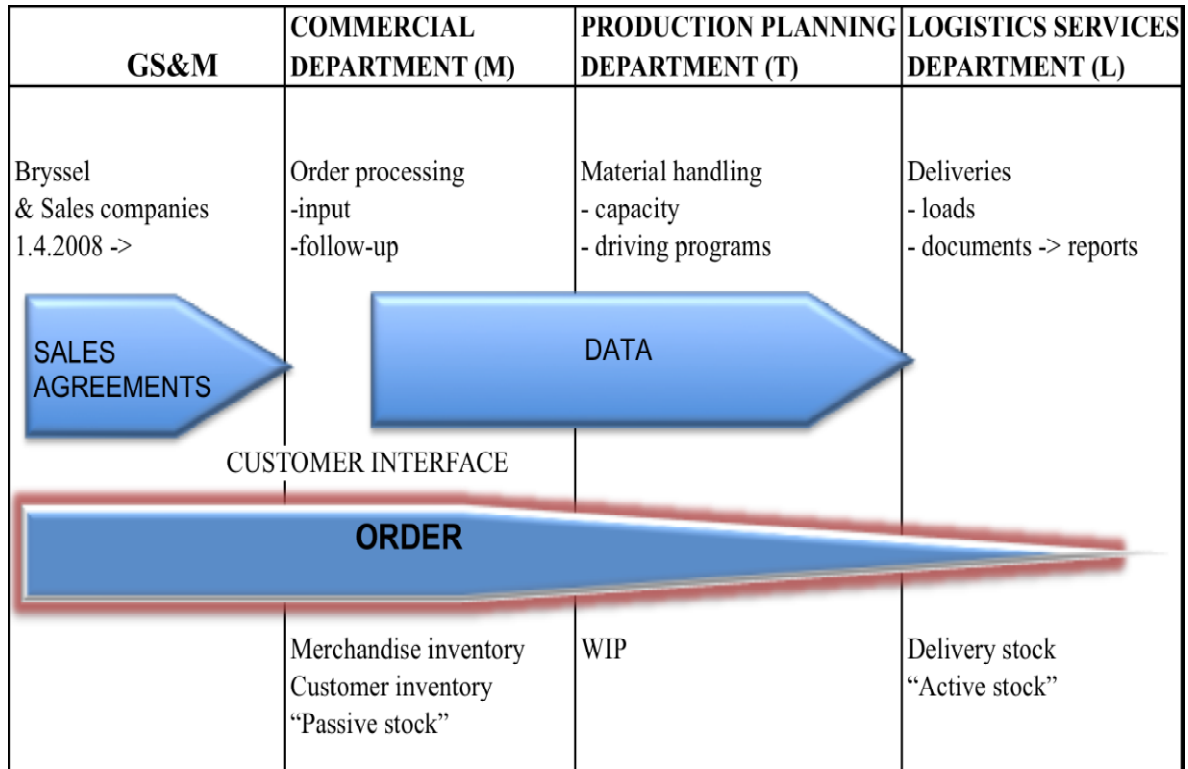
divided by geographical areas. Each person in a team operates as a team leader, i.e. the team leader is rotated every year.

#### 4.1.4 Order-supply process

The order-supply process consists from interactions between GS&M in Brussels, and from the MTL-chain at Tornio Works. As the sales are nowadays centralized within the whole Outokumpu Group, Tornio Works sales process is also mainly done in the GS&M organizations office in Brussels, or, in the sales companies across the world. The commercial department in Tornio is basically supporting the GS&M organization as their eyes in the Tornio Works.

As it can be seen in the Figure 2, after the GS&M has received the order enquiry from the customer, the GS&M employees forward the enquiry to the Tornio Works commercial department and to its commercial coordinators. The coordinators check the order enquiry, collate that that the order is within the technical limitations and therefore possible to manufacture. If the order is non-standard, i.e. its dimensions differs from the regular coils and plates, the commercial coordinator verifies the order with the help of the technical customer service employees, and also possibly with the laboratory employees. With regular size orders, there is no need for this kind of check up process. When the order is verified as suitable for the production, commercial coordinators enquire the timetable for production and delivery from the production-planning department.

Having received the enquiry from the commercial coordinator, the production planners check the production capacity and programs to find out when the production of this specific order can take place, after which they inform the commercial coordinators the production week. As the strategy is to manufacture stainless steel as cost-effectively as possible, it is not possible to produce for example one coil at the time. As one order is one position and the position is a one product, it means that for example in one steel coil there can be products for multiple customers and as some qualities are only produced in certain weeks, some orders may be delayed.



