

INTERNAL LOGISTICS AS A PART OF SUPPLY CHAIN
Case: Nokia- China, Dongguang Branch

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ABSTRACT

Internal logistics is one of the most important sections within enterprises, especially in the large manufacturing companies. It manages, arranges, plans and delivers the finished products. It is an indispensable part of the supply chain, as well as reflects the result of implementation company strategy.

This study focuses on finding the possible ways to improve the operation process of Nokia-China internal logistics by looking into Nokia-China's internal logistics in Dongguan Branch- Supply Logistics Department.

NOKIA is already a strong, international and successful company. It has its own set modes in organization and management. In the study, the case department is presented as example of internal logistics process for others. However, every department has to constantly improve itself, and create maximum benefits.

This thesis states relevant theories of logistics, supply chain and performance measurement. The analysis of the internal environment of Nokia-China and SWOT method are to formulate the current situation of Nokia-China. And this thesis makes a deep study of every logistics activity within the case company's internal logistics as well.

Lastly the result brings forward possible suggestions to improve Nokia-China's internal logistics performance, which is based on the responsiveness of internal information exchange, implementation of company strategy and enhancement the professional skills of employees.

Key words: Logistics, internal logistics, supply chain, logistics process, performance measurement, Nokia-China, Dongguan Branch

ABBREVIATIONS

CIP	Carriage Paid To
CIQ	Custom Immigration Quarantine
COO	Country of Origin
C wk	Current Week
DDU	Delivered Duty Unpaid
DN	Deliver Note
EDI	Electronic Data Interchange
E2E	End to End
FCA	Free Carrier
IE	Import & Export
L & P	Logistics & Planning
LSP	Logistics Service Provider
MM	Material Management
MY	Malaysia
NCIC	Nokia-China Investment Co. Ltd
NOI	Nokia Own Inventory
NTL-DG	Nokia Telecommunication Ltd. Dongguan Branch
OF	Order Fulfilment
OM	Order Management
PGI	Post Goods Issue (Shipping Date)
POD	Delivery Date
PO	Purchase Order
R/3	Logistics Management System
SAP	System Application and Products in Data Processing
SL	Supply Logistics
SO	Sales Order
SOI	Supplier Own Inventory
SOP	Supply Operation Planning
TC	Trade Compliance
TO	Transfer Order

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1 INTRODUCTION

1.1 Objective

Supply Logistics is a significant department for Nokia-China. It ensures that every product delivery from this company get to the correct country in correct date, model quantity and so on. It relates to production, material management, warehousing, transportation, etc. Nokia occupies approximately 40% of global mobile devices' market share. And China is the biggest customer as a single country of Nokia of which the net sales occupies 13% within Nokia Global market. There are two Nokia's manufacturing sites in China which produce and supply the mobile devices for both Chinese and other areas' market. It's apparent from these figures, more increase of market share, more orders to Nokia-China, more works to Supply Logistics.

Supply Logistics represents the internal logistics of Nokia-China, which reformed by Logistics & Planning department and Import/Export department since July. Thus, the purpose of this thesis is to find out the possible ways to make Supply Logistics performance become more integrated, efficient and effective. In addition, this paper discusses case company's internal logistics working process from all teams' views, and evaluates internal environment of Nokia-China, as well as analyzes Nokia-China's company strategy. All of these results are to help bring possible solutions, improve ways and suggestion for case company's internal logistics performance.

1.2 Research Methods

Having right research methods for thesis study is essential. It is the guide for building up the thesis, as well as illustrates the understanding of the practical sides

of operation to readers. In the thesis, the qualitative research method is used to find out the data for the case study.

The topic of this study is internal logistics as a part of supply chain, by looking into Nokia-China internal logistics in Dongguan Branch. The primary research question is to find out possible ways to improve case company's internal logistics performance, which is an exploratory question.

Firstly, the study is looking into the concepts of logistics and supply chain. In this part, information was gathered based on the literatures and theories. These findings are used to find similarities or patterns through which one could explain the phenomenon under analysis.

The research question is to find the improvements for case company's internal logistics performance. Thus in the second part, the literature findings illustrate the performance measurements of logistics. However, in order to measure case company's logistics performance, the principles and bounds of performance measurements are essential. Furthermore, in this part, key performance indicators for logistics performance are also discussed.

The aim in case study is to allocate internal logistics activities descriptions, using collected information from interviews. Most of research questions within interviews are descriptive questions. The interviews are in order to know about the current situation of case company's internal logistics operation, and the relationships between each team, as well as the key element which could influence the whole department.

Practical experience in the case company has contributed to the process and findings of the study as well. Half year of working experience in both Order Fulfilment department and Trade Compliance department plays a crucial role in

understanding the case company's process behaviour and the impact and importance of internal logistics operation.

1.3 Limitations

First of all, the author has signed the security contract with the case company (NTL-DG), in the thesis the information concern technology, finance and business secrets could not be discussed.

Secondly, because of author's work position, production planning will not be concerned in this study. However the study puts emphasis on the operation of internal logistics performance, the missing part will not influence the research.

Lastly, the topic of this thesis focuses on both Nokia-China and Dongguan branch. But it's necessary to identify that, the current situation of company will focus on Nokia-China, and the study of internal logistics will emphasize Supply Logistics' performance in Dongguan branch.

1.4 Structure of thesis

The study begins with a look at the logistics concepts, in order to find out what are the main functions of logistics activities. The concepts include management, integration, information systems, and organizations of logistics. The theoretical findings are to help explain and understand case company's internal logistics operations. At the same time, there is few knowledge about the advantage competitive which logistics led to, this point is to know about that, the logistics activities is not only a "tool" to transports and manages the goods, but also it is the key element of achieving high level of customer service. After that, there is some brief knowledge of supply chain. As internal logistics is not only to provide logistics works and duties, equally, it also acts as a significant part within

supply chain.

The following part will focus on the performance measurement by giving the key performance indicators and models. Within an organization, the performance measurement is an efficient way to evaluate logistics activities' operation. It is the path to find and build up the improvement orientations. This theoretical part will link to the last part of this thesis.

To finish off the theoretical part of study, it is going to analyze internal environment of Nokia-China step by step, which includes general knowledge of Nokia-China, company resource, etc. In order to figure out the current situation of Nokia-China, this paper will use SWOT method to analyze. In this chapter it will discuss Nokia-China's strategy as well.

The empirical part follows by the theoretical study and Nokia-China's analysis, which covers half of the thesis. This part emphasizes internal logistics performance in case company, via deeply descriptions and analysis of all logistics activities which within Supply Logistics.

The improvements for case company will be presented in the last chapter. It is not only the suggestions for case company, but also summarise the achievements of whole study.

In order to easy understand the whole structure of this thesis, the following chart shows the process of the thesis

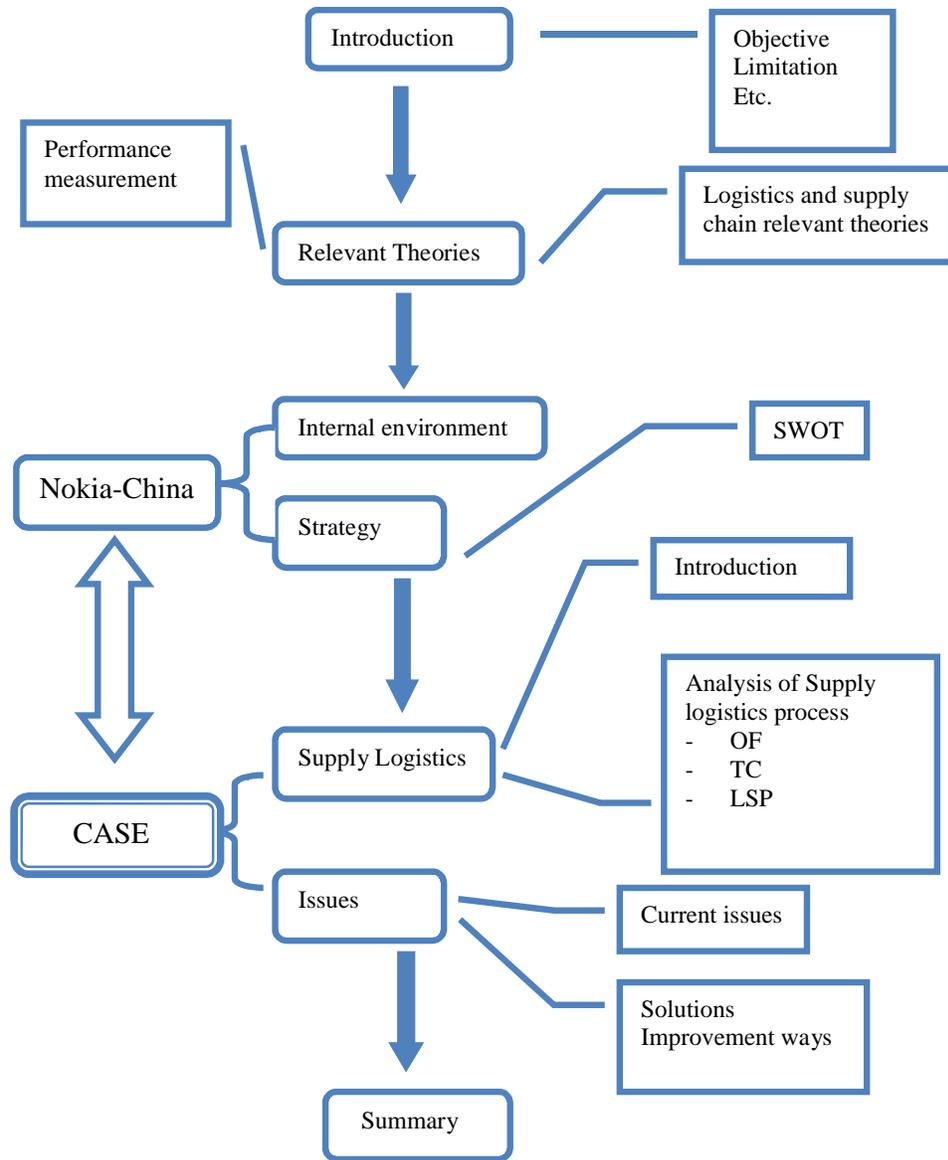


Figure 1- Process of Thesis

2 LOGISTICS AND SUPPLY CHAIN

2.1 Logistics

2.1.1 Logistics concept

As times goes on, there is a certain degree of changes of logistics concept, which is generalized (Logistics) and narrow (Physical distribution) distinctions. In 1991, Council of Logistics Management formally the concept of logistics, physical distribution changed from logistics. In addition, modern logistics is defined as: the process of planning, implementing, and controlling the efficient, effective flow and storage of goods, services, and related information from point of origin to the point of consumption for the purpose of conforming to customer requirement (Johnson, Wood, Wardlow & Murphy, 1998, 5)

The characteristics of this definition so that emphasizes customer satisfaction, the efficient logistics activities and logistics extend from the original sale of the logistics to the supply logistics, business logistics and sales logistics (see Figure 2).

