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FUTURE COMPETENCES FOR LOGISTICIANS

Degree Programme International Business

2018

## FUTURE COMPETENCES FOR LOGISTICIANS

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Degree program in International Business

June 2019

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Pages: 51

Appendices: 2

Keywords: logistic, situation, trends, competences, improvement suggestions

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The purpose of this thesis is identifying the essential knowledge, skills and attitude for future logisticians. The competences are clarified by collecting opinions of current logisticians in the Finnish market regardless of their working fields and position in the market. Base on the competences, logistics curriculum will be adjusted and improved to adapt to the changes of the markets.

The theories are divided into two parts including basic contents of logistics and conceptual framework. The basic information about logistics describe the definition, development and operational fragments. The conceptual framework contains the world development trends, current situation of global and Finnis logistics market and competences needed.

The empirical data collected from interviewing logistics managers in Finnish market, especially in Satakunta region. They provide their perspective about preferable development trends, current situation, plans of their companies as well as requirements for necessary competences. The author uses the qualitative data to compare, analyze and identify the necessary competences for future logisticians. The method to collect quantitative data is also prepared by designing a questionnaire which will be sent out in future.

There are three recommendations which are suggested for adjustments of the curriculums. They are improving practicality, updating IT competences and maximizing customization. By applying the suggestions to improve curriculum, learners could gain the critical competences before joining the labor markets.

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## 1 INTRODUCTION

The thesis presents the process and result of a logistics research. The research is one of the main activities of an international project founded by European universities. The ultimate purpose of the project call EFLE is adjusting the current curriculum of the logistics programs in the universities.

Curriculum can be considered as the backbone of any studying program. It is the content of the program and the guideline for educators to teach students. By applying a suitable curriculum, educators can easily provide the knowledge for students. Learners can also acquire the essential competences to prepare for their jobs in future. To design a qualified curriculum, educators must research the current situation on markets, identify the demand from employers and decide what competences needed to train the future workers. The EFLE project is one of many implementations of the research for curriculum's improvement.

The logistics project contains at least three local researches of corresponding students from Netherland, Belgium and Finland. In the project, the main researcher are the students and instructors are the steering committee including the educators from the involved universities. Each research is individual work, but the researchers still cooperate and assist each other for the best possible outcomes. Specifically, the students together prepare the plans to collect empirical data, find the articles to complete the literature review. On the other hand, analyzation, collecting data conduction, and writing are individually.

The competence research for Finnish market is conducted by Ha Nguyen, a student from Satakunta University. The research is her thesis for graduation. During five months of research period, Finnish market, development trends and essential competences regarding of logistics are studied and presented in the report.

## 2 ABOUT THE PROJECT “FUTURE COMPETENCES FOR LOGISTICIANS”

### 2.1 Introduction about the EFLE project

#### 2.1.1 “Future Competences for Logisticians” project (EFLE project)

The EFLE project is Dutch abbreviation for the Future Competences for Logisticians project. The project has been conducted annually since 2015 by students and educators from European universities to identify essential competences for employees in logistics markets. From 2018, two students named Yunlin Jiang and Ha Nguyen respectively studying at Arhem Business School (Netherland) and Satakunta University of Applied Sciences (Finland) have commenced doing the project. Under the instruction and support of senior teachers named Daniela Tanhua and Jansen Jan of the two universities, Yunlin and Ha have gradually done a logistics research to achieve the final purpose of the EFLE project. Besides the direct lead of the two main senior educators, other educators from several European institutes also involved in the project by contributing to direct the project, giving recommendations for the survey and interview questions as well as sharing articles in terms of literature review.

#### 2.1.2 Purposes and beneficiaries of the EFLE project

The ultimate purpose of the project is developing a 4-year curriculum for logistics bachelor based on the findings in the research. By utilizing the outcomes in the research, educators of involved universities can upgrade their current teaching logistics programs to adapt to future market trends. Specifically, educators in the European universities will base on the future logisticians’ competences identified in the report to design and adjust their logistics education programs. The new programs are expected to significantly assist logistics learners to acquire knowledge, skills and attitudes that will be extremely necessary for them when joining the labor markets.

In terms of other beneficiaries in the research, managers, workers and students in logistics markets can be beneficial from this report. When reading the report, the

managers will know about the preferable developing trends of logistics in future to create suitable operational strategy for boosting their business. Regarding of benefits for workers and students, the subjects may refer the report for finding out which competences that they must acquire to response to the requirements of employers.

### 2.1.3 Objectives of the research

To achieve the final goal of the EFLE project, the research must give the answers for the following three questions.

- What is the knowledge that future logisticians need to absorb before and during joining the workforce?
- What are the skills that future logisticians need to master for tackling tasks?
- What are the attitudes that future logisticians should have in working environment?

The above questions are also the objectives of the research. As discussed before in the meetings to conduct the EFLE project, the essential competences for future logisticians need to combine knowledge, skills, and attitudes. Firstly, the researchers must identify the knowledge should be known and understood by future logisticians. Then, the useful skills for logistics workers must be determined. Suitable attitude is the last aspect that will be studied. Altogether, the three researched contents will create a framework of important competences for future logisticians.

## 2.2 Conceptual framework

To successfully identify essential competences for future logisticians, the researchers must studied about logistics development trends as well as current situation of logistics business. Initially, future trends of economics and demands of customers must be thoroughly researched. Then, current situation of Finnish logistics also is studied. In this research, operation types of Finnish logistics is divided into B2B and B2C businesses. The information collected is used as a referencing framework to identify the essential competences. Base on the development path of global logistics and development strategy of logistics business, the researchers conclude which knowledge, skills and attitudes that perfectly match requirements of the future logistics. In the

report, the researcher of Finnish market give suggestions in terms of the competences based on the current conditions of each types of the logistics businesses to adapt to the global development.

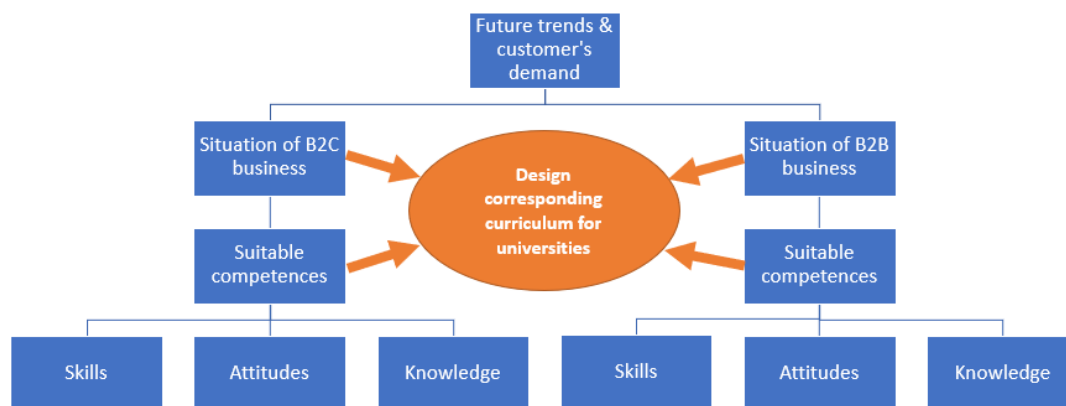


Figure 1: Conceptual framework of the research

## 2.3 Implementation of the research

### 2.3.1 Tasks of the author in the research and implementation plan

In terms of the study of Finnish market, Ha Nguyen is the main researcher and the author of this report. Her main tasks are leading in designing interview questions, contributing to create the questionnaire, collecting information, analysing, writing and editing the report to perform process and result of the research. All the tasks of the research are consecutively conduct within five months.

The 5-month research is divided into three stages including literature review, preparation to collect data and analyzation. Specifically, the period of the research is estimated to completed in five months from January to May of 2019. Literature review is studied in the first month of the period. During this time, the author individually researches about current development trends in Finnish logistics market and essential competences for logisticians. In the next two months, to come up with the interview questions and design questionnaire, the author collaborates with her teammate and lecturers. Firstly, the research team creates a questionnaire and interview questions. Then, they are presented to lecturers to receive advices for adjusting. The survey and interview questions are adjusted many times until they are qualified for distribution to

interviewees. After the preparation stage, the author contacts managers to request and conduct for interviews. The last stage which is analysing data collected from interview is implemented in May. The writer applies deductive methods to compare the information from the interviews to the theories performed in the literature review to withdraw the most possible accurate Finnish logistics situation and logisticians' competences; after that, she suggests some solutions for upgrading the university curriculum that can adapt to the requirements for logisticians in the future Finnish logistics. In case of unplanned occurrences like postponement of interview, the research can be extended till the middle of June. This time also is the latest deadline for the project.

### 2.3.2 Involvement of other members in the research

Table 1: Roles of other members involving the research

Member	Role in the project	Meeting method	Meeting frequency
Yunlin Jiang	Co-researcher	Online	Flexible
Daniela Tanhua	Instructor	Face-to-face	Weekly
Jan Jansen	Instructor	Online	Weekly
Aleksi Jalonen	Supporter	Face-to-face	Flexible

There are another people involving in the research, they have different roles to affect the final outcomes. Co-researchers are other students in the logistics project. Having the same role as the author, the persons study about the domestic market of their countries, but they simultaneously work with other researchers in the big project at some specific periods to mutually create an interview question pack and a questionnaire. They also support each other in building theoretical frameworks by sharing references. Instructor are the lecturers from the universities. They instruct students to do the research and guarantee for the quality of the research. The lecturers provide their opinions about the critical parts of research like literature review, questionnaire and interview contents for delivering the best possible result for the researches as well as the whole project. Supporter in the research removes language obstacles. Because the main researcher is a foreigner while the targeted market studied is Finland, language is an issue when contacting with local logistics managers. The assistant takes the responsibilities of directly contacting interviewees and translating the request into

Finnish. Although the involvers partly contribute the contents in the research, they do not interfere the writing. The author is the only person who writes this report.

## 2.4 Boundaries of the research

In the research, the Finnish market and essential competences for it are discussed. The researcher mentions total logistics which all stages is included in, no specific stage is studied more thorough than others. The same track is also applied to research about competences. The author just identify that which competences is important for future logisticians and the reasons for this. She does not thoroughly study about the contents of the competences. Furthermore, the author provides suggestions based on the result found. They are used as reference for adjusting current curriculum and the tasks of redesigning curriculum belong to the educators and the next stages of the big project. Accordingly, contents of both current and adjusted curriculum are not presented in this report. In the five-month period, the researchers conduct one data collecting method which is interviewing. The outcomes analyzed base on the empirical data from solely interviews. Survey will be conducted in the next period of the project which specifically is in the autumn of 2019. Therefore, the result of analyzation also is narrowed by quantities, working fields and geographic areas of interviewees.

## 3 THEORETICAL BACKGROUND

### 3.1 Definitions and development of logistics

Base on the clarification of the Council of Supply Chain Management Professionals, logistics is a fraction of supply chain; this part plans, implements and manages the smooth flows of transporting goods and service including forward, reverse as well as storage. Logistics also monitors related information from origin to destination or consumption place of goods to response to customers' requests. (Murphy & Wood 2011, 22). The similar definition of logistics was given in the book *Logistics, International edition* 2002. Integrated logistics is the process of forecasting customer requirements

and desires. During the process, businessmen utilize all of enterprises' essential resources including materials, information, personnel, and technologies to maximize effectiveness of producing network of goods or service. Enterprises base on the network to accomplish customers' demands in a proper time. (Bloomberg, Lemay & Hanna 2002, 6.)

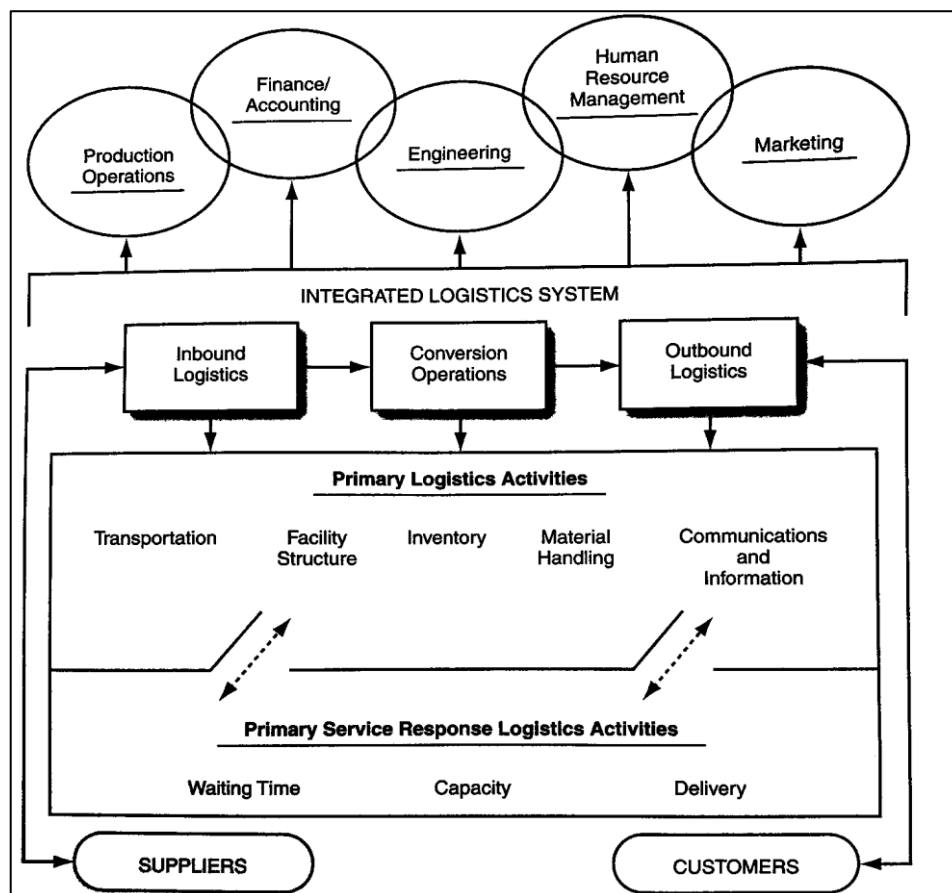


Figure 2: The Integrated Logistics process (Bloomberg, Lemay & Hanna 2002, 7)

Also, in the same book, Logistics is divided into three stages: inbound part, conversion operations and outbound part. Inbound stage is the transportation of goods from origin to a company. Conversation operations relate to flow of moving commodity or stock within business premises such as factories, warehouses or stores. Outbound logistics combines activities to transport finished products from the sites to customers. (Bloomberg, Lemay & Hanna 2002, 6.) For instance, in the logistics process of making and selling cakes to customers of a bakery, inbound stages is bringing raw materials from suppliers to the bakery. Conversation operations move products, unfished or finished,

made from raw material inside bakehouse or from the place to stores. Delivering cakes from stores to customers belongs to the stage of outbound logistics.