**Figure 2.** Order-supply process (Untinen 2009)

Now, if the gained information satisfies the customer and the order takes place, the commercial department inputs the order to their system with all the required information in it to initiate the information flow. At this stage the order is in passive stage, which means that the order is still on going, not yet ready for delivery. When the order stage changes from passive stage to an active stage, the order is supposed to be ready and the material available for delivery. This is important information from the logistics department's point of view, as their work starts from this stage. The logistics coordinators prepare the order deliveries to the customers. They also make the documents and reports of the products to be delivered with the help of the delivery information received from the commercial department. The logistics coordinators organize the transportations for the estimated production week. When the finalized material ordered comes from the production, it is packed and loaded as per the

customer's wishes and its delivery to the customer can begin. The delivery takes place only at the right time, which is agreed on with the customer.

#### 4.2 Interview outcomes

According to the Manager of the production planning department, Mr Mauri Kvist (2009), the chain is basically a crop of independent working processes in different functions, that are connected together in order to produce the needed information flow without delays no matter what happens in physically. Basically MTL –chain should be revised as "the information upgrading chain". Every department has their own long history, with own needs and working procedures.

##### 4.2.1 Logistics services department

The logistic departments manager Ms Tuula Untinen (2009) wanted to point out that there are plenty of information available in the Tornio Works, as there are so many competent employees working. Only problem is that, in some situations it is difficult to find out where the information can be reached, and this is one matter, which should be solved. Loads of unnecessary tuning and bureaucracy slows down the process. One example is that, in especially from logistics services point of view in some situations they cannot get the correct information from the production-planning department. This situation occurs when there are troubles with some positions, which are not ready on the agreed time schedule, and there are no explanations available why this happened. Why the driving programs are not keeping their schedules? Is someone deviating from the schedule? Also Ms Untinen pointed out that she cannot understand that, the production planning is already making some new positions if the older ones are still undone. All the material that is not really on time is premature, and therefore wrongly produced, and it should not be the priority.

Ms Untinen (2009) was also asking after for a common liaison person to the commercial department, for whom to contact if some troubles occur. According to Ms Untinen (2009), this has been always the same thing. Also some data blocks happen every now and then, which are annoying. There should be also someone in the

production planning who controls the production times, and someone who controls the whole order process as the goods are not coming on time from the production.

According to the logistic coordinator, there seems to be some demand for additional information from the other departments. For example, if the position should be ready on the next day, and a truck has been booked with special equipment in order to be ready for loading on the agreed time. Then suddenly in the morning it just comes out that something went wrong in the production and the material is not available for loading after all. These situations occur, but from the logistic coordinators point of view this means that if there cannot be arranged any other product to be loaded into this truck, there will be extra cost for nothing. (Hyttinen 2009)

New model of working could be that some conversation will be made already in advance in order to avoid problems later on. Motivation could be one that improves the efficiency. People are thinking too much for only their own actions, not what it does in the bigger picture. Solution could be mutual working methods. (Untinen 2009.) The logistic coordinator Ms Hyttinen (2009) also agrees with Ms Untinen. When you know what the others are doing, you are also able to improve your own tasks to more efficient way. Work rotation for example could improve the collaboration. Even if it is a short period it could be useful.

#### 4.2.2 Production planning department

Production planners Piritta Hiukka and Marjo Uusitalo (2009) stated that the production-planning department is between the production and the sales (commercial department). According to Uusitalo, “the commercial department is selling and we are revising the orders if those are possible to produce. Then we are trying to produce the ordered goods.” Production planner is trying to plan the orders as optimal as possible. Cost-effectiveness is the target and there are certain rules for that. One order is one position and that is basically one product. One steel coil is made from several positions. Basic orders are handled automatically. The quality of the production is the determining factor.

The estimated production week is not given before the position is fully ready for production. This means that all the instructions have to be correctly stated by all the parties involved. If there is a delay in the production, the present system should generate the information automatically forward towards the commercial department. (Röyttä 2009)

When the system is working correctly, it should produce a result without any difficulties. All the information should be inputted into the systems, and there should not be any external information, which is not in the system, available. One piece of information should be inserted in to one place, and not the same piece into many places. (Kvist & Röyttä 2009)

The information however, is not always coming through and there are continuous inaccurate orders coming through the system. Probably those are not intentionally inputted, however, this is very irritating. Everyone should take responsibility from his or her own doings. Besides this, cooperation with others both internally and externally is functioning well. (Hiukka & Uusitalo 2009.) According to Kvist (2009), the communication lines are always open towards the commercial department. However, the same applies towards the Logistics department practically only in the case of coil deliveries to the Terneuzen plant. There is also a responsibility to maintain dialogical connection within the notable matters.

In order to improve the collaboration, Hiukka & Uusitalo (2009) stated that everyone should intervene to the issues that are causing troubles and define why those issues are problems. Only this way the problems can be solved. Difficulty is to get the employees motivated in the means of expressing themselves.