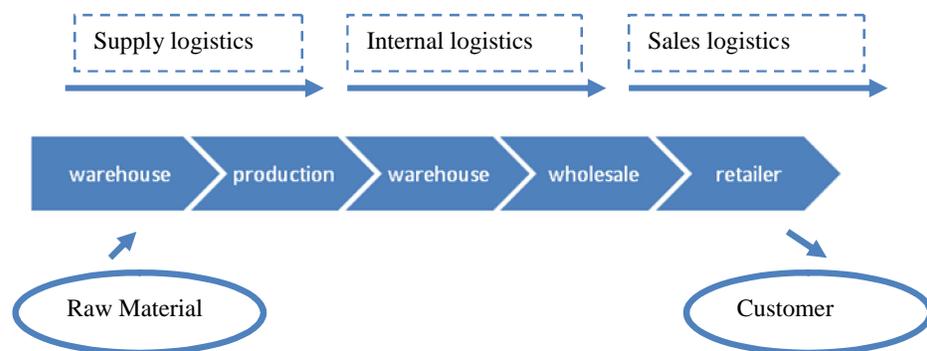


Figure 2- Extension of modern logistics concept

However, there are a number of commonly accepted definitions of logistics nowadays. One simple definition is the “Seven R’s of Logistics”. The Seven R’s defines logistics as ensuring the availability of the right product, in right quantity and right condition, at the right place, at the right time, for the right consumer, at right cost. A second definition is one that was adopted by Council of Logistics Management in 1998, which defines logistics as: the part of the process of supply chain management that sees to effectively planning, implementing y, and monitoring the storage and direct and reverse flow of goods, service, and all the information related to them, between the point of origin and the point of consumption, with the aim of fulfilling the consumer’s expectations. Equally, Christopher in 1998 stated: Logistics is the process of strategically managing the procurement, movement, and storage of materials, parts and finished inventory (and the related information flows) through the organization and its marketing channels in such a way that current and future profitability are maximised through the cost-effective fulfilment of orders (Jane & Ochoa 2006, 11-12). Finally, a much simpler definition of logistics is offered by Robert V. Delaney, which is: Logistics is the management of inventory in motion and at rest... (And that) the goal of the logistics manager is to achieve the lowest level of investment in inventory consistent with ensuring customer service and maintaining efficient production. (Stephen & C. John 2000, 73)

In short, traditional logistics generally refers to activities after products manufactured, such as packaging, transport, loading, unloading and warehousing, etc. Moreover, modern logistics stated the integrated logistics management concept and implementation. Specifically, the meaning to extent and combine the social logistics and internal logistics, the supply logistics from the beginning, after the production logistics, re-entering the sales logistics, at the same time, go through the packaging, handling, transportation, storage, processing, distribution and deliver to consumers, and finally have recycling logistics. It is important to

discover, the modern logistics should be the means of during production and operation of the entire process. And all kind of information flow and activity-related services are involved in every business field, including product from manufacturing to scrap this entire physical process of circulation. Thus, logistics is the product flow within manufacturers, through materials procurement and physical distribution of these two functional activities, respectively to both supplier and customer orientation of the longitudinal extension of the structure of the supply chain system.

2.1.2 Logistics management

Logistics management has many names, which including:

Business logistics	Logistics
Channel management	Materials management
Distribution	Physical distribution
Industrial logistics	Quick-response systems
Logistical management	Supply chain management

(Stock & Lambert 2001, 2)

Logistics management is most commonly accepted among those above names. The Council of Supply Chain Management Professionals which is the precursor is council of Logistics Management, a association which is the world's leading source for the supply chain profession, defines logistics management as: the part of supply chain management that plans, implements, and controls the efficient, effective forward and reverses flow and storage of goods, services and related informational between the point of origin and the point of consumption in order to meet customers' requirements (cscmp.org).

This definition includes the flow of goods, services, and information in both the manufacturing and service sectors. Hence, it is easy to see that, the features of logistics management are:

- Achieve customer satisfaction for the first goal
- Focus on the entire logistics channel
- Optimize the overall enterprises for purpose
- Based on information technology as the driving force, effectively link from the supplier to the end-user.
- Unified management

What's more, the objective of logistics management as follows:

- Quick response

Quick response related to the timeliness of enterprise services which meet customer needs. Improve information technology in the shortest possible time is to complete homework logistics and inventory as soon as possible to deliver.

Quick response capacity changes the focus of logistics operations from forecasting and inventory into from shipment to customer demand.

- Small variation

The small variation controls any damage of logistics performance systems, and the occurrence of the unanticipated events. These events include the time delay of customer receipt, unexpected manufacturing damaged, and the goods deliveries to incorrect locations. The way to solve the traditional methods of variation is to set up security stock or use the high-cost premium transportation. The use of modern information technology is possible to active control logistics.

- Low inventory

The objective of low inventory is to reduce the burden of assets and improve the related turnover rate. The possibility of a high inventory turnover rate means that

the distribution of funds in the stock on the effective utilization. Therefore, to keep the low inventory is to reduce inventory as same as the lowest level of customers service.

- Transport integration

The most important one is the transport logistics cost. In general, the need of larger transport, the longer the distance, the lower transport cost per unit. Hence, this has required innovative planning, put the shipment of small quantities together, with great quantities of integrated transport.

- Quality of Product

Because of logistics work must be implemented at any time, across widely areas, the requirements of quality have been strengthened. As the vast majority of logistics operations are without the vision of supervisors, so that, an incorrect shipment or transit damage would cause redo customers orders, and the cost would be more than first expenses incurred. Hence, the logistics is the main component of development and maintenance of total quality management need continuous improvement.

2.1.3 Logistics Integration

Integrated Logistics is mature stage of logistics industry development. Highly developed logistics industry, improving the logistics system, the logistics industry become a leader in the production chain and coordination, and is able to provide the community with a full range of logistics services. The development of logistics integration can be further divided into three levels: self-integration, macro and micro integrated logistics (Feng 2004, 21).

Logistics is a fragmented and often uncoordinated set of activities spread throughout various organizational functions with each individual function having its own budget and set of priorities and measurements. Some companies

discovered that total distribution costs can be reduced by integrating such distribution related activities.

Successful integrated logistics management ties all logistics activities together in a system which works to minimize total costs and maintain desired customer service level (Kenderdine & Larson 1988, 5). It is necessary to state that, the total cost includes six major cost categories of logistics, which are, customers service levels, transportation costs, warehousing costs, lot quantity costs and inventory carrying costs.

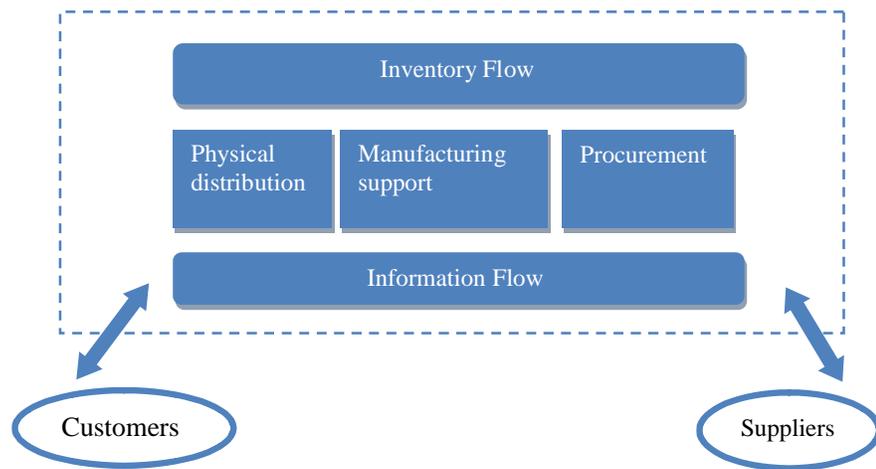


Figure 3 – Logistical Integration

Furthermore, information flow plays an important role in the logistics integration. Logistics is viewed as the competency that links an enterprise with its customers and suppliers. As it mentioned in the previous sections, information from the about customers flows through the enterprise in the form of sales activity, forecast, and orders. The conceptualization of integrated logistics is illustrated in the shaded area of Figure- 3 (Bowersox & Close 1996, 34)

2.1.4 Logistics organizations

Effective and efficient logistics organizations are vital elements of supply chain management (Stock & Lambert 2001, 582).

Prior to the 1950s, functions now accepted as logistics were generally viewed as facilitating or support work. Organizational responsibility for logistics was dispersed throughout the firm. This fragmentation often meant that aspects of logistical work were performed without cross-functional coordination, often resulting in duplication and waste. Information was frequently distorted or delayed, and lines of authority and responsibility were typically blurred. Managers recognizing the need for total-cost control began to reorganize and combine logistics functions into a single managerial group (Bowersox & Close 1996, 597). To understand various departments grouped in one integrated logistics organization, it is helpful to know the development of logistical organizations. (See Figure 4)

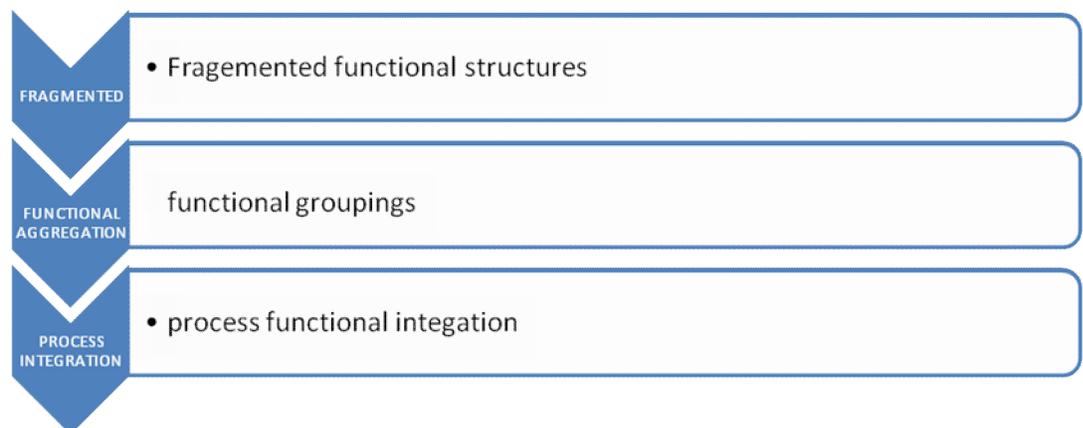


Figure 4- Logistical organization development cycle

These stages above of organizational development are based on the relative balance of functional aggregation and information integration.

2.1.5 Logistics information systems

Many logistics experts believe that the correct identification, integration, and implementation of information technology tools is the single most important issue facing logistics managers today and into the foreseeable future (Richard, Max & Bill 1995, 123) In addition, information flow is a key element of logistics operations. Customer orders, inventory requirements, warehouse work orders, transportation documentation, and invoices are the common types of logistics information. The uses of technology logistics information systems have made the logistics information exchange more efficiently, effectively, and rapidly.

Logistics information systems are the threads that link logistics activities into an integrated process (as mentioned in 2.3). The integration builds on four levels of functionality: transaction, management control, decision analysis, and strategic planning systems (Bowersox & Close 1996, 187). Figure 5 shows the logistics activities and decisions at each level of information functionality.

For enterprise, a logistics information system has following functions:

- Simplify management, improve the internal and the exchange of information between enterprises, and enhance the work efficiency
- Improve the speed of operation of the system, in the shortest possible time will be right goods and services provided to customers
- On staffing and resource utilization to optimize and create the largest input-output ratio;
- Acquisition and analysis of suppliers, customers and partners relevant information to help businesses make better decisions.

Of course, the role of logistics information system is also more than this. GartnerGroup who is from RR, the world's leading research consulting firm, said that, "If you stop using the SAP software, will announce the collapse of the German economy. If the United States stops using it? Many places the United States is bound to fall into darkness, such as Silicon Valley." It can be seen that the use of information systems have given businesses what foreground.