As can be seen in the figure 2, coexisting with the three stages, logistics also has two logistics related subsets of activities comprising primary and service response. Primary logistics contains five activities which physically involve in moving goods throughout distribution channel while service response activities mainly relate to customers. (Bloomberg, Lemay & Hanna 2002, 7). On the other hand, logistics has specific influence on the remaining departments of business such as production, finance, marketing, engineering and personnel.

Table 2: Evolution of Integrated Logistics (Bloomberg, Lemay & Hanna 2002, 8)

Fragmentation (1940s–1960s)	Logistics (1970s)	Integrated Logistics (1980s)	Total Channel Integration (1990s)
Inbound traffic Carrier selection Mode selection Public vs. private carriage Purchasing Raw material inventory Demand forecasts Production scheduling	Materials Management	Inbound Logistics	
Warehouse planning Warehouse management Distribution center planning Distribution center management Plant site selection Work-in-process inventory Salvage/scrap disposal Material handling Packaging		Conversion Operations	Supply Chain Management
Outbound traffic International traffic Finished goods inventory Parts/service support Return goods handling Order processing	Physical Distribution	Outbound Logistics	

In the table 2, term “integrated logistic” appeared in 1970s when logisticians combined conversion operations into the whole process. In 1970s, logistics was just material management and physical distribution. Before that, logistics was not officially and clearly defined. The evolution of logistics continued until 1990s; businessmen created a completed integration called supply chain management with involvement of providers, producers and other intermediates (Bloomberg, Lemay & Hanna 2002, 8). Even

though supply chain was developed from logistics, they are still different. Particularly, logistics focuses on improving fluency of movement of products, supply chain management concentrates on controlling relationship of involving entities in business to inchmeal reduce cost for final products, value that customers finally receive. As Christopher (2016, 3) stated, “supply chain management is a wider concept than logistics.” While purpose of logistics is creating transporting flow for products and information from their origin to customers; supply chain management uses planning framework of logistics to complete network and co-ordination between business and other stakeholders in logistics pipeline (Christopher 2016, 2-3).

### 3.2 Participants in logistics market

Along with the development of economy, function of logistics providers also evolves to response to demand of business. According to the Morgan Stanley 5PL model, functions of logistics providers are classified into five levels which represent for different logistics operations in supply chain.

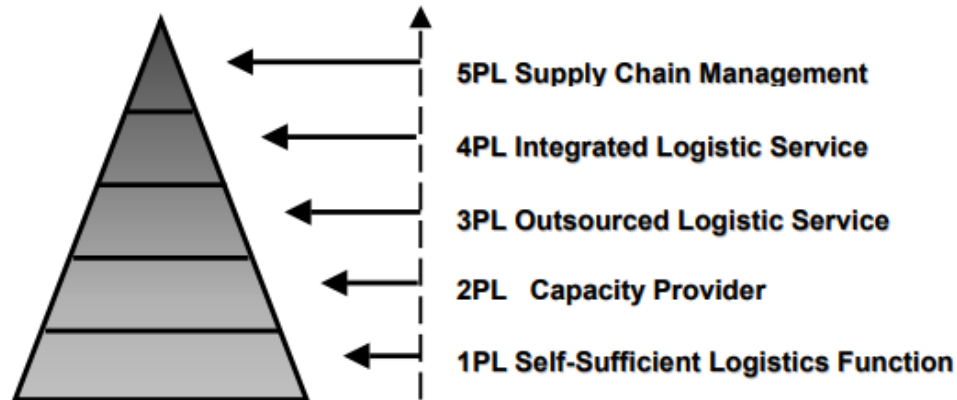


Figure 3: The Morgan Stanley model (Lu & Su 2002, 17)

First party logistics (1PLs) is self-logistics provider. This means that manufacturers or enterprises operate their own logistics activities like warehousing, delivery goods. Local businesses which purchase and sell products only in their regions is a typical example for 1PLs. (Lu & Su 2002, 17.)

Second party logistics (2PLs) providers involve in supply chain of enterprises when businesses expand internationally. The 2PLs providers own assets such as trucks,

cargo ships or warehouses that are capable for logistics activities; they are logistics suppliers. As demand of manufacturers, the capacity providers make contracts with enterprises to operate one or some activities in logistics process. Business of 2PLs does not bring high profit, but they must deal with high level of asset intensity that leads to high expenditure. Road, rail, sea and air freighters are the typical 2PLs providers. (Lu & Su 2002, 17-18.)

As demand of outsourcing logistics highly increases, 2PLs providers evolve into 3PLs firms. The outsourced providers take charge of one or a few stages in supply chain of customer firms. Instead of just providing separated logistical activities for customers, 3PLs companies offer logistics solutions for them thence optimizing their supply chains. For explanation, operation of the outsourced providers is taking charge of a portion in customers' logistics process like inbound or outbound, they can use their own assets or hire 2PLs partners to execute a component in logistics process. 3PLs firms earn profit from managing logistical information and knowledge rather than just offering separated logistics activities. Therefore, 3PLs companies is more profitable than while asset-based cost is lower than 2PLs subjects. Furthermore, the relationship between 3PLs providers and customers is stronger than 2PLs suppliers. (Lu & Su 2002, 18-19.)

4PLs includes all functions of 3PLs but it is an upgrade version of 3PLs. The differentiation of 4PLs from 3PLs is that it gives advices for customers as added value services to maximize efficiency in their logistics. Functions of 4PLs providers is planning and operating whole logistics system of manufacturers in term of transport, warehousing, finance, monitoring, consulting and even information technology (IT) integration. 4PLs providers also outsource 2PLs and 3PLs suppliers to fulfill their logistics solution. They offer end-to end logistics solution for customers. In other words, 4PLs is integrated logistics service. (Lu & Su 2002, 17,19.)

The highest level in the Morgan Stanley model is supply chain management, 5PLs. In this level, all of parties in supply chain are unify in a network. In the network, transparency in information system along supply chain are visualized and utilized. Accordingly, 5PLs creates win-win situation for involving parties. (Lu & Su 2002, 20-21.)

Like other industries, logistics business is designed for B2B and B2C purposes. B2B and B2C respectively stand for business-to-business and business-to-consumer. B2B is transactions between manufacturers and wholesalers or retailers while B2C is doing business to provide products or services to final customers (Kumar & Raheja 2012, 447,448). Major difference between B2B and B2C is using purpose of goods and services offered; whereas B2C firms sell products and related services to satisfy consuming demand of final customers, goods and services of B2B firms are used as material and supporting activities to complete business operation of other enterprises. (Kumar & Raheja 2012, 450).

Nevertheless, the development of operation of supply chain will not stop at 5<sup>th</sup> level. According to Degola Global Logistics, an international freight forwarder, roles and involvement of logistics in business should be developed till 10<sup>th</sup> level. At the level, supply chain can aware and operated by itself. Before that, at 6<sup>th</sup> level, artificial intelligence will play a vital role in logistics while 7<sup>th</sup> level will aim to create autonomous competitors that will be used to test strategies of supply chain. 8<sup>th</sup> and 9<sup>th</sup> levels will respectively focus on analyzing results of competitors by a super committee and utilizing crowdsourcing. (10PL – Logistics to the power ... 2012).

In logistics industry, B2B operations including logistics service providers and carriers is occupying overwhelming market shares. Logistics services providers (LSPs) such as 3PLs/4PLs firms, freight forwarders deal with carriers to transport goods of manufacturers or wholesalers. In some cases, LSPs hire CEP standing for courier, express and parcel, the businesses offer fast and home delivery services, to execute outbound stages in supply chain of customers. Due to this, all of players in logistics market are operated according to B2B model. Contribution of B2C enterprises to the industry revenues is not considerate. Only CEP businesses can be considered as B2C operation when their delivery services directly serve private users, but in fact, the attribution of B2C companies is just around a third in whole income of CEP. (Tipping & Kauschke, 2016, 5.)

## 4 CURRENT CIRCUMSTANCE OF LOGISTICS

### 4.1.1 Situation of logistics in general

In accordance with globalization, logistics also significantly evolves and plays a crucial role in total economy. Nowadays, a huge number of enterprises expands business scope beyond their nations' borders; oversea outsourcing and online shopping are the most typical examples of this business phenomenon. In the nearest 18 years, revenue of global outsourced service had increased from 45.6 to 85.6 billion US dollars, the amount of money reached its peak in 2014 with 106.6 billion US dollars (Statista: Global market size of outsourced services from 2000 to 2018 2019). In China, clients of offshore industry spread from West to East; companies from Europe, North America, Korea and Japan are main payers for Chinese outsourcing (Wright, 2009). Consequently, length of transport routes is extended to move raw material from origin to outsourcing countries or return finished products back to headquarter or abroad selling branches. (Ceniga & Sukalova 2015, 161).

On the other side, online shopping has become a popular buying behavior. In 2017, around 1.66 billion people, almost one quarter of world population, used online channels to purchase goods (Statista: Online shopping and E-commerce worldwide 2019). Within the most five recent years, sales of global online retail rocketed from 1336 to 2842 billion US dollars. The sales growth is estimated to continuously increase till 2021. (Statista: Retail e-commerce sales worldwide from 2014 to 2021 2019.) To adapt the explosion of e-commerce, logistics has changed flexibly in term of quality and diversity. In online shopping, customers directly involve in outbound logistics process, they chose transport type of parcel such as pick-up point or doorstep delivery. Therefore, requirements of final customers such affordable price, short transporting time or reliability must be considered in orientation and strategy of logistics these days (Ceniga & Sukalova 2015, 161). Along with development of logistics to meet the current economic trends, it considerably contributes to economy and creates job opportunities for population. Particularly, in 2015, logistics and fast delivery service took a 9-percent fraction of global gross domestic product (GDP). In Germany, there were about

2.6 million employees in logistics industry, accounted for 7% of total nation labor. (Ceniga & Sukalova 2015, 161.)

Outstandingly, outsourcing and online shopping heavily contribute to create third-party logistics, the most preferred solution for transporting and delivery in current. According to Yang (2014, 18), existence of third-party logistics is crucial and undeniable in whole logistics process. To explain for this, the outsourced logistics has brought many benefits users. The big proscenium of 3PLs is reduction in costs such as transporting, inventory, and personnel. Additionally, enterprises have many options in packaging and delivery, this helps companies avoid risks of fluctuation and uncertainty in supply chain and accordingly enhances flexibility and efficiency of logistics process. Due to this, firms can gain competitive advantages by using the third-party service in their supply chain. (Yang 2014, 18.) In the 3PL Study of 2016 (Langley 2015, 6), 70% of users claimed that cost of overall supply chain had decreased thank to the contribution of third-party logistics, 83% said that 3PLs improved customer service, and three quarters of respondents had an opinion that it suggested new and innovative solutions to advance effectiveness of total logistics. In fact, the popularity of 3PLs has increased doubly in around 20 years. In the early years of 1990's, the usage rate of 3PLs was 40% of 500 companies in Fortune list, the list points out 500 largest American enterprises in term of revenue annually. (Website of Fortune 2019.) Until 2014, almost 80% of the 500 firms in Fortune list used 3PLs (Yang 2014, 18).

#### 4.1.2 Situation of logistics in Finland

Finland has a highly developed logistics industry. For clarification, Finland's logistics performance index (LPI) calculated by World Bank was normally high. The LPI rank of Finland was respectively 14<sup>th</sup>, 24<sup>th</sup> and 3<sup>rd</sup> in 2016, 2014 and 2012. (Solakivi, et al. ... 2017, 24.) Recently, logistical industries comprising transporting and relating services employed 10% of Finnish workforce, higher than Germany, the current logistics leader, with 7%. The share of logistic in total Finish economy was one tenth with 22.5-billion-euro turnover in 2014, the percentage was nearly equal to the global ratio, 9%. (Solakivi, et al. ... 2017, 26.) Even though ranked high positions by World Bank, Finnish logistics does not play a vital role in total national economy. Table 3 proves for the

small logistics industry of Finland, the data of the countries in 2011 was much lower than of other considered countries. The percentage of Finnish logistics in national exporting service industry was only 4.4%, lowest among considered countries. By contrast, import fraction of logistics was quite high compared to other countries with 18%, the portion was only lower than Denmark with 25.4%. However, percentage of exporting logistics of Denmark accounted for more than half of total export industry. Therefore, Finland was the only that imported logistics services more than exporting those services. Finland was also the sole country that have negative balance of payments for logistics with around -3650 million US dollars.