#### 4.2.3 Commercial department

The present organization model, in which the product managers are organized into Clusters, and the coordinators are working by geographical areas or by countries, is rather confusing. Even the customers are confused sometimes, as they do not know to whom to turn into. Also, the present order input system gives a headache, as the sales companies are now able to input their orders by themselves to the systems. Earlier there



were not even domestic sales companies existing, so everything is working a bit differently now. (Rauté & Ahrikala 2009.)

According to the commercial coordinators, their duties include making quotations, answering to customer enquiries among other duties. This means that there is no time for continuous follow-up for every order. Earlier, one person knew customers' every requirement, now the information is shattered all around. The work of the commercial coordinator is very independent; everyone has to create his or her own working habits. As there is no actual direct supervisor, it is also difficult to get any help if you are confronting some obstacles in the job. This should be no problem if you are experienced but as a newcomer it might. As some certain matters are crystal clear for somebody, it might not be as clear for someone else. (Rauté & Ahrikala 2009.)

The present common working rules apply for the products only. There is a lot of information available, but for how long? The risk is huge as there are no written working instructions for this department and many special persons with experience are leaving soon as they are going to retire and this is worrying. It is difficult to say what happens after that when all that information is matching through the gates. The manager of the Commercial department Mr Hannu Lähteenmäki (2009) admits that they do not have the written working instructions recorded yet, and it is now under operations. He also said that some of the roles are not functioning too well, and there are some improvements to do. However, he only came in charge of this department few months backwards so the implementation is just now beginning.

The overall information is mainly following the order. Schedules have been basically agreed in advance. In some cases, there is already so established practice with the older colleagues in the other departments that they already know quite well what the customer requires. This is commonly happening especially with the Production planning department.

Interviewees pointed out that it is important to get to know what the other departments are doing, how they are working and what other duties they have. It would be useful especially when there are some new employees coming to work. This way people get some new perspective that what happens outside of his or her own duties. Only disadvantage is that the other departments are located too far away that these introductory

occasions does not happen too often. Interviewees remember only few this kind of occasions and they have been working for quite a long time already for this company. It would be ideal for the newcomers if they would be able to get to know each other's duties. Not just in to their department but also to the other department's duties. (Rauté & Ahrikala 2009.)

#### 4.2.4 Cooperation and communication between the departments

Previous research (Peltoniemi 2006) argued that, there are some issues within the cooperation between the functions. According to each of the participants interviewed for this thesis, the cooperation is working decently in everyday working situations, especially when it is concerning regular and normal size orders. The interviewed employees are so experienced professionals in their field of interest that, the routine level and knowledge is high in most of the situations. Most of the communication is done basically by emails. Information flow is going directly through the order inputs systems where all the necessary information is inputted manually. According to the interviews direct contact for example by phone is rarely needed or used. This kind of communication happens mainly if some changes need to be done. Or, if something in the process has gone wrong.

Communication between the different parties varies and depends on the situation. Every department has their own weekly meetings, where the latest issues concerning their own actions and coming events are examined. Additionally there are team meetings within the each department. In managerial level, there are two meetings per month between the different functions. However, there are no employee meetings at all where participants from every function would attend. What came out from the interviews is that there is no need for any additional meetings, unless the subject is something urgent. On the other hand, even though there was no need for more meetings, especially in the logistics department there was in time-to-time demand for more information. Additional information was needed especially when something unusual happens, in the means of delayed material, extraordinary positions etc. so that for example suitable transportations can be arranged on time. Also the coordinators in the commercial department had acknowledged that sometimes the information from the problems in the production is not coming automatically, even though it should.

There seems to be plenty of information available in the Tornio Works, but in some situations it is difficult to find out where the information can be reached. Basic ground rules for each department's duties are found in written format only in the logistics departments and in the production planning's files. I understood that in the commercial department the common working rules were still under production during the interview time periods. However, each of the participants had their own working methods written down in some way. Interviewees in the commercial department were also a bit worried about this matter, as the average age in the department seemed to be rather high at the moment, and soon in the future some people are going to retire and take their knowledge from the working methods with them. Especially this is a problem in the commercial department as they are working in the interface with the customer.

#### 4.2.5 Group Sales and Marketing

The GS&M organization was unfamiliar to most of the interviewees. The fact that the GS&M has been working only for few years might explain this. According to the manager of the Commercial department Mr Hannu Lähteenmäki (2009), GS&M defines what kind of products they are selling, and to where. GS&M also should have the knowledge from the costs of the production and deliveries, as they regulate the prices and sends product orders either directly, or through the sales companies. However, the roles and the responsibilities are not quite clear for everyone yet. He also pointed out that the roles should be clear for everyone so that their hands do not get frozen in a tight place.

