**MYKOLAS ROMERIS UNIVERSITY**

**FACULTY OF PUBLIC GOVERNANCE AND BUSINESS**

**INSTITUTE OF BUSINESS AND ECONOMICS**

**IRENA FROLAND**

# APPLICATION OF NEW TECHNOLOGIES IN CUSTOMER SERVICE BY FREIGHT FORWARDERS (The United Arab Emirates case)

**A master's thesis**

**Supervisor**
**Dr. Jusif Seiranov**

**VILNIUS, 2021**

**MYKOLAS ROMERIS UNIVERSITY**

**FACULTY OF PUBLIC GOVERNANCE AND BUSINESS**

**INSTITUTE OF BUSINESS AND ECONOMICS**

# APPLICATION OF NEW TECHNOLOGIES IN CUSTOMER SERVICE BY FREIGHT FORWARDERS (The United Arab Emirates case)

**A master's thesis on freight market**

**Study programme 6211LX068**

**Supervisor**
**(signature) Dr. Jusif Seiranov**

**Performed by**
**stud.of group LVAvAmns20-1**
**(signature) Irena Froland**
**13 12 2021**

**VILNIUS, 2021**

# CONTENTS

# Tables

# Figures

# Acknowledgements

Completing this thesis could not have been possible without the guidance and support of thesis supervisor Dr. Jusif Seiranov . I would like to thank you for encouraging my research and allowing me to grow as a research scientist.

I want to thank you for your patient support and all of the opportunities I received to further my research.

I would like to thank Dr. Asta Valackienė. Her expertise was invaluable in formulating the research questions and methodology. Your insightful feedback pushed me to sharpen my thinking and brought my work to a higher level.

I would like to thank all the lecturers who were teaching me through this fantastic year and a half and University for giving me this opportunity to become who I am today.

# GLOSSARY

**Customer satisfaction** is the measure of how products and services supplied by a company meets or surpasses customers expectation or the percentage of total customers whose reported experience with a firm, its products, or its services ratings exceeding specified satisfaction or goals. When customers have high expectations, and the reality falls short, they will be disappointed and will likely rate their experience less than satisfying.

**Customer service** is the provision of service to customers before, during and after the purchase of any product. Customer service is a series of activities designed to enhance the experience of the customers. The sole purpose of the customer service is to meet the expectations of the customers so that they are satisfied with the outcome.[1]

**Digitalization -** is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business.[2]

**Digitization** is the process of converting information into a digital (i.e. computer-readable) format.[3]

**E-commerce** is the activity of electronically buying or selling products on online services or over the Internet.[4]

**Economic globalization** refers to **the increasing interdependence of world economies** as a result of the growing scale of cross-border trade of commodities and services, flow of international capital and wide and rapid spread of technologies.[5]

**Expat** -is a person who lives outside their native country.[6]

**Freight-** the transport of goods by truck, train, ship, or aircraft [7]

**Freight Forwarders**- a **freight forwarder**, **forwarder**, or **forwarding agent**, is a person or company that organizes shipments for individuals or corporations to get goods from the manufacturer or producer to a market, customer, or final point of distribution. Forwarders contract with a carrier or often multiple carriers to move the goods.[8]

**Freight Management** is the process of overseeing and managing a cost-efficient operation and delivery of goods. Freight management combines logistics experience, human resources, and knowledge to ensure smooth coordination between carriers and shippers.[9]

---

[1] https://entrepreneurhandbook.co.uk/what-is-customer-service/
[2] https://www.gartner.com/en/information-technology/glossary/digitalization
[3] https://en.wikipedia.org/wiki/Digitization
[4] https://en.wikipedia.org/wiki/E-commerce
[5] https://www.un.org/en/development/desa/policy/cdp/cdp_background_papers/bp2000_1.pdf
[6] Oxford Dictionary
[7] https://www.encyclopedia.com/social-sciences-and-law/law/law/freight
[8] https://en.wikipedia.org/wiki/Freight_forwarder
[9] https://supplychaingamechanger.com/whats-the-difference-between-freight-management-and-logistics-management/

**Globalization** is the spread of products, technology, information, and jobs across national borders and cultures. In economic terms, it describes an interdependence of nations around the globe fostered through free trade.[10]

**International freight forwarders** typically handle international shipments and have additional expertise in preparing and processing customs documentation and performing activities of international shipments. [11]

**Logistics -** is the process of strategically managing the procurement, movement and storage of materials, parts and finished inventory (and the related information flows) through the organization and its marketing channels in such a way that current and future profitability are maximized through cost-effective fulfilment of orders. (Christopher 2005)

- the activity of organizing the movement, equipment, and accommodation of troops the commercial activity of transporting goods to customers
- the detailed organization and implementation of a complex operation.[12]

**Logistics management** is the part of supply chain **management** and supply chain engineering that plans, implements, and controls the efficient, effective forward, and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption meet customer's requirements. [13]

**Supply Chain Management** encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies.[14]

---

[10] https://www.investopedia.com/terms/g/globalization.asp
[11] https://en.wikipedia.org/wiki/Freight_forwarder
[12] https://www.lexico.com/definition/logistics
[13] https://www.sciencedirect.com/topics/engineering/logistics-management
[14] https://cscmp.org/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms.aspx

# ABBREVIATIONS

**CRM**- Customer relationship management is a process in which a business or other organization administers its interactions with customers, typically using data analysis to study large amounts of information.[15]

**DP World-** Dubai Ports World is an Emirati multinational logistics company based in Dubai, United Arab Emirates. It specialises in cargo logistics, port terminal operations, maritime services and free trade zones.[16]

**ERP**- is an acronym that stands for **enterprise resource planning** (ERP). It's a business process management software that manages and integrates a company's financials, supply chain, operations, commerce, reporting, manufacturing, and human resource activities.[17]

**EZ Dubai**- E-Commerce Zone Dubai provides a range of logistics facilities and customized business solutions designed for startups, SMEs and multinationals. The aim is to support local, regional and transcontinental businesses serving both business-to-business and end-consumers.[18]

**GCC** - The Cooperation Council for the Arab States of the Gulf, originally known as the Gulf Cooperation Council, is a regional, intergovernmental political and economic union that consists of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.[19]

**LTL** – Less than truckload freight shipping (**LTL**) is used for the transportation of small freight or when freight doesn't require the use of an entire trailer. [20]

**MENA**- is an acronym that refers to the Middle East and North Africa. MENA countries- Algeria, Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates and Yemen. [21]

**TEU** - The twenty-foot equivalent unit is an inexact unit of cargo capacity, often used for container ships and container ports. [22]

**TL**- full truckload; shipments take up the space or weight limit of an entire trailer.[23]

**UAE**- United Arab Emirates

---

[15] https://en.wikipedia.org/wiki/Customer_relationship_management
[16] https://www.dpworld.com/
[17] https://dynamics.microsoft.com/en-us/erp/what-is-erp/
[18] https://www.dhl.com/global-en/home/about-us/delivered-magazine/articles/2020/issue-5-2020/ezdubai-a-catalyst-to-the-uaes-vision-redefining-the-future-of-e-commerce-in-the-region.html
[19] https://en.wikipedia.org/wiki/Gulf_Cooperation_Council
[20] https://www.freightquote.com/define/what-is-ltl-freight-shipping/
[21] https://en.wikipedia.org/wiki/MENA
[22] https://en.wikipedia.org/wiki/Twenty-foot_equivalent_unit
[23] https://www.freightquote.com/blog/less-than-truckload-vs-truckload-freight-whats-the-difference/

# INTRODUCTION

Since the mid-1990's when the Internet emerged and the Web came along, it started a massive transformation in commerce, trade and economic landscape. Innovative technologies, intelligent assistants, smart devices are surrounding us in everyday life. They help us, anticipate us, make everyday life and tasks more manageable. For example, the logistics industry has changed dramatically since World Wide Web emerged. Manufacturing, transportation, last-mile delivery – all these areas and services have improved exponentially and keep getting better and more intelligent with the emergence of technologies and Artificial Intelligence.

The outsourcing of logistics has been one of the determining trends of the global logistics industry. Logistics companies are expected to put forward operational efficiencies with investments in technology adoption. According to professor and author of "Global Supply Chain Management and International Logistics" Alan Branch, - "The development of international trade is driven by international logistics and management and the provision of the global supply chain. The ultimate objective of global supply chain management is to link the marketplace, distribution network, manufacturing/processing/assembly process, and procurement activity in such a way that customers are serviced at a higher level yet lower cost". (Branch 2008, p.2)

E-commerce is widely acknowledged as driving force of Logistics Industry. E-commerce and Digital phenomenon have changed the customer behaviour in buying and what service customers expect - a fast delivery, low price and free shipping. Those demands and delivery schedule challenges for traditional logistics and supply chain models and companies are now forcing them to adjust and readjust their strategies to provide low-cost and on-demand delivery service. E-commerce share is growing. This growth and demand undoubtedly impact the logistics and transportation industry as companies need to manage increased volume and delivery expectations.

As we progress, the pattern of international trade and services is in continuous change and challenge. It is becoming more complex and driven by many elements on a global basis. Today, companies and their entrepreneurs engaged in the worldwide business network formulate a strategic approach to conduct their business based on a logistics focus.

Globalization affects the world enormously. However, the global logistics sector during all years of development until the present time had been put through with some challenges, which were accompanied by structural changes, global obstacles to executing their international transport activities in the way of global sourcing. Consequently, the challenges mentioned above enabled global logistics firms to set up a customized logistics service provider -a freight forwarder.

Freight forwarders who can offer innovative online solutions in freight, customs intermediary services ( or brokerage services), and transportation management solutions are expected to transform the segment with enhanced customer experience.

**The novelty of the study.** Previous research suggested that, “Whether your supply chain depends on ocean shipping or moving your cargo via air freight companies, you likely are using freight forwarding services at some point. These companies organize, consolidate, and ship cargo using air, ocean, rail, and land shipping. However, recent economic, environmental, technological, and political changes keep this industry in flux.” (“Top 7 Challenges Freight Forwarders Are Facing Today - Asiana USA” n.d.)

Every sector of business has its challenges, but what are the challenges in the Freight market? What are the challenges in day-to-day operations freight forwarders are facing?

Since the beginning of the 20th-century, Logistics was facing a variety of challenges, political, economic. As a result, before the product reached its final consumer, it has to go through several stages and different countries.

Nowadays, you may see logistics facing a few more challenges than it was at the beginning of the 20th-century. The main challenges are: Transportations costs, Business processes improvement, **Customer service**, Supply chain visibility, Supply chain finance, Economic factors, Human resources shortage, Government regulations, Sustainability and **Technology advancement**.

The research focus is **the relationship between Technological progress and Customer service**, how it moves forward. How these challenges which freight forwarders are facing interconnected.

This thesis investigated new technologies in customer service used by freight forwarders. And focus continued about the United Arab Emirates specifically. Paper assessed and analyzed the modern technologies, new tools, and how to improve customer service, sales, velocity and performance of freight forwarders.

Keshavdas M., Co-founder of Wexoz technologies, in the article “Top 10 Challenges Logistics Companies Are Facing In 2019”, have an obvious solution for logistics companies to above-stated challenges by saying: “Adopting new and innovative technology solutions has become imperative for logistics companies. But, given the above challenges, can logistics companies meet rising customer expectations and generate profits and growth? Yes, the answer is

- provided they remain flexible and committed to upgrading technology, people, and processes. Constant evolution is the name of the game."[24] (Keshavdas n.d.)

New Technologies, software, and applications have become widespread in customer services to improve customer experience and reduce cost and reliance on humans to provide consistently good customer service.

This **scientific research is about** the application of new technologies in customer service used by Freight forwarders, opposite of the general digitization of the logistics sector. Previous research suggested that, "There is strong research needs to address the key technical issues of IoT, promote various IoT technologies in logistics practice, and jointly develop advanced information and communications technologies and management systems. "(Ding et al. 2020)

This thesis analyses the technological trends that are transforming the Freight Market by applying new technologies such as Artificial Intelligence, Internet of Things IoT, Cloud computing, Cybersecurity, Big data analytics and other technological pillars of Industry 4.0.

To understand and analyse this phenomenon following authors were reviewed A. Rushton (2017), P. Croucher (2017), P. Baker (2017), P. Murphy (2018), M. Knemeyer (2018), M. Christopher (2005), and M. Levinson(2016) etc. and Logistics Industry professionals cited such as J. Treimane, M. Millar and C.M. Roberson.

**Statement of the scientific problem**. The application of new technologies by any industry or any player can generate more productivity, connectivity, safety, efficiency, flexibility. Industry 4.0 helps to improve all these mentioned factors. According to several authors [25](Michael Rüßmann, 2015) "Industry 4.0 also lays the foundation for adopting new business models, production and innovation".

Uckelmann, in his research paper "A Definition Approach to Smart Logistics" from 2008, refers to Industry 4.0 and Logistics 4.0 as "Smart Logistics". As Smart Logistics" will change according to the actual technology used, it has a time dependency; thus, it is essential to seek out state–of–the–art technology". (Goos et al. 2008)

Smart logistics or Logistics 4.0 brings companies closer to customer needs. It gives innovations such as intelligent containers, intelligent warehouses, autonomous trucks, and AI-driven technologies to increase velocity and enhance customer service. For freight forwarders agility, cost-saving and customer satisfaction is the leading force of the business.

This scientific paper is approaching the aim by raising the following **research questions and hypotheses:**

---

[24] https://fleetroot.com/blog/top-10-challenges-facing-logistics-companies-in-2019/.

[25]https://www.bcg.com/publications/2015/engineered_products_project_business_industry_4_future_productivity_growth_manufacturing_industries

1. What are the dynamics of digitization in the Freight Market posed by customers' growing demands?

2. Customer satisfaction is a vital metric for companies. What companies need to understand in customer processes to keep them satisfied?