Table 1- Information Functionality

Strategic Planning	<ul style="list-style-type: none"> • Strategic alliance formulation • development and refinement of capabilities and opportunities • focused customer service analysis
Decision Analysis	<ul style="list-style-type: none"> • vehicle routing and scheduling • inventory levels and management • network location configuration • vertical integration vs. third party
Management control	<ul style="list-style-type: none"> • financial measurement • assets management • customer service measurement • productivity measurement • quality measurement
Transaction systems	<ul style="list-style-type: none"> • order entry • shipping • inventory assignment • pricing and invoicing • order selection • customer inquiry

However, quick information flow is based on good information technology. EDI and ERP are the best “logistics assistant” in any companies overall the world.

EDI (Electronic Data Interchange) is identified as intercompany computer-to-computer exchange of business documents in stand formats. EDI describes both

the capability and practice of communicating information between two organizations electronically instead of via the traditional forms of mail, courier or even fax. The capability refers to the ability of computer systems to communicate effectively (Bowersox & Close 1996, 204).

ERP (Enterprise Resource Planning), is an enterprise-wide information system designed to coordinate all the resources, information, and activities needed to complete business processes such as order fulfilment and billing. An ERP solution is characterized by supporting a variety of business functions such as manufacturing, supply chain management, financials, projects, human resources and customer relationship management from a shared data store (wikipedia.org).

2.1.6 Logistics lead to competitive advantage

Effective logistic management is the key element to improve both the profitability and competitive performance of enterprise.

As Figure 6 shows below, state the three elements of marketing concept, customer satisfaction, integrated effort and company profit and logistics' relationship, it is easy to see that logistics plays a key role in each of these elements.

When enterprise starts focus increase attention on their basic operation capabilities, it would extend beyond the manufacturing and which include logistics activities. Therefore, logistics has become an important basis of competition in enterprise. Low cost, superior customer service, valued-added services, flexibility and innovation are the five sections which enterprise could create competitive advantages from logistics.

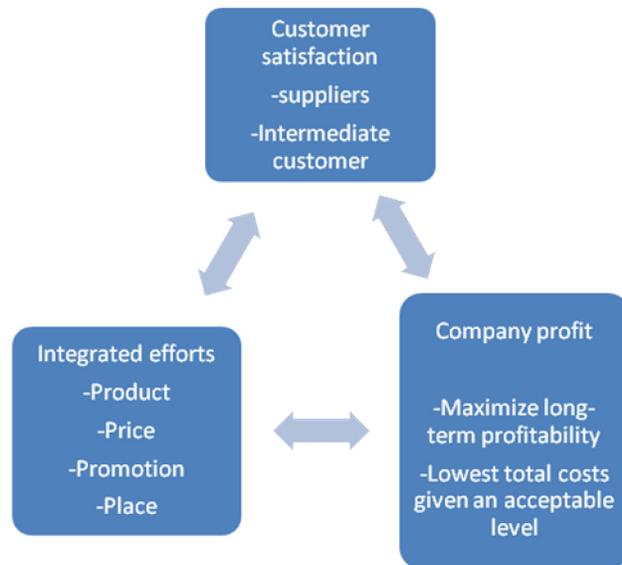


Figure 6- Marketing / Logistics management concept (Lambert, Stock & Ellram 1998, 12)

2.2 Supply Chain

When think about the definition of supply chain, there are few aspects which should be considered. Firstly, supply chain is formed by many entities, which is a quiet complex system. Secondly, the activities which implement in these entities should be taken into account, because of these activities, the flow of goods and customer service in the supply chain can be enabled. Thirdly, supply chain must be treated as a whole system, the relationships through the entities should be considered, such as interaction relationship, dependent relationship and the supply and demand balance of finished-product and service.

Therefore, the supply chain defines as: the system of organizations, people, technology, activities, information and resources involved in moving a product or service from supplier and customer. Supply chain activities transform natural resources, raw material and components into a finished product that is delivered to the end customer (Wikipedia.org)



Figure 7- Simple Supply Chain Chart

2.2.1 Supply chain management concept

Supply chain management is an operational management technology, which can make the activities of enterprises ranging from only the best for the big expansion of the logistics activity to all the functions of the enterprise. These functions include marketing, processing, manufacturing and finance, all of these functions to the best way to work closely together as a whole. Equally, supply chain management is the expansion of the integrated management of logistics, its purpose is to organize the logistics functions and supply chain partners such as the functions of the logistics part of a merger or seamless connectivity to internal logistics functions and external suppliers and customers, or third-party logistics league to connect together to form a complete integrated system. Furthermore, supply chain management is the practical application of a common goal at the core of the organization and management.

In addition, CSCMP (Council of Supply Chain Management Professionals) states that, the supply chain management (SCM) profession has continued to change and evolve to fit the needs of growing global supply chain. With the supply chain covering a broad range of disciplines, the definition of what is a supply chain can be unclear. Often times SCM can be confused with the term logistics management. (cscmp.org)

As what have been discussed above, the definition of supply chain management is stated as: supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies.

(cscmp.org)

2.3 Internal supply chain

Supply chain can be divided into two parts, the dynamic supply chain and internal supply. Internal supply chain enterprises are only considering their own business without considering its extension. Dynamic supply chain is composed of a group of independent entities, one of the lead entity looking for those with superior resources of partners, each partner contribute to the supply chain core competitiveness. In fact, supply chain management manages all related activities of the internal and external business, enterprise's internal operations is as same as external operations, there exists value-added activities, so enterprises in supply chain management time must integrate the coordination of external relations and internal supply chain management coordination.

2.3.1 Internal supply chain concept

Early definition of the supply chain limited to the operation of the enterprise, mainly referring to manufacturing enterprises from external procurement of raw materials and parts after the production, processing, sales to customers at the internal process. That is, internal supply chain. With the theory of supply chain research and entrepreneurial development in depth changes in the supply chain concept of the internal shift from the original external, by the linear

shift network type. Therefore, there have been external supply chain and internal supply chain classification.

In this study, the concept of internal supply chain is in the production and product flow, the process of raw material suppliers, manufacturers, storage, transportation, retailers and ultimately consumers, composed of networks of supply and demand. Internal supply chain concept confined to a single enterprise, emphasize internal marketing, sales, planning, manufacturing and procurement co-ordination between departments, can be seen as a reduction of external supply chain, and in the enterprises such as the procurement department can look for an external supply chain suppliers.



Figure 8- Internal Supply Chain Chart

2.3.2 Internal supply chain management

Internal supply chain management, management refers to the use of the planning, organization, command, control and coordination functions of the enterprise products in all aspects of circulation involved in logistics, capital flow, information flow and business processes to a reasonable regulation to achieve the greatest efficiency, lowest cost, and to provide maximum customer value (Ma, Guo & Qin 2004, 70). Internal supply chain management emphasize the supply chain flow coordination in order to achieve business efficiency, cost reduction, supply chain systems integration to lay a good foundation.

2.4 Supply chain integration

"Integration" means that the system of the elements of organization, coordination and restructuring, so that resources will be the optimal configuration, the highest system efficiency. Supply chain is a node contains all enterprise and internal department systems, in this system have the information flow, capital flow and logistics flow of transmission, will be in the supply chain to integrate the various elements to improve the efficiency of supply chain management are core mission.

Supply chain integration is defined as suppliers of raw materials to finished goods to end-users the full process, including outsourcing, manufacturing, distribution, inventory management, transportation, warehousing, customer service, unified coordination and restructuring in order to make this Net chain enterprises can achieve maximum benefits.

Supply chain integration has two basic points: First, flow integration, the main aspect is the convergence of various functions to optimize the efficiency of integration; second, integrated sections, the main sections are the functions of the efficiency of the integration itself, usually happed as a whole system(Yang 2007, 11). Generally supply chain integration including the integration of the following elements:

- Integrated flow from raw material supply, product manufacturing, product distribution, to the end-users
- Integration of suppliers, manufacturers, distributors, retailers, customers
- Process integration of information flow, logistics, capital flow and management
- Comprehensive integration of supply chain management, organization, management technology, and management approach

Supply Chain Management emphasis includes suppliers, manufacturers, channel intermediaries and customers integration. J Stevenson proposed four stages of integration: the benchmark organizations, the functions integration, internal integration, external integration (Stevenson .G, 1998,8).

Stage of internal integration is to implement the direct control of enterprise integration and supply chain implementation within enterprises and external supply chain suppliers and their respective user management part of the integration, the formation of the internal integration of the supply chain. At the same time, internal integration is not only the Department integration, is also the department's standardized flow integration, the formation of the standard flow and management mechanism. In the study, the main consideration in the optimization of resources, capacity, based on the lowest cost and fastest speed in the production of the best products, quick response to user needs in order to improve the responsiveness and efficiency of enterprises.

External integration is the key to integration, the internal and external supply chain suppliers and users together to form an integrated supply chain network. External integration is the most advanced stage, the actual meaning of that supply chain integration. Supply chain integration through information technology tools and management tools to achieve the supply chain of manufacturing processes and logistics seamlessly (Kate, P. B. , 1998).

2.4.1 Internal supply chain integration

Internal supply chain integration is to have the internal relations between supply and demand adjust to optimize the flow, so that products or services at a faster transmission, more flexible, more economical and effective, so that the operation of enterprises improve operational efficiency, improve business competitiveness.

Through information technology and management tools for internal supply chain integration, enterprise internal supply, manufacture, sales in pursuit of common objectives and implementation strategies in line. Internal supply chain integration has four main areas: information integration, decision-making integration, financial integration and the operation of integration. Information integration refers to the supply chain to participate in Department information sharing, which is the basis of supply chain integration. Decision-making supply chain integration refers to a number of aspects on the synergy between the plans. Financial integration will change the supply chain nodes to pay the relationship between the departments, is to coordinate the overall interests of the supply chain means. Integration refers to the operation of upstream and downstream supply chain between the human resources (such as procurement, marketing, design, etc.) as well as the sharing of material resources (Yang 2007, 14). Internal supply chain integration will involve the operation of enterprises of various flow and business department, coordination and restructuring, so that various departments within enterprises connected, open and effective information sharing, so that the optimal overall operation more efficient operation.

3 PERFORMANCE MEASUREMENT

Performance evaluation assessment system directly affect the target performance level of business operations and development, a good measurement system to ensure that the enterprise's short-term objectives and long-term goals.

3.1 Performance measurement principle & bound

3.1.1 Performance measurement principle

In order to reflect the operations of the supply chain, there should be set up with suitable methods of supply chain performance measurement and to determine the appropriate target system for performance measurement. Measurement of supply chain performance indicators not only reflect the operating performance of the enterprise, but also evaluate the overall operation of the supply chain performance levels. In actual operation, in order to set up an effective supply chain performance measurement target system, the following principles to be followed: (Nie 2004, 66)

- 1) Analysis focus on key performance indicators
- 2) Should use the target system performance which reflect the supply chain business process
- 3) Measurement indication should be able to reflect the operation of the whole supply chain, rather than just reflect a single node in the operations of enterprises
- 4) Should maximize the use of real-time analysis and evaluation methods, performance metrics should be extended to reflect the supply-chain information in real –time operation , because this analysis is more valuable than after the work

- 5) When measure the performance of the supply chain, it is necessary to use the measurement indication, which reflect the relationship of suppliers, manufacturers and users, extend the measurement objects up to relevant enterprise in supply chain

The three objectives for developing and implementing performance measurement systems include monitoring, controlling, and directing logistics operations.