According to the production planning department manager Mr Mauri Kvist (2009), the GS&M gives the sales targets for each year, and the MTL-chain prepares its functions operations so that at least this target can be delivered from their behalf. GS&M is also controlling the lot sizes and updating the customer requirements. Cooperation with GS&M is working sufficiently without any bigger adjustments. To the logistic department, GS&M did not have any major effects at this stage. Ms Untinen (2009) from the Logistic services informed that all the information they need from the GS&M should be coming though the commercial department.

### 4.3 SWOT analysis of MTL-chain

The SWOT analysis identifies the companies, and in this case, MTL-chains existing strengths and weaknesses, its emerging opportunities, and the worrisome threats facing the organization. Strengths and Weaknesses are classified as internal attributes and the external attributes are Opportunities and Threats. According to Kaplan & Norton (2008, 49), A SWOT summarizes external and internal analyses into a succinct list that helps in creating understanding from the key issues within the organization. Honkanen (2006, 410) argues that the SWOT analysis can be also used as an overall framework for the strategy planning process.

Strengths can be identified as organizations recourses and capabilities that can be used for developing a competitive advantage. Weaknesses can be viewed, as an absence of some certain strength, or in some cases weaknesses may be the flip side of the strength. The Opportunities can be new opportunities from external environment, which may bring growth and also profit. Threats can be changes in the external environment, which may possess threat even for the whole enterprise, not just for the organization in concern.

MTL-chains Strengths, Weaknesses, Opportunities, and Threats are analysed from the interviews and those can be identified as following:

#### Strengths

- Each function has strong expertise in their own field
- All the needed tools for working efficiently are available
- Employees are experienced professionals -> level of know-how is high
- The whole process is functioning
- Ongoing projects for improving processes

#### Weaknesses

- Functions are too separated from each others
- Each functions have own operational goals, even though the overall object is shared with the other functions

- Overall communication is lacking
- There is not enough coordination from the management
- Divergent organization structures
- Employees do not know the whole process well enough
  - o They may not know how their own actions are affecting to the others
- Cooperation is done only when necessary, not as precautionary

#### Opportunities

- Increased level of delivery process
- Improved customer service
- Increased production
- Reduced order-cycle times

#### Threats

- Cross-functional rivalry
- Production problems
- New rules and regulations from GS&M
- Vanishing tacit knowledge
- Employees are ageing -> low number of personnel turnover

#### 4.3.1 Evaluating the SWOT

Aim of this part is to balance the main strengths and weaknesses against opportunities and threats, which can be seen in the Figure 3. This way it can be found out what actually is the MTL-chains overall situation, and can the chain continue to pursue with its current way of functioning.



**Figure 3.** The SWOT analysis

The MTL-chain is functioning decently and the functionality is the main strength. Expertise is very strong among the different functions, and the employees are very competent in their field of specialty. Whole organization is sharing the same objective at least externally, which is to improve the delivery reliability of Outokumpu Tornio Works. Management is supporting this object by obtaining new ways to improve the deliveries with ongoing projects, like Mi6 (See chapter 2.5), and also by maintaining proper tools for working. Weaknesses, on the other hand, are clearly operational. All the three functions that belong to this chain are separated from each other both organizationally and physically. Due to the previous, every function also has own operational goals and divergent organization structures. Cooperation between the functions takes place only when necessary, not as a precautionary matter. As a weakness, can also be seen the ageing of the employees. In every function, there are several core employees who are soon heading for well-deserved leave with their tacit knowledge. If that know-how cannot be shifted to the newcomers, company may be in trouble in the coming years.

Possible opportunities can be obtained with improved cooperation. When the order-cycle time decreases the deliver reliability increases and the customer receives more value for their orders. Also, when the order-cycle gets shorter, the production capacity should increase, as there are more orders coming in. Biggest threats are also among production. If there are problems in the material production, MTL-chain cannot do much for maintaining, or improving the deliver reliability. In this point it would be crucial for cooperation improvement within the MTL-chain parties. Potential threats are also rivalry between the functions, if the management cannot get all the participants working for the same direction without hesitations. This would need a much more flexible cooperation across the organizational boundaries. Another threat is the core employees' retirements, as there have not been so many changes within the employees during the last years. This is a huge risk especially in the commercial department, as they are playing a major role in the whole order-supply process and they do not have a sufficient working instruction recorded yet. There is lot of knowledge available, but for how long?

As an external threat, can be also calculated the new rules and regulations from the corporate level. As the GS&M organization is still rather new, and it is still searching its directions, there might be coming some new directives and instructions every once and while. When these new instructions come in force it always takes some time to implement those to the working level and this can be frustrating for the employees.