Table 3: Balance table of payments for logistics services between Finland and peer countries (Solakivi, et al. ... 2017, 29)

year. 2011 million USD	Finland	Sweden	Denmark	Norway	Germany
<b>EXPORTS OF SERVICES</b>	27 074	66 012	66 262	39 319	250 263
<b>Exports of transport services</b>	3 285	10 436	40 376	16 216	57 286
... of which freight and logistics services	1 197	5 950	35 756	10 935	33 710
Freight and logistics services from exports of services, %	4,4	9,0	54,0	27,8	13,5
<b>Exports of freight and logistics services % of GDP</b>	0,6	1,5	14,5	3,1	1,2
<b>IMPORTS OF SERVICES</b>	26 902	50 545	60 068	43 899	284 283
<b>Imports of transport services</b>	6 492	7 537	30 779	8 923	69 234
... of which freight and logistics services	4 846	3 045	15 253	2 225	30 649
Freight and logistics services from imports of services, %	18,0	6,0	25,4	5,1	10,8
<b>Imports of freight and logistics services % of GDP</b>	2,5	0,8	6,2	0,6	1,1
<b>BALANCE OF PAYMENTS FOR SERVICES</b>	172	15 466	6 194	-4 579	-34 019
<b>Balance of payments for transport services</b>	-3 207	2 900	9 596	7 293	-11 948
... of which balance of freight and logistics services	-3 649	2 906	20 503	8 710	3 061
GDP nominal prices, million USD	196 869	404 946	246 075	358 248	2 703 120

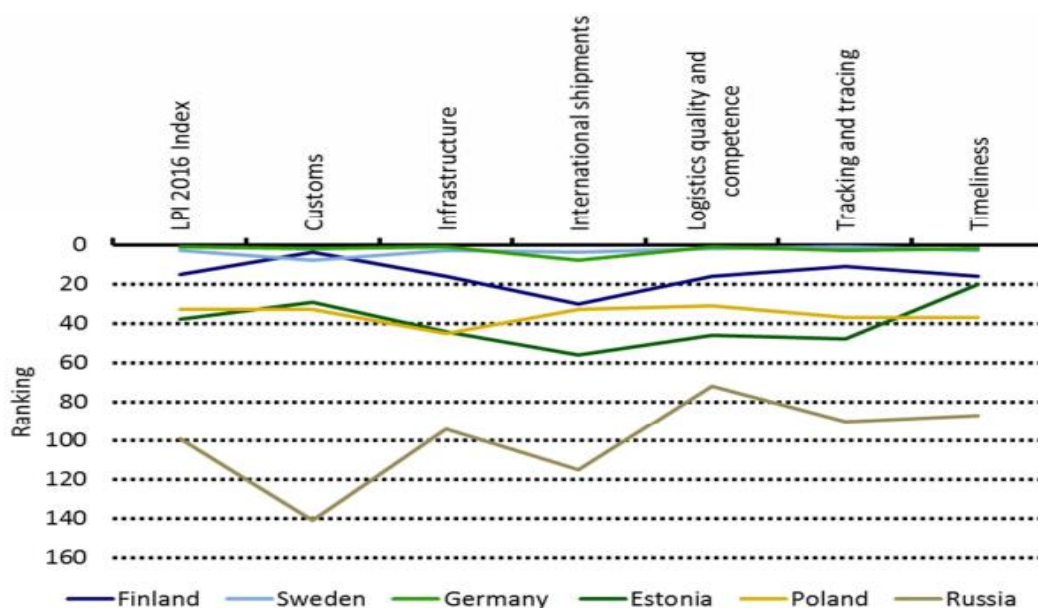


Figure 3: Comparison of logistics components according to World Bank in 2016 (Solakivi, et al. ... 2017, 36)

When World Bank evaluated each component of logistics, result of Finland was higher than most of the countries but still lower than its fellow countries. As can be seen in the above chart, in 2016, none position of logistics factors was below 40<sup>th</sup>. Especially, customs system was ranked second over 160, this rank only was lower than German, the current leader in the evaluation. Other components of logistics were also higher than 20<sup>th</sup> in 160 countries considered. Only international shipping had the lowest rank at 30<sup>th</sup> position.

Having a small logistics industry, turnover of transporting and logistics was much lower than of manufacturing and trade when it always was around 20 billion euros that is pointed out in the figure 3. Nevertheless, the logistics revenue was quite stable comparing to the other two industries. This partly proved that only logistics services in Finland was not affected by economic crisis commenced in 2008 (Solakivi, et al. ... 2017, 22).

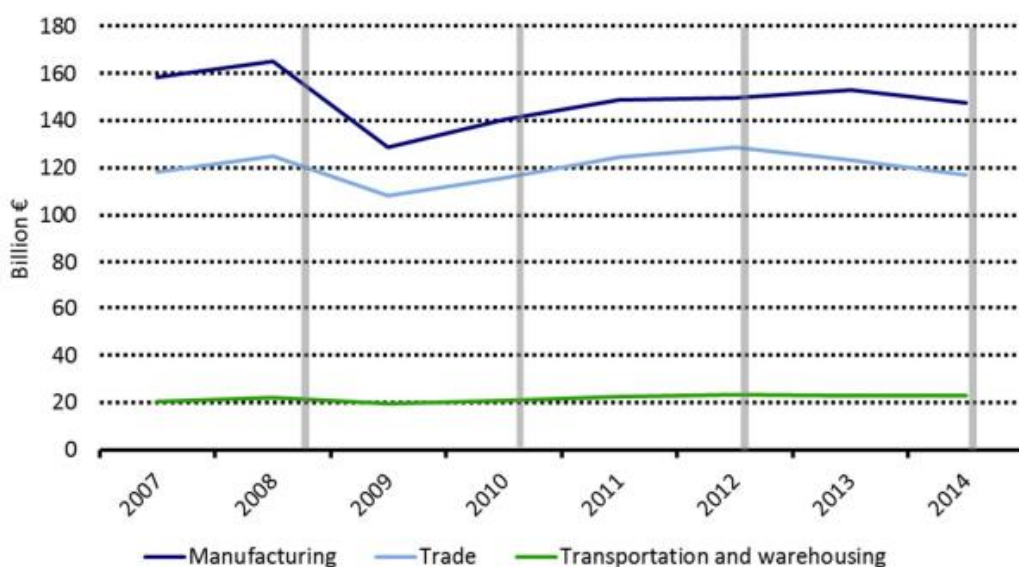


Figure 4: Turnover development (Solakivi, et al. ... 2017, 22)

Beside directly contributing to economy under an independent industry of transportation and warehousing, support of logistics to turnover of total Finnish industry are performed by value added to main industries like manufacturing. Figure 4 shows the total added value of types of services in supply chain. Among those sectors of logistics, land transport had the highest value added with around 4 to 5 billion euros and its trend

is increasing. The same trend can be seen for warehousing, the second highest position in the chart, but its value added was much lower than road transport. Values added of the remaining logistics services were quite low and unstable.

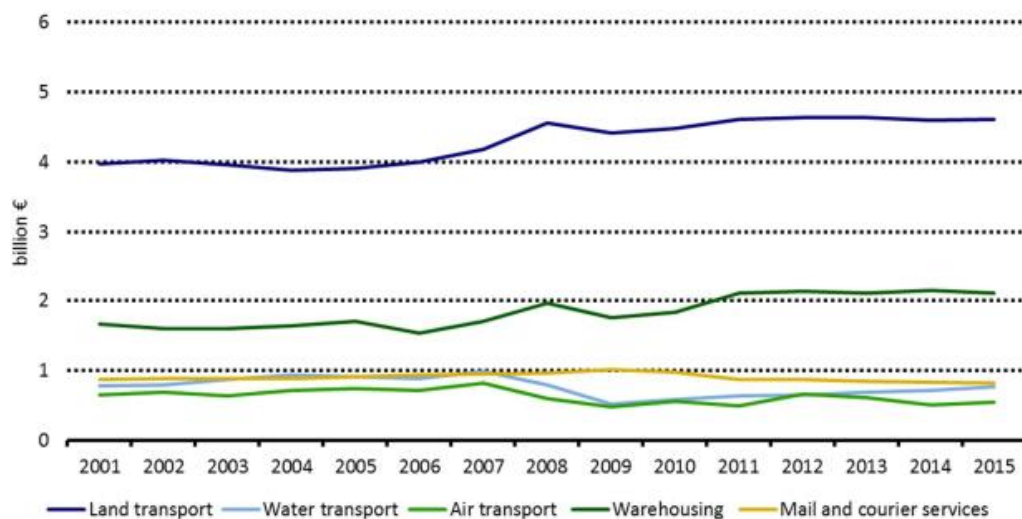


Figure 5: The chart of gross adding value of transport sectors (Solakivi, et al. ... 2017, 27)

In term of payment of domestic firms for logistics services, Finnish enterprises paid more money to internal logistics services than outsourcing those services, this is illustrated in figure 6. In 2016, 14.2 billion euros was paid for internal logistics. Among the internal logistics activities, inventory carrying took the highest cost with almost half of the total cost. Regarding of outsourced logistics activities, total spend was about 9.2 billion euros and the highest cost belonged to transportation.

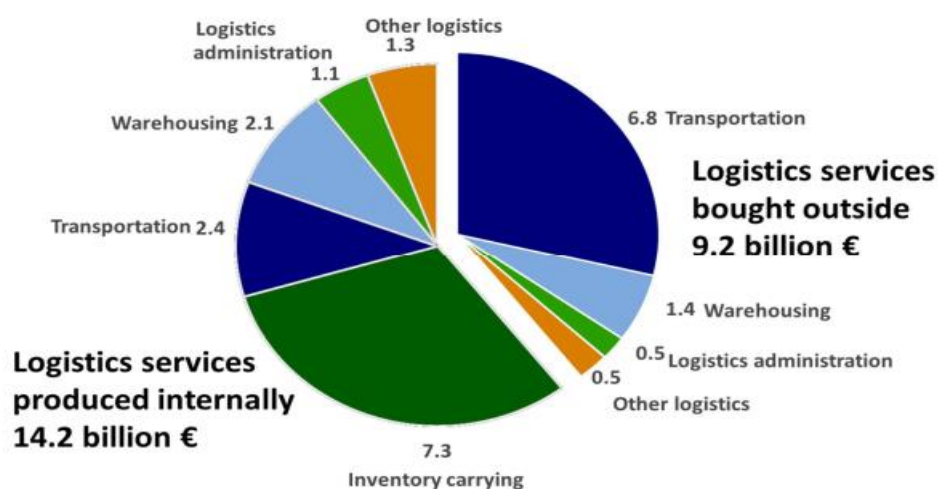


Figure 6: Costs of logistics service internally and outsourced (Solakivi, et al. ... 2017, 31)

Relating to evaluation of participants in logistics field, they also had the same evaluation as international organization, World Bank. Additionally, 1100 respondents in the survey of logistics evaluation also had similar opinions for each component (Solakivi, et al. ... 2017, 37). For more detail, in figure 6, in grade range from 1 to 5, customs' efficiency was graded highest under perspective of logistics participants. Quality of infrastructure of transport had the biggest differences in grading. Like World Bank, availability of transport was estimated as the lowest performance of Finnish logistics. Among the survey respondents of different industries, logistics teachers had more positive perspective than others.

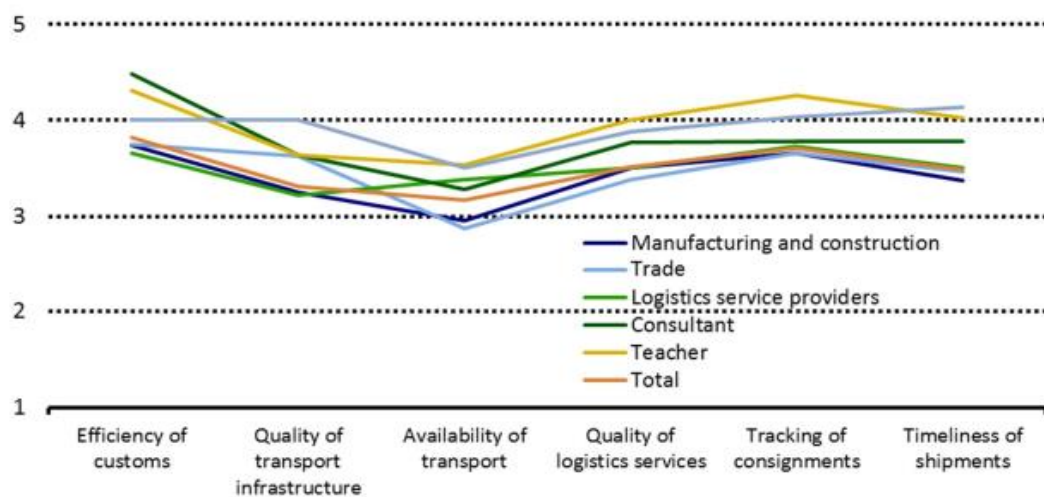


Figure 6: Assessment of participants in Finnish logistics field (Solakivi, et al. ... 2017, 37)