Monitoring measures track historical logistics system performance for reporting to management and customer. Controlling measures track ongoing performance and are used to refine a logistics process in order to bring it into compliance when it exceeds control standards. Directing measures are design to motivate personnel (Donald & David 1996, 670).

3.1.2 Performance measurement bound

In general, there are three aspects should be considered in supply chain performance measurement:

Firstly, internal performance measurement; secondly, external performance measurement; integrated supply chain performance measurement is the third one.

- 1) Internal performance measurement

Internal performance measure of the supply chain is mainly on the evaluation of the performance of the enterprise. There is a common target: Costs, customer service, productivity, good management, quality and so on.

- 2) External performance measurement

External performance measurement is the evaluation of enterprises on the supply chain operation. The key indications of external performance are: customer satisfaction, benchmarking of best implementation.

3) Integrated supply chain performance measurement

General supply chain performance measurement aspects includes: customer satisfaction, time, cost, asset and etc.

3.2 KPI of performance measurement

3.2.1 Lummus performance measurement KPI

Lummus listed the KPI (key performance indication) of supply chain performance measurements. Each target has three target values: the ideal value, target value and current value. Supply Chain Performance Management is aimed at the value set in accordance with the ideal value; subsequently improve the performance of the current situation.

Table 2- Lummus performance measurement KPI (Nie 2004, 68)

TYPE	ASSESSMENT INDICATION
Supply	Reliability: Lead Time
Transition	Process reliability, processing time, plans achievement situation
Transportation	Order completion rate, add lead-time, delivery days
Demand management	The total supply chain inventory costs, the total turnaround time

3.2.2 Roger model

Roger (1999) considered the quality of service customers is the most important mean of measuring supply chain management platform application performance,

which include: tangibles, reliability, responsiveness, competence, credibility, security and access seven areas: (Nie 2004, 70)

- 1) Tangibles: an enterprise supply chain performance reflected external function.
- 2) Reliability: the indication reflects reliability performance of the operation of supply chain management platform. Reliability is the most basic protection of platform.
- 3) Responsiveness: the indication reflects the response speed of supply chain management platform, as well as the quick response to customer service through the supply chain management platform. Time is the main measurement of this target variable.
- 4) Competence: in order to achieve the established level of service, enterprises must master the skills and knowledge; in the other hand the depth management capabilities of evaluating supply chain management platform.
- 5) Credibility: the ability of deliver goods on time to evaluate the application of supply chain performance platform.
- 6) Security: the indication reflects the enterprise through the application of supply chain management platform, to reduce and avoid risks, dangers and conflicts.
- 7) Assess: this indication reflects the very strong supply chain management platform to control information sharing and capacity.

3.2.3 SCOR model

Supply-Chain Operations Reference-model (SCOR(r)) is a process reference model developed by the management consulting firm PRTM and AMR Research and endorsed by the Supply-Chain Council (SCC) as the cross-industry de facto standard diagnostic tool for supply chain management. SCOR enables users to address, improve, and communicate supply chain management practices within and between all interested parties in the Extended Enterprise. (en.wikipedia.org)

SCOR(r) is a management tool, spanning from the supplier's supplier to the customer's customer. The model has been developed by the members of the Council on a volunteer basis to describe the business activities associated with all phases of satisfying a customer's demand. (en.wikipedia.org)

However, SCOR model states 13 supply chain KPI (key performance indication), these indications are formed by delivery reliability, supply chain responsiveness, supply chain flexibility, supply chain costs and supply chain efficiency and asset management these five main aspect, which are the supply chain performance operation measurement index system. The 13 indications as following:

- 1) Delivery Performance: the percentage of executive order in accordance with the number of days required by customers, or before the customers required number of days, or prior the original planned number of days
- 2) Fill Rate: the percentage of inventory shipments when receive the order within 24 hours.
- 3) Order Fulfillment Lead Time: the average time required from customer orders to actual orders received.
- 4) Perfect Order Fulfillment: the completed order percentage of meet all delivery requirements. The accurate documents with current delivery, current quality, current volume, and without produce damage.
- 5) Supply Chain Response Time: the response time of the non-normal or significant change within supply chain system.
- 6) Production Flexibility: the upper stream enterprise: achievement which can bear non-plan production capacity by 20 percent the number of days required. Downstream enterprises: in the absence of loss of inventory or cost of the cases, 30 days before the due date will bear enterprises to reduce the percentage of orders.

- 7) Total Supply Chain Management Cost: the sum of relevant supply chain costs, including management information systems, finance, planning, inventory, materials management, procurement and cost orders.
- 8) Cost of Goods Sold: Purchase of raw materials and manufacturing costs, including direct and indirect costs.
- 9) Value-Added Productivity: per capita value-added rate, total sales, minus the total cost of procurement of materials, divided by the total number of employment.
- 10) Warranty Cost or Returns Processing Cost: Materials, labor and product costs of defects in the diagnosis of the problem, or deal with the cost of return.
- 11) Inventory Days of Supply: the standard cost calculate of the total value of inventory cost.
- 12) Cash-to-Cash Cycle Time: the number of days supply of inventory, coupled with the number of days sales outstanding bills, less the average number of days of procurement of raw materials payment.
- 13) Asset Turns: the total sales divided by net total assets. (Nie 2004, 69)

3.3 Performance measurement implementation

After set up the system of key performance indicators, Enterprises also need to focus on key performance indicators set up evaluation criteria for the assessment of performance indicators and evaluation of rules, as well as the hope of achieving the ideals of corporate status or the best industry level. Through the comparison of performance appraisal of the effectiveness and the ideal status, identify problems and gaps, proposed improvement plan, ensure continuous improvement of enterprise performance

First of all, put the performance level of each target is divided into five levels. According to Level 1-5, the best level of 5 points, the worst level of the industry sub-1, and so on.

Secondly, the allocation of resources based on business and strategic planning, setting the various performance indicators of achievement target level of performance over a period of time.

Furthermore, to collect all relevant data and calculation results. To map out comparison of the ideal achievement level and the actual operating results chart. If the performance of enterprises set up the performance indicators as new sales rate, information sharing rate, customer satisfaction rate, the order fulfillment rate and cash-flow period. The ideal achievement levels are (5 , 4 , 4 , 4 , 5), the actual operation result are (4 , 3 , 4 , 5 , 5), thus the comparison chart as following:

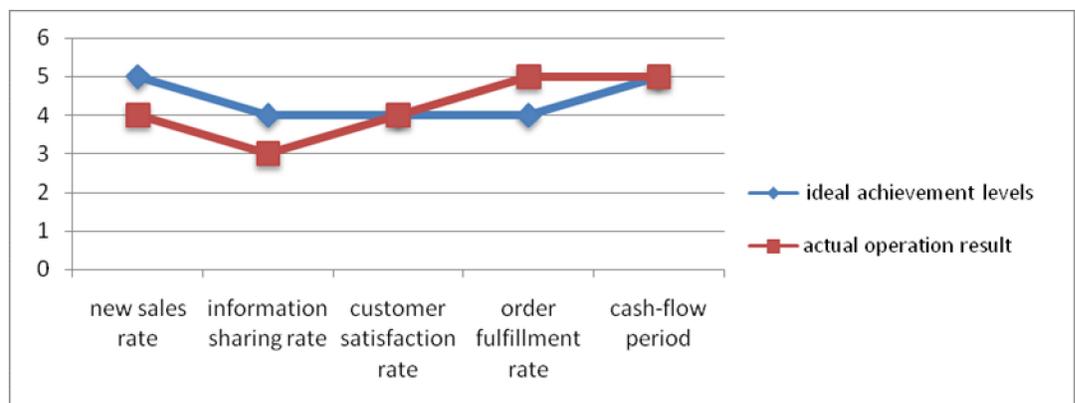


Figure 9- Comparison chart of ideal achievement level and actual operation result

Finally, identify the causes and problems, formulate plans for improvement.

4 CASE STUDIES: NOKIA-CHINA

4.1 NOKIA-China Background

Adhering to the purpose, “walk hand in hand to create a better future,” Nokia and local partners build long-term development in China. And Nokia is committed to becoming the best partner within Chinese market. From 1950s, Nokia has established the trade relationship with China. Since 1985, in Beijing, Nokia opened its first offices in China, which began early stages of development. In the mid-90's, Nokia set up manufacturing sites through joint ventures in China, Nokia realizes that the localization of production can make Nokia-China gradually develop into Nokia’s world's leading production base. Entering the new century, Nokia is to strengthen cooperate with the Chinese at the latest in communications technology, deeply involved in China's information industry development, and further into a Chinese Nokia global R & D and talent base.

2006 is the milestone year for Nokia-China, the annual sales and total exports were more than 10 billion Euros. Among them, the net sales were more than 5.3 billion Euros, with exports amounting to 4.8 billion Euros. China continues to be the world's largest market for Nokia. Chinese telecommunications industry as the biggest export enterprises, among them, Nokia in China's total exports over the past seven years were more than 18.2 billion Euros. In 2006, Nokia local procurement in China was more than 35 billion Yuan. Nokia-China as one of the Chinese largest foreign-invested enterprises, it has implemented the promotion of local sustainable economic development. Nokia-China is Chinese most admired company, from 2004 to 2006, Nokia was elected three times in a row by the First Financial and Horizon Research named the “most influential Chinese multinational corporations”.

China is not only a strategic significance market for Nokia, but also it's the Key production, R & D and innovation base of Nokia. Beginning in 2004, with a rich series of innovative products, in-depth localization strategies, successful channel construction, as well as increasing brand loyalty, Nokia won first place in the overall mobile phone market.

Nokia continues exploration and innovation combine the mode of globalization operation with Chinese characteristics. Thus, Nokia's brand strength in China is ever-increasing, as an outstanding employer status, Nokia-China has attracted a lot of excellent local talent. Only during a dozen years, Nokia-China has changed from a personal representative office in Beijing to a multinational corporation, which has a possession of dozens of offices in all over China, a number of R & D institutions, production base and more than 12,000 staffs. Nokia as a good corporate citizen, continue contributing to China's development (nokia.com.cn).

4.2 Company Resources

Nokia-China established in 1985. The net sales in 2008 reached more than 6.4 billion Euros, representing 13% of Nokia global net sales. Nokia-china is the market leader in Mobile Devices as well, over 70 million sold in 2008. It's one of the biggest foreign invested companies in China. In 2007, Nokia-China was the leader in Corporation Responsibility and Environmental initiatives. Nokia-Beijing and Nokia-Dongguan, these 2 terminal manufacturing sites are serving global and local needs. In addition, Nokia Siemens Networks has infrastructure manufacturing sites in Suzhou, Beijing and Shanghai.

In the human resource part, Nokia-China employment guidelines set out commitment to treat employees fairly, equally and with respect. Labour conditions at all production sites must meet recognized international standards. Monitor conditions in all factories and carry out on-site assessments every two

years. Nokia-China labour condition standard based on International Labour Organization and UN Human Rights conventions- provide a framework for assessment, follow-up and improvement plan.