#### 4.3.2 TOWS analysis of MTL-chain

SWOT analysis is a framework for analyzing the internal strengths and weaknesses, opportunities and threats. TOWS analysis uses the strengths to capitalize on opportunities and to counter threats. The weaknesses are minimized using opportunities and both weaknesses and threats are avoided. TOWS analysis is an effective way of combining internal strengths with external opportunities and threats, and internal weaknesses with external opportunities and threats to develop a strategy.

It is common that companies identify their strengths and weaknesses, and the opportunities and threats in the external environment. But it is often overlooked that

combining these factors may require distinct strategic choices. To systematize these choices, the TOWS matrix, or situational analysis, is proposed. The TOWS is a conceptual framework for a systematic analyse that facilitates matching the external threats and opportunities with the internal weaknesses and strengths of the organization. (Weichrich 1982, 8-9)

Tows matrix (Figure 4) helps thinking about the options that could be pursued when matching external opportunities and threats with internal strengths and weaknesses. In the matrix, strengths against opportunities (S-O) analyses how to use strengths to take advantage of the opportunities? Strengths against threats (S-T) analyses how to take advantage of the strengths to avoid real and potential threats? Weaknesses against opportunities (W-O) find out how to use the opportunities to overcome the weaknesses experienced? And Weaknesses against threats (W-T) analyses how to minimize weaknesses and avoid threats? (Mind Tools Ltd 2010.) Following analyses is based on the interviews made for this thesis.



**Figure 4.** TOWS matrix



S-O strategy specifies the strategies, or actions, for success that helps maintaining the competitiveness. In this strategy, the intention is to use the present strengths in order to maximize the opportunities. (Honkanen 2006, 414-415.) All the strengths show that the order-supply process is functioning decently even with the present model and this is the matter that should be taken into account. When this functionality can be improved with some adjustments that target into a smoother cooperation within the departments, there is potential to maintain the competitiveness. After all, if the different departments work together and share a common target there should be possibilities to improve the collaboration, and among time also the level of delivery. The actions to improve the competitiveness are the use of good results from the ongoing projects like Mi6 in order to improve the whole cooperation process. This way the order-cycle times can be decreased. With the help of employees' high expertise and improved customer service the increase of whole delivery process level should be gained.

W-O strategy typically specifies development strategies for organizations and personnel. (Honkanen 2006, 414-415.) In this strategy, the intention is to overcome the weaknesses with the use of opportunities. The opportunities can be reached with the new organizational model, or with a new way of thinking within the departments. When the people stop seeing the organizational borders and start having an outlook from the bigger picture, the whole process, and not least the customer will benefit from this model in the means of improved customer service and delivery process. The information is more easily available when the functions are for example in the same place physically as it decreases the level of communication. Also, a more intensive familiarizing to each other's functions and duties could improve the collaboration as this would effect to the wider knowledge of what the others need to do their duties properly.

S-T strategy consists of typical defence and prevention action planning. (Honkanen 2006, 414-415.) In this strategy, or action, intention is to find out how to take an advantage of the strengths to avoid the real and potential threats. The major threat to the whole MTL- chain is the problems in the production line. There is not much what the different functions can do to avoid these problems, as it seems that the production problems depend totally from different matters. However, they can use the expertise and tools they have in order to overcome these obstacles already in beforehand by communicating with each other's and also with the customer. If there is some fear or

expectation in advance that there might be delays in the production, customer can be informed about these and this way more time for delivery might be available. Same sharing of knowledge and information method could also assist in recruiting new employees possibly from other functions with work rotation issues. At the same time this action could also decrease the possible bottlenecks between the functions as the employees can see how the duties are handled in other functions and this way imbibe more awareness.

W-T strategies can be described as reassessment plans or similar. These actions can be considered also how to prepare for the possible threats. (Honkanen 2006, 414-415.) This strategy includes those actions, which aims to minimize the weaknesses and avoid the threats. In order to minimize the weaknesses, the management should encourage the employees to be more involved with each other's and to encourage them to communicate and participate more often with each other's. The communication should preferably happen in advance and not after the damage has already occurred. All the mutual objects of the MTL-chain could be shared with all the members with some reasonable time periods so that those who are working within these matters knows and could tell what their common interest in the business level is. This would ease the cross-functional affection and bring some new working ideas into action.

## 5 DISCUSSIONS

The main objective of this research was to investigate how the collaboration between the MTL-chain functions is presently working and how it can be improved in order to gain better delivery reliability within the Outokumpu Tornio Works. The MTL-chain consists of three different functions: from the commercial department, from the production-planning department and from the logistic services department. Another objective was to find out is there possibilities to implement those different functions into processes. The following research questions were addressed to find answers to them:

1. What are the main interfaces between the different functions that need to be investigated in order to improve the collaboration in the order-supply chain?
2. How can the collaboration between the different functions within the same organization be developed?
3. How can the different order-supply functions be changed into processes that create added value for the customers?
  - What is the role of management in this change?
  - What is the role of GS&M organization in this change?