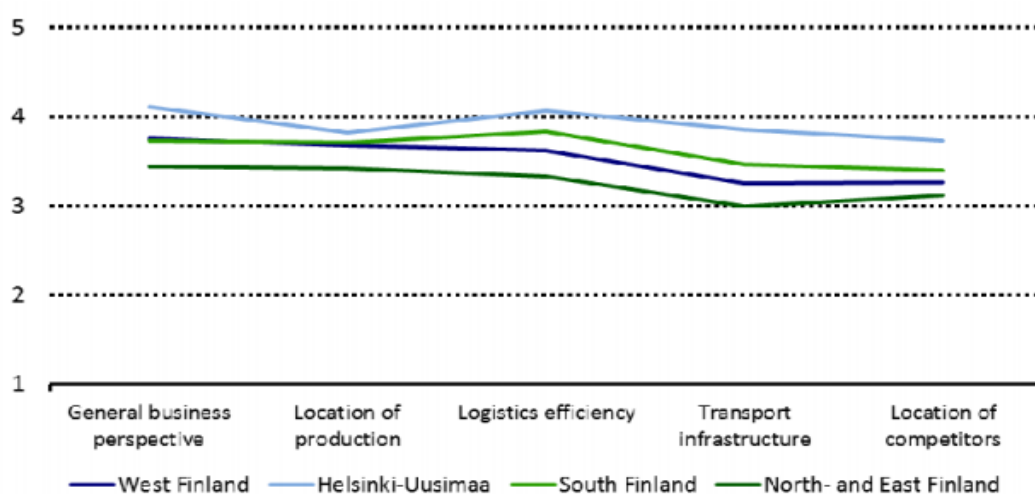


Figure 7: Assessment of Finnish logistics firms sorted by regions (Solakivi, et al. ... 2017, 39)

Based on evaluation on figure 7, logistic services in Helsinki regions had the best performance while North and East Finland had the worst performance under perspective of local respondents. This result can be explained by the busy transportation activities of Helsinki, the capital of Finland and nearby regions. Particularly, Vantaa airport of Helsinki is the biggest airport of Finland, it averages carries 81% of total passengers in Finnish air transportation system (Website of Vantaa Airport 2019). Road transportation in the regions also is more active than other regions. In figure 8, it is clearly the road transport system in the South and West of Finland is denser than the North and the West and the busiest traffic focuses in the capital regions.

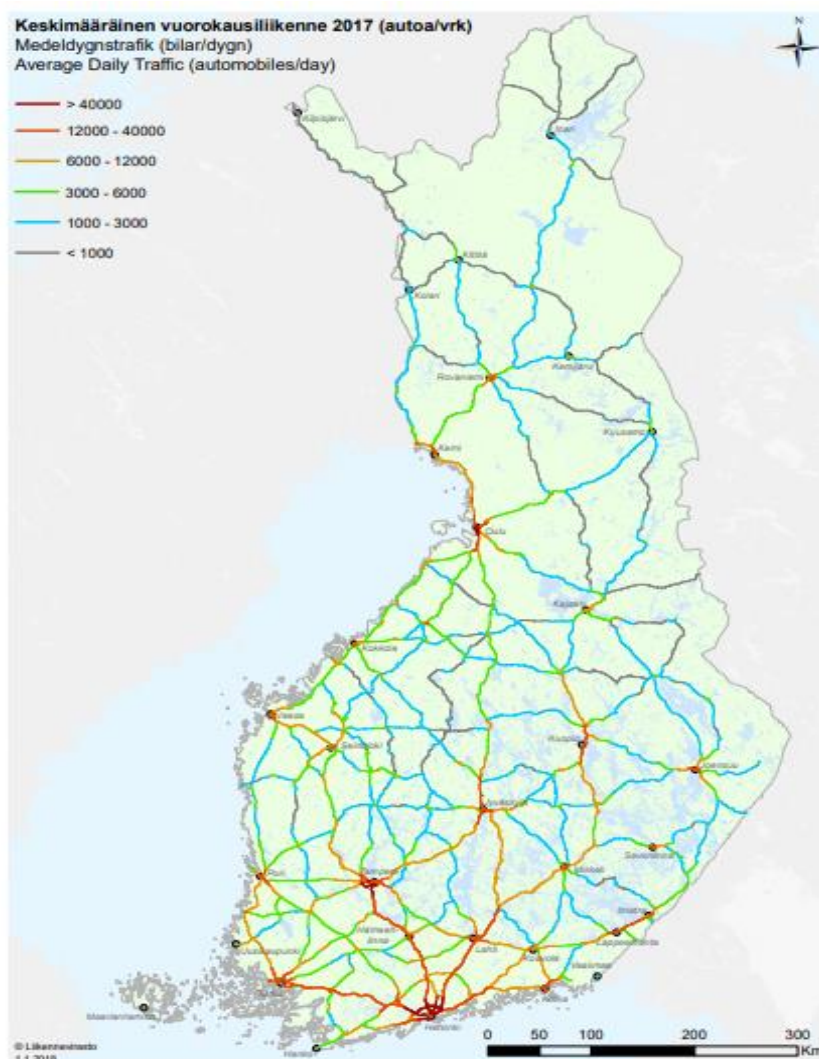


Figure 8: Road transportation (Official Statistics of Finland (OSF): Statistics from the Finnish Transport Agency 2018, 9)

## 5 FUTURE LOGISTICS TRENDS

### 5.1.1 Global logistics trends

According to Ceniga and Sukalova (2015,162), sustainability is the main concept for future development of logistics. Beside contributing for global economic growth, logistics nowadays must contemporaneously understand and conduct its responsibility for protecting environment. It is obvious that logistics activities are the main source of carbon releasing worldwide. In 2009, the World Economic Forum reported that 5.5% of amount of global GHG was released by logistics industry while road freight took a sixty per-cent portion of total CO<sub>2</sub> emissions from services of logistics included transport. In the next year, freight transportation took responsibility for nearly 8% of energy-related CO<sub>2</sub> release worldwide. (Oskarsson 2014, 3.) Consequently, logistics needs to come up with new solutions or even business models to reduce carbon emission will become the key core content for logistics trends. (Ceniga & Sukalova 2015, 2016).

Besides sustainability, researchers of DHL, a top global logistics enterprise (Website of DHL Global), have given another three key driving forces for logistics development including customer orientation, technology and robotics. Recently, the buying of customers is stronger than ever. During buying process, they require many conditions such as transparency, short-time delivery, suitable price, convenience as well as easy return systems. This hence forces logisticians to develop new to satisfy all of the customer's requirements. (Chung, Chaturvedi, Topan & Claire, 2018, 6.) The evolution of information technology like 5G, Wifi, Bluetooth or cloud storage has optimized the opportunities of connecting internet and data. This helps to enhance speed, smartness, agility and accurate prediction in logistics process. (Chung, Chaturvedi, Topan & Claire, 2018, 9.) To deal with the global problem of future labor shortages, using robots in logistics activities is a suitable and innovative solution. The development of automation technology also supports for involvement of robots in logistics industry. (Chung, Chaturvedi, Topan & Claire, 2018, 11.)

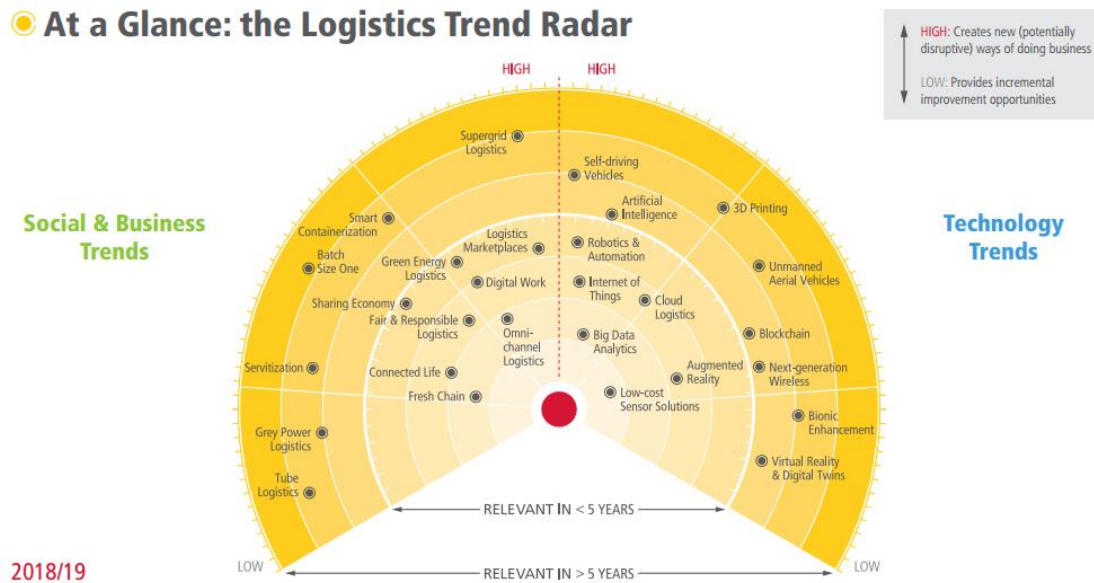


Figure 9: Logistics Trend Radar (Chung, Chaturvedi, Topan & Claire, 2018, 15)

All of the future trends are presented in figure 9, DHL researchers have relied on four factors to create the trend radar comprising global trends, microtrends and startups, customers and logistics professional with study partners (Chung, Chaturvedi, Topan & Claire, 2018, 13). The trends are sorted into social and business or technologies sectors. Moreover, the impact and lifespan of each trend are also performed in the radar respectively from low to high and under or over 5 years. Among those trends, a few technology trends are currently used in logistics companies and they are estimated to popularize in future.

Big data is the data-driven research to explore and utilize value of information in the organization to achieve success. (Jesk, Grüner & WeiB 2013, 3). To truly apply big data for businesses, enterprises must know how to find out additional value from the enormous amount of data and utilize it. (Jeske, Grüner & WeiB 2013, 4). With millions of operation activities like shipments, storages, banking transactions are conducted every day, if information from these is fully exploited, this can create a huge advantage for logistics enterprises. (Jeske, Grüner & WeiB 2013, 5).

Augmented reality (AR) allows users to access huge amount of information of the objects they are observing and considering by looking at the item through glasses. (Glockner, Jannek, Mahn & Theis, 2014, 3). Augmented reality is another application

that will be able to provide enormous advantages for logistics businesses. AR is estimated to be applied most of categories of logistics including storage operations, optimizing transporting, door-to-door delivery and improving value-added services. (Glockner, Jannek, Mahn & Theis, 2014, 13.)

3D printing also is a trend in logistics, especially in warehousing. With the ability to capture imagination of people, 3D printing can manufacture any object as required. (Chung, Niezgoda, Beissman 2016, 3). Due to this, business can significantly reduce cost of warehousing. Instead of producing and storing mass number of spare parts, producers just need to create exactly the product only when customers require. (Chung, Niezgoda, Beissman 2016, 18).

Blockchain is a high secured distributed ledger technology. It records and safeguards permanently transactions between parties in a network. By using blockchain technology, roles of intermediates or third party to assist and conduct transactions are no longer needed. Furthermore, data in the network are freely to be shared but still be kept in protected silos. (Kückelhaus & Chung 2018, 3). In global logistics, there are parties in the supply chain such as exporter, importers, forwarder, carriers, banks. This leads to complexity and low transparency in the information flow. The troubles in logistics processes can be vanished when using blockchain. By doing so, global logistics processes can create speedy and lean supply chain, transparent and traceable database and automated trade processes. (Kückelhaus & Chung 2018, 12-13).

Internet of Thing (IoT) is the act of connecting physical objects to Internet. Instead of only to computer, IoT allow Internet can assess to other object such as household devices or machines. Due to this, the connected devices become “smarter”, they can receive, store and send information to their owners. For instance, warehouse managers can receive an alert from forklift for technical issues if they apply IoT on the forklift. (Macaulay, Buckalew & Chung 2015, 3). By connecting all assets in logistics process, logisticians can improve operational efficiency, analyze data gathered from the connections and giving better solutions for their business. In future, when price of IoT devices become more affordable, speed of Internet is faster and capabilities of data processing which compound exclusively business benefits is rising, IoT will be the disruptive technical logistics trend. (Macaulay, Buckalew & Chung 2015, 14).

Nowadays, 5G is developing and replacing 4G, by applying the newest technology, many logistics trends can be actualized and become popular, especially IoT. 5G technology is known as the fifth generation of wireless communication. It can acquire extremely high rate of data and low latency when comparing to the preceding generation, 4G. Due to this, quantity of information transmitted by using 5G is enormous. Expected transmission speed of the fifth generation is up to 30 gigabits per second, which is 50 times faster than 4G. (Dahiya 2017, 49.) Basing on these advantages, 5G allows machines including man-made objects to interconnect via a much larger wireless network that 4G can offer. This is the framework for IoT implementation. Thanks to 5G, IoT technology can satisfy many market's demands such as punctuality and remote delivery. Installing IoTs in a blockchain, the devices are secured and protected from malicious sources. Accordingly, 5G-powered IoT and blockchain will create big improvements in supply chain. (Dewey, Hill and Plasencia 2018, 43-44).

#### 5.1.2 Future trends for Finnish market

Regarding of Finnish market, local enterprise's opinion is that digitalization has the most visible effect on their future businesses, logistics is included. If the expectation of firms happens in the next year, there will be dramatically fluctuation in logistics market and demand for numerous digital applications will soaring very soon. Fluency in sharing information between stakeholders optimize efficiency for business, hence this become a benefit for both customers and service providers. However, the development trend of digitalization is a negative signal for tradition logisticians when price of literal transporting is diminishing. The added value transforms from moving goods to services and related information management. (Solakivi, et al. ... 2017, 60).