3. What is the future of Freight Forwarders if/when digitization will cover the main tasks of the "middle man"?

After the research questions following hypotheses were raised:

1. ***Hypothesis:*** Technological advancements in digitization have transformed the business and operational landscape of the global freight transportation industry.
2. ***Hypothesis:*** Data-driven insights help freight operators move forward and gain a competitive advantage over their peers with improved and easy to use service.
3. ***Hypothesis:*** The balance of technological advancement and replacement of human tasks by machines and smart logistics tools must be balanced and controlled.

**The object of this study** is the latest technologies applied and used by Freight Sector in customer service.

**The subject of the study** is application of new technologies in customer service by Freight Forwarders in the United Arab Emirates.

**Research aims** to investigate the relationship between technological advancement and customer service in Freight Market.

**Research Objectives:**

1. To analyze the conceptual framework of freight market and types of freight forwarders
2. To evaluate Customer service importance in logistics.
3. To investigate and get the perspective about technologies and the newest technologies available in the freight market to improve customer service.
4. To investigate the application of new technologies in customer service by freight forwarders in the United Arab Emirates.

**Methodology of the research**. Mixed methods research is chosen for this study. According to (Creswell 2014, p. 76), the core assumption of this form of inquiry is that the combination of quantitative and qualitative approaches provides a more complete understanding of a research problem than either approach alone."

**The purpose of this study** was to investigate the relationship between technological advancement and customer service in a Freight market. A mixed methods research has provided a

comprehensive framework for the study and answered the research questions and tested hypotheses. The study included both quantitative and qualitative data gathered by conducting correlational and phenomenological approaches. The quantitative data was used to test the theory that predicts that digitization or Industry 4.0 is influencing the logistics processes general and it also benefits the customers with better and faster service by collecting numerical data. The qualitative data explored descriptive data gathered by applying case study and interview methods. The two forms of data were combined and analysed by applying explanatory sequential design method.

**The scope of the research.** The paper investigated new technologies trends available in today's freight market and chosen region. How digitalization of the business increases the sales, velocity, cost-saving and customer satisfaction.

**Methods of data collection.** Following steps and methods were applied to collect the data.

1. To get the primary understanding of Freight forwarders, Customer service in Logistics and Freight from the literature review and available scientific articles.
2. Analyze the interconnection between Industry 4.0 and Logistics 4.0.
3. Two case studies selected and analysed: one local freight forwarder and one international freight forwarder.
4. To interview industry professionals about the impact of the technologies on business and customer service to solicit responses.
5. Conduct desk research to create a perspective of business digitalization and trends.

**Theoretical value of the thesis.** The relationship between Technological progress and Customer service for the Freight and logistics industry is imperative. The outsourcing of logistics has been one of the determining trends of the global logistics industry. On the contrary, freight companies are expected to put forward operational efficiencies with investments in technology adoption.

This research answers why the study was needed after Qualitative research was completed and conclusions were made. What is missing and needs to be done to make less of the challenge of technological advancement and customer service that logistics and freight companies face today.

Furthermore, this study provides sufficient evidence to conclude that dependence on efficient business digitalization also depends on the region and country, technological advancement, labourer and maturity of the market.

**The practical value of the thesis.** This research can be used as a reference for the companies to see the possibilities and gives an understanding of the pivotal role of digitization of their operations to compete in the present world of Industrial Revolution 4.0.

This thesis can be used as an additional source of information for other students who wants to conduct further research on the related field.

**Structure of the thesis.** Chapter one is about the conceptual framework of the freight market. Theoretical material from scientific articles, academic publications and online sources systematized by the author. It covers the concept of the Freight Market, the understanding of the status of emerging technologies and their influence on the market. Industry 4.0 technologies in the freight market and dynamics in the market. The importance of customer service in the logistics sector is stated by and reviewed relationships with technologies.

Freight Market in the United Arab Emirates and emerging technologies on the market discussed. Country logistics' market, technological readiness, and current trends analysed.

The theoretical material and thoughts of industry professionals in this chapter summarize how huge the Freight market is, the fundamentals of the market, business digitalization and customer service importance.

Chapter two is about the design of the study. This part is about establishing a research model and analyzing the problem.

Chapter three's analytical part is about accessing research data based on research methods. An analytical table and figures are provided together with numerical data to do it.

The main conclusions of the research and recommendations are presented in the Conclusions and recommendations part, which is the last part of the thesis.

Annexes sequence based on the empirical data order provided in the paper. The structure of the Master thesis (see Fig.36) is attached in Annex 1.

# 1. CONCEPTUAL FRAMEWORK OF FREIGHT MARKET: FORWARDERS, TECHNOLOGIES, AND CUSTOMER SERVICE

*"There are tens of thousands of books about logistics and supply chains. Literally.*
*Amazon has 31,817 books about the supply chain and 24,934 about logistics.*
*That's 6,751 supply chain and logistics books.*
*All those books would weigh 49,000 kilograms – half the cargo mass of a Boeing 747-200F.*
*Stacked, those books would be as tall as 10.7 Empire State Buildings".*[26]

*By Eytan Buchman, CMO, Freightos*

This chapter covers the concept of the Freight Market, the understanding of the status of emerging technologies and their influence on the market. Scientific literature is reviewed and analysed. Literature source was connected to the research aim and questions.

Emerging Digital Freight Forwarders, who are they and what is the dynamics between long established logistics companies and players as such. Chapter also covers recent developments of cutting-edge technologies in the freight market and dynamics in the market. Framework of Interconnection between Industry 4.0 and Logistics 4.0 discussed and presented. How technologies offer a wide range of capabilities to logistics companies, from autonomous machines to artificial intelligence. From the invention of the steam engine and the automated digital production, all industrial revolutions and mainly the 4$^{th}$ one, have led to significant changes in the logistics process. Sustainable and automated processes have emerged and reshaped the industry.

The importance of customer service in the logistics sector and relationship with technologies reviewed. The following subchapters also provide some qualitative and quantitative information about freight market players, about market share and technologies. Customer service importance analyzed and opinions gathered from industry professionals and scientific literature. What are the newest technologies used in customer service and why it is needed? Their benefits and flaws if such.

The last subchapter is about the Freight Market in the United Arab Emirates and emerging technologies on the market. Information provided familiarize the reader with the country logistics' market trends, technological readiness, current trends together with some statistical data. A brief overview about the sector disruptions by COVID-19 looked over.

Conclusions of this chapter summarize how immense Freight market is, the fundamentals of the market, business digitalization and customer service importance.

---

[26] https ://www.freightos.com/10-books-logistics-and-supply-chain-experts-need-to-read/

## 1.1. Freight Forwarders concept

There is an enormous number of resources to analyse and assess the freight market. Multiple theories, multiple problems addressed and discussed. Myriad researches have been done since the term “freight” concept appeared in the 15th century and Logistics development began in 1939.

Since medieval times, freight forwarders have organized transportation on behalf of a) shippers, by air, ocean or land, and b) carriers, to get physical goods from A to B. They have contracts with carriers to move goods and guarantee loading capacity at stable prices. They allow for consolidated invoicing because shippers do not need to interact with all the carriers, ground handling agents, customs agents, etc. involved, but only with a single counterparty. In the process, freight forwarders have become supply chain, warehousing, packaging, and documentation experts, too. (Deloitte 2019)

Freight forwarders play an essential part in the whole supply chain. They perform a crucial role in complex and sensitive transportation operations to move product from the supplier to the final consumer without damaging or delaying it. And this must be done in perfect condition - per se 7R (Getting the Right product, in the Right quantity, in the Right condition, at the Right place, at the Right time, to the Right customer, at the Right price).

Freight companies provide door-to-door solutions and reach the final consumer or delivery point. They do not do only customs clearance, documentation, and handling, but arranging different modes of transport and supervision of all aspects of transportation to ensure the best possible and cheapest way to make the arrangements to deliver. Freight forwarders usually have worldwide networks and offices to work and perform efficiently.

“The handbook of logistics and distribution management” by Alan Rushton gives a brief job description of Freight Forwarders as following: “Because of the particular complications concerning import and export documentation, as well as for other reasons, many companies use the services of freight forwarders.

Typical services that are offered include:

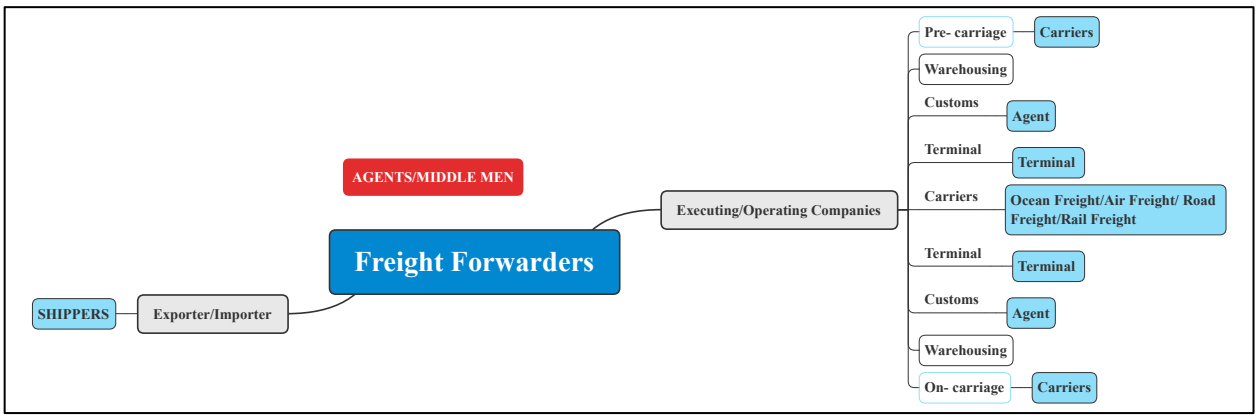
- preparation and checking of shipping documents;
- booking space with carriers;
- arranging the order collection from the point of origin to the shipping port;
- arranging the customs clearance and final delivery at the destination country;
- provision of advice in export regulations, documentation requirements, etc.;
- detailed knowledge of carriers, ports, etc.;

- understanding of the different modes of international transport;
- knowledge of the various costs associated with other transports modes and destinations.

Many freight forwarders act as principals to the transport contract, for example, by providing road and container groupage services or air freight consolidation. In these situations, the freight forwarder takes responsibility for the transport, rather than just acting as an agent." (Rushton, 2017, p.444)

A freight forwarder is the go-between representative who acts as an intermediary between a shipper and the preferred transportation service carrier. Hiring a freight forwarder to import and export goods on your behalf can make the process much less daunting and stressful. This is because the freight forwarder acts as a middleman who strings together all the executing / operating companies and their services for the process of shipping goods from the shipper (exporter) to the consignee (importer). ("Freight Shipping (Import) to Amazon FBA Warehouses in Europe" n.d.) (see Fig.1.)

**Fig.1. Infographic. Industry players and Freight Forwarders role in it.**



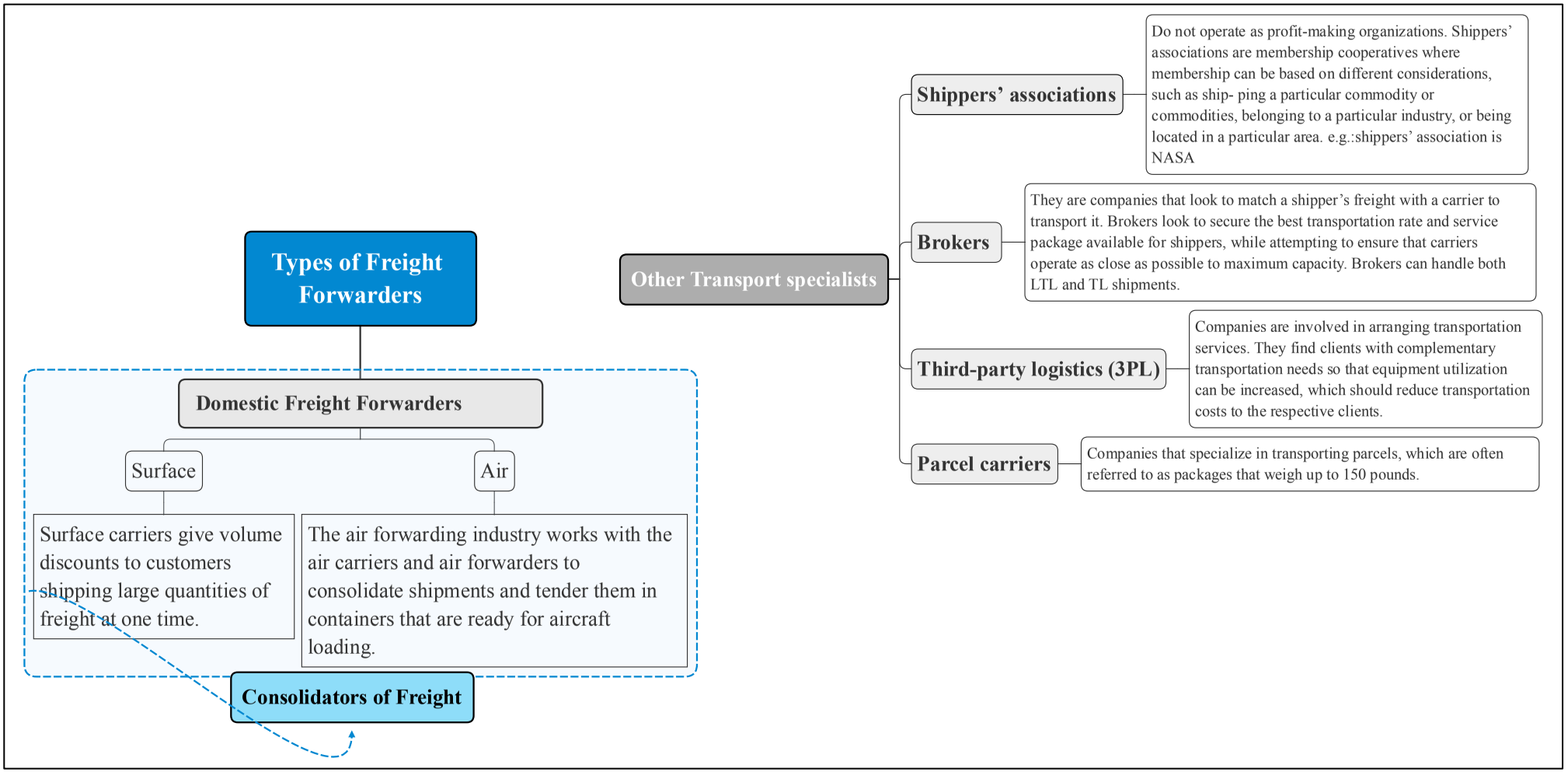

Compelled by the author. Source: Multiple sources.