In the first two questions the intention was to find out how the collaboration is now working and how it can be improved. The third question was for finding out how the present organization model can be changed to more suitable one.

One of the most important aspects in this MTL-chain is the information flow, which follows the cooperation from the beginning into the end. The biggest role in this information flow is in the commercial coordinators who are in the pole position. They receive the orders, input those into the order systems wherefrom other parties in the production planning and logistic services eventually find the information and operates based on that information inputted. If there is some mistake already in this point of the chain, it cannot be fixed without extra efforts. Another aspect, which was revealed through the research, was that normally the commercial coordinators receive the order from the sales companies, or from the GS&M organisation, and in many cases the orders are not even possible to arrange within those limitations the customer has ordered

them. This means that the salespersons are possibly not up-to-date in their tasks and they have promised too much for the customer.

Collaboration between different functions is basically workable. Previous research (Peltoniemi 2006) into Outokumpu Tornio Works shows that there has been lack of knowledge from the other functions, which may have been effecting to the collaboration, and the lack of team spirit. This thesis showed that the lack of knowledge from other functions was still there in somehow but the interviewees were not really bothered about that. Other aspects from the previous studies were concerning the basic working methods and rules to everyone in the chain. On the basis of this research there cannot be found any exact interface, which shows that there is a problem in it. The only disadvantage seems to be the lacking direct communication between the functions. The operating parties are relying much to the current operating systems, which is suitable in the standard conditions. However, always when some issues comes out in the means of false information in the orders, or delay in transportation and production, there should be an automatic direct contact between the persons involved. This is not the situation at the moment. Especially this should apply automatically between the production planning department and the logistic services department as the latter ones are arranging the transportations and deliveries to the final customers. As one of the interviewees from the logistic services rightly expressed, “it is rather difficult to make any corrections from the end part of the chain”.

One bottleneck that could be found is the coordinating from the management side. It seems that each of the functions is so separated from each other with their own goals that the management cannot support the cooperation enough. There could also be a demand for some contact person in each of the departments who could assist in the problem solving situations.

The second research question is how to develop the collaboration between the different functions within the organization? According to the results of this thesis, the collaboration is functioning well to an extent. However, as the experience from the ongoing Mi6 project shows, the collaboration process can be improved with more intense cooperation. When everybody really has to concentrate on his or her duties and have to make sure that the information flow does not break down because of them,

improved collaboration is achievable. This way the customers can also be provided with more value for their orders as they get the ordered goods delivered on the right time.

According to the findings of this thesis the missions and values of the whole MTL-chain should also be clarified, as their statements seem to be unknown. Probably the reason is that the chain is not official and it is not stated as a part of the current SCM for example even though it clearly belongs to it.

Answers to the third research question were provided through the literature. It is highlighted so that the produced goods are not really bringing decent value before those are in the final customers' hands. Also before the goods reaches the final customers or consumers, there are several internal customers in the value chain to serve in order to get the optimal outcome from the process. Traditionally, like similarly to Outokumpu, organizations are divided in different functions whereby all the activities take's place. These different functions have own management, working teams and working procedures. Even though the functions are working for the same final customer, they tend to be disconnected from the other functions. This way there are several middlemen in the process and the time to respond to the customers gets longer. If the functions were able to respond quicker to the customer requirements, they could create more value to the customers, both internal and external. Mi6 project is a good example of this idea. In this project, there were no major borders between the functions, and as the communication between the parties was immediate and natural they were able to make the order-supply process much more efficiently than in standard conditions. Decision-making was prompt and if any problems occurred, answers were available immediately from the other parties. They were acting like cross-functional teams; involved persons from each three functions and the results were seen in the delivery performance that was almost perfect 98 %. As Kaplan & Norton (2006, 95) state, every enterprise can benefit from the knowledge sharing throughout the organization. This applies also to the MTL-chain. Even though the cooperation is working, there is always place for improvement in the means of knowledge sharing. Maybe there could be need for larger implementation of cross-functionality, e.g. in the Mi6 project. Finding a way to generate added value between the different functions could create more interaction and reliance to each other.

Christopher (2005, 272) found out that several companies gathered cross-departmental teams where each of the activities in the order-supply chain was located both physically and organizationally together. Instead of seeing each function as a different step, these are clustered together with the people brought together as well. Because all the key-people are working in the same place together, they are able to solve the problems and bottlenecks more easily. According to Christopher (2005, 272), the companies in his research also obtained reduced order-cycle times as the non-value added activities were eliminated and customer service problems could also be solved more quickly since all the persons involved were in close connection. This kind of inter-functional cooperation could be a good solution for the emerging problems in the MTL-chain also. However, in the larger scale it could be difficult to implement as the functions are so differently organized both physically and organizationally in the Tornio Works. In smaller scale it could be worth trying.