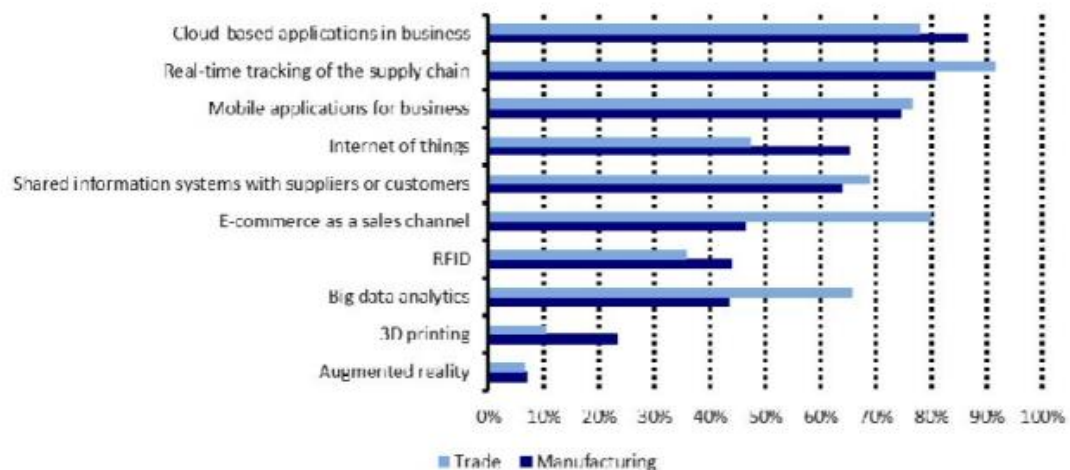


Figure 10: Estimation of manufacturing and trade firms for future application in 2020 (Solakivi, et al. ... 2017, 15)

In the above graph, in 2020, Finnish firms estimated that real-time tracking is the most common use in supply chain. This partly explains that Finnish firms is trying to improve their timeliness. Applications related to information also will become extremely popular in 2020. At least 60% of firms will use cloud base and shared information system in their business. Nevertheless, data analytics only will be applied widely in trade firms. E-commerce will be utilized much more in trade industry than manufacturing industry. By contrast, the percentage of manufacturing firms applying internet of thing and 3D printing will be bigger than of trade companies. Augmented reality is still not a popular trend in Finnish market when both types of firms estimated that its popularity in applying was less than 10%.

Regarding of B2C logistics in Finland, digitalization also involves in the development plans of the business. Posti Group, the leading company for postal in Finland, is upgrading its retail network to response to the demand of customers. As Lasse Huttunen, Superior for Retail Network in Posti, said that: “We expect to see further e-commerce growth. Over the past decade, the number of Posti's service points has more than doubled, mostly due to parcel lockers. As the number of lockers continues to grow and customers have constant access to our digital services, Posti’s services are even closer to customers than before,” (Posti plans to increase... 2019). Specifically, more than half of Finnish population have used parcel locker, a type of self-service point; and they also prefer to use mobile related services such as tracking regardless of time and

space. Due to this, the company is implementing a lot of Smartpost parcel lockers in many areas in Finland including apartment buildings to serve for sending and receiving goods of private customers. From 2019 to 2020, Posti would close 21 outlets in different regions of Finland. Some of the closed outlets will be replaced by self-services points. The renewal plans of Posti has again proved for the intense involvement of digitalization in the Finnish logistics development. (Posti plans to increase... 2019).

Table 4: Reduction targets of greenhouse gas release of Finland (Kostiainen, 2012, 14)

Greenhouse gas emission target	Target year	Indicator (cf. 2.3)	Source
Maintain transport emissions at 1990 levels or below	2012		(European Environment Agency, 2002)
Reduction of 16% compared to 2005	2020		(European Commission, 2009a)
Maximum emissions of 11.4 million tonnes (15% reduction compared to 2005)	2020		(Ministry of Transport and Communications Finland, 2009), (Finnish Government, 2008)
Passenger car stock emissions at or below			(Prime Minister's Office Finland, 2009)
80–90 g CO <sub>2</sub> /km	2030		
50–60 g CO <sub>2</sub> /km	2040		
20–30 g CO <sub>2</sub> /km	2050		

Besides digitalization, green logistics is also focused in Finland. Finnish government has defined target to reduce CO<sub>2</sub> emission released from transports (Kostiainen 2012, 14). The regulations will play an important role in driving market development, encourage logistics enterprise to give more eco-friendly solutions (Kostiainen 2012, 29). For implementation, technical upgrade, intelligent transport systems (ITS) are recommended to be applied in transportation (Kostianen 2012, 17). Specifically, to meet the goals set by authorities, companies should use more effective engines and apply information and communication technology (ICT) to optimize efficiency of logistics network (Kostiainen 2021, 17 & 24).

## 6 COMPETENCES FOR LOGISTICIANS FROM PERSPECTIVE OF PROFESSIONALS

### 6.1 Necessary knowledge, skills and attitudes

Depending on features of each logistics participant in logistic markets, competences needed for logisticians are different and diversified. According to a research developed by APICS, the first-rated professional association and provider of education and certification relating to supply chain, logistics managers must obtain a huge amount of knowledge as well as acquire many appropriate skills and attitudes (Distribution and Logistics managers... 2014, 23). In the project, competences are divided the levels of fundamental and profession.

In term of the fundamental level, the competences are organized into three sub levels including workplace, academic and personal. In the research, logisticians should have responsible, collaborative, honorable and studios attitudes. Creativity, high awareness and good communication also are necessary characteristics for individual. In work-place, logisticians must be able to own the following skills: problem solving, customer driving, decision making, planning and organization and conflict management. Relating to academic competences, the managers must possess the abilities to read and write comprehensively, conduct and analyze statistics, understand basically about business administration, supply chain, material management, enterprises operations and economy.

Referring to the occupation competences, there are 16 professional and 9 general subjects comprising necessary knowledge and skills for working in logistics field. At the operation category, logisticians should acquire the competences in business administration, sustainability and technology application. The knowledge and skills are important for whom are managers in economy. When working as logistics mangers, the persons must be familiar with the subjects representing for corresponding operation areas in supply chain. (Distribution and Logistics managers... 2014, 4.)

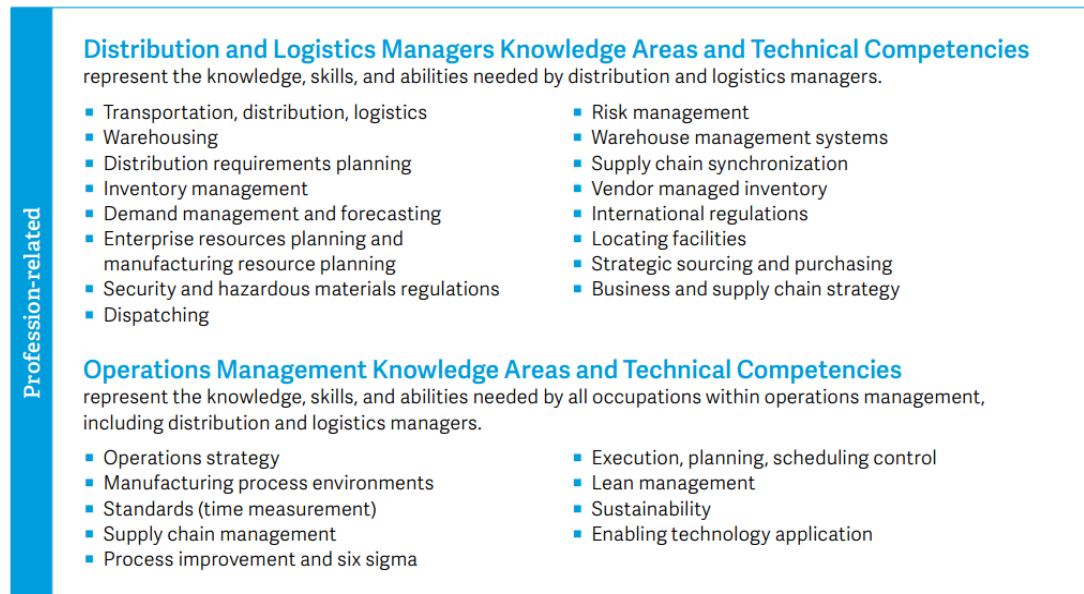


Figure 11: Competences for logistics managers (Distribution and Logistics managers... 2014, 4)

As playing another role in supply chain, the necessary competences are narrower and more specific. For instance, to be a freight forwarder, must-have knowledge relates to transport operation such as INCOTERM, ICT, documentation or cost-calculation. English, self-organization and good communication are critical skills the participants when processing international documents. Beside this, attitude of entrepreneur is also welcomed to act in the business network. (Jugović & Vukić 2016, 122).

## 6.2 Importance of each competence

On the other hand, the essential of each competence are also different regarding of participants and market. For those people who work at managing level, in the thesis of Orkasson (2014, 42), customer service is the most important subjects. Transportation and inventory take the next positions in importance level.

Table 5: Areas of logistics knowledges and skills based on 7 researches in developed markets (Orkasson 2014, 42)

Rank	Murphy and Poist (1991)	Murphy and Poist (2007)	Thai et al. (2012)	Thai (2012)	Rahman and Qing (2014)	Sodhi et al. (2008)	Bourlakis et al. (2013)
1	Customer service	Customer service	Customer service	Customer service	Inventory management	Inventory management	Transportation
2	Transportat. management	Inventory management	Logistics info. management	Contract management	Supply chain costing	Forecasting	Supplier management
3	Inventory control	Transport. management	Inventory management	Transport regulations	Distribution planning	Customer service	Inventory and forecasting
4	Warehousing	Logistics info. management	Integrated logistics	Transport management	Demand forecasting	Performance metrics	Global issues
5	Distribution	Warehousing management	Warehousing management	Logistics terminology	Warehousing	Transportation	Service & after sales support

In another survey reported in the book of McKinnon, Flothman and Hoberg (2017, 39), different regions will have distinct opinion of importance of each content. Most of training areas in emerging markets receive bigger attention than in developed markets. In developing countries, many respondents thought that logisticians working as employee should be trained about basic logistics knowledges like transportation, warehousing or inventory. The general subjects like purchasing, planning and management also should be trained. Just about a third of respondent thought about training in-dept knowledge like IT use, security. Soft skills and foreign languages received low vote from emerging market, respondent from the markets do not think that the subjects are important to be taught. Respondents from developed markets do not overestimate the importance of any training areas, especially the basic logistics subjects. They expect that their employees already acquire those basic knowledges and skills before joining market labors. (McKinnon, Flothman & Hobalerg 2017, 38). In developed markets, IT usage, customer service, soft skills and foreign language receive more attention of respondents in term of training content than in developing markets.

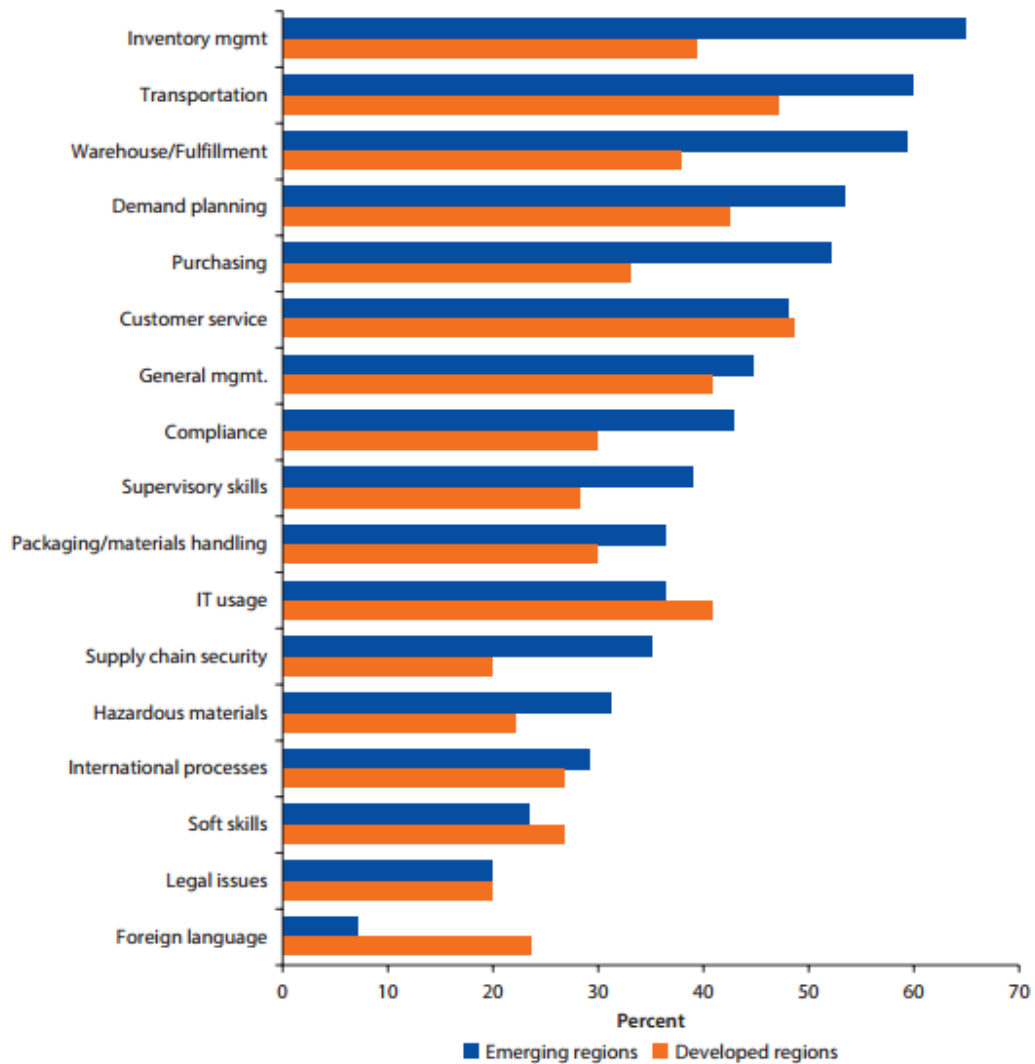


Figure 12: Survey result of training content (McKinnon, Flothman, Hoberg & Busch 2017, 39)

Generally, regardless of roles in any logistics markets, every logistician should acquire the understanding about transportation, warehousing, inventory and customer service beside basic knowledge of business. Communication, supervisory and language skills are critical in the field. Collaborative attitude is essential in any working situation.