On the top level, there is an exporter who needs to ship goods to an importing company. The forwarder is the middleman who arranges the essential services required to place the shipment. Freight Forwarding business is a "Relationship Business". This means setting pre-carriage, warehousing, appointing a customs agent, organize terminal handling, sea freight, and the same local services after arrival at the port of discharge. A forwarder does not move the goods but acts as an expert in the logistics network. The carriers can use a variety of shipping modes, including ships, airplanes, trucks, and railroads, and often use multiple transportations for a single shipment. ("Freight Shipping (Import) to Amazon FBA Warehouses in Europe" n.d.)

### 1.1.1. Types of freight forwarders

It is effortless to get confused about who are freight forwarders and what they do? To understand the differences between transportation specialists, Paul R Murphy in Contemporary Logistics book explains that “Freight forwarders are not modes, but from the shipper's viewpoint, they are analogous to other carriers. There are two types of domestic freight forwarders - surface and air, and they can best be thought of as consolidators of freight.”(Murphy, 2018, p. 231) Fig.2. explains transportation specialists’ categories, the difference between them, and how they operate.

**Fig. 2. Transportation specialists explained**

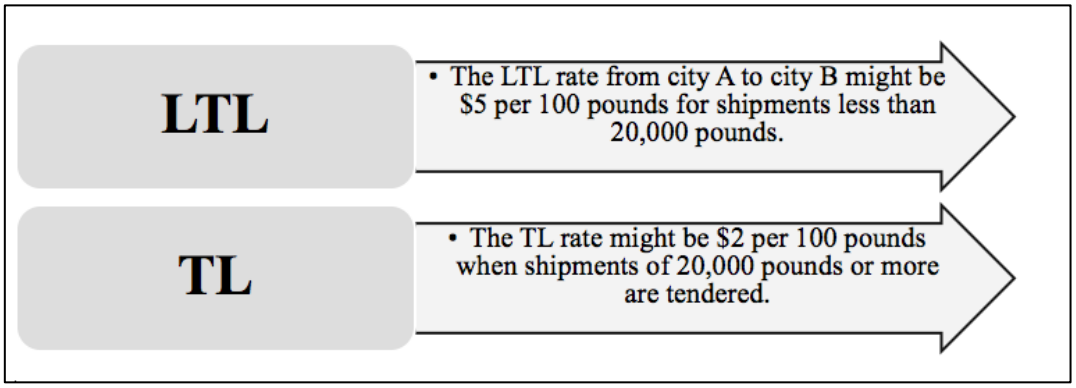



Compelled by the author. Source: (Murphy, 2018)

Surface carriers give volume discounts to customers shipping large quantities of freight at one time. The freight forwarder exists by offering a service to shippers that use LTL ( Less than truckload or Less than truckload freight shipping )rates because they do not generate enough volume to use TL( full truckload) rates. (Murphy, 2018)

The transport of freight that does not require the entire space of a truck is also known as less than truckload (LTL) shipping, whereas full truckload (TL) shipments take up the space or weight limit of an entire trailer.( see Fig.3) (Freightquote, 2019)

**Fig.3. LTL and TL rates example**




Compelled by the author. Source: (Murphy, 2018)

TL are lower than LTL rates for three reasons:

- the shipper loads the goods, and the consignee unloads the trailer;
- the load goes directly from shipper to consignee without passing through terminals;
- paperwork, billing, and other administrative costs are little more for a 25,000-pound shipment than they would be for a 250-pound load.

Without the freight forwarder, the shipper has to use the $5 rate for LTL. However, the freight forwarder offers the same transportation service for a rate between the LTL and TL rate—say, $4 per 100 pounds.

This is possible because the freight forwarder consolidates enough small shipments to reach a volume of at least 20,000 pounds and thus qualifies for the $2 per 100 pound TL rate. ( Murphy, 2018)

### 1.1.2 Digital Freight Forwarder

As players in the logistics industry look towards digitalization to improve the efficiency of their operations, on the other side of the spectrum, some players aim to make life easier for those

looking for logistics solutions. These are so-called digital freight forwarders, which utilize their developed platform to connect shippers and carriers at a moment's notice, facilitating the relationship between a carrier and a shipper momentarily. For example, digital freight forwarders offer their customers the ability to get a solution provider not by the brand name, as in the company, but the trucks that are available on the platform. Connecting a customer and a truck directly removes the middle man, making the process of booking a full truckload (FTL) delivery, in theory, much more manageable.

While digital freight forwarders have recently come onto the scene, the concept of a service that directly connects a service provider, such as a person who wants to rent out an apartment, and a user looking for temporary accommodation, is nothing new. Such companies, whether it would be Airbnb or Uber. ("Digital Freight Forwarders: The Future of Logistics?" 2021)

Digital freight forwarder or online cargo agent is an international ocean freight company that accelerates the process of booking and managing your ocean freight shipment with technology. (More, 2021)

Traditionally slow to capitalize on new technologies, freight forwarders feel the pressure to keep pace with the rapid digitalization and automation. With industry competition intensifying, the race to establish market-leading positions built on the latest technologies and innovations is now well and truly on, with key players going head to head to deliver the optimal customer experience. A staggering array of e-business companies have come to the fore, promoting a range of new digital services designed to take costs and inconveniences out of shipper supply chains. Some market themselves as cloud-based e-forwarders and brokers or online sales platforms, while others manage freight rates and data and sell information. (DHL 2020)

In road freight, the battle to 'Uberize' trucking has been ignited by the emergence of digital freight marketplaces like Saloodo!, a subsidiary of Deutsche Post DHL Group (DPDHL), which enables shippers to search for road freight carriers, and carriers to find cargo shipment requests, at the click of a button. (DHL 2020)

Qafila, the Middle East's first digital freight forwarder, recently announced the availability of its digital freight forwarding services with live notifications and updates on a mobile app. The company was accepted by in5[27], an enabling platform for students, entrepreneurs and startups into its incubation programme in 2018. Dubai-UAE based Qafila's digital freight and logistics platform, the first in the region in this sector, is currently offering logistics support for FCL (Full

[2727] * in5 is an enabling platform for entrepreneurs and start-ups, offering five key benefits through its robust start-up framework, creative spaces and specialised industry centres, training and mentorship programmes, community-wide networking events and access to investors. in5 nurtures ideas and businesses to their next phase of growth.

Container Load) by ocean and air shipments and LCL (Less Container Load). (“Qafila Launches UAE’s First Digital Freight-Forwarder Platform – LogisticsGulf” 2019)

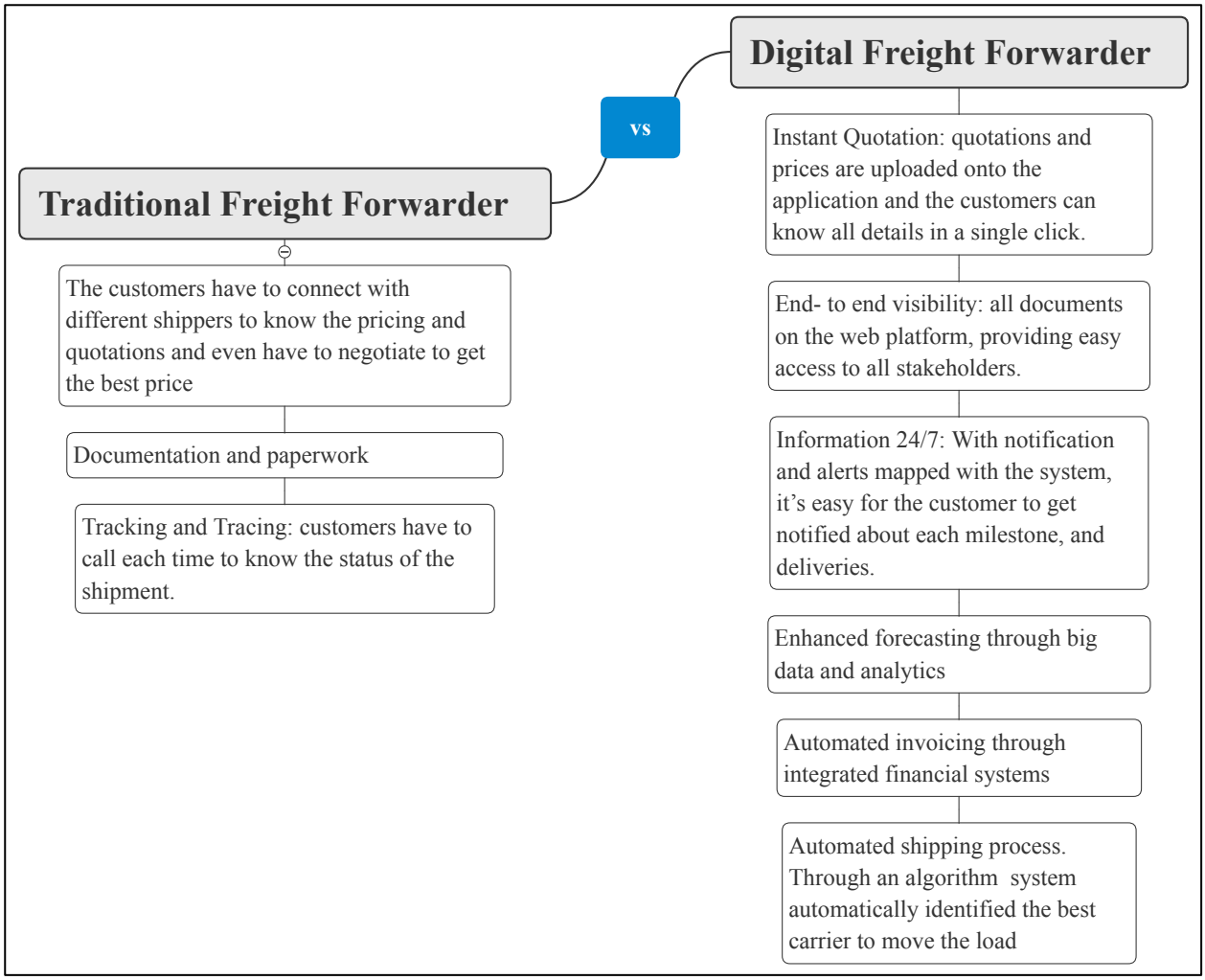
Over the past years, there has been a remarkable increase of digital freight forwarders. It is the result of the imminent need for digital transformation that has been growing in the logistics industry.(van der Biest , 2018)

Digital Freight Forwarders like Freighthub, Flexport or marketplaces such as Freightos were founded in the last five years. New players enter the freight market by developing innovative business models that will improve customer experience and operational inefficiencies.

Why do digital freight forwarders exist? Did you know that it can take up to 100 hours to finally get a price quote for your cargo? That’s how long it takes most freight forwarders to fill out and check shipping documents within several interactions via email. Would you wait one week for a quote if you could get it in seconds? They automate back-office and operations to save costs of approx. 40% through digitalization. Yet some traditional freight forwarders still rely on emails, personal handoffs and even faxes!  (Frese, 2019)

To understand the difference between traditional Freight Forwarder and Digital, (see Fig.4) a few differences between the Traditional Freight Forwarder and Digital Freight Forwarder are presented. Traditional business model as mentioned previously – is a” relationship business” and digital is about agility, visibility and automated processes. With traditional model customer gets more personalized service, where digital model can provide only “one size fit all”.

**Fig. 4. Traditional Freight Forwarder vs Digital**




Compelled by the author. Source: multiple sources.

In other words, digital freight forwarders are mainly leaning on technology to be more efficient and to offer a better customer experience, which is giving them a lot of profit too. Only in 2017 Flexport, a digital freight forwarder handled 80.000 TEU. (van der Biest, 2018)

Digital Freight Forwarder is compared with Uber and Airbnb, but Uberization means not delivering, but only connecting people or companies with the service providers or delivering companies. The dynamics between the shipper and the broker is heavily based on relationship. And as for now, it is pretty complicated to say that Digital Freight Forwarder has a more considerable competitive advantage than Traditional Freight Forwarder and will take the front row.

## 1.2. Customer service role in logistics

Customer service is vital. It surrounds us from every corner, every viewpoint of services and products we get, we use, we consume daily. We can see the label or screen of "customer service"

everywhere (to give your opinion, complaint, or give credit), for example, even when you fly. At the airport, you go through the security checkpoint; after you went through the scanner, collected your items, you can see at the exit point "screen to press"- a sad smiley, or happy smiley, or maybe a bit upset smiley. Nevertheless, the Security checkpoint will be defined as customer service.

Customer service in logistics can be a bit different -it is variety of relationship such as B2C, B2B and so on, but the level of importance of customer service is the same as in any other businesses. It is a life force of the business and the essence of customer service in logistics is to develop a relationship where customers want to endure over the time.

Nowadays, logistics as a discipline became very sophisticated and management of logistics require more than it was before, if to compare 20 years ago. It became an apparatus of processes involving industry professionals, engineered and sophisticated processes and advanced technologies. All these components are not visible to the customers, because a good customer service it is a way to make complex processes easy.