At Outokumpu, the management role in this change would be extremely important, as everything needs to be implemented together. The right strategies and working procedures need to be found out with adequate resources. After all, the focus of supply chain management is to manage the relationship in the chain and to gain more profitable outcome through the improved performance in it. These functions that are involved in the MTL-chain can no longer be isolated from each other, they have to work together and create superior value to the customers by performing their activities more cost-effectively and reliably than earlier.

## 6 CONCLUSIONS

The purpose of this research was to study the order-supply chain called as the MTL-chain at the Outokumpu Tornio Works and its present functionality. The general objective was to find out how the collaboration between the three different functions in the MTL-chain is working and if there are possibilities to implement those functions into processes in order to improve the delivery reliability.

When taking into account the character of the research questions, a comprehensive solution for that cannot be found exactly. This can be easily said, as this subject could be furthermore researchable from the different perspectives. However, it can also be argued that with the present findings from this research, the understanding for this investigated phenomenon has grown, and therefore, a solution is also achieved. The result could be different if this research had been expanded in every function more extensively. However, as the selected interviewees were experienced professionals who have worked several years in the company it can be assumed that the result of this thesis represents the overall picture and is therefore true.

The empirical findings from the theory show that, the overall business context today changes continuously and it has an effect on the supply chain management in the case company as well. In this case, the effect has to be recognized also in the MTL-chains performance. The major competitive edge is the actual product, but nowadays it is not enough. The customer expects that the supplier is delivering their orders in time. This means that in order to keep up their competitiveness, organizations need to respond rapidly and flexibly. The importance of logistics excellence has become more essential and with the reduced delivery times and flexibility, it can play a major role in winning the orders. Traditionally, organizations are slow to respond to changes. Organizations are built from functions or departments in order to ensure the efficient use of resources similarly to the case company Outokumpu's example. However, according to Doz & Korhonen (2008, 32), these organizations are slow to respond to changes in the volatile markets as there are often long times to respond from function to another. Seeking of efficiency decreases the flexibility. Companies with a more agile way of operating can have a significant benefit from their way of working. Those companies who are able to respond rapidly to customer requirements tend to focus more upon managing the processes that create more added value for the customers. The importance to develop

the internal processes and to eliminate the possible overlaps in the supply chain are playing major role in the value creation.

According to the findings of this research, the MTL-chain is functional and its different functions operate independently well and adequately together. Maybe it is the Finnish humble and unselfish mentality that was the reason for the outcome, but it was difficult to get any dissatisfaction out from the interviewees. Almost everyone was satisfied with the present situation. Only a few of the interviewees were willing to define exact suggestions or grievances. Those important notes from the interviewees were concerning the information flow, or more precisely lack of the information in some certain situations. Overall, no exact ground rules could be found for cooperation. Functions have their own procedures for working and so far this has worked decently. In order to improve the collaboration and the total process it would be advisable to create common ground rules that apply in problem situations.

Obviously the MTL-chain at Outokumpu is not perfect and problems occur especially within the communication over the organization boundaries. The employees are satisfied with the cooperation between the functions and with some enchantments it will be even better. This is a standard example from the process where the respond times are high due to the divergent organization structures. If there are no additional organizational barriers, the collaboration and information flow should work seamlessly. It is clear that there cannot be too much information available, and therefore, proactive working method could improve the whole order-supply process. Therefore, management should encourage employees in more active collaboration among each other. Collaboration between the different functions can also be improved even more with cross-functional teams that are in connection with each other all the time. These cross-functional teams can bring more value for each of the participants in the means of better communication and problem solving matters, flexible working processes and higher responsiveness as there are no other middlemen in the process. These previous actions would result in improved overall performance towards the customers at Outokumpu. It has been found out that cross-functional collaboration and effective interdepartmental relations benefit with improved distribution service performance (Ellinger 2000, 87). On the other hand, lack of collaboration may result in failure to deliver the promises made to the customers. It would be also advisable to bring the customer focus to every function. Now, the commercial department's role is to be the



messenger between the customer and the supplier. If this customer focus, or customer knowledge can be distributed to the production planning department and to the logistic services more efficiently, it would benefit in creating better value for each and everyone in the means of improved service.

On the basis of this research it cannot be shown that the delivery reliability would improve if the collaboration within the different functions in the MTL-chain improves. However, there is a clear connection with the cross-functional working methods such as in the Mi6 project. The project shows that, it is clearly possible to improve the delivery reliability, and with these on-time deliveries to gain more value for the customers. This method requires continuous communication and interaction between all three functions. The Mi6 way of working demands more from the counterparties but it also gives more benefit in the means of improved deliveries to the customers and decreased transportations costs. Always when the production is able to remain in their original schedule, it is possible to increase delivery reliability percentage close to the maximum. However, maintaining the competitiveness requires a constant development within the organizations. The organization has to be agile, and the management duty is to make sure that the employees have tools for that. Key methods are motivation, commitment and appropriate coordination.