## 7 METHODOLOGY

### 7.1 Collecting data methods

Data was collected through interviews then it was analyzed to answer for the objective given in the beginning of the project. Regarding of collecting quantitative data methods, questionnaire is the optimal solution. It is the term to express all collecting data techniques that each respondent only answers one pack of questions which is pre-organized in order. (Saunders, Lewis & Thornhill 2009, 360). The structured interview is an effective way to collect information from a big number of people, so researchers can have many variables of answer. Nevertheless, students normally have one chance to interview individuals through the method because people tend to remain anonymous when doing survey; it is difficult to ask the same person two different sets of question. Accordingly, to have a qualified questionnaire which obtains high response level, reliable and valuable data collected, researchers must consider the following aspects: careful-designed personal questions, clear layout and explanation of survey's purpose, pilot testing and well administration. (Saunders, Lewis & Thornhill 2009, 361-362).

There are two ways to conduct and manage questionnaire which are self-administer and interviewer-administer. The method that administrators send question samples via postal, internet or intranets and collect data by the corresponding means is called self-administered questionnaire. Interviewer-administered questionnaire uses when the interviewers directly talk to interviewees through phone or physical contact. Unlike unstructured interview, questionnaire is hardly limited by location or time, this forces researcher set up more limitations for their questionnaires such as types and numbers of questions, size of sample. They must also care about contamination and distortion of answers of respondents. (Saunders, Lewis & Thornhill 2009, 363.) To achieve projects' objectives when using questionnaires, types of question used are diversified such as listing, rating, ranking or gridding. (Saunders, Lewis & Thornhill 2009, 375-380).

In term of nature of interview, it is defined as discussion between two or more people. The purpose of interview is gathering valuable and trustworthy information to serve for the initial objectives of researches. (Saunders, Lewis & Thornhill 2009, 318).

Interview can be conducted by many methods and due to this, it is also classified into two types: standard and non-standard. Questionnaires are the basic of standardized or structured interviews which serve for quantitative analysis while non-standardized interviews are used to analyze qualitatively. The non-standardized interviews are conducted under many forms and means. Interviewers can discuss with only people or a group. The interrogators can conduct the interviews through telephone, direct meeting or internet network. (Saunders, Lewis & Thornhill 2009, 321.)

The qualitative interviews are used for exploratory and explanatory studies, when researchers want to understand about opinions, attitudes or decisions of their interviewees. The studiers aim for “probe” answers which requires respondents must give detailing and depth responses. Questions give in the interviews should be open-ended and probing, they are started with the words like “what”, “why”, “how” (Saunders, Lewis & Thornhill 2009, 337-338.) Consequently, the data collected is more beneficial to achieve the projects’ purposes. (Saunders, Lewis & Thornhill 2009, 324). Due to the features of the unstructured discussions, there is no time range for interviewees to complete their questions. The interviews also should be started when respondent have nearly no pressure. (Saunders, Lewis & Thornhill 2009, 325.) To conduct a successful interview, the interviewers should carefully prepare about knowledge of research topic, credibility of information supplied in the meeting. (Saunders, Lewis & Thornhill 2009, 332).

## 7.2 Data analysis

### 7.2.1 Quantitative data

Quantitative data normally is performed in assemblages illustrated by graphs, statistics, or charts. When it appears separately as raw form of the data, it can cause confusion to reader because of its poor meaning. (Saunders, Lewis & Thornhill 2009, 414). To analyze quantitative data, researchers must code data, enter data into computers, check for errors, explore and preset data. Before that, data is classified into two groups: numerical or categorical. Any data that can be measured by quantity systems is classified as numerical and vice versa. (Saunders, Lewis & Thornhill 2009, 417). Then, both

types of data are recorded by numerical systems. For instance, researchers code data by counting appearing times of each variable. After entering data into computer, it is needed to be corrected if errors happen. Studiers must identify the faults occur in coding or entering step. Faulted data can lead to wrong conclusion, so checking is important when analyzing. In the end, data can be explored and presented in many ways. In general, bar charts are used to show specific values from the highest to the lowest. Trends and proportion are respective illustrate by line and pie charts. To compare variables, table or mixed charts can be utilized. Statistics can also be used to describe and analyze data. By observing charts and statistics, readers can examine and assess relationships between variables, then give the final answer for their research questions. (Saunders, Lewis & Thornhill 2009, 431-465.)

### 7.2.2 Qualitative data

Any data that cannot be counted by any measure systems is identified as qualitative data. The type of data itself contains more complex information than quantitative data. Researchers obtain the data from in-dept interview or open-ended questions in survey. To utilize the data, it must be analyzed and understood by both approaches of deduction and induction. (Saunders, Lewis & Thornhill 2009, 480). While quantitative data is expressed by diagram or statistics, qualitative data is analyzed by using conceptualization, it is obviously non-standardize. (Saunders, Lewis & Thornhill 2009, 482). Therefore, the qualitative data analyzation is completely different from the ways used to analyze quantitative data. Firstly, data must be transcribed from audio records or written documents. When interviews are conducted via email, studiers must save data by capturing or scanning. Then, researcher may choose approach types for data analysis. If they use deductive method, a theoretical framework should be drawn and become guideline to analyze qualitative data. On the other hand, inductive approach does not need a theory foundation before analyzing data. Studiers explore the data to find out which themes or concept it belongs to. Due to this, inductive approach normally is more difficult for inexperienced users to achieve objectives. In any approach, analyzation must start with clear purposes. During analyzing time, data must be processed by summarizing, categorizing or structuring in narrative. (Saunders, Lewis & Thornhill 2009, 490.) To process data, researchers can use aids like interim summaries, self-

not or study diary for easily presenting, tracking data. (Saunders, Lewis & Thornhill 2009, 498). After that, all of data are displayed, connected in a network where researcher can answer for their study questions and draw conclusions. (Saunders, Lewis & Thornhill 2009, 503).

## 8 PREPARATION FOR COLLECTING DATA

### 8.1 The interview questions

To interview the managers in logistics, the author has created a question package based on the conceptual framework. The purpose of interview is to collect logistics managers' opinions about development trends as well as suitable personal competences for Finnish logistics. To explain why logistics managers are the subject to be interviewed, it is because they understand thoroughly development strategy of their companies to set business goals for certainty of their companies' longevity (What are the Main..., 2017). Additionally, the persons directly work with a lot of other logisticians including their staff, and business partners. Therefore, perspectives of logistics managers become reliable and timely references; this helps the author to successfully research and identify the essential competences. For assisting the interviewer easily and exactly achieve the objectives of this research, the question package focuses on finding out preferable logistics trends in Finnish markets and competences to adapt to the market development. Particularly, the first three questions ask about which social and technology trends are becoming popular and truly developed in Finnish logistics field. Involvement of 5G technology are the content of the fourth question because it also is a part researched in the project. The next four questions respectively mention about knowledge, skills and attitudes needed for any logistician; and time to acquire the competences is the content of the last question. Before sending out the interview package to the managers, it has been adjusted and approved by instructors to achieve the best possible in which are competence identification.

## 8.2 The questionnaire for the survey

The questionnaire is the work of cooperation between the two researcher, Ha Nguyen and Yunlin Jiang, the leading person in designing the survey. The questionnaire is used to collect the opinions of many logisticians regardless of their business fields in the logistics market. The purpose of the survey is finding out the most essential competences based on the perspectives of logistical participants. However, because this is a structured interview, the questionnaire must be designed extremely specifically with as much options as possible for the interviewees. The frame of the structured interview contains three main parts that are personal information of interviewees, multiple choice questions and open questions. Like the order of interview questions, the questionnaire will respectively ask about personal information, technical and social trends, suitable knowledge, skills and attitude for different players in the market. The number of questions is 32, the quantity can cover all the topics discussed in the research. Information used in the survey is also referred from many theoretical sources. Especially, to avoid confusion for logisticians, the questions about knowledge are classified by the five logistical roles which are shipper, carrier, forwarder, distributor and integrated logistician. The interviewees will answer the job-related question which matches to their jobs and skip the questions that are not referred to their job. The survey also includes in present the perspective of managers will have been collected before to increase practicality. Thanks to this, the logisticians do not feel difficult to complete the survey and their opinions will be more objective. Before sending out the survey, it is adjusted many times by instructors to guarantee both academic and practical factors.

## 9 ANALYSIS OF EMPIRICAL DATA

### 9.1 Empirical data collected

The empirical data is collected by interviewing three managers working in logistics firms located of Finland. In general, the three managers have the similar opinions toward development trends of logistics.

Table 6: Sources of empirical data

Order	Title of the managers	Types of the companies	Type of interview	Questions answered
1	Site manager	International	Face-to face	9/9
2	HR manager	Domestic	Face-to face	9/9
3	Department manager, Forwarding	Finnish-based	Answer via mail	7/9 (except 8th and 9th)

### 9.1.1 Development logistics trends and innovate applications of the companies in future

Firstly, technology trends are considered to affect significantly on future logistics. Even though green energy, fair and responsible logistics were mentioned as social affecting trends to Finnish market, the technical innovations still have bigger influence on the market. As a manager stated: “The technological development makes more possibilities for social field.” Especially, according to the managers, digitalization will create the most important influence on logistics development. All the three managers directly and indirectly emphasize the term “digitalization” in their answers. Additionally, automation, robotics and artificial intelligence are also mentioned by a manager as future trends. Due to this, digitalization is estimated to gain competitive advantage for logistics companies. “The party who has the best digital software and business management systems are the winners.”, a superior said.

Beside the digital involvement, the trends relating to information analytics might create huge benefits for logistics enterprises. Particularly, a manager thought that the party which manages the whole supply chain or controls information can win the market. As a result, digitalization and automation transformations will be applied in the companies. For more detail, the companies will reduce paperwork in solving processes of logistics activities. The routines of logistics will be changed from personal desks to computers that are connected in a big network. Paper documents will be gradually replaced by electronical documents. All steps in the transportation process will be solved electronically by computers or phone. The other related logistics activities will accordingly change their ways of operation toward digitalization. For instance, business customers can book and track their shipment via a website or software. Regarding of automation innovations, they are applied in future logistics; machines will replace human to conduct some logistics tasks. Particularly, a manager claimed that his company has a project that use a storage lift system (varastoautomaatti) in the warehouses.

The innovation could considerably change the current operation by saving time, and workload of employees. However, the digitalization and automation applied in future will not be supported by 5G technology in near future. The interviewees said that their companies have not planned to use the technology for logistics activities. The manager working in the international company explained that it would be very costly for their company if they upgrade the technology to 5G in the logistics operation because of large number of vehicles owned by the firm.

### 9.1.2 Essential knowledge, skills and attitude for future logisticians

In term of specific competences for future logisticians, the three managers have given various opinions. When being asked about necessary knowledge for logisticians, the first interviewee thought that each participant would need different logistics professional knowledge because each job is tailor made. For instance, in his company, new graduates hired for forwarder or traffic coordinator are assigned to do paper works in their first period of working. Then, they learn through doing tasks and acquire knowledge in their own business working fields. Nevertheless, the manager also thought that the more knowledge new workers know, the more benefit they have when joining the labor market. Having a small different perspective from the first manager, the third managers stated that a logistician need to acquire a lot of knowledge such as incoterm, shipping term or custom procedure. He spoke: “You are in a between the client and authorities, shipping lines, trucking companies, etc. So, you must give customer service for all parties and have as wide network as possible to all sides of the business area.” Logistics activities require involvement from many parties, they offer services to many customers objects. Therefore, understanding a lot of logistics knowledge is a needful competence. Relating to the most distinctive perspective, the second manager conceived that the role of information technology is becoming more important more important in logistics. Knowledge and skills related to information technology would be essential for future logisticians. Relating to critical skills for future logisticians, the three managers also had both different and similar opinions depending on operating areas of the companies. The necessity of foreign language is a typical example for the difference in terms of the competences. While the first managers thought that foreign languages are not critical for domestic logisticians, and the second manager just considered it as a bonus point of employee in his company; the last manager put English as a must-have skill for all logisticians. Additionally, the first interviewee repeated the opinions of “each job need distinctive skills”; the second manager requires employee to understand about the operation of business, “what to do, where

the company gets the money”, so business skills are obviously necessary; and the last manager emphasized professional skills. Nevertheless, they had some similar options referring to the personal skills which were problem solving, communication. They all accept the fact that a logistician must work with many persons and the business field is hectic. Accordingly, quick solving trouble and socializing are very useful for the people who work in logistics.