To evaluate Customer service importance in logistics, sampling of utterances of the following authors are presented in the Table 1.

**Table 1. Customer service role in logistics**

| Customer service role in Logistics | Author |
|---|---|
| "Customers are important to organizations, and organizations that view customers as a "nuisance" may not last very long in today's highly competitive business environment. Consider several metrics associated with unhappy customers. A frequently cited metric is that it costs approximately five times more to develop a new customer than to retain an existing one. | (Paul R. Murphy, Jr., A. Michael Knemeyer - Contemporary Logistics, Global Edition, 2018, page 137). |
| "The whole purpose of supply chain management and logistics is to provide customers with the level and quality of service that they require and to do so at less cost to the total supply chain. In developing a market-driven logistics strategy, the aim is to achieve 'service excellence' consistently and cost-effectively. | Logistics & Supply Chain Management creating value-adding networks (Christopher, 2011, p.65) |

Continuation of Table 1

| Customer service role in Logistics | Author |
|---|---|
| "For any company or organization, it is vital, therefore, to have a clear definition of customer service and to have specific and recognized customer service measures.<br>The role of customer service as a critical success factor for most companies and satisfying the customer is the key to achieving competitive success. Companies that fail to appreciate this do so at their peril because they may lose significant market share. | The Handbook of Logistics and Distribution Management Understanding the Supply Chain ( Rushton, 2017, page 33, 55) |
| "If you're looking at your budget and considering cutting back on support for customer service, you might want to reconsider. About 96 per cent of unhappy customers do not take the initiative to tell you they are unhappy with your service, but they will tell nine other people and not return. Customer service should be as important to you as it is to your customer, and customer service is second in importance only to product quality when it comes to satisfying customers." | (Jessica Tremayne, The science of service, Smart Business, 2009) |
| The uncertainties of global logistics activities were categorized by Bowersox and Closs (1996). They identified the '4'Ds' 'f uncertainty as distance, demand, diversity, and documentation.<br>In practice, what Bowersox and Closs were referring to were:<br>• longer transport distances;<br>• increased uncertainty of demand;<br>• diversity of culture and administration;<br>• the wide differences in the documentation required to facilitate international freight movements.<br>However, in the 21st century, we may add a fifth 'D' (4 Ds + 1) to this list: the increasing desires of customers who expect both the lowest prices and the highest standards of service. This is the environment within which freight forwarders operate. | The Handbook of Logistics and Distribution Management Understanding the Supply Chain, 2017 (Rushton 2017, p.602) |
| "Customer service is inextricably linked to the process of distribution and logistics." | (Rushton, 2017, p.33) |
| Achieving "service excellence" is the key priority of the whole industry. The goal was not to confirm it but to see the significance level in relation to the Freight industry. Leaders start with the customer and work backwards. They work vigorously to earn and keep customer trust. Although leaders pay attention to competitors, they obsess over customers. | Amazon Leadership principles.[28] |

Source: composed by the author.

[28] https://a-data-driven-guy.com/amazons-16-leadership-principles/

The observations above are all from “logistics and supply chain giants” and professionals who have extensive logistics, economics, and freight forwarding carriers. They have performed research and stated in various ways how Customer Service is essential and where it stands.

Alan Rushton, Phil Croucher and Peter Baker in The Handbook of Logistics and Distribution Management dedicated the whole chapter to Customer service and its importance to companies and businesses. Furthermore, customers are essential, and customer service's role is critical for success factor in any business. Therefore, achieving “service excellence” is the key priority of the whole industry.

## 1.3. Industry 4.0 and Logistics 4.0

In this subchapter some results of research done by the author are presented (Froland, 2021, p. 59-68) of “Analysis of the Interconnection between Industry 4.0 and Logistics 4.0”. A brief information about the Interconnection to understand the timeline and development of digitalization and the impact on logistics.

### 1.3.1. The Framework of Industry 4.0

The integration of physical operations in industrial production, information, and communication technologies is called Industry 4.0. (Paksoy et al.,2021)

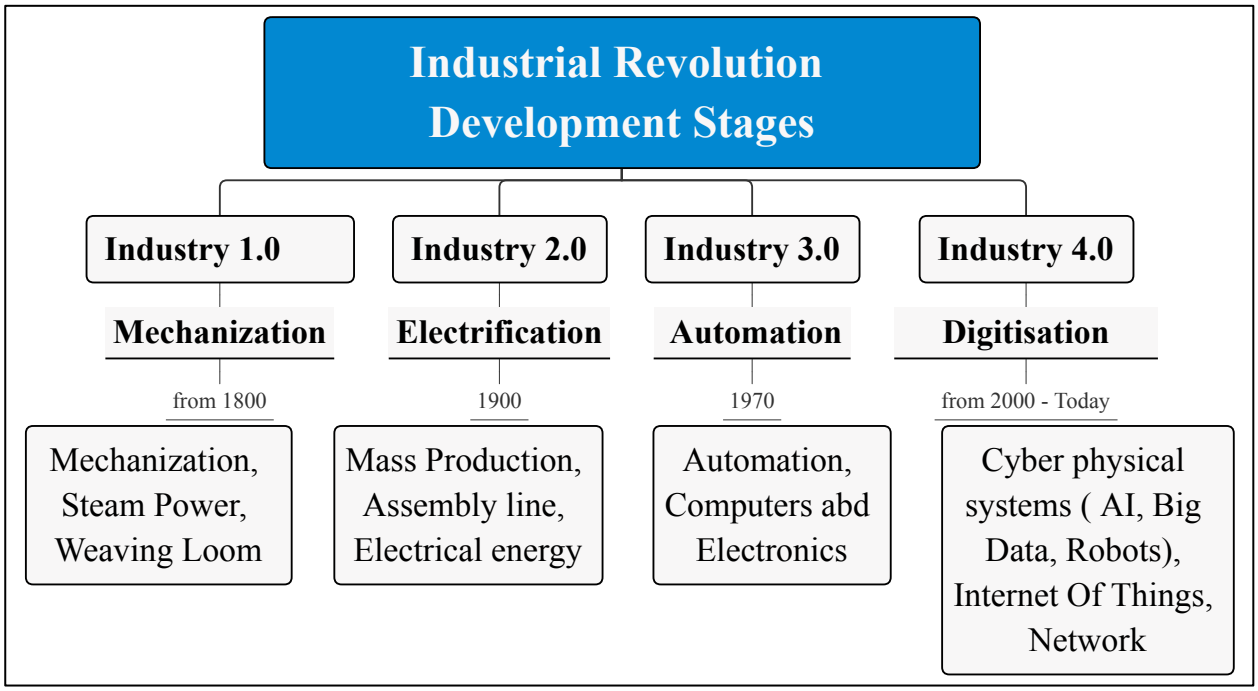
The industrial revolution is counted as one of the main historical events of development in human history.(Stearns 2012) It shaped how people work and live, how things are manufactured, transported and sold. And it continues to shape the industries and the world.

Manufacturing and service industry has been broadly affected by the past industrial revolutions. Swift changes in manufacturing and service systems caused by industrial revolutions led to improvements in productivity for the companies. From the invention of the steam engine to digital automated production, the First Industrial Revolution and the following revolutions have led to significant changes in the manufacturing process. As a result, ever more complex, automated and sustainable manufacturing systems have emerged. (Paksoy et al., 2021)

**The shift in action.** “In 1985, the Cray-2 supercomputer was the fastest machine in the world. The iPhone 4, released in June 2010, had the power equivalent to the Cray-2; now, the Apple Watch has the equivalent speed of two iPhone 4s just five years later. With the consumer retail price of smartphones tumbling to below $50, processing power skyrocketing and adoption in emerging markets accelerating, nearly everyone will soon have a literal supercomputer in their pocket.” (Schwab, 2017, p.304)

**Industry development stages.** Innovation in logistics began long ago with the mechanization of transport enabled by trains, cargo vessels, and automobiles. However, after being evolved to the systemization of logistics, based on electronic communications, logistics is increasingly moving towards automation with the help of crucial Industry 4.0 technologies such as IoT, AI, Big data and Blockchain.Industrial revolution development stages and timeline (see Fig.5.)

**Fig.5. Industrial revolution development stages**




Prepared by the author. Source: multiple sources.

The Industry 4.0 initiative has attracted stakeholder's attention due to its ability to apply a bundle of technologies to execute more efficient production systems. This initiative has been accepted as the Fourth Industrial Revolution by many due to its high potential. Connecting physical items such as sensors, devices, and enterprise resources to the internet are major attributes for industrial manufacturing in Industry 4.0.(Alexopoulos, 2016)

**The development of containerization.** The shipping container has made revolutionary changes in the shipping industry and cargo handling. The book The Box, Mark Levinson, is about the Shipping Container and how the construction of a container made the world smaller and the world economy bigger. The intermodal container was upraised and created a massive impact on the shipping industry. It is a history about the "Father of containerization", Malcolm Purcell McLean, a business entrepreneur. He developed the modern intermodal shipping container, which revolutionized transport and international trade in the second half of the twentieth century.

"Malcolm McLean's had a great managerial insight and understood that transport companies' true business was moving freight rather than operating ships or trains."( p. 16). He was looking for solutions how to simplify his business by saving time and resources when shipping goods.

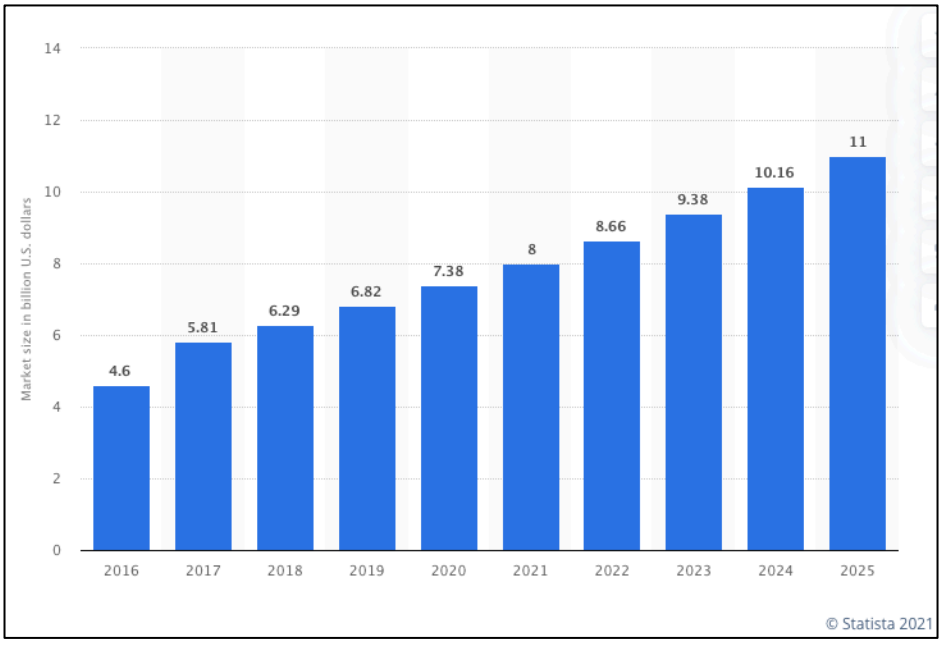
"That understanding helped his version of containerization succeed where so many others had failed" (Levison, 2016, p. 17). This idea to create one single standard to ship goods – a box – has shaped how good are manufactured and transported today.

"On April 26, 1956, a crane lifted fifty-eight aluminum truck bodies aboard an ageing tanker ship moored in Newark, New Jersey. Five days later, the Ideal-X sailed into Houston, where fifty-eight trucks waited to take on the metal boxes and haul them to their destinations. Such was the beginning of a revolution".(Levinson, 2016, p.27)

**Size of the global shipping containers market between 2016 and 2025.** In 2016, the global shipping containers market was worth about 4.6 billion U.S. dollars, and its size is expected to reach 11 billion U.S. dollars by 2025. Between 2017 and 2025, the Freight sector market size was forecasted to grow at a compound growth rate of 8.3 per cent. (see Fig.6.) ("• Global Container Shipping: Market Size | Statista" n.d.)