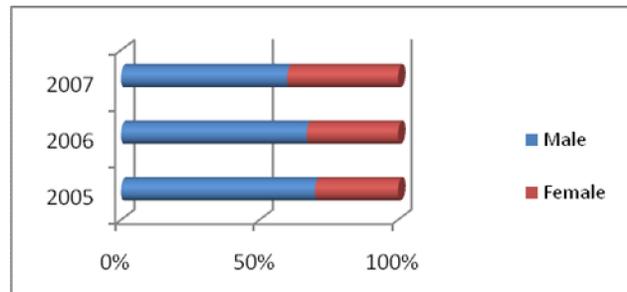


Figure 10- Nokia-China Employee gender distribution, % (Nokia, 2008)

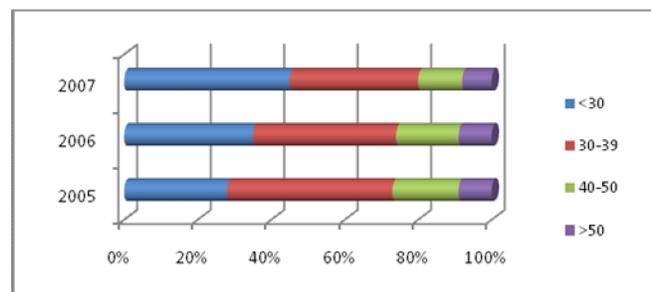


Figure 11- Nokia-China age distribution, % (Nokia, 2008)

Nokia-China brand resource is from the customer satisfaction and mobile devices quality in the telecommunication industry. As it mentioned in background part: Nokia-China as one of the Chinese largest foreign-invested enterprises, it has implemented the promotion of local sustainable economic development. Nokia-China is Chinese most admired company, from 2004 to 2006, Nokia was elected three times in a row by the First Financial and Horizon Research named the “most influential Chinese multinational corporations”.

4.3 Internal management



Figure 12- Nokia-China Structure (Nokia, 2008)

Devices is responsible for developing the best device portfolio for the marketplace, including sourcing of components

Services & Software reflects our strategic emphasis on developing and growing our offering of consumer

Internet services and enterprise solutions and software

Markets is responsible for management of our supply chains, sales channels, and brand & marketing activities

The Corporate Development Office focuses on our strategy and future growth, and provides operational support for integration across all the units.

Nokia Siemens Networks, a separate company jointly owned by Nokia and Siemens and consolidated by Nokia.

NAVTEQ is a leading provider of comprehensive digital map data for automotive navigation systems, mobile navigation devices, Internet-based mapping applications, and government and business solutions.

4.4 SWOT analysis

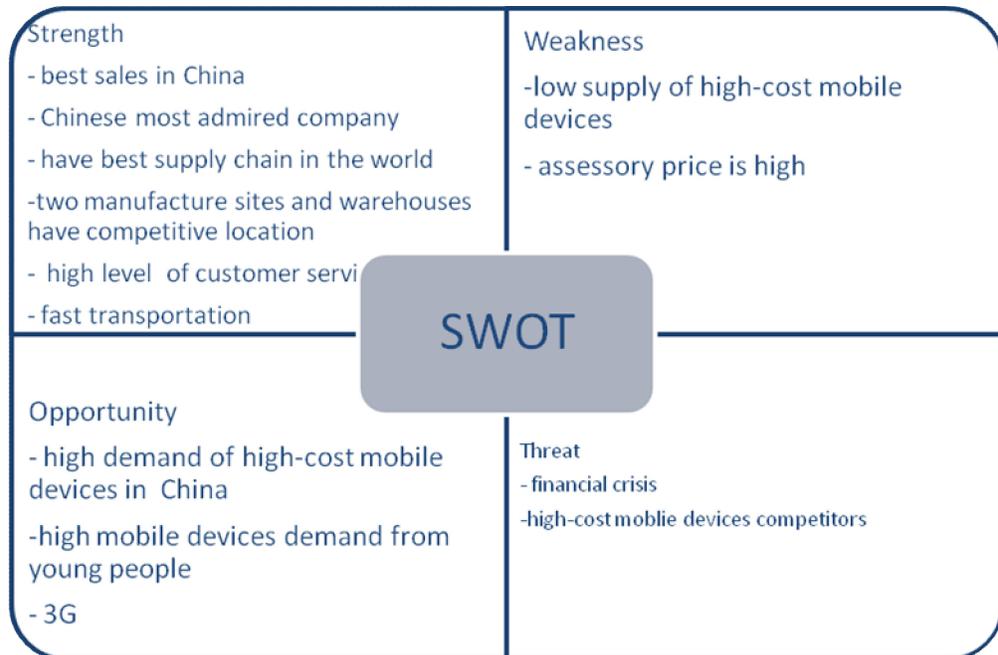


Figure 13- Nokia-China SWOT analysis

In recent six years, Nokia always leads the Chinese mobile phones market. Nokia-China has absolute advantage, and the sales of mobile devices occupy half of Chinese market. Nokia-China is the Chinese most admired company in five consecutive years. Furthermore, it has best supply chain in the world, always provides best customer services, and satisfies customer needs in quick response way. The production lines are efficient and robotization, especially the Dongguan branch company has the best production line among other nine manufacture sites around the world. In addition, the manufacture sites and warehouse of Nokia-China have absolute competitive location, in order to completely satisfy the supply of the Great China and other Asian countries by a very fast transportation. The high level customer services of Nokia-China not only limit to the final users, but also satisfy all the sales office requirements, which means, in Nokia-China, every

department could be each other customers, treat the internal services as final customer services, in order to achieve the completed satisfactions by final users. The air transport is the only transportation mode which Nokia-China chose to deliver the goods, ensure the product quality and fast shipment.

In the world, only Beijing and Korea produce the high-cost mobile phones for global customers. However, the supply of high-cost mobile phones in China is low. As the economy growth, more and more Chinese have that demand for high-cost mobile phone.

As the low supply of high-cost mobile phone is a weakness for Nokia-China, but on the other hand, it also could be the opportunity for Nokia-China to increase the supply. Young people, especially the college students are the most target groups for the mobile markets, to keep the students group, satisfy the various requirements is the challenge for Nokia-China, but also for all mobile devices suppliers. The 3G era of China is coming, it's the time to begin optimize, integrate products, and strive for the mobile phone to inject new vitality into the market.

Financial and economic crisis is the biggest threat for Nokia-China, how to keep the sales and customer, how to decrease the cost, how to still increase or keep the current profit in the special time, these are what Nokia-China should consider. Although, facing the crisis, at the same time, there also have the threats from high-cost mobile phones competitors such as Apple, Sumsung.

4.5 Company Strategy

To become the first of telecommunication business areas, the most popular international enterprises for government, operators and consumers, and employer who able to attract, retain the best talents is what Nokia-China achieve for. But, facing changes in the industry and competitors such as Apple, Google, Microsoft,

Motorola, and perhaps Samsung in Chinese mobile devices market, how dose Nokia-China, as the leader continue to change the industry and lead the industry to a place where it will be customer and consumer-driven, where Nokia-China will be able to turn its sales into solutions, not just devices, but services. What kind of execution plan dose Nokia-China need to lead its company to reach their strategy goals.

The strategy goals and objectives for Nokia-China are:

- To become the Strategic Partner for Operators.
- Next phase of distribution and retail leadership.
- Drive Customer Retention and Brand.
- Build the Software and Services Business and Platforms.
- Talent Development, Talent Retention and Efficiency.

As what mentioned above, Nokia-China will reach strategy goals as following steps:

- To get more customers and keep their loyalty to Nokia during their lifetime is the fundamental and most important responsibility of Nokia-China people.
- Spending lot of resources every year to do customer research and Nokia-China really need to utilize this customer knowledge and make it serve the achievement of strategy goals.
- Aiming to evolve Nokia-China from a handset brand to experience brand that sells not only devices but also services and solutions enriched with context.
- Nokia-China will continue to leverage their sales channel so that they can be more successful.
- Lastly, Nokia-China needs to be really customer-driven to execute their strategy so that they can even stronger Demand Supply Network.

What's more, it's important to Nokia people remember that, as an integrated company, Nokia has one strategy, which is executed by the four units: Markets, Devices, Services and Software and the CDO. Equally importantly, Nokia-China is a consumer-led company as well, so that the primary job for Nokia-China is to create emotional engagement with their consumers and customers. Nokia-China is going to approach in three areas: Trusted consumer relationships; Best mobile devices everywhere; and Context-enriched services.

In order to execute these objectives, Nokia-China has four capability strategies, brand channel, technology and people. And these are long-term supportive strategies for their business strategies. They've been the backbone on top of which Nokia-China execute the business strategy.

5 NOKIA-CHINA INTERNAL LOGISTICS: SUPPLY LOGISTICS IN NTL-DG

The supply “chain” of Nokia-China is a “network” of organizations co-operating and working together to control, manage and improve the flow of material (Nokia Phones / Spare parts & Stock) and information from suppliers to their customers.

As the various logistics definitions mentioned in Chapter 2, according to a simple definition of Logistics: right product at the right time at the right place at the right price.

However Nokia-China defines its own internal logistics as:

Managing the procurement of spare parts from our supplier's, its transportation, storage, finished product (Nokia Phones) through the Organization efficiently to ensure that Nokia remains the # 1 Phone manufacturer in the World. (Nokia, 2008)

5.1 About supply logistics

In the Great China area, Nokia-China owns two manufacture sites, one warehousing, several R&D offices and lots of sales offices. The case company, NTL-DG is one of the manufacture sites and produce low-cost mobile devices for global customers. The chart bellow shows the organizational structure in case company, NTL-DG.

As it discussed in Chapter 4, SL is managed and assumed primary responsibilities by Global Customer and Market Operation Department.



Figure14- Structure of NTL-DG

SL is the internal logistics department of NTL-DG, it aims to deliver Nokia products and logistics service to Customer from NTL-DG in the most efficient and cost effective way. This is a reformed department which established by Logistics & Planning department and Import/Export department in July, 2008. The following chart shows the structure of SL:

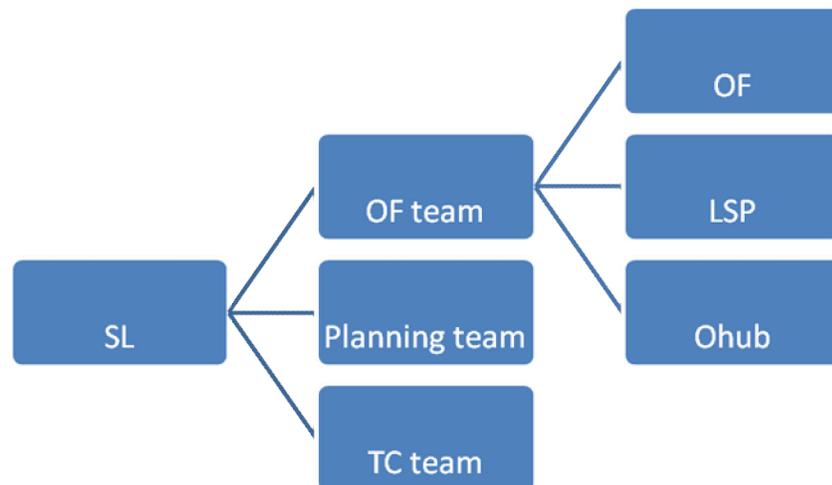


Figure15 – Organization chart of SL

“Where there is will, there is a way” is the way of SL working, it can be explained in four factors: customer, challenge, respect and achievement.

SL focuses on both internal and external satisfy the customers. Customers’ satisfaction directs their actions, they anticipate, discover and fulfil customer needs, as well as deliver value to their customers. Equally importantly, they respect, care for and delight their customers.