The insight of IT knowledge and skills is not obligatory for future logisticians, the workers just need to understand about IT enough to use the systems. Although employers do not demand their employees to be IT specialists excluding people hired to work IT department, the staff at least must be able to use the high technology machines devices and systems. Especially, “if you are white collar, you have to understand profoundly” about IT. For instance, a warehouse worker just needs to know how to use the mobile picking terminals, but a white-collar worker must understand about the operation as well as technical details of the machine.

Table 7: Critical skills for logisticians according to the managers (X is the competence that the managers had mentioned)

Skills	First manager	Second manager	Third manager
Communication		X	X
English or foreign languages		X	X
Problem solving	X		X
Decision making	X		
Working under high pressure	X		
Business skills		X	
Professional skills			X

According to the managers, “adaptive” is the essential attitude for future logisticians. The market is changing every day, there are more and more new technologies and systems applied in the companies, this forces the workers become quick learners to adapt to the innovations. Besides that, “diligent” is another attitude that is necessary for the employees, because the staff must be hard-working to deserve with their salaries. Other attitude like “patient”, “positive”, etc. is also good competence that logisticians should have. On the other hand, a manager thought that the attitude is not acquired at schools, it is constructed in workplace.

Table 8: Attitudes mentioned by the managers

First manager	Second manager
adaptive, patient, positive, confident, and enthusiastic	diligent, and willing to learn new things

To answer for the question of the appropriate time to master the competences, the two managers both agreed that working is the best way for acquiring the logistics knowledge, skills as well as attitudes. Specifically, opinion of the first manager is that “no one is ready after university”. The workers learn by doing. However, being well educated about fundamental knowledge and skills would be a helpful prepare for new graduates to join the market labor. Almost similarly, the second manager stated that “basic warehouse workers can study almost everything at work” while logistics specialist would need a period of few-year education before working.

## 9.2 Result of analyzation

### 9.2.1 Current situation and development trends in the local market

Because the three mangers work in Satakunta region of Finland, their perspectives reveal current situation as well as the logistics trends in the area. Even though having a small logistics market compared to the neighbor countries, Finland and the Satakunta region also apply the very new technologies in their logistics activities. Generally, the local market is developing as the same pace as worldwide. In fact, the internalization has strong involved in the logistics operation of the region. Geographically, Rauma Port is the fifth largest harbor in Finland, it is internationally connected to Europe, North America and Asia. (Basic information of ... 2019). The busiest operation of transportation is accordingly the sea freight. Moreover, Satakunta’s road traffic density is slightly above the average rate comparing to whole Finland, this is demonstrated in the figure 7. In the South-West region, the number of automobiles moving per day is just less than the East-West region, it is still more crowded than the further North areas of Finland. The area also has an airport located in Pori, the capital of the region. Specially, in 2017, although the airport is one of the smallest air terminals in Finland, it is the most developed aircraft unit with many positive signs of internationalization. Regarding of total number of passengers with the increase of 140,8%, twice as the second

developed unit with 70,4% (Passengers by Airports 2018). The mitigation of the developing happened in 2018 with 24%, and the number of international customers is always higher than of the domestic ones presently (Passenger by Airports 2019). Therefore, it is not a surprise that the logistics companies realize the influence of globalization on their business and response to this by upgrading their communication methods and technology.

Similarly, the development situation of the local market is nearly identical to the whole Finnish market where digitalization is seen as the most outstanding trends. Besides that, they focus on environment-friendliness in doing business. Specifically, two out of three companies intend to maintain their connection to customers from paper works to computers, the remaining firm already uses communication electronically. This application reduces waste of papers and increase automation in business. Base on the plans, mobile and cloud-based application for business, shared information system are the innovations that would be likely to use in future. Big data analytics might also be applied due to the perspective that the winner of the market is the party who manage the whole supply chain and control information. Information technology will also involve in the market development through launching connection systems, software or automatic machines. Despite of the local market will develop toward digitalization and information technology, 5G technology is still not utilized to support the innovations because of strategical and financial reasons. As explain in the literature review, 5G technology speeds up the internet connection, it significantly helps for linking all electronic devices in one network. Without the support of 5G, the influence of innovations that the enterprises would apply will be diminished.

### 9.2.2 Essential competences trends for future logisticians

The competences emphasize the importance of customer service, IT application and transportation. Due to the similarity in business situation and development trend between the Satakunta region and the whole Finland, there is no distinctiveness in the competences required for future logisticians in the developed regions. According to the perspectives of managers, logisticians must work with many parties and conduct many stages to complete logistics activities. Fundamental knowledge is still obligatory

for all logisticians. New workers must master at least the fundamental information regarding of general business. They need to understand about basic business, especially customer service. The result performed in the literature review that customer service is an essential competence that logisticians must master since logistics is client-based business. Therefore, it is the most essential business knowledge that logisticians need to thoroughly understand. They must also at least acquire the considerable amount of logistics knowledge to be able to complete tasks. On the other hand, the theoretical information reveals that forwarders are currently accounting for the biggest portion in total logisticians, the knowledge that is obligatory for the type of participant would be critical to acquire during studying time in university. A little of IT knowledge is extremely necessary for logisticians to adapt to the digitalization and automation of in future. Because the managers have emphasized the importance of occupying and using information in the development of logistics companies, the insights relate to controlling information like big data and block chain will be necessary for future logisticians.

In terms of skills, communication and problem solving are the most critical skills for any worker. As logisticians are not individually workers, they cooperate and offer services to many parties on markets. For instance, forwarders must work with senders, carriers, receivers and colleagues in their job. Having a good communication skill would be critical for them to convince the stakeholders. Problem solving is another important skill for logisticians due to the reason that many unexpected troubles can happen during transportation processes. Internationalization trends expands the length of the routes, this means that more troubles can occur during the transporting period. Being logisticians, they must guarantee for the safety of goods and smoothness of the routes, quick problem solving consequently becomes an indispensable competence. Foreign language and IT usage would be essential in the future of the Satakunta's logistics market which is likely developing digitally and internationally.

To satisfy the rapid changes of the logistics market and requirement from employers, "adaptive" and "diligent" are the attitudes that every logistician need. The digitalization and automation applications in business require worker to be a quick learner and quickly get use to the new innovations. Additionally, hard-working persons would be perfectly suitable to handle the heavy working schedule of the logistics companies currently and in future.

Table 9: Outstanding competences for all participants in logistics market

Essential competences	
Knowledge	<ul style="list-style-type: none"> <li>_ Business operations in total               <ul style="list-style-type: none"> <li>• Customer service</li> </ul> </li> <li>_ Fundamental logistics               <ul style="list-style-type: none"> <li>• Incoterms</li> <li>• Shipping terms</li> <li>• Custom clearance</li> <li>• Etc.</li> </ul> </li> <li>_ Information technology               <ul style="list-style-type: none"> <li>• Blockchain</li> <li>• Big data</li> <li>• Etc.</li> </ul> </li> </ul>
Skill	<ul style="list-style-type: none"> <li>_ Communication</li> <li>_ Problem solving</li> <li>_ Working under high pressure</li> <li>_ Foreign languages</li> <li>_ Using high technology devices</li> </ul>
Attitude	<ul style="list-style-type: none"> <li>_ Adaptive and diligent</li> </ul>

## 10 SUGGESTIONS

To help learners acquire the essential competences when they are studying, there are seven suggestions that focus on improving practicality, IT application and customization in studying environment.

Table 10: Suggestion for designing curriculum in the future

<b>Practicality</b>	<ul style="list-style-type: none"> <li>_ Field trips to the logistics companies</li> <li>_ Practical case study</li> <li>_ Get use to work under high pressure</li> </ul>
<b>IT application</b>	<ul style="list-style-type: none"> <li>_ Proficiently use computers</li> <li>_ Update IT knowledge</li> </ul>
<b>Customization</b>	<ul style="list-style-type: none"> <li>_ Identify role in logistics before joining the market</li> </ul>

### 10.1 Increasing practicality

The practicality in the curriculum should be maximized by field trips, case study and a high-pressure studying environment. University should contact to local logistics companies to organize field trips to the work locations such as warehouses, ports and offices. In the trip, future logisticians have many opportunities to observe real working environment, study thoroughly about operations of logistics. They can visualize their future roles in the market and have a suitable study plan to prepare for themselves to work as logisticians. Furthermore, solving troubles and giving solutions logistics companies in the current market is the second suggestion. The school can cooperate with new and young local businesses to come up with practical cases for students to solve. The cases are the real problems of the companies. For instance, an entrepreneur wants to create a supply chain for his business that are cost-saving, customer orientated, he wants a solution that must satisfy at least two issues including affordable routes for the flow of goods and customer satisfaction to response to all the demands of the businessman. When handling the case study, students have to research about the case company, the issue that they are encountering. Students need to combine many factors like knowledge, skills, creativity to identify which solution is the most suitable for the companies. To successfully come up with a practical and innovative solution for logistics companies in a few months, student must be very hard working to solve a huge amount of workload. Additionally, as the managers said that the logistics market is very hectic, to solve the case study, the lecturers should create some challenges for students by setting up time limitation or have more requirements in terms of quality of solutions. The challenges make student to be able to work under high pressure, which are a necessary skill for future logisticians. The essential knowledge, skills and attitude therefore will be acquired after solving the practical cases.

### 10.2 Updating IT knowledge and skills

On the other hand, the curriculum should mention IT knowledge and skills. The students must be familiar to using computers, digital devices and online network. Mastering the type of knowledge and skills will be an advantage for new graduates when they apply for jobs. Particularly, the students do not need to be IT specialists, designing

a software is not a necessary competence in this case. The skill for future logisticians is using proficiently computers, smart phone as well as the electronic devices such as scanning machine for work. This will help new workers to easily use and understand systems and automation machine applied in their enterprises. Big data and blockchain are also needful for by logisticians because of the importance of information in winning the logistics market. The communication in logistics network is moving from offline to online, knowing the knowledge significantly assist logisticians in analyzing and manage the flow of information, then they can gain the competitive advantage for their enterprises.

### 10.3 Maximizing customization

As presented in the theory part, logistics contains a lot of activities and all of them are linked together to create a smooth supply chain. Because logistics is evolving into supply chain which a lot of parties work together to create a smooth flow of goods. The change of one activity can affect the total chain. For instance, late transport of a parcel can increase the period of leap day or changing storage plan. As a result, to optimally design and the chain, logisticians must understand about the operation of every stage and the whole network. Due to this, logisticians must know a huge amount of knowledge to be able to work. The wider network they have and the higher position they work, the more knowledge they must master. However, studying a bulk amount of knowledge can cause overload and stressful so the suggestion to solve this case is customizing the curriculum for each student. Future logisticians should identify which field and position in the logistics market they would like to work. For instance, if students want to be a forwarder, they need to know thoroughly about Incoterm, customs clearance. In case they want to be warehouse worker, they need to know a lot of information about labeling and packaging. Base on their desire, lecturers can consult them to create their own study plans. The plans will perform the competences they need to master, the critical competences will be prioritized to focus. By doing so, the students can identify what is the most essential competences for them and master them as soon as possible.

## 11 CONCLUSION

The thesis performs the contents of the logistics research from the preparation to results. The thesis includes the following critical parts conducted consecutively to bring out the final report.

- The information of the EFLE project
- Literature review
- Empirical data
- Result of analyzation and suggestions

The EFLE project is an international project which is created for the purpose of improving curriculum of logistics studying programs in universities. The project contains the individual researches about competences for future logisticians which is conducted by the logistics learners. Each learner studies about the corresponding domestic markets of the countries they are living. In the report, Finland is the targeted market.

The content of literature review is written on the conceptual framework. It includes the definition and development of logistics. The logistics situation of the world and the Finnish market as well as essential competences for future logisticians. Generally, online shopping and outsourcing are the biggest oriented factors for the development of logistics. To adapt to the demand of customers and businesses, global logistics has research and applied many innovations in terms of technology and social. Finland also is affected by the development trends. Logistics of the country mainly develop toward digital. Nowadays, due to the diversity of logistics markets, employers require different competences for logisticians.

The empirical data reveals the current situation of the local market, applications for development and necessary competences for workers through logistics managers' perspectives. The local market develops similarly to Finland and the world. Managers refer logisticians to have skills of problem solving, communication and working under pressure. They also would like their employees to be diligent and adaptive. The knowledge regarding of general business and fundamental logistics is obligatory for the workers. IT competence is another benefit for future logisticians while the involvement of information technology is more and more visible.

To help new graduates to acquire the essential competences before they join the labor market, practicality and customization are the three factors that should be maximized while IT competences should be updated in the studying programs. A learning environment that is as much as practical as possible will make student to be familiar to the real logistics work. Learners should also identify which participant they want to be in logistics market to create their own study schedule that specific competences are defined and mastered. A little insight about IT knowledge is always useful for future logisticians. The suggestions hopefully adjust the curriculum to response to the development of logistics.