United Arab Emirates Container Port Throughput was reported at 19,171,000.000 TEU in Dec 2019. This records an increase from the previous number of 19,054,000.000 TEU for Dec 2018.[29]

**Fig.6. Size of the Global shipping containers market (between 2016 and 2025)**



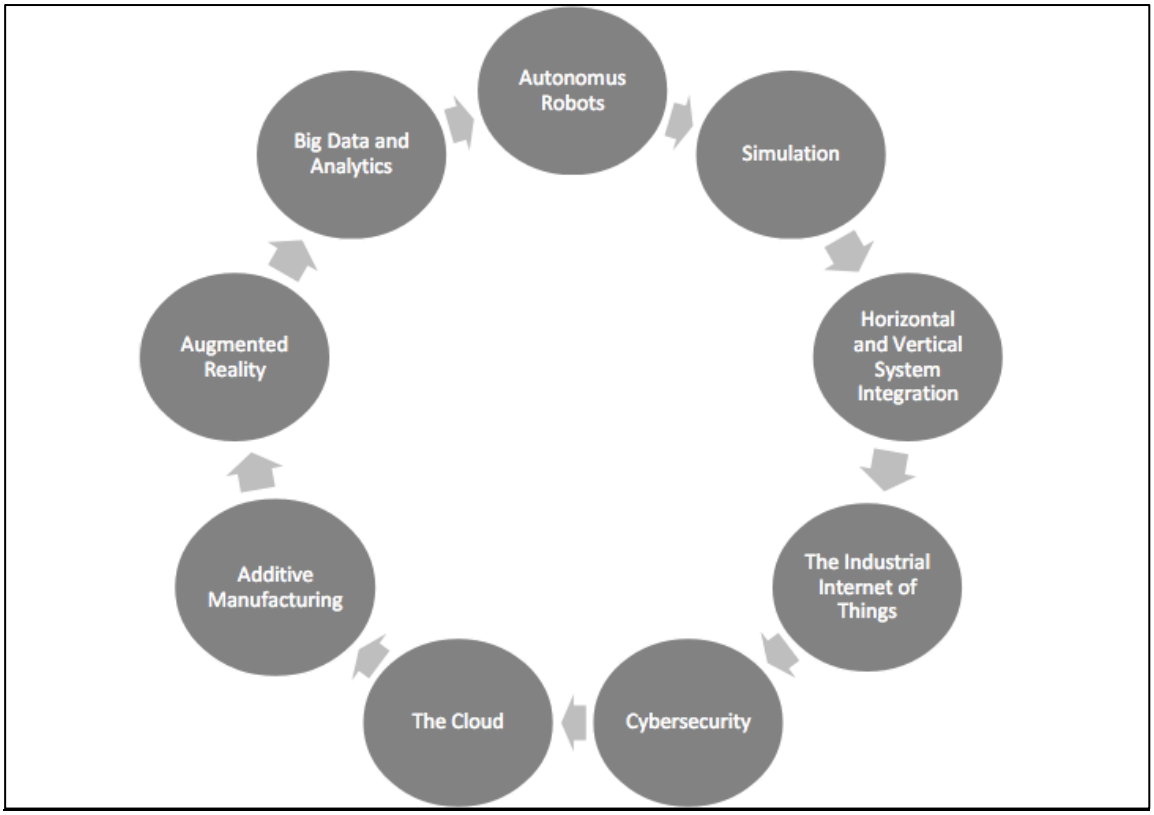

Source: Statista.com

[29] https://www.ceicdata.com/en/indicator/united-arab-emirates/container-port-throughput

**Technological pillars of Industry 4.0**

Today, the world is connected more than ever, and the growth of data generation has been exponential with intelligent devices and process automation. Data-driven insights help freight operators move forward and gain a competitive advantage over their peers by being productive, connected, safe, efficient and flexible. These are 9 technological pillars of Industry 4.0 (see Fig.7) and brief description of each follows.

**Fig. 7. Technological pillars of Industry 4.0**




Source:(Rüßmann et al. ,2015)

- **Augmented Reality or AR**

It is an interactive experience of a real-world environment where the objects that reside in the real world are enhanced by computer-generated perceptual information, sometimes across multiple sensory modalities, including visual, auditory, haptic, somatosensory and olfactory.[30]

- **Internet of Things IoT**

It describes the network of physical objects—a.k.a. "things"—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with

[30] https://en.wikipedia.org/wiki/Augmented_reality

other devices and systems over the Internet.[31]

- **Multi-Agent Systems: Autonomous robots and Artificial Intelligence**

It is a computerized system composed of multiple interacting intelligent agents.

**AI**- is a branch of computer science dealing with the simulation of intelligent behaviour in computers.[32]

**An autonomous robot**, also known as simply an **Auto robot** or **Autobot**, is a robot that performs behaviour or tasks with a high degree of autonomy (without external influence). Autonomous robotics is usually considered to be a subfield of AI, robotics and Information engineering. [33]

- **Big Data Analytics**

Big data is a field that treats ways to analyze, systematically extract information from, or otherwise deal with data sets that are too large or complex to be dealt with by traditional data-processing application software.[34]

- **Simulation software**

It is based on the process of modelling a real phenomenon with a set of mathematical formulas. It is, essentially, a program that allows the user to observe an operation through simulation without actually performing that operation.[35]

- **Cyber Security**

Measures are taken to protect a computer or computer system (as on the Internet) against unauthorized access or attack. [36]

- **Cloud Computing**

It is the practice of storing regularly used computer data on multiple servers that can be accessed through the Internet.[37]

Cloud computing is the delivery of computing services—including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet ("the cloud") to offer faster innovation, flexible resources, and economies of scale.[38]

- **Additive Manufacturing or 3D printing**

Instead of the old approach of carving a usable part out of a large block of material, additive manufacturing builds an object up layer by layer.[39]

---

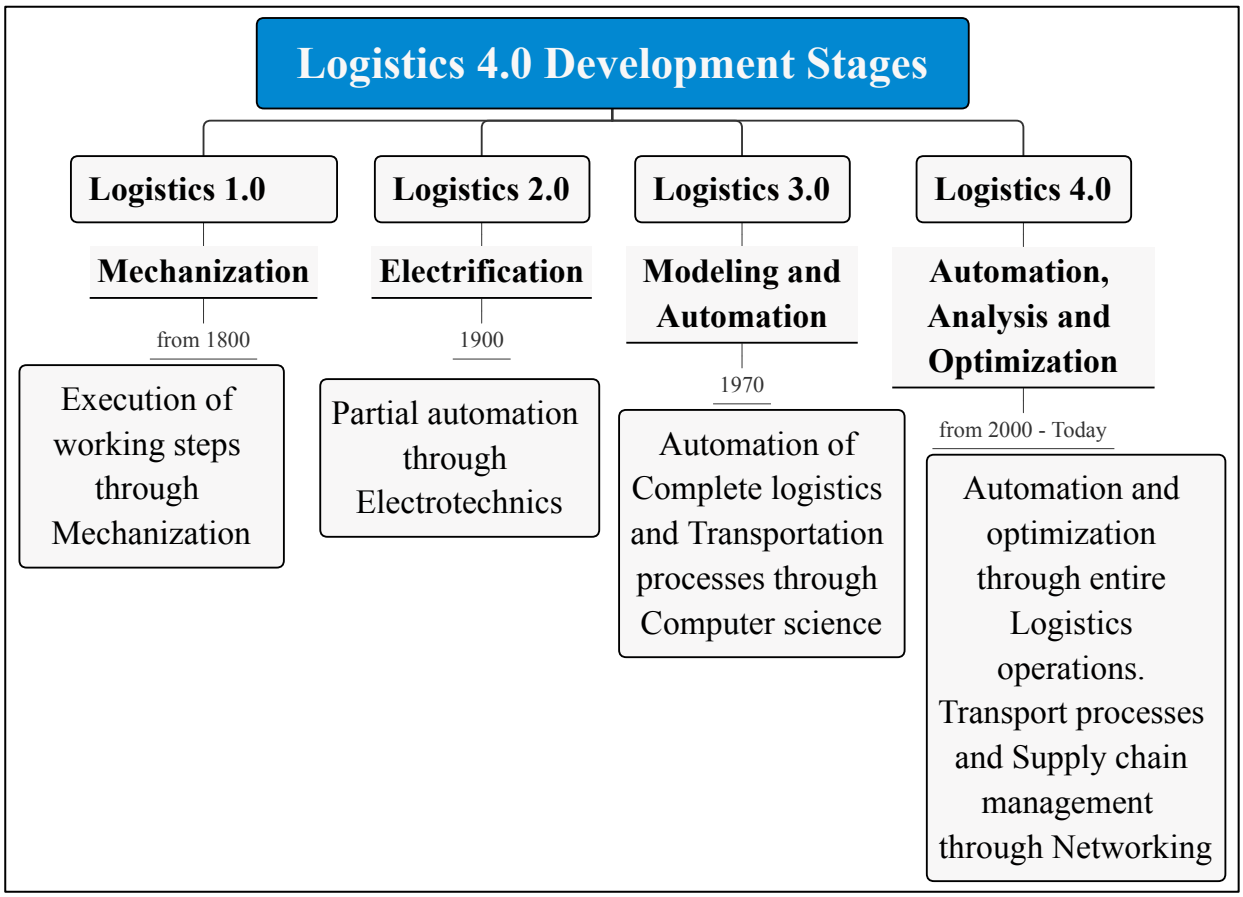
[31] https://en.wikipedia.org/wiki/Internet_of_things
[32] https://www.merriam-webster.com/dictionary/artificial%20intelligence
[33] https://en.wikipedia.org/wiki/Autonomous_robot
[34] https://en.wikipedia.org/wiki/Big_data
[35] https://en.wikipedia.org/wiki/Simulation_software
[36] https://www.merriam-webster.com/dictionary/cybersecurity
[37] https://www.merriam-webster.com/dictionary/cloud%20computing
[38] https://azure.microsoft.com/en-us/overview/what-is-cloud-computing/
[39] https://www.merriam-webster.com/dictionary/additive%20manufacturing

### 1.3.2. The Framework of Logistics 4.0

Logistics 4.0 is an element of Industry 4.0, and these two cannot be thought of as independent from each other. (Wang, 2016)

As an element of Industry 4.0, Logistics 4.0 creates possibilities for new business models. Instantaneous information exchange, computerized business solutions, and real-time big data analysis capability are some of the features that companies enjoy adopting Logistics 4.0. The combined use of all these features of Logistics 4.0 is changing the way companies do their business. This transformation is expedited by the Industry 4.0 technologies such as CPS ( physical systems), IoT, IoS, smart products and smart processes.(Strandhagen, 2017) (see Fig.8)

**Fig. 8. Logistics 4.0 Development stages**




Prepared by the author. Source: (Wang, 2016).

Technological ability is the most critical factor for companies, and Digitization brings benefits such as agility, velocity, and transparency to the business operations. And traditional

business models or non-digitized businesses struggling with frictions, delays, inefficiencies, lack of transparency, and agility.

Companies, big and small that embrace Logistics 4.0 will gain a competitive advantage since it will provide AI, Internet of Things (IoT) and Big Data analytics to improve processes successfully, analyse big data faster, and reduce human errors and labour. The results include a comparative advantage and tangible benefits for their customers, improved cost-saving, agile supply chain, and optimization of logistics processes. Smart logistics or Logistics 4.0 brings companies closer to customer needs. It gives innovations such as intelligent containers, intelligent warehouses, autonomous trucks, and AI-driven technologies to increase velocity and enhance customer service. For logistics companies' agility, cost-saving, and customer satisfaction is the leading force of the business. (Froland, 2021)

Vital elements of Logistics 4.0 or Freight 4.0 are:

**Visibility**- logistics companies can achieve this by digitizing and transforming logistics processes.

**Smart Utilities**- meaning, adoption of smart technologies, such as a smart container.

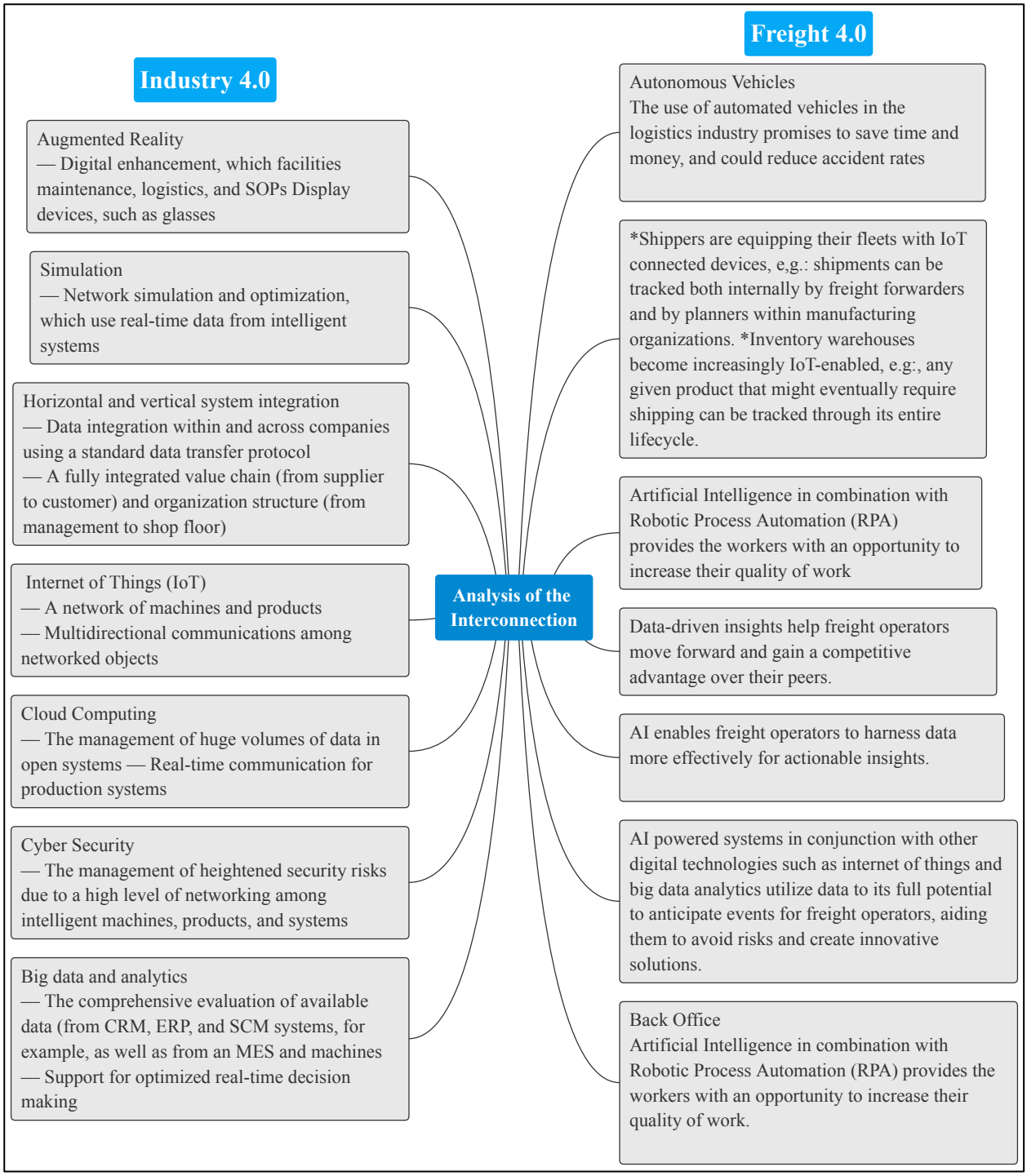
**Data analytics**- data collection and analysis. It also real-time data collection.