This department fights against complacency and challenge the conventional. A willingness to change and develop is what the members in SL need have. They have the courage to innovate and shape the future, as well as appreciate diverse views.

In the SL, this big family, they treat each others with trust and respect, and communicate with others openly and honestly. They value the environment and communications around them.

Everybody in SL is responsible and accountable for success and has the will to fight in order to win.

SL is emphasis on supplying mobile devices and logistics services for APEC area, South East area and Mid-East area. In order to achieve the high level of customer services, there are five main co-operators which are DHL, DANZAS, EXEL, PANALPINA, and UPS, help SL to deliver the shipments to destinations.

(Discuss more in 5.2.3)

5.2 Supply logistics process

Processes have generally been derived to enable each separate function within an organization to undertake its particular role, but they are not streamlined to act across all company functions as a united whole. Thus, an effective process should be designed as seamless operation rather than as a series of different elements

(Rushton & Alan 2006, 120). In the case company, the operation of supply logistics department implement as a logistics process, each logistics activity operate integration, following on from this, the supply logistics department process is aim to satisfy customer demands and expectations. And it is cross-functional their duties within the whole process. This case could be an exemplary internal logistics to others as well, the cross-functional logistics process and integrated logistics within supply chain implement completely. In order to understand supply logistics actions, it is necessary to study the logistics activities perspective within supply logistics department.

5.2.1 Order Fulfilment

The aim of order fulfilment process ensures that a customer's order is received, checked, selected and delivered according to the customer's requirements, with no disruption and with complete accuracy (Rushton & Alan 2006, 120). Besides, the order fulfilment process system is the nerve centre of logistics process. A customer order serves as the communications message that sets the logistics process in motion (Stock & Lambert 2001, 146). In the case company OF is towards to become the bridge between customers and factory, in order to fulfilment customer demand for Nokia products and logistics service.

Customer's order is the most important information within the case company. The order information flow across the whole department until the order has been delivered to the customer. The following process chart shows how OF operate the duties across the internal logistics.

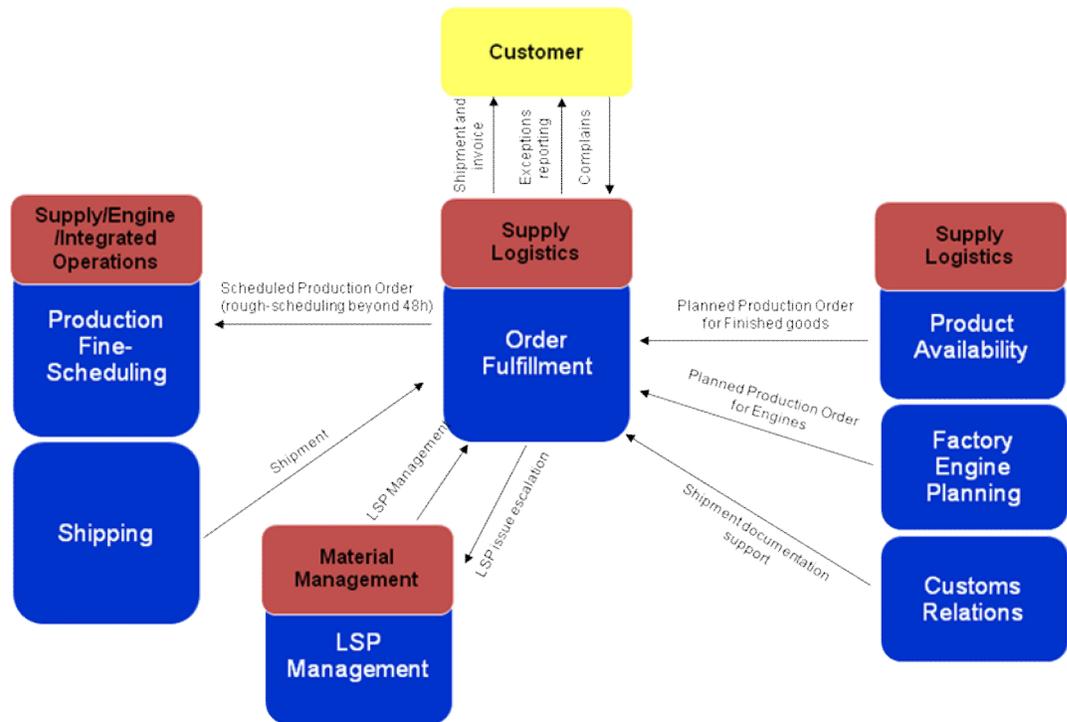


Figure16- OF key interface

There are five main functions which are implemented by OF: delivery, invoicing, shipping process, other Customer/Country Logistics related roles and processes, and reverse Logistics.

1) Delivery

Logistics specialist prepares export shipments; create export shipping documentation in line with customer requirements, and shipping document preparation, e.g. packing list and the document which apply COO needed. Create Delivery Note for payment confirmed orders base on flight space and bonded or non-bonded information, after checking the key dates on order (many cases automatic). Support the outbound logistics team on transportation planning by giving delivery related information.

2) Invoicing

Invoice creation or printing if needed; invoicing of export shipments (in EMEA non EU). Arrange Order fulfillment via shipping arrangement (Full Truck Load, Car Pool)

3) Shipping process

Manage Order fulfillment via shipping arrangement. Communicate with shipping the orders to ship on a daily basis, and customer Logistics ship dates. Sending order summary report to related LSP team for flight space booking. Logistics specialist is the key role in expediting orders – following the shipment for special reason. Customer orders follow up till revenue recognition. Inform trade compliance team to apply CIQ (China Inspection and Quarantine) base on delivery schedule for export shipment. Securing BIS, delivery follow-up and informing of delays, organizing of express deliveries and related communication with LSP, change of transportation method e.g. FTL – collaborate with Transportation specialist

4) Reverse Logistics

Hand customer complaints by working with the Quality team.

5) Other Customer/Country Logistics related roles and processes

Logistics specialist is the contact window between customer of Sales Cluster and factory supply. Manage the Service Class for the responsible countries / customers in liaison with outbound team. Stakeholder manages on POD commitment with Transportation Planning Specialist. LS weekly/monthly order book, delivery status reporting

Computers and electronic commerce of services can help reduce the time between order placement and product shipment. In the case company, OF uses various information systems which was created by Nokia, in this way, orders can transmit

directly from buyer to OF, as well as the information flow within the department. OF receive the customer orders by a particular information system. According to the orders information, OF arrange the shipment and needed documents. SAP is used to prepare the DN (delivery note), shipment, and release the customer orders. The update information will reveal on Easyjob, which the whole department can look over.

Case company regards customer order as call-off. OF according to call-off to arrange the shipment and prepare the documentations. There are two kinds of call-off, the one called in-frame, which means the order that both agreed by customer and Nokia, based on the forecast. On the other hand, another kind of call-off called off-frame, which the order that added after in-frame, usually when the in-frame cannot satisfy the demand of customers. In the case company, the customers have the enough time to add the off-frame. Usually, OF and customer have agreed the regular off-frame added days (see appendix 1, Malaysia example). Generally, OF receive customer orders in C-1 wk (the week before deliver / current week), the off-frame will be received before PGI (delivery date), during C-1 wk and C wk (current week). Basically, when receive the in-frame, the first call-off, OF start to arrange the shipment.

However, the call-off would not be precision in every C-1 wk and C week. When the factory cannot finish the order in the C wk, but customer still hold the order and would not cancel it, the order would be confirmed in the C+1 wk (the week after current week). When the customer cannot confirm the order, usually the payment problem, however the problem would be fixed in C wk. Hence, the order would be confirmed as the first call-off in C+1 wk. These two kinds of orders called backlog.

The OF performance measurement KPI based on:

- Volume Fulfillment Rate

- Off-frame Fulfillment Rate;
- PGI;
- POD;
- Customer Complain Rate

(Nokia, 2008)

5.2.2 Trade compliance

Generally, the responsibility of TC is cross boarder logistics activities handling. In detail: Managing Import Export operative activities to ensure the on time deliveries for inbound/outbound and asset investment; obtaining enough supports and on time licenses from authorities; to explore preferential or new processes with authorities in prioritizing best tax and trade treatments; Ensuring the full compliance of the company cross border activities with local and international rules and regulations; Participate on building new business models/channels and creation of favorable business environment in Trade

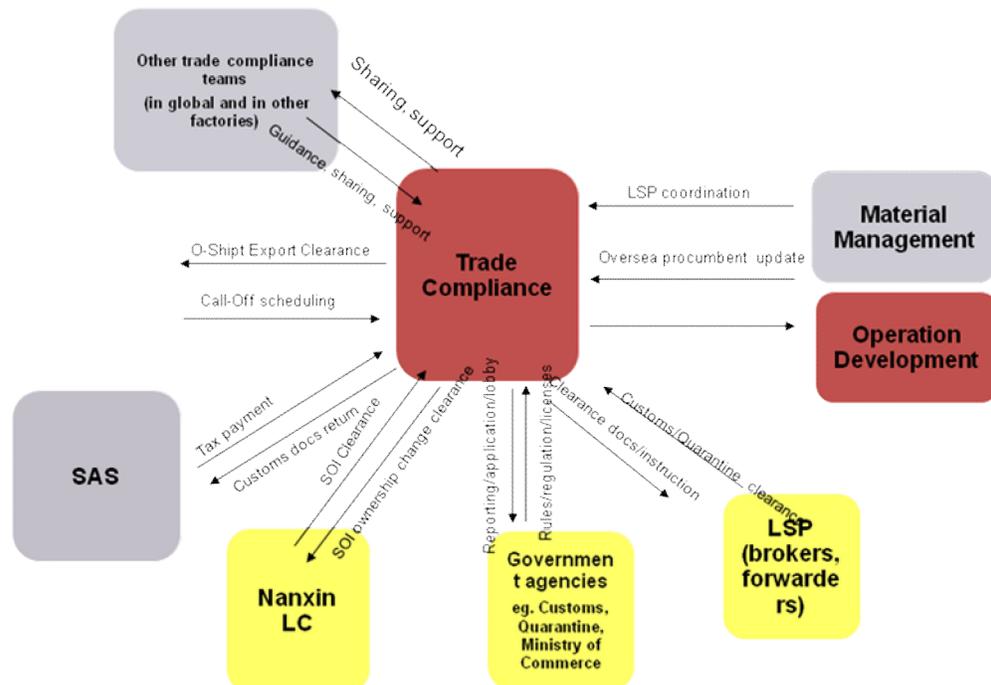


Figure 17- TC key interface

TC have been divided into three elements, import team, export team and customs declaration Team.

1) Import Team

- Documents verification with HK for import.
- Application and modification for logbook.
- Balance transfer among logbooks
- Contract closure
- To apply for import license.
- To provide information to the other teams, including RTV, COO, CPT and Rework.
- Comparison with Nanxin's system for SOI import data synchronization
- To pass CDF and tax invoice to FSP.
- Reporting making for TC operation.

2) Export Team

- Documents preparation for export and material sale.
- Check on licensable , prohibited or restricted goods
- Make sure that customs area requirement for transit documents are met
- Monitor SOI 1st and 2nd declaration in DG
- Implement SOI year-end 2nd declaration with all parties
- To provide information to other teams

Customs Declaration Team

- Customs Declaration for TC business including materials, mobile devices and equipments.
- Explanation for cargo release when it checked by customs.
- To get the approval of CIQ (China Inspection and Quarantine Bureau), COO (Certificate of Original) and the other necessary license for I/E operation.(Excluding Import License).