As a result of this research, it can be argued that the managements concerns over the MTL-chain cooperation problems are exaggerated. The most evident problem generating matter at Outokumpu seems to be the unstable production, which causes difficulties to the MTL-chain parties and also determines the working conditions. If the production is not in time, or unless there is a constant safety stock or a buffer of certain materials available, there will always be some delays in deliveries to the customers. Final outcome for improved collaboration is in the way to motivate the counterparties for continuous development in their duties. This could be also a suggestion for further research topic.

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GENERAL

How long have you been working in this company?

- How long time in this current task?
- What are your main responsibilities in this task?

What are your departments' main responsibilities?

What kind of organization structure is in your department?

MTL -CHAIN

What do you know overall about this MTL -chain?

How it is assured that every member in the department knows his/her duties?

- Are there any written rules or regulations?
- Are these methods working?

If some sudden changes happen to the orders or transactions in the process, how then will be proceeded?

Are there any kinds of bottlenecks within this process?

COOPERATION AND COMMUNICATION BETWEEN THE DEPARTMENTS

How is the overall communication performed between the departments? / Are there any regular meetings?

- What kinds of subjects are topical in these meetings?
- How the communication can be improved?

How the overall market and customer information flows between the departments?

What kind of relationships there are between different functions?

How the cooperation relationship can be improved?

- What are the main problematics in the cooperation between the departments?
- Where does this conduct?
- How these obstacles can be removed?

How is the internal communication arranged in your department?

- What should be done to get all parties motivated equally into cooperation among others?
- How can you improve your own or your departments performance?
- What could be your motivator?
- How do you get response from the job well done? How about in the opposite situation?

### GS&M

How the GS&M –organization controls your operations?

- Any additional work from this?
- How to improve cooperation with GS&M?

Any suggestions how to improve the chain more functional?

YLEISTÄ

Kuinka kauan olet ollut töissä Outokummulla?

- Entä tässä kyseisessä tehtävässä?
- Mitä tehtäviisi kuuluu?

Mikä on teidän osastonne vastuualue?

Minkälainen on osastonne organisaatorakenne?

MTL –KETJU

Kertoisitko minulle mitä tiedät MTL -ketjun toiminnasta?

Miten on varmistettu että jokainen osastonne jäsen tietää tehtävänsä?

- onko esim. kirjoitettuja ohjeita/pelisääntöjä?
- toimivatko nämä systeemit?

Miten yleisesti menetellään, jos jotain merkittävää muutosta tapahtuu tärkeille tilauksille/tapahtumille oman osastonne kohdalla?

Minkälaisia pullonkauloja mielestäsi ketjun toiminnassa on?

OSASTOJEN VÄLINEN VIESTINTÄ JA YHTEISTYÖ

Miten eri osastojen välinen viestintä hoidetaan? Onko esimerkiksi säännöllisiä tapaamisia/kokouksia?

- minkälaisia asioita näissä käsitellään?
- Kuinka viestintää voisi parantaa?

Miten yleinen tiedonjako asiakkaista ja markkinoista osastojen välillä tapahtuu?

Millaiset suhteet osastojen välillä on?

Kuinka yhteistyötä eri osastojen välillä voisi/pitäisi parantaa?

Mikä on mielestäsi suurin ongelma yhteistyössä muiden osastojen kanssa?

- Mistä nämä ongelmat mielestäsi johtuvat?
- Miten nämä ongelmat voitaisiin mielestäsi poistaa?

Entä miten viestintä oman osaston sisällä tapahtuu?

- Mitä pitäisi mielestäsi tehdä jotta kaikki osapuolet ketjun sisällä olisivat yhtä motivoituneita yhteistyöhön?
- Miten itse voisit parantaa omaa (tai osastosi) toimintaa?
  - Mikä sinua tässä motivoisi?
- Miten tiiminne saa tietää hyvin tehdystä työstä? Entä vastakkaisessa tilanteessa?

### GS&M

Kuinka konsernin GS&M (Group Sales & Marketing) organisaatio säätelee teidän toimintaanne, vai sääteleekö?

- Millaista lisätyötä tästä tulee osastonne toiminnalle?
- Miten mielestäsi yhteistyötä GS&M:n kanssa voisi parantaa?

Millaisia ehdotuksia antaisit MTL -ketjun toiminnan muuttamisesta entistä toimivammaksi?



17.11.2009 Tuula Untinen - Logistics department

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