Fig. 9 represents the Interconnection between Industry 4.0 and Logistics 4.0 or, in this case I have gathered only a few interconnection cases, for e.g., how AI in conjunction with other digital technologies such as IoT and big data analytics utilize data to its full potential to anticipate events for freight operators, aiding them to avoid risks and create innovative solutions or how Data-driven insights help freight operators move forward and gain a competitive advantage over their peers.

Technological ability and Digitization brings benefits such as agility, velocity, and transparency to the business operations. The Industry 4.0 technologies offer logistics companies a wide range of capabilities, from autonomous machines to predictive analytics.

The complete transformation of the logistics industry due to Industry 4.0 innovative technologies is imperative in the near future and Digital transformation doesn't have to be overwhelming. It's not something to check off a list, but instead a mindset that becomes part of the organization's culture and experience. Because the goal is to achieve competitive advantage through both cost reduction and service enhancement. (Christopher, 2005)

**Fig.9. Interconnection between Industry 4.0 and Freight 4.0**




Prepared by the author. Source: multiple sources.

Based on the performed analysis, it is on the record that technology gives companies the ability to compete. For business strategy, it is a must to go along with the technological strategy to succeed and gain a competitive advantage. Industry 4.0 and Logistics 4.0 make one's way and interconnect in multiple ways. Integration of Industry 4.0 into logistics has an enormous impact on business processes. But with all the benefits, there are specific negative impacts companies

should be aware of, such as accountability, liability, job losses, processes elimination, network structure change, cybercrimes and many more. (Froland ,2021)

## 1.4. How Systems and Technologies shaping Freight Market

As mentioned in the introduction part, the emergence of digital technologies and the rapid technological advancements in digitization have transformed businesses and their operations. Digitization is one of the significant challenges in logistics. Freight operators need to embrace these innovations and adapt because this is the only way to grow and turn this into advancement. John J. Coyle, Robert A. Novak, Brian Gibson, Edward J. Bardi in “Transportation- A Supply Chain Perspective “position that “Technology can be viewed as an internal change factor since it can enhance the efficiency and effectiveness of an organization's operations. However, technology can also be viewed as an external driver of change in most organizations since the rapid development of technology (hardware and software), and its application by individuals forces companies to change and adapt; otherwise, they may perish”. (Coyle, 2011, p.4)

As reported by Material Handling and Logistics, “70% of freight forwarders are expecting the rate of technological change to increase in the year ahead, in comparison to one year ago, and 81% of forwarders believe technological innovation will have a positive impact on their business.” (“Freight Forwarding Technology: The Freight Forwarder’s Tech Stack”n.d.)

According to the The "Artificial Intelligence (AI) in the Global Freight Transportation Industry, Forecast to 2025" report posted ResearchAndMarkets.com: Increased trade flow and the fleet population in freight transportation has become denser, the expectations of customers have evolved beyond recognition, and this resulted for complex transport operations to require operational flexibility from freight operators. The key prevailing concerns with freight operators are to match supply and demand by avoiding:

- human errors in operations
- underutilized assets,
- low workforce productivity,
- inefficient operational planning,
- inability to match supply with demand,
- trimmed profit margins.

Today, the world is connected more than ever, and the growth of data generation has been exponential with smart devices and process automation. As a result, the freight operators enhance

their capabilities with artificial intelligence and technologies, bringing benefits such as efficiency and personalized service offerings.

- **Data-driven insights** help freight operators move forward and gain a competitive advantage over their peers.
- **Artificial intelligence** enables freight operators to harness data more effectively for actionable insights.
- **Artificial intelligence-powered systems** in conjunction with other digital technologies such as the internet of things and big data analytics utilize data to its full potential to anticipate events for freight operators, aiding them to avoid risks and create innovative solutions.
- **Machine learning algorithms** based on neural networks powered by artificial intelligence would unlock multiple benefits for companies operating in the freight transportation industry.
- **AI** brings changes to the supply chain with **autonomous vehicles**, helping fleet operators reduce operating cost and fuel consumption and plan optimized routes for service.(“Artificial Intelligence in the Freight Transportation Industry, 2020-2025 - Featuring Cargofy, FERO and KONUX” n.d.)

### 1.4.1. Freight digitization and customer

Against this background of unfulfilled customer expectations, it’s clear the primary benefit of freight digitalization is not operational efficiency. The real opportunity is for forwarders to stay relevant for their customers.(The Freightos Group 2018)

Generally speaking, there are four areas freight forwarders need to be good at: technological product, customers, knowledge and network. Of course, a digital freight forwarder might be ahead of the competition when it comes to technology – but what about the rest?

Customers: Of course, automation, standardization and digitalization bring benefits, but what happens at the moment something goes wrong with a shipment? In that case, people revert to most analog technologies, speaking to another human (at least on the phone). There isn’t a logistics professional that wants to rely on a website when their export submission got rejected or something else “non-standard” happened. Most people prefer to talk to a logistics expert, someone who really knows what to do in import/export and what the situation is – good customer service. A website sometimes is not enough.

Knowledge: As of now, most digital freight forwarders can only offer a one-size-fits-all model. The moment supply chain becomes more complex and shippers want services such as

inland movements, need licenses or access to capacity and warehouses, a dedicated expert team of a Traditional Freight forwarder and knowledge is a huge advantage.

A global network: Digital freight forwarders haven't been around for long and therefore not able to open offices in every key market. Most customers in logistics space though prefer to work with forwarders that have a global network. A partner who really can help if something goes wrong at a port on the other side of the world. (Frese, 2019)

Forrester Research Director, Michael Barnes warns companies that they they must commit to a complete business transformation if they want to satisfy rising customer expectations and keep up with the speed of the market.

According to Maersk's corporate vision "It starts and ends with customers. We must continue to strengthen this focus to become a truly customer-centric company, serving our customers' individual needs."

After all, when it comes down to it – digitalization is nice, but customers are better." Zvi Schreiber, CEO, Freightos. (The Freightos Group 2018)

### 1.4.2. Smart Logistics from Freight forwarders perspective.

Industry 4.0, Logistics 4.0, Freight 4.0 – main synonyms are "Smart "or "use of smart technologies" or "digitization".

The emergence of digital technologies and the rapid technological advancements in digitization have transformed the business and operational landscape of the global freight transportation industry.

To repeat ones again- speed and communication are crucial factors in the logistic sector. For logistics companies and freight forwarders to ship products quickly and without spoilage is the main target. Freight companies must hold communication with their customers to high standards, and customers need to track their shipment at any time. Being great at being fast and communicate well can bring your business to the high grounds. To perform competently, companies have several ways to do it. That involves improved communication capabilities as well as data collection and analysis through software available on the market.

**Freight Digitization Market**

Freight Digitization Market is divided to following segments:

- **Software**

  Includes Booking, Vessel Scheduling and Loading/Unloading.

- **Service**

Includes Consulting & Training, Implementation & Integration, Operation & Maintenance and Managed Service.

- **Deployment**

Cloud Based and On-premise.

- **End User**

Ports & Terminals and Maritime Freight Forwarders

Freight digitalization enable tracking real-time data for cargo movement while they are in transit and to be evaluated in real time. With the fast-growing e-commerce industry, the demand for faster delivery and the ability to manage larger number of shipments with minimal errors has made way for digitized supply chain. Digitization helps in making movement of cargos easily with digital process. This will make it conceivable to find the correct position of the cargo and recognize rising specialized defects at the earliest. Moreover, helps in enhancing the unwavering quality and security. On the other hand, blockchain can play a pivotal role in achieving transparency at every stage of freight movement. Recent developments in the technologically advancing maritime freight landscape reflects a rise in the digital transformation of booking software. Thus, resulting in the growth of the freight digitalization market. Digitization of sea freight booking through automation and cloud-based technologies is showing unprecedented growth in the digital transformation of maritime freight market. Moreover, helps in enhancing the unwavering quality and security. (Mutreja, 2021)

Few most known technologies powered by AI to improve customer service and used by Freight Forwarders are FERO technologies such as:

- **AI-powered Voice Assistant TiA**

TiA digitalizes and aggregates all logistics software and stakeholders, thus creating a single UBERIZED cluster.[40]

- **SaaS – Freight Management Platform**

A Control Tower for entire freight operations on the demand as well as supply sides. A digital meta platform that creates uber clusters out of each freight forwarder.[41]

Fero's Integrated Freight Communications Platforms provides the benefits of real-time freight quoting and tendering. Leverage automated freight forwarding processes at a fraction of the cost to differentiate, retain and build new customers and compete in any market. These technologies provide the Future Ready Eco-system for Freight Forwarders.

---

[40] https://fero.ai/
[41] https://fero.ai/

Aggregators using modern technology are trying to eliminate intermediaries from the chain hence trying to disrupt freight forwarders. Fero believes that forwarders are the world's oldest Ubers, therefore, providing SaaS products to help mitigate market risks, stay agile and be disruption-proof and ready for Freight 4.0.("Fero Freight Forwarders" n.d.)

- **AI-powered Virtual Assistant by CARGOFY**

AI-powered freight broker, which can do all the processes without human involvement. A technological solution to streamline the industry for independent truckers. It is a mobile App that provides truckers easy access to freight loads based on their location, available equipment, route and shipment plans.[42](By 24/7 2018)

Freight Management Systems Market is very diverse and its presents exponential offering and possibilities based on AI, Cloud Computing, Automation, Big Data Analytics and other technological pillars. The variety is great and Software companies are offering different solutions with different pricing options for the Freight and logistics companies. Key players in the market are Descartes (Canada), Oracle (US), Werner Enterprises (US), MercuryGate (US), SAP (Germany), Accenture (Republic of Ireland), JDA Software (US), Ceva Logistics (Spain), UPS (US), DB Schenker (Germany), C.H. Robinson TMC (US), Riege Software (Germany), Retrans (US), BluJay Solutions (UK), McLeod Software (US), FreightView (US), Freight Management (US), Linbis (US), Logisuite (US), DreamOrbit (India), Manhattan Associates (US), Magaya Corporation (US), Kuebix (US), ImageSoft (Australia), and 3GTMS (US).

Descartes is among the most crucial players in freight management market. The company's solutions include routing, mobile, and telematics; transportation management; customs and regulatory compliance; logistics network services; and broker and forwarder enterprise systems. The solutions of the company fulfill the needs of its customers, across different modes, such as airways, roadways, and waterways. The company also offers a logistics technology platform, which is a multimodal logistics community that enables companies to quickly and cost-effectively connect and collaborate with each other.("Freight Management System Market by Solution (Freight Tracking & Monitoring, Cargo Routing & Scheduling, Security, EDI, TMS, Order Management), End-User (3PLs, Forwarders, Brokers, Shippers), Transportation Mode, and Region - Global Forecast to 2023" 2018)

[42] https://www.supplychain247.com/article/ai_virtual_assistant_to_transform_traditional_freight_brokers/cargofy https://cargofy.com/about

About technologies improving freight operations and customer experience, the following mentioned sources state that ( see Table 2):

**Table 2. Logistics from Freight Forwarders perspective**

| Smart Logistics from Freight Forwarders perspective | Author |
|---|---|
| "Smart logistics consists of smart freight transportation, warehousing, and delivery. It makes the logistics system information sharing, rapid response, and resource integration through the application and integration of IoT, big data, cloud computing, AI, and advanced management. It aims to build a more agile, accurate, efficient, and safer logistics system, which provides customers with more flexible, accurate, faster, and safer logistics services." | "Smart Logistics Based on the Internet of Things Technology: An Overview." *International Journal of Logistics Research and Applications*. (Ding et.al.,2020) |
| Technology is also an important factor in modern global supply chains as it enables better, faster and more reliable communication. The use of communications technology has increased remarkably during the last few decades due to increases in computing power and storage that have fostered the invention of personal and laptop computers, global positioning systems, 'smart' mobile phones and tablets. Such technology has become increasingly automated, complex and rapid, and has enabled firms to develop faster and longer supply chains due to their ability to trace and track goods in production or storage or transit. | Sustainable Logistics and Supply Chain Management Principles and Practices for Sustainable Operations and Management (Grant, et. al., 2017) |
| Information, Communication and Technology (ICT) are implemented in the forwarding industry to allow transparent and seamless processes. It changes from the manual paper-based process to the electronic system. The forwarding industry's significant ICT implementation provides a better platform for freight forwarders to deliver services effectively. | International Journal of Research in Business, Economics and Management "The Usage of Information and Communication Technology in the Freight Forwarding Industry: a Descriptive Analysis. (Aziz, et. al., 2018) |

Continuation of Table 2

| Smart Logistics from Freight Forwarders perspective | Author |
|---|---|
| Digital challengers can't replace every step in the value chain, at least for now. But they will nonetheless transform it over time. The more comprehensive digital forwarders will act as catalysts for the new technologies, but increasingly, successful companies will be specialists, offering advanced data-based solutions. All surviving forwarders will be more digitized by 2025 than they are today, and by 2030 they will be very digitized indeed. The better they leverage these technologies to reduce their internal costs and **improve the customer experience**, the better their chances of keeping or extending their share of the profits. | "Air-freight forwarders move forward into a digital future". McKinsey & Company (Bäuml and Hausmann n.d.) |
| "Your company is likely to face an extinction event in the next ten years. And while you may see it coming, you may not have enough time to save your company. | Forrester Research VP and Principal Analyst, Nigel Fenwick, warned against failing to digitalize. (Waters, 2018) |
| "We're not in the shipping business; we're in the information business" | Peter Rose, Expeditors Founder |

Source: Composed by the author

McKinsey & Company gives us a glimpse of their perspective on the future trends of technological advantage in their article. Another opinion above state how technology is essential and only technologically advanced logistics companies and freight forwarders will survive the race and competition. Data-driven insights help freight operators move forward and gain a competitive advantage. AI-powered systems and other digital technologies such as the *internet of things* and *big data analytics* utilize data to its full potential to foresee incidents or unexpected issues for freight operators by helping them avoid risks and create innovative solutions**.**

As mentioned before, since the mid-1990's when the Internet emerged and the Web came along, it started a massive transformation in commerce, trade and economic landscape. Customer service, customer experience - this is the primary and significant drive for all the businesses oriented to sell or deliver services and make their customers happy and build a customer base.