- To get tax invoice for payment and receiving.
- Applying for classification and price confirmation for material import.
- To submit the documents to authorities for contract closing, including local ETB (Economic and Trade Bureau), BOC (Bureau of Commerce) and Customs.

5.2.3 Logistics service provider

Logistics service provider is known as outsourcing, in which an organization hires an outside organization to provide a good or service that it traditionally had provided itself, because, because LSP is an “expert” in efficiently providing this good or service, while the organization itself may not be (Lambert, Stock & Ellram 1998, 34).

Relatively speaking, LSP is a department more complex than the other two departments which have been mentioned above. There are transportation specialists, Ohub, as well as forwarders manage and operate together.

Transportation specialists work and coordinate with LSP on truck/flight bookings and transportation capacity planning (higher view). Understand Customer’s shipment requirements & shipping information. Execution the updated process from each sales cluster OBLT and Global OBLT (i.e. RFQ related, new LSP implementation, lane card, SOP, CFM(=cargo flow map)) . Participates and/or manages LSP projects; Follow up of Cargo flow Map from the factory (lead-times from Nokia factory to Customer’s warehouse). Check Freight invoicing for every shipment or monthly review Reverse Logistics (Customers’ return). Freight’s Logistic Claim support (damaged/ missing/ pilferage packing/ wrong shipping document). Reverse Logistics related transportation coordination. Manage Outbound LSP. Follow up LSP Performance: Daily basis (every shipment); Monthly Business Review (MBR) - LSP Scorecard follow up with LSP; Quarterly Business Review (QBR) with LSP & sales clusters outbound logistics team.

Analysis POD performance and outbound cost, as well as report to each sales cluster OBLT (outbound logistics team) and other stakeholders.

In case company, the Ohub in a other word, the outbound warehousing is outsourced to DHL. DHL key tasks include:

- EDI error correction
- hub management
 - hub operation performances follow up
 - Daily PGI monitor (PGI performance,)
 - Monthly /quarterly review with O-hub (DHL)
 - hub Cost model setup and follow up
 - Consumable cost control in O-hub

DHL, DANZAS, EXEL, PANALPINA, and UPS are the five forwarders which help case company deliver the shipment to the destination countries. The followings are the modes of shipping:

- Air Express (Courier)
- DHL Express, TNT Express, Federal Express, UPS etc.
- Air Freight – Exel, Danzas Global Forwarding, Panalpina etc.
- Air Charter's
- Road Transport
- Ocean Freight

Nokia Dongguan branch with LSPs together provide E2E (end-to-end) physical and document flow.

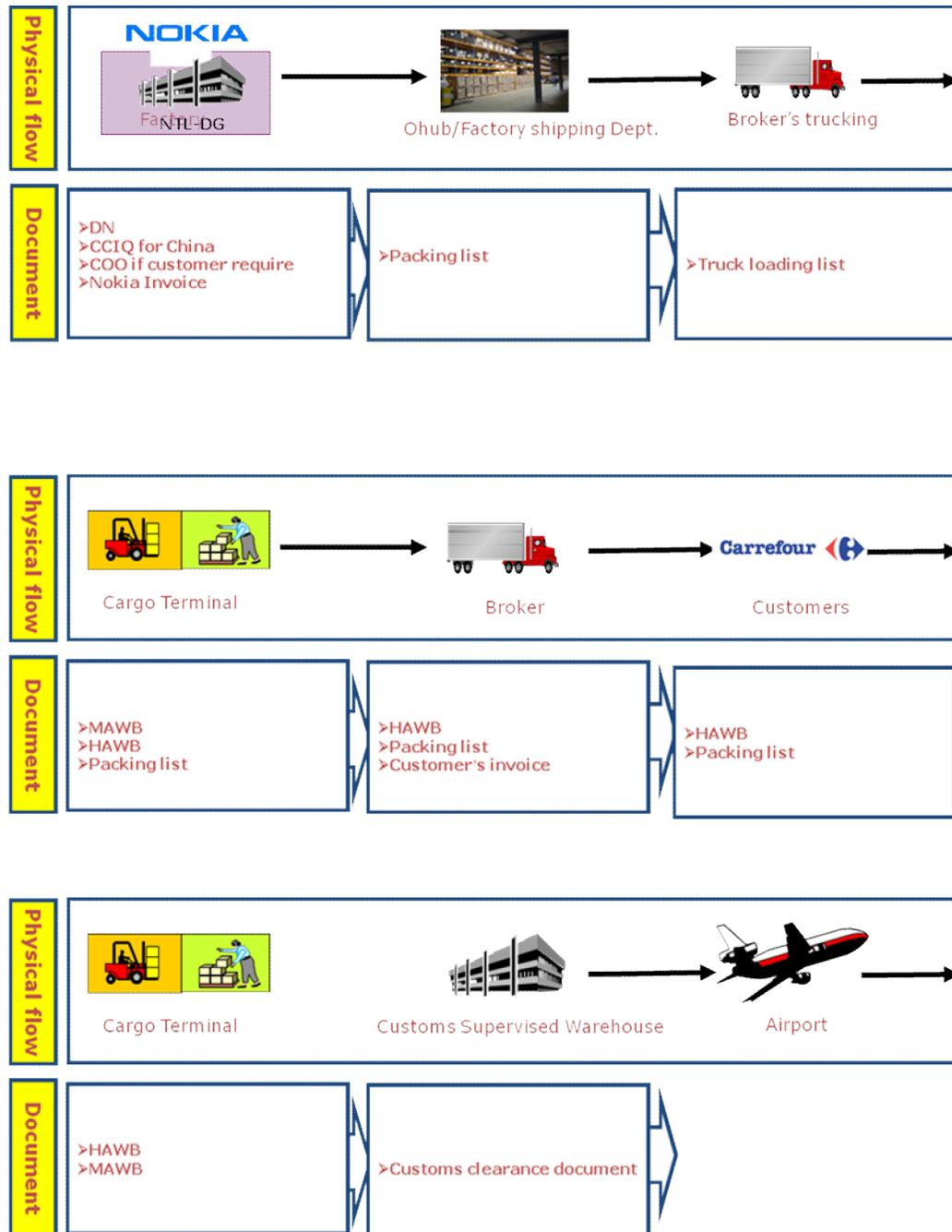


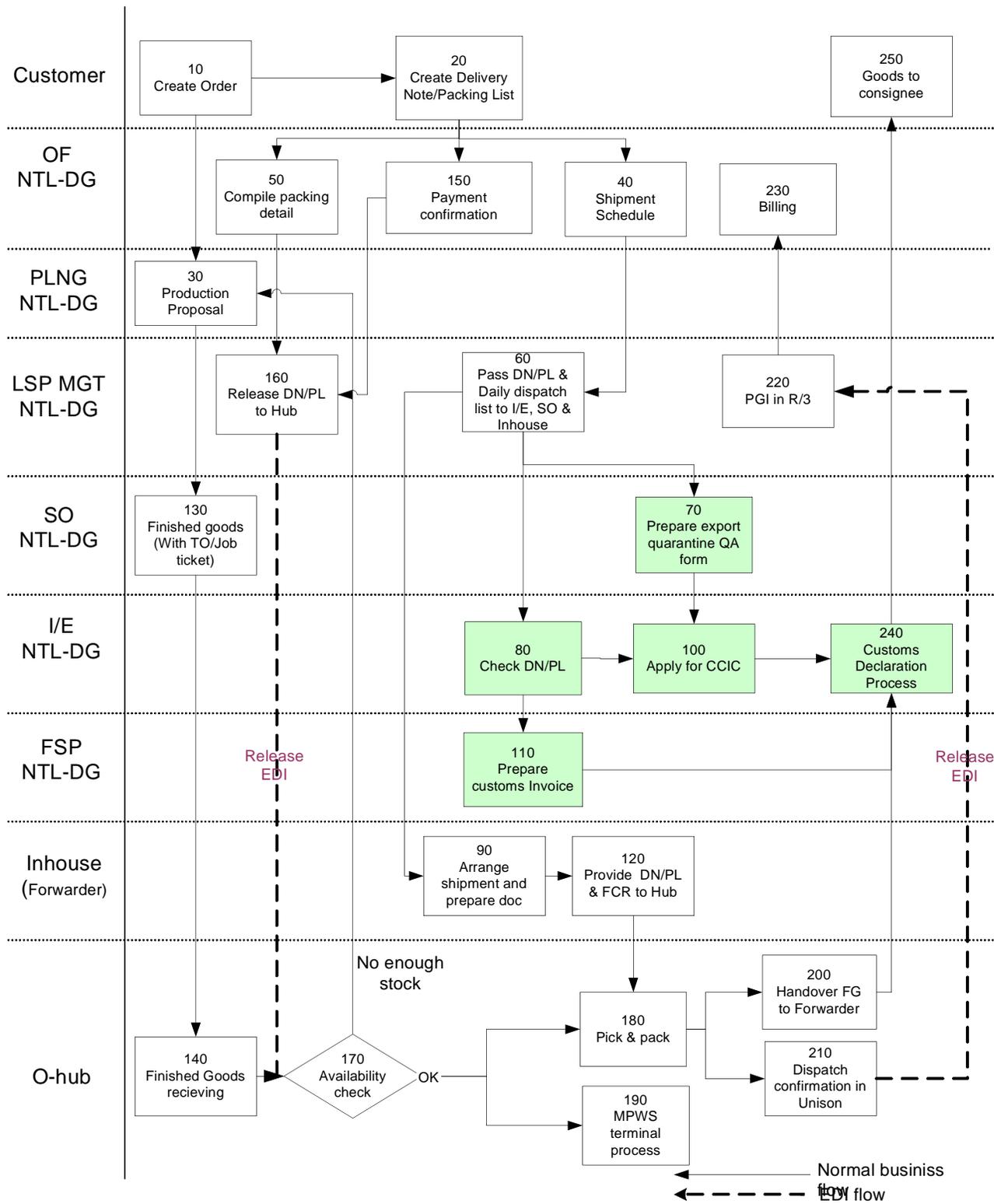
Figure 18- Three kinds of E2E physical and document flow (Nokia, 2008)

Electronic Data Interchange (EDI) refers to the structured transmission of data between organizations by electronic means. It is used to transfer electronic documents from one computer system to another (i.e.) from one trading partner to

another trading partner (Wikipedia.org). In case company, transportation specialists transmit the shipping information to Ohub via EDI system.

According to the E2E physical and document flow above, in general, Ohub pick up goods in the light of shipment and packing list which provide by OF. Combine the documentations from TC and transportation planning offered from transportation specialist, forwarder deliver the shipment which is prepared by Ohub to the planning places.

5.3 Overview of whole Supply Logistics Process



The chart shows above, discuss the whole process of the case company's internal logistics process. The followings are the descriptions of each step:

10. Create Order

The order will be created by NCIC, sales office, NTL-DG and ATO factory.

The order covers: Intercompany sales order, Interplant purchase order, Plant-to-plant order, StanI/Erd sales order.

20. Create delivery order

NCIC OF or NTL-DG OF will create the Delivery Order/Packing list.

The DN/PL may be created in advance, but it will not be sent to LC by EDI until it's released.

30. Production proposal

PLNG will complete the production proposal for production with reference to shipment schedule.

40. Shipment Schedule

NTL-DG OF releases the shipment schedule to LSP in-house by mail/public folder.

50. Enter packing/pallet/ ctn info in R3

Enter the packing info on each DN/PL and print out the hard copy. Prepare dispatch list for C2SEAP.