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# INTERVIEW QUESTIONS

## THE PROJECT “FUTURE COMPETENCES FOR LOGISTICIANS” (EFLE PROJECT)

*The questions are used to interview logisticians working as managers. Based on the opinions of the interviewees, researchers will identify preferable logistics trends (studied by DHL) in local markets as well as suitable competences for future logisticians.*

### ☉ At a Glance: the Logistics Trend Radar

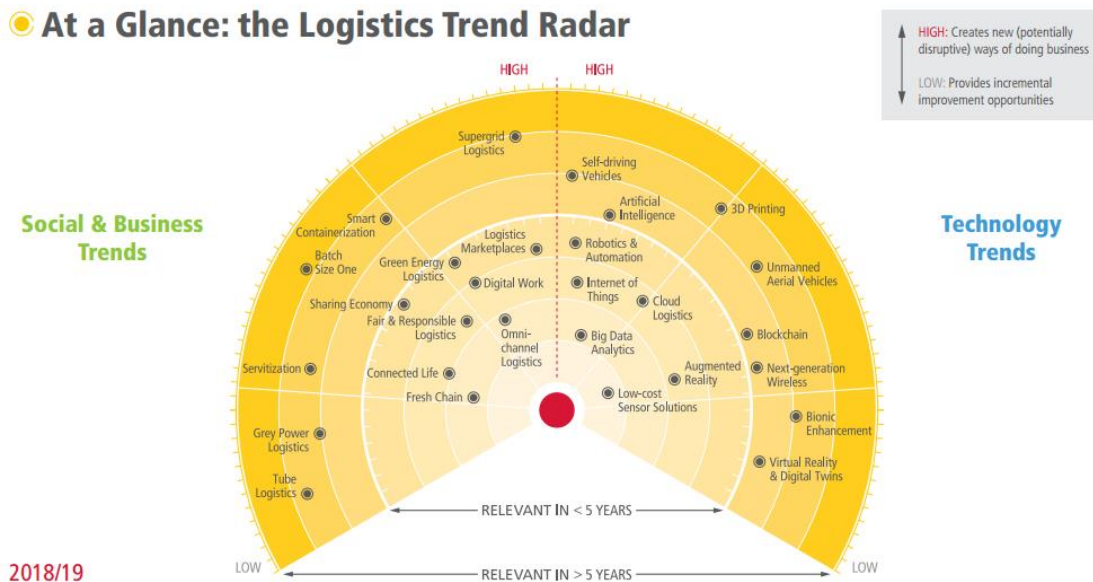


Figure 4: The Logistics Trend Radar 2018/2019 (researched by DHL)

### Interview questions:

1. Based on the research by DHL, logistics development trends are classified into two categories: social and technology trends. In your opinion, which trend will significantly affect the logistics field?
2. Which specific factors/trends will create significant competitive advantage for logistics companies in the future? Why?
3. Which trends your company will apply in the near future?
4. 5G is being developed in Finland, would your company apply it in logistics? And how?

5. Besides fundamental logistics knowledge, is there any knowledge that is necessary/obligatory for learners to acquire before becoming a logistician? (For instance: warehouse and inventory management, INCOTERM, customer service, etc.)
6. Which personal and business skills are critical for future logisticians? (For instance: personal skills can be foreign language, communication; and business skills can be planning, problem solving or analyzing.)
7. The applications of IT and digitization in logistics operations are increasingly important; as a logistician, do you think the knowledge and skills related to IT will become indispensable to work in the future logistics business? (For example: a logistician must acquire IT knowledge like big data, blockchain and data analytics, etc. as well as being able to use software or even know how to design a program to serve for logistics activities.)
8. Which attitudes should a logistician have when working with customers/co-workers to adapt to the new logistics development trends? (For instance: a logistician should be collaborative, positive, and adaptive, etc.)
9. What is the appropriate time for logisticians to acquire the competences in terms of knowledge, skills and attitude? Would it be at the university or when joining the workforce?

**End**

## APPENDIX 2

*Note: This is the latest version of the questionnaire until June of 2019. The document is the cooperation between Yulin Jiang and Ha Nguyen. Yulin Jiang is the editor of the document.*

Questionnaire for the survey

Introduction:

Dear Sir/Madam,

You are invited to participate in our online survey as part of the research regarding required future competencies for the logistics students (bachelor level). The survey is carried out by Kennis DC Logistiek Gelderland From Hogeschool van Arnhem and Nijmegen (HAN); and SAMK University of Applied Science in Finland, Hogeschool of Gent in Belgium. The aim of the research is to identify the required future competencies that a bachelor logistics study program should cover.

The intent of this survey is to gain to gain insight about the required future competencies for the logistics students (bachelor level) from Knowledge, Skill and Attitude aspects.

During this survey, you will be asked to answer 32 questions, it takes approximately 15 minutes.

Your participation on this survey is completely voluntary. You can withdraw from the survey at any point you want. Your response will not be used for other purpose except the one mentioned above. Your answers and personal data will stay confidential.

Thank you very much for your time.

### **Section 1: General questions**

1. What is the industry sector of your company?

Transportation service	
Transportation modes	
Logistics service provider	
Food retail and service	
Electronics and telecom	
FMCG; retail	

Healthcare	
OEM	
Chemicals	
Others	

2. What is your company business type?

B2B Business	
B2C Business	
Both	

3. What size is your firm? (in terms of employees)

Large-sized company (more than 250 employees)	
Medium-sized company (50-249 employees)	
Small and medium sized company (1-249 employees)	
Small sized company (10-49 employees)	
Micro company (less than 10 employees)	

4. What size is your firm? (in terms of turnover)

Large-sized company (more than 50 million euros)	
Medium-sized company (11-50 million euros)	
Small sized company (less than 10 million euros)	
Micro company (less than 2 million euros)	

5. In which function department that you are in the company?

HR	
Supply chain& logistics	
Procurement	
Business administration	
Finance	
Marketing	

Sales	
IT	
Others	

6. Which level is your position involved in the company?

Strategy	
Operation	
Tactical	

7. In which region that your company is conducting business activities?

Africa	
Asia	
Central America	
Eastern Europe	
European Union	
Middle East	
North America	
Oceania	
South America	
The Caribbean	

8. What is your age?

Below 25	
25-35 years old	
35-50 years old	
Older than 50	

9. How long have you been working?

3-5 years	
5-15 years	
15-25 years	
Over 25 years	

10. What do you think the popularity of applying IT technologies in your firm currently?

Departments activities	Very common	Common	Neutral	Not common	Rarely
Operating transportation activities					
Warehousing and inventory					
Control and monitoring information					
Communication in supply chain network					
General management					

**Section 2: Trends**

11. Which enginery technology trends that you think will be popular in near future?

Trends	Very common	Common	Neutral	Not common	Rarely
Self-driving vehicles (SVs) (ex: self-driving car, truck)					
Unmanned aerial vehicles (UAVs) (ex: drones)					
Robotics					
Internet of things (IoTs)					
3D printing (3D)					
Low-cost sensors solutions (LSSs)					
Artificial intelligence (AI)					

12. Which information technology trend that you think will be popular in near future?

Trends	Very popular	Popular	Neutral	Not popular	Not happening
Blockchain					
Big data analytics					
Cloud logistics					
Augmented reality					

13. Which enginery trends that you think will be applied in your company in the future?

Fill in scale 1 to 5 (1 is least possible, 2 is slightly possible, 3 is neutral, 4 is possible, 5 is most possible)

Trends	SVs	UAVs	Robotics	IoTs	LSSs	3D	AI
Department activities							
Operating transportation activities							
Warehousing and inventory							
Control and monitoring information							
Communication in supply chain network							
General management							

14. Which information technology trends that you think will be applied in your company in the future?

Fill in scale 1 to 5 (1 is least possible, 2 is slightly possible, 3 is neutral, 4 is possible, 5 is most possible)

Trends	Blockchain	Big data	Cloud logistics	Augmented reality
Departments activities				
Operating transportation activities				
Warehousing and inventory				
Control and monitoring information				

Communication in supply chain network				
General management				

15. Which customer-oriented trends that you think will be popular in the future?

**Batch size one** develops micro-production that satisfy high customizing demand and fast delivery.

**Connected life** provides innovative pick-up and delivery services based on the popularity of smart phone and home devices.

**Digital work** is the kind of job that requires high technical skills such as programmers of robotics in logistics operation.

**Fresh chain** is developed from online shopping increasing demand. It stimulates companies to create innovative solutions for cold-chain shipment (used to deliver fresh goods).

	Highly relevant	Relevant	Neutral	Not relevant	Hardly relevant
Batch size one					
Connected life					
Digital work					
Fresh chain					

16. Which type of logistics trends that you think will be popular in the future?

**Fair and responsible logistics** aims to increase social welfare and protect environment by creating a customer- and eco-friendly supply chain.

**Green energy** logistics encourage companies to utilize eco-friendly sources such as solar, wind in logistics operation, especially the last-mile delivery in urban areas.

**Grey power logistics** combines all logistics services that satisfy the delivery and transport demand of aging population.

**Omni-chain logistics** is creating a seamless supply chain which all of stakeholders operating logistics activities can interact to customers.

**Tube logistics** is created to decrease congestion in megacities. Companies will construct routes from tubes (Hyperloop) for cargo or passenger express.

**Supergrid logistics** is the model of orchestrating international supply chain network. It is the integration of many parties from different economy fields and due to this, develop business opportunities for them.

	Highly relevant	Relevant	Neutral	Not relevant	Hardly relevant
Fair and responsible logistics					
Green energy logistics					
Grey power logistics					
Omni-channel logistics					
Tube logistics					
Supergrid logistics					

17. Which smart business trends that you think will be popular in the future?

**Servitization** focus on business transformation from product-base to service-base to maximize customer-friendliness.

**Sharing economy** opens up opportunities for logistics service providers to increase their income by leasing their assets. (e.g. AirBnB, Uber)

**Smart containerization** applied technologies like IoTs, sensor or self-driving vehicles to create smarter activities and processes which involve containers.

	Very popular	Popular	Neutral	Not popular	Not happening
Servitization					
Sharing economy					
Smart containerization					

18. How important is the sustainability as the development strategy in your company?

Very important	Important	Neutral	Unimportant	Very unimportant

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19. How important is 5G technology for logistics industry development?

Very important	Important	Neutral	Unimportant	Very unimportant

### Section 3: Competency

Competences are the individual attributes of a person. Acquiring good competences leads to efficient performance in job. In the project, knowledge, skills and attitude are the three competences studied. Knowledge is information or facts acquired through education. Skills are abilities to perform certain tasks, they can be gained by training. Attitude is feelings or behaviour toward something.

20. How important is the competencies in terms of professional attitude for the logistics professionals?

Essential Attitudes	Very important	Important	Neutral	Unimportant	Very unimportant
Collaboration in network					
Positive and adaptive to troubles					
Entrepreneurship to adapt to new trends					

21. How important is the competencies in terms of personal skills?

	Very important	Important	Neutral	Unimportant	Very unimportant
Communication					
Decision-making					
Time management					
Leadership					
Reliability					

Language (other than English)					
Presentation					

22. How important is the competencies in terms of business skills?

	Very important	Important	Neutral	Unimportant	Very unimportant
Data analysis skills					
Task-prioritizing					
Project management					
Financial management					
Team working					
Problem-solving					

23. How important is the competencies in terms of IT skills?

	Very important	Important	Neutral	Unimportant	Very unimportant
System operation					
Programming (with SQL, Python)					
Big data					
Data-visualization					
Data analysis with software (SPSS)					

24. How important is the competencies in terms of knowledge about shipper business?

(please skip this question if you are not working at this type of company)

	Very important	Important	Neutral	Unimportant	Very unimportant
Transportation modes					

Import& export					
Custom					
Trade regulation					
Handling equipment relevant knowledge					
Route planning					

25. How important is the competencies in terms of knowledge about carrie business?

(please skip this question if you are not working at this type of company)

	Very important	Important	Neutral	Unimportant	Very unimportant
Transportation modes					
Laws and regulation					
Consolidation/ bundling					
Inbound& outbound logistics					
Custom tariff					
Warehousing					
Inventory management					
Capacity optimization					

26. How important is the competencies in terms of knowledge about forwarding business?

(please skip this question if you are not working at this type of company)

	Very important	Important	Neutral	Unimportant	Very unimportant
International transportations					
INCOTERM					
Risk management					

Labelling and packaging					
Routing design					
Customs and tariff					
Documentation and contracts					
IT application					

27. How important is the competencies in terms of knowledge about distribution business?

(please skip this question if you are not working at this type of company)

	Very important	Important	Neutral	Unimportant	Very unimportant
Warehousing management					
Distribution operation					
Service design					
Customer service					
sustainability					
Lean management					
IT application					

28. How important is the competencies in terms of knowledge about integrated logistics?

	Very important	Important	Neutral	Unimportant	Very unimportant
Transportation operations					
warehousing					
Inventory management					
Risk management					
Customer service					

Business and logistics regulations					
sustainability					
Lean management					
IT application					

29. What are the other future logistics trends from you point of view?

30. What are the other logistics competencies regarding skills from you point of view?

31. What are the other logistics competencies regarding knowledge from you point of view?

32. What are the other logistics competencies regarding attitude from you point of view?

### **Theoretical background**

**10, 12 & 14.** Activities included in supply chain

[https://en.wikipedia.org/wiki/Supply-chain\\_management](https://en.wikipedia.org/wiki/Supply-chain_management)

**20.** Distribution and logistics manager competency model (APICS) and Jugovic, T. P. & Vukic, L. 2016. Competencies of logistics operators for optimization the external costs within freight logistics solution.

**21,22.** Distribution and logistics manager competency model (APICS)

**23,24,25** Beniusiene, I., & Orzekauskas, P. (2008). Evaluation of professional competences of logistics managers in companies of Siauliai region.

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Salkhanova, Z., Akhmetzhanova, A., Jalamova, Z., & Kakisheva, N. (2015). The Concept of Knowledge Carrier's Competence in the System of Continuing Education.

26. SAMK's lectures of forwarding

27. <http://foundersguide.com/functional-areas-of-a-business/>  
<https://www.entrepreneur.com/article/190460>

28. combine 26 and 27

Section 2: trends, DHL Trend radar report 2018 (DHL Global, 2018)

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