Many companies provide their customers with information through smart online chats, social media, life chats, and SMS. A few most popular to mention are:

- **Drift -** is a cloud-based solution designed to help businesses automate sales processes by adding live chat windows to websites for increased customer experience and loyalty. Key

features include chatbots, geo-targeting, offline access, proactive chating and transfers/routing. [43]

- **Zendesk -** Customer Service Software[44]
- **Twilio** is a cloud communications platform that allows software developers to make and receive phone calls programmatically, send and receive text messages, and perform other communication functions using its web service APIs.[45]
- **Textline** is a business texting app that lets you text message customers from your computer. SMS is the most convenient communication channel for your team.[46]
- **Intercome** - a software company that produces a messaging platform that allows businesses to communicate with prospective and existing customers within their app, on their website, through social media, or via email.[47]

Social media is counted as one of the most popular customer support platforms because it is free.

Altogether, Freight Forwarding business is a “relationship business”, and with Industry 4.0 and its emerging technologies, is it disappearing? Nowadays, customer service and “up to date” new technologies must go in conjunction. “In the High-Tech, High- Touch Customer Service book Micah Solomon the "new guru of customer service excellence," says: You can’t afford to be similarly left behind by today’s transformational technologies. So many things have changed and continue to change in the world of commerce. We need to realize that the internet, mobile technology, social media, and self-service technologies of various stripes are now, with absolute finality, integral to what customer service means today—and there is absolutely no turning back. (Solomon, 2012)

Moreover, the COVID-19 pandemic in 2020 has disrupted the entire world, and the logistics industry was no exception. As a result, the logistics landscape is contradicted with uncertainty and disruption. Still, it is also kick-started the more significant necessity for digital transformation and finding new ways for the best customer service.

One of the top B2B integration providers, Cleo Integration Cloud articles states that: Those companies that migrated to a modern integration platform before COVID-19 were the ones that put themselves in the very best position to manage disruption to their supply chain. COVID-19 has shined a light on the importance of modern integration platforms.

---

[43] https://www.softwareadvice.com/live-chat/drift-profile/
[44] https://www.zendesk.com/
[45] https://en.wikipedia.org/wiki/Twilio
[46] https://www.textline.com/
[47] https://en.wikipedia.org/wiki/Intercom_(company)

Companies that succeed in 2021 and beyond are those that will embrace a combination of the top trends in logistics management to become resilient to supply chain shocks.(Hughes n.d.)

Digitization brings to the business operations benefits such as agility, velocity, transparency. And traditional business models or non-digitized businesses struggling with frictions, delays, inefficiencies, lack of transparency, and agility. Conventional business models are more complex, using more resources. There will be a difference in customer service and quality delivered primarily if the traditional model is not tech-savvy and does not invest in the newest technologies.

**Tech Developments.** Globalization and Containerization was the main push for logistics companies to start a move towards digitalization.

But it has been stated a few times during the interviews with industry professionals or researchers that the logistics industry was always behind and slow to move with technological progress, but it is not valid anymore. It took quite a time for the logistics sector to realize that digitalization is a must and they have to change, and yet many companies operate as its 2000's.

Nevertheless, between 2010-2015 when new market entrants started to show up and started to embrace technologies, the longtime players- large companies had to react and change operations to keep their positions as the leading players in the market.

As mentioned previously, the real push towards digitalization was the COVID-19 pandemic, when companies had to adjust their operations over a night and keep freight going.

The global COVID-19 pandemic has created a climate of uncertainly for the freight forwarding industry and a perfect storm of challenges, including skyrocketing freight rates due to capacity crunches in supply chain networks; escalating demand for consumer goods and e-commerce; mounting port congestion and port closures; increasing container shortages due, in part, to abandoned cargo; and continuing factors such as illness among port and terminal operators, bad weather, and the Suez Canal being blocked for nearly a week. (Thuermer, 2021)

Meanwhile, the relationship between the giant forwarders and consolidated shipping industry has also been called into question. "Forwarders have found it difficult to provide a consistent service to their customers and have blamed the carriers for many of the problems," says Jon Manners-Bell, chief executive of London-based freight analyst firm Transport Intelligence (Ti). (Thuermer, 2021)

Agility and the ability to adapt to challenging circumstances remains the No. 1 attribute for freight forwarders, and the pandemic has put them to the test.

By investing in technology that increases efficiencies and enhances operations and creates new solutions, freight forwarders were able to mitigate the impact of bullwhip effects in the supply

chain and stay connected with the customers by providing the complete visibility of the processes. (adapted from Thuermer 2021)

Today, most freight forwarders have customer portals that aggregate huge sums of data for enhanced order and shipment visibility, improved shipment planning and inventory management, predictive analytics and standardized systems and processes. The table below shows a few examples of the tech developments in logistics and freight. (see Fig.10.)

**Fig.10. Tech developments**

| Tech developments | | | | | | |
|---|---|---|---|---|---|---|
| | **Kuehne + Nagel's new SeaExplorer** | **DSV Panalpina** | **Hellmann Worldwide Logistics** | **GEODIS** | **DHL Global Forwarding** | **CEVA Logistics** |
| | new SeaExplorer functionality that was introduced during the height of the pandemic to help mitigate disruptions. "It provides users a single, digital platform to find the best option for container shipping needs, including transparency on alternative routings and sailings. Using artificial intelligence and data mining, SeaExplorer provides shippers with realistic lead times for routings, service updates, up-to-date sailing schedules, and alternative departures for canceled sailings. It also provides detailed information on the CO2 emissions of each route. | introduced new track-and-trace capabilities and also implemented new robotic storage and retrieval systems in its warehouses to support e-commerce operations.<br><br>In collaboration with Verity, DSV Panalpina is implementing an autonomous drone system to better manage inventory at several warehouse operations. Operating mainly at night, the drone system can scan barcodes without human interaction and detect if pallet positions are empty or occupied. This supports cycle counting and overall inventory management. | announced its rollout of CargoWise, the integrated single-platform transportation management system (TMS) from WiseTech Global. It will be implemented for all air and sea freight operations across its network. "The goal is to enhance operational processes by standardizing systems and databases and enabling more efficient resource usage across the supply chain," says Armstrong.<br><br>Following the completion of a pilot phase, Hellmann will implement CargoWise across 42 countries including the U. S., Australia, Germany, UK, India, South Korea, South Africa and Hong Kong. Hellmann is also deploying a digital warehouse management system for a long-standing customer in Bor, Czech Republic, that leverages artificial intelligence to better manage the customer's material flows. | has developed its own final-mile retail digital transportation management platform dubbed GEODIS City Delivery. It enables retailers to manage the delivery of goods such as apparel, health and personal care products, and high-tech merchandise directly to U.S. consumers from their closest retail store. It interfaces with GEODIS' mobile driver application, GEODIS Zipline, to provide shipment status updates and information. | upgrading its TMS to speed up and simplify processes, increase responsiveness, eliminate paper, and operate more efficiently. It's applying incremental technology innovations in its operations, such as scanners and sensors, to increase speed and accuracy, and add customer transparency. The company is piloting the use of artificial intelligence (AI) and machine learning (ML) to improve route and capacity planning, and using new capabilities such as chatbots, virtual reality, myDHLi, and a data analytics platform to improve customer experience and employee training. It is the only fully integrated online platform for freight forwarding customers. "myDHLi provides completely transparent management of freight rates, offers, transport modes, carbon emissions, and all other relevant shipment data, | began its digitalization processes prior to the pandemic and is focusing on myCEVA, a customer-facing platform that offers real-time quoting and booking, end-to-end visibility, document sharing and best-in-class digital customer service.The myCEVA platform makes it possible for CEVA to offer value-added services like customs clearance, insurance, and environmentally friendly options. |

Source: Prepared by the author. Adapted from(Thuermer 2021)

## 1.5. Freight market/ market segmentation

Freight forwarding is a very complex and highly skilled business. As I mentioned before, Freight Forwarders are the middlemen, they are the go-between representatives, and they act as principals to the transport contracts, as experts in the logistics network.

Their skills are to work with multiple logistics service providers, customs and governments.

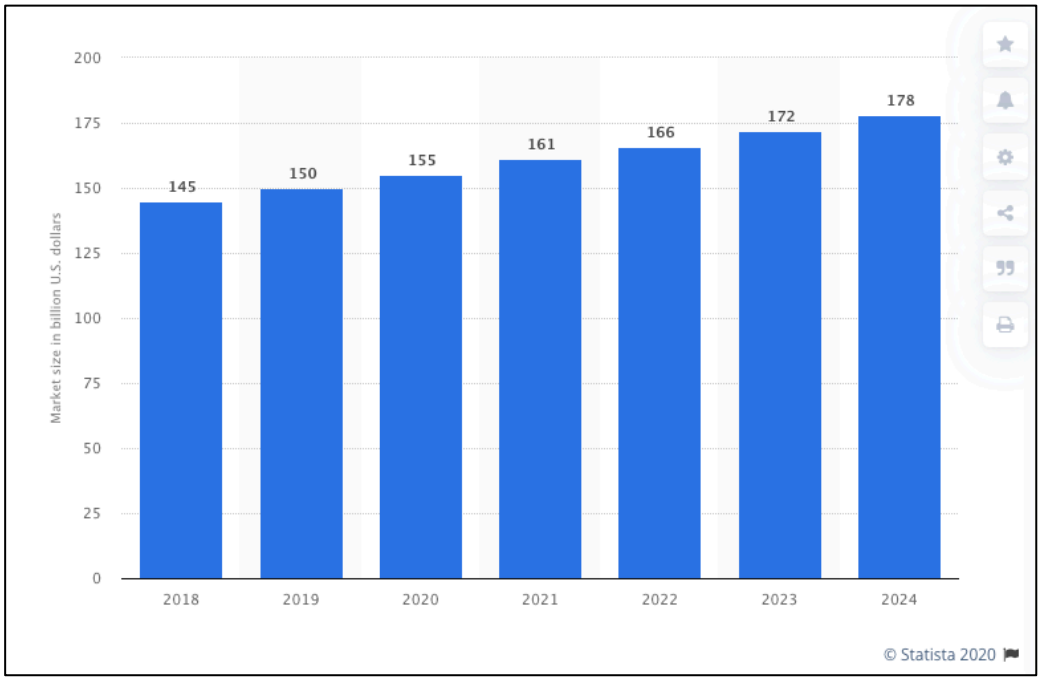
There are different size and types of freight forwarders. Companies range in size and global coverage. It can be global, international or only domestic who acts only as agents on behalf of other more prominent freight companies. There is no universal model of freight forwarders. They can be regional, global, digital or traditional.

Like in the Handbook of logistics and distribution management, authors define that: "Freight forwarders own or lease logistics assets as it suits their business. It is impossible to describe a universal model that freight forwarders employ. Their business models are as varied as the forwarders' size and the industries they choose to service."(Rushton, 2017)

### 1.5.1. Freight market size

International trade is one of the significant drivers of growth for the freight forwarding market. According to Statista statistics information (see Fig.11.), the global freight forwarding market reaches 155 billion dollars in 2020 and is anticipated to reach 178 billion dollars by 2024.

**Fig.11. Size of the freight forwarding market worldwide**




Source: Statista.com

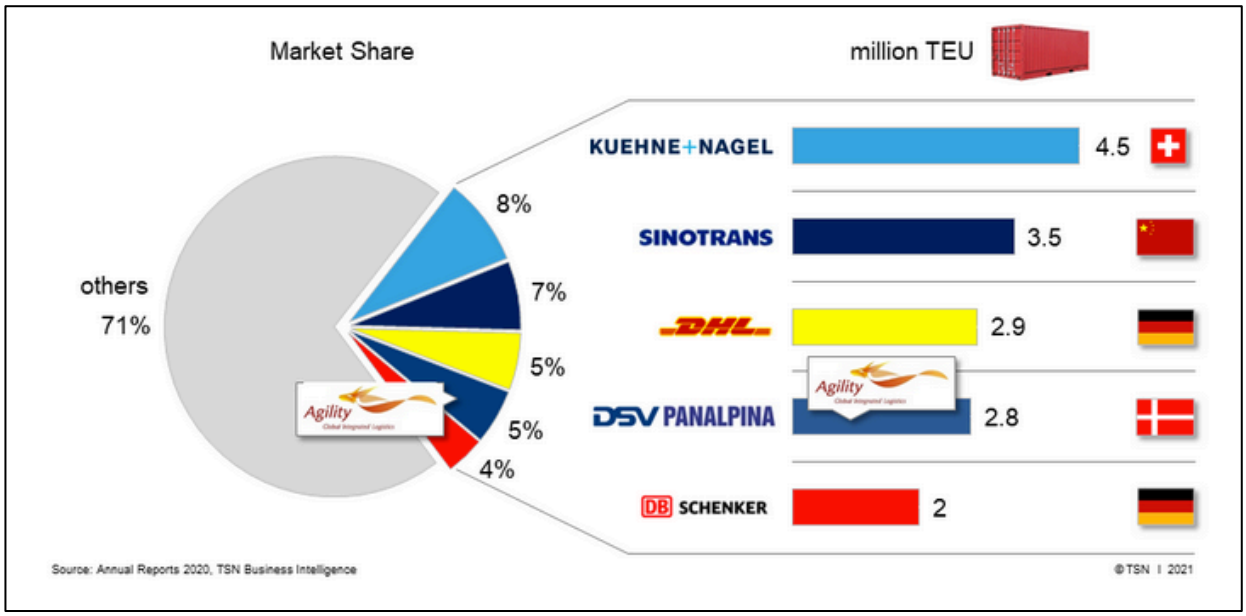
### 1.5.2. Freight Forwarders market share

In Mark Millar's research "Overview of the Global Freight Forwarding and its impact on globalization", he indicates that the modal share between air freight and sea freight of the dollar value of global forwarding remains relatively consistent at a ratio of 52:48, with air representing 52% of total freight forwarding revenues and sea representing 48%.