60. Pass DN/PL dispatch list to I/E, SO and in-house

For C2SEAP, I/E will get daily dispatch only, no DN/PL.

70. Prepare export quarantine QA form

This is done by SO.

80. Check DN/PL dispatch list

TC needs to check the info on the DN/PL and daily dispatch form.

90. Arrange shipment and prepare doc

In-house need to arrange truck and flight once get the shipment schedule, and prepare SLI and Forwarder cargo receipt after get the DN/PL.

100. Apply CCIC

Apply for China Commodity Inspection Certificate.

110. Prepare custOFs invoices

The U/P on customs invoice should match that in R/3.

120. Provide DN/PL, DDL and FCR to Hub

In-house should provide the doc to Hub for availability check, packing. Being shipped out with the physical goods.

130. Finished goods (with TO or job ticket)

Production staff will put a TO or job ticket on the finished goods: Variance; No variance

140. Finished goods receiving

Refer to 5.1 finished goods receiving----Need real time inventory report by variance level for OF LC.

150. Payment confirmation

OF needs to get the payment confirmation for releasing shipment.

160. Release DN/PL to Hub

The DN/PL will be release upon the payment confirmation from OF.

170. Availability check

LC needs to check whether the physical goods can meet the shipment requirement.
Cut off time for checking: Export: 5 pm one day earlier than departure day;
domestic: once the DN/PL is released.

180. Pick and pack

Pick and pack should base on: DN/PL from in-house (variance info); TO/Job ticket; Packing SOP

190. MPWS terminal process

Hub needs to send the IMEI files to customers. Pay attention to distribution list and IMEI file format

200. Hand over Finished Goods to forwarder

The goods will be handed over to forwarder according to the info on the DN/PL and shipment schedule.

210. Despatch confirmation in Unison

LC does the posting after goods hand over to forwarder. ----Need real time inventory report by variance level from LC.

220. PGI in SAP

PGI is triggered automatically by the despatch confirmation from EDI. Before that the EDI will trigger workflow to finish the TO creation and confirm then PGI.

230. Billing

System will do auto billing for or need to be done by OF

240. Customs Declaration process

TC will perform the customs declaration process.

250. Goods to Consignee

The goods will be sent to consignee.

5.4 Supply logistics process features

On the current terms, SL is running flow characteristics of the entire department based on the customer-facing. The department reflects logistics management, integrated logistics and internal logistics most vividly. Especially when based on supply chain management, there's set up and very mature and strong management between customer and case company, not only in the treatment of the customer order on irregular, but also even up to meet customer requirements.

Customer order is the focus of the entire process. From the flow chart and analysis of each department, the customer orders transform into different kinds of data and flow in the entire process. From this we can see that, the internal logistics, the information flow is a timely basis to meet customer demand in the case company. Hence, the case company attach importance to the development and implementation of information systems. The same as mentioned earlier, SL not only use relatively common logistics management system such as SAP, EDI, R / 3 systems. And in order to satisfy the customer and the company direct and timely information flow, case company also created a lot of information system, for better data flow.

In the case company, SL as an internal logistics and co-operate perfectly with LSPs, provide the accurate shipments deliver destination country. In order to meet customer demand for timely, case company only use air transportation mode to delivery mobile devices. In addition, case company on the geographical location also accounts for a tremendous advantage. Hong Kong is only from more than one hour's drive. Forwarder required shipping mobile devices by truck to the airport Hong Kong or customer's warehouse.

6 ISSUE ANALYSE

The case company has a very scientific management of internal logistics, a world's front-end logistics management, and the most advanced information systems. Dongguan Branch not only uses sophisticated supply chain management, but also has co-operated with the world's most reputable LSPs. Every logistics activity within Supply Logistics is in order to ensure a high level customer service.

Even so, every department within the case company has to constantly improve itself, and create maximum benefits. Thus, according to author's practical experience in the case company, the study of SL and theoretical part knowledge, there are three issues have been found within the case company's internal logistics performance, and which need to be improved.

6.1 The responsiveness of internal information exchange

Irrational working process is the one of the main reasons of wasting time resource. Therefore, optimization of business process, integration, and the streamline flow are the inevitable requirement that the organization can have the quick-response capacity. The process management breaks the traditional enterprise boundaries among organizations. Each work is a part of the process, which must achieve the time requirement of the whole process. Time is the key performance indicator of the efficient process.

In order to save the time and provide a better internal logistics, the case company needs to measure the external quick-response and internal quick-response. The external quick-response means the fast rapid of reflecting the customer orders. On the other hand, the internal quick-response states the fast rapid of exchanging the customer orders information, especially the anomalistic orders besides the off-frame, as well as the cancellation information of customer orders. Within both

quick-responses, OF plays an important role, and it's the core factor of the quick-response.

According to the logistics information knowledge which have been discussed in Chapter 5, and the SL process study, the slow-response of failed customer order and cancelled order information exchange within internal logistic process is the biggest challenge for case company.

The consequences of internal slow-response of failed customer order: delay the delivery date; decrease the level of customer satisfaction; extra over time labor working; decrease the mouth PGI rate.

The consequences of internal slow-response of cancelled order: Waste cost of declaration application, package and transportation; waste labor force.

As the result, increase the responsiveness of internal information exchange is the most important requirement to improve the internal logistics performance in the case company. Based on the previous discussion, the timely information flow is the breakthrough in this situation. According to the knowledge in the theoretical part, information flow is a key element of logistics operations and the use of technology logistics information systems make the exchange of the logistics information become more efficient, effective, and rapid. The case company should consider establishing an internal information "updater" within department. The "updater" can provide the latest customer order changing information and internal logistics activities confirm changing information.

In this way, the speed of irregular Customer Order will greatly improve. Case company can 100% to meet the various needs of customers

In addition, based on the elements of logistic integration, the information flow is the most indispensable foundation. Hence, the increase of the responsiveness of information flow is not only have the function to meet the customer needs, but also could make the whole department operate more integrated.

Equally, it can also be a platform which helps case company's logistics managers to manage and control logistics performance expediently.

6.2 Implementation of company strategy

Market dominated is from the seller-oriented into the buyer-oriented. Market competitions are intensified and fierce. Enterprises are in a changing market environment. Science and technology, customer needs, competitors, and so on factors make the changing of market environment become faster and faster.

In such a volatile market environment, product life cycle is becoming shorter and shorter. Especially in this economic and financial crisis period, to completely implement company strategies, help company keep the customers, and even create new customer relationships become the key tasks for SL.

As the customer service is the one of key elements of both market mix and logistics. Although Nokia-China has the world best supply chain and brand credibility. However, the level of customer service needs to increase by improving the logistics performance. In this particular time, in order to achieve customer satisfaction as usual, case company has to enhance the required levels of both self-demand and customer services. At present, China is entering the 3G era, facing the various competitors, SL has to accurately fulfill customers' orders and deliver the shipments.

To sum up briefly, the core element of both responsive information exchange and implementation company strategy focuses on the high satisfaction level of customer service.

6.3 Enhancement the professional skills of employees

People are the most precious resource in the enterprise. The operation of organization, achievements of the each task, all of these needs human's competence to implement. Thus, enhancement the professional skills of employees has a great significance.

Under the integrated logistics working environment, like SL, the staffs' requirements are high. The flow management causes every department within SL break through the boundaries. The aspects of working have been re-integrated, as well as cross-functional duties.

The performance requirements of SL managers:

- Management of the wider range: the increase of staffs numbers under the direct management, the increase of things that need to manage, and the increase of capacity of dealing with the amount of information;
- Clear duties of management: managers need to increase the scope of responsibility, and respond the assume duties to initiatively;
- Rapidly changing of market demands, which require managers to improve response capabilities, quick response to customer demand.

For the employees:

Besides taking the reins of technical skills, interpersonal skills, the professional relevant logistics concepts skills need to be strengthened as well. As employees need interpersonal skills to dispose the information exchange with other staffs. At the same time, employees avail professional concepts to help themselves solve the problems independently. Employees also need to master the advanced communication and communication skills, and the skill of using technological information systems.

The elevation of both managers and employees professional skills can make the performance of SL become much better, more efficient and integrated. The case company should set up a more robust training system. Equally, continue to improve staff quality, and enhance innovation capability has become an imperative business for case company. The case company should not only multi-skill training of personnel, but also it should encourage the establishment of the organization-based study group. Team member can not only make the sharing of knowledge between the implementation, but also can improve team cohesion. Upgrade the competence of staff is the most powerful guarantee to improve the performance of SL.

SUMMARY

To sum up briefly, internal logistics performance attaches more and more importance to organizations nowadays. Internal logistics is not only transportation or logistics management department, more and more instances proved that, internal logistics has become a very significant element of increasing company competitiveness and achieving customer satisfaction. In fact, lots of enterprises believe that, if there is an unsuccessful market, the internal logistics has failed; on the other hand, if the enterprise owned a successful internal logistics, the market of this enterprise must be prosperous.

Overall, this study discussed the operation of internal logistics as a part of supply chain by introducing the basic concept of both logistics and supply chain. In order to improve the performance of logistics activities, this paper described the KPIs and models of performance measurement as well. Then this thesis presented the analysis of Nokia-China current situation and descriptions of internal logistics performance within the case company as well.

At last, three required improvements have been presented to the case company, which are, the responsiveness of internal information exchange, implementation of company strategy initially and enhancement the professional skills of employees.

After deep study, the importance of information flow and customer service cannot be neglected. In the case company the customer order is the core element, every logistics activity is based on it. Furthermore, Supply Logistics provides physical goods and documentations flows both end-to-end. Based on these, it is easy to see that, the using of technological information systems is significant for the internal logistics performance.

However, after this study, the case company's internal logistics can be an exemplary role to others. The author dares to say that, the logistics operation of case company implements the modern logistics and supply chain concepts efficiently and completely. At the same time, there are expectations for other manufacturing companies as well; the exploration and study of logistics management and performance should be constantly updated. Logistics is a gradual change and growth of activity, it needs time to be implemented and certified.

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Interviews date: July-November, 2008

Interview place: Nokia Telecommunication Ltd. Dongguang Branch

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APPENDIX

Appendix 1: Malaysia order handing process

Appendix 2: Outbound Logistics Overview

Appendix 3: FG export process

Appendix 1

Malaysia order handing process

Malaysia	C-1 week			C week							
	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	
Service Class					1st PGI	2st PGI	1st POD				
Call off process	Call off	Off-frame call off									
Daily Operation	Update call off & inform SOP *										
	Send all SO info for MY finance to release credit block for production	Confirm off-frame and update call off Arrange shipment for orders released credit; send DN info for finance to release credit block				Arrange shipment					
Remark:	*Four major customers: Zitron,Avaxx, Supura, Incomm. (Zitron, Avaxx, Supurain MY; Incomm in Brunei)										
	* Incomm: PGI+2day=POD, only have fright in Mon&Wed; Other customers: PGI+1days=POD, can PGI on each day										
	* Credit block on SO&DN level, SO and DN info should be sent to MY BC to release credit; DN and physical delivery arranged on sign of credit released.										
	* For Zitron,don't comble different Model to one pallet , one code one DN.										
	* MEBU shipment follows the same service class										
MY Logistic Team	Lung David (Logistics Manager)										
	Kong Vivien: (Sr. Sales Coordinator)										
	Ong Siaufong: (Accountants Executive)										

Appendix 3 FG export process

day0

day1