Across many thousands of service providers, almost 60% of the global freight forwarding market is controlled by the top 20 global forwarders. This results in an unavailable market for all other forwarders of nearly 57 billion USD dollars (40.5% of the total market). (Millar 2018)

Fig.12. shows the the world's 5 largest ocean freight forwarders in 2020. Scale is a key competitive advantage in freight forwarding, with significant operational and commercial benefits. DSV announced the acquisition of Agility Global Integrated Logistics (GIL), following the purchase of UTi Worldwide in 2015 and Panalpina in 2019. The combined company will handle approx. 2.8 million standard containers (TEU) per year in ocean freight, ranking it number four in the world. DSV Panalpina is the fastest-growing company in the industry due to its successful strategy, M&A, and post-merger integration processes.(The Strategists Network 2021)

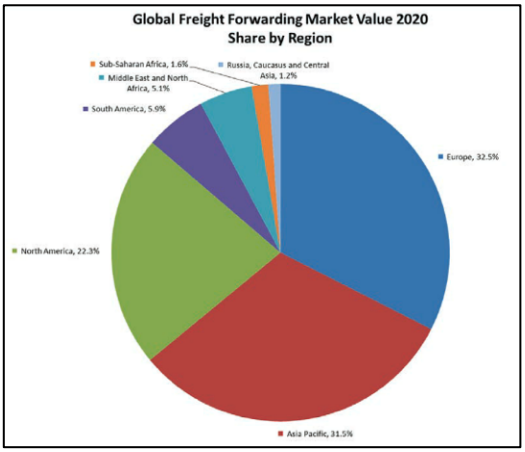
**Fig. 12. The worlds 5 largest ocean freight forwarders in 2020**

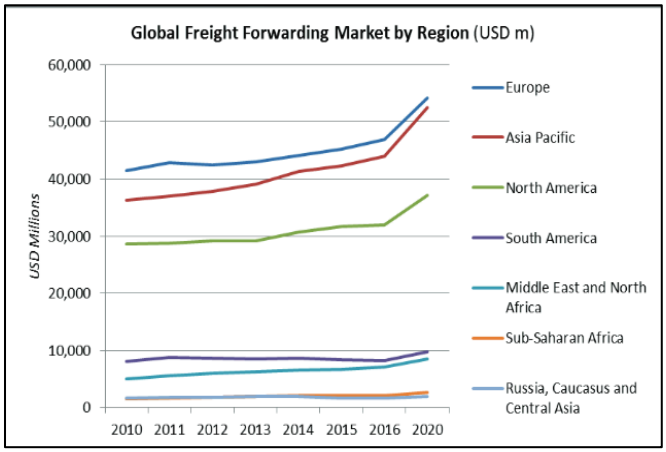



Source:(The Strategists Network 2021)

The major regions of Europe, Asia Pacific and North America dominate the geographic share, together representing 86% of the global market. (see Fig.13.) (Millar, n.d.)

**Fig.13. Global Freight Forwarding Market Value. Share by Region**




Source: Ti

Armstrong & Associates (A&A) backing up this information, ( see Table 3). It shows that in 2019 market share has not changed much, and leaders who dominate the market stays the same. Cathy Morrow Roberson, president of the consultancy Logistics Trends & Insights, says: In our opinion, rankings of forwarders are considered more of an art than a precise science; And while we agree with Armstrong & Associates that DHL Global Freight Forwarding is a dominant player, we believe that Kuehne + Nagel surpassed DHL as the leader in this market."("Top 25 Freight Forwarders in 2018: Blending Art and Science - Logistics Management" n.d.)

"The freight forwarding market is also concentrating more on the small- to medium-sized business segments," says Morrow Roberson. "Several forwarders such as Agility have introduced online platforms and other services to focus on this growing segment. In the meantime, UPS and FedEx have both introduced fulfilment services, and Amazon is playing a bigger role in attracting more third-party sellers to their platform by offering logistics and freight forwarding services."("Top 25 Freight Forwarders in 2018: Blending Art and Science - Logistics Management" n.d.)

**Table 3. Top 25 Freight Forwarders in 2018**

| A&A Rank | Provider | Gross Revenue (US$ M) | Ocean TEUs | Air Metric Tons |
|---|---|---|---|---|
| 1 | DHL Supply Chain & Global Forwarding | 28,120 | 3,225,000 | 2,150,000 |
| 1 | Kuehne + Nagel | 25,320 | 4,690,000 | 1,743,000 |
| 2 | DB Schenker | 19,968 | 2,203,000 | 1,304,000 |
| 3 | DSV | 12,411 | 1,442,348 | 689,045 |

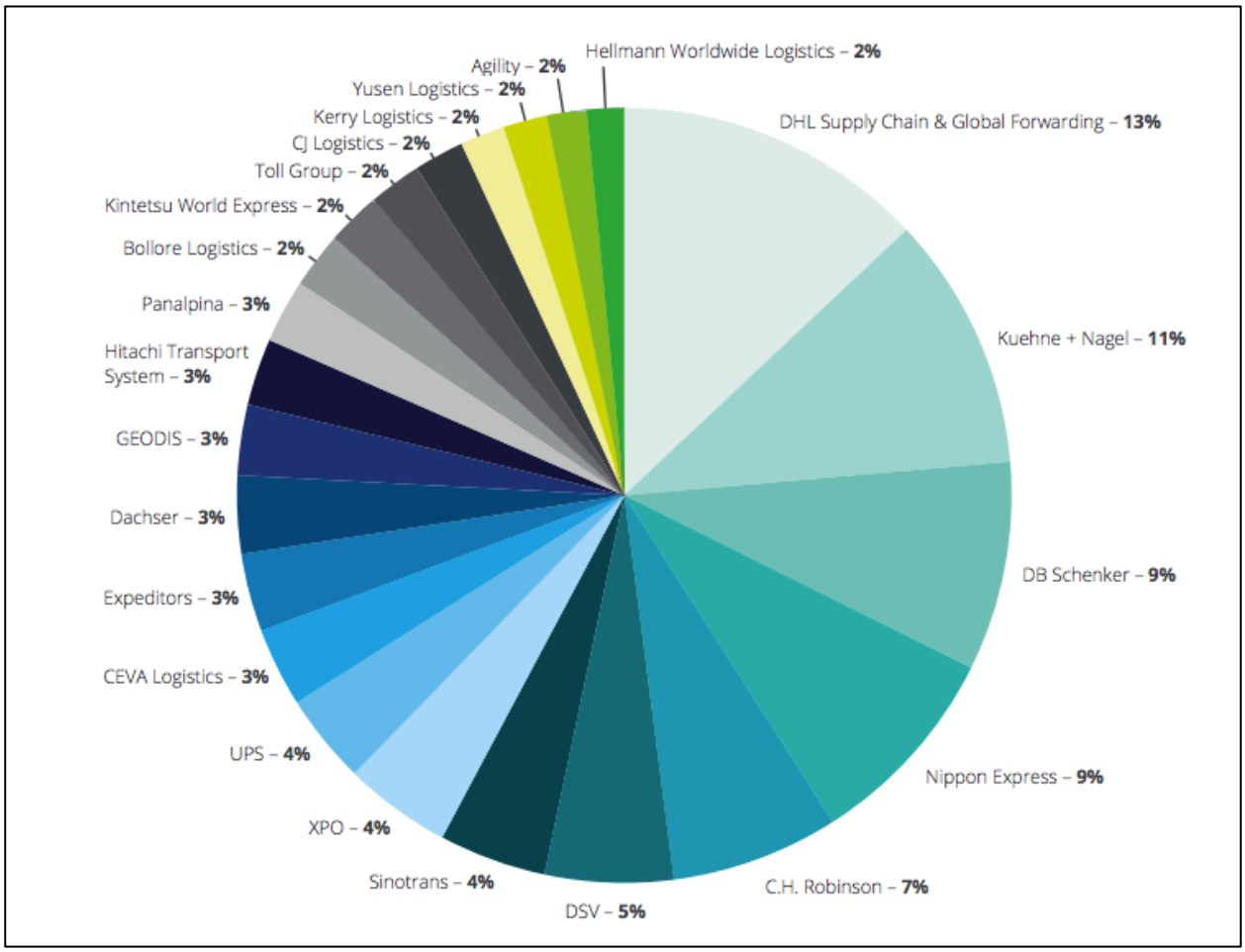
Continuation of Table 3

| A&A Rank | Provider | Gross Revenue (US$ M) | Ocean TEUs | Air Metric Tons |
|---|---|---|---|---|
| 4 | Sinotrans | 10, 174 | 3,740,000 | 530,100 |
| 5 | Expeditors | 8,138 | 1,167,820 | 1,011,563 |
| 6 | Palapina | 6,156 | 1,484, | 1,038,700 |
| 7 | Nippon Express | 18,781 | 686,206 | 899,116 |
| 8 | UPS Supply Chain Solutions | 9,814 | 600,000 | 935,300 |
| 8 | Bolloré Logistics | 5,415 | 873,000 | 690,000 |
| 9 | C.H. Robinson | 16,631 | 1,000,000 | 225,000 |
| 10 | CEVA Logistics | 7,356 | 786,600 | 476,600 |
| 11 | Kerry Logistics | 4,875 | 1,196,607 | 409,127 |
| 12 | GEODIS | 6,645 | 798,173 | 363,451 |
| 12 | Hellmann Worldwide Logistics | 3,646 | 901,698 | 578,007 |
| 14 | Kintetsu World Express | 5,310 | 700,043 | 600,849 |
| 15 | Yusen Logistics/NYK Logistics | 4,715 | 815,000 | 380,000 |
| 16 | Agility | 4,400 | 710,000 | 415,000 |
| 16 | DACHSER | 7,602 | 536,900** | 344,900 |
| 17 | Hitachi Transport System | 6,283 | 532,000 | 300,000 |
| 18 | Damco/Maersk Logistics | 6,082 | 639,132 | 175,502 |
| 19 | Toll Group | 5,980 | 503,400 | 106,600 |
| 20 | XPO Logistics | 10,850 | 131,500 | 72,600 |
| 21 | Logwin | 1,346 | 600,000 | 180,000 |
| 22 | Mainfreight | 2,038 | 342,741 | 127,418 |

Source: Armstrong& Associates A&A

Fragmented structure of freight forwarding industry of major players is presented (see Fig. 14). According to Deloitte, the forwarding market remains a highly fragmented business with hundreds of thousands of companies operating in this market. Even market leaders have low market shares, low bargaining power, if digital freight forwarders are to take place anywhere, it must be under the radar without a breakthrough being visible to the customer.

**Fig. 14. Fragmented structure of the freight forwarding industry with selection of major players**




Based on ARMSTRONG & ASSOCIATES (2018a, b), BIFA (2018), BCG (2018). Source: Deloitte

Mergers and acquisitions were a key highlight in 2019, when the consultancy Armstrong & Associates (A&A) compiled its annual Top 25 Freight Forwarders list. (see Table 4)

DSV's purchase of Panalpina last year, for example, was going to move them up significantly in the rankings, making it a legitimate contender to leaders like DHL Global Forwarding and Kuene+Nagel.

To compare two years later the logistics sector saw a broad downturn in the second quarter of 2020 and only expects a gradual recovery. Another key trend was is the impact COVID-19 on various modes of transport.

Over that period of time, Maersk launched its new Maersk Flow digital platform, part of an ongoing quest to provide value added services.

According to Rogers, aside from weaker volumes, the forwarders also face continued technology-led competitive pressure. Those include blockchain-based schemes that could disintermediate the forwarders' paperwork processes as well as new entrants including Flexport and Amazon.

"Flexport's volumes handled on U.S.-inbound routes climbed 118% year over year in the second quarter on the back of a 263% surge in shipments from Asia apart from China," says Rogers. "Amazon, which provides forwarding services for Chinese merchants on its e-commerce platform, experienced a 97.5% jump in the second quarter. Both firms set new records for handling in June, shrugging off the wider industry malaise."(Burnson 2020)

**Table 4. Top 25 Freight Forwarders in 2020**

| A&A Rank | Provider | Gross Revenue (US$ M) | Ocean TEUs | Air Metric Tons |
|---|---|---|---|---|
| 1 | DHL Supply Chain & Global Forwarding | 27,302 | 3,207,000 | 2,051,000 |
| 1 | Kuehne + Nagel | 25,875 | 4,861,000 | 1,643,000 |
| 2 | DB Schenker | 19,349 | 2,294,000 | 1,186,000 |
| 3 | DSV Panalpina | 14,355 | 1,907,126 | 1,071,266 |
| 4 | Sinotrans | 11,200 | 3,770,000 | 502,000 |
| 5 | Expeditors | 8,175 | 1,125,137 | 955,391 |
| 6 | Nippon Express | 19,953 | 703,061 | 752,942 |
| 7 | CEVA Logistics | 7,124 | 1,050,000 | 416,000 |
| 8 | UPS Supply Chain Solutions | 9,302 | 620,000 | 965,700 |
| 9 | C.H. Robinson | 14,630 | 1,000,000 | 210,000 |
| 10 | Kerry Logistics | 5,274 | 1,250,038 | 409,408 |
| 11 | Bolloré Logistics | 5,180 | 839,000 | 634,000 |
| 12 | GEODIS | 6,379 | 866,631 | 308,173 |
| 12 | Hellmann Worldwide Logistics | 2,974 | 955,800 | 586,670 |
| 13 | Kintetsu World Express | 5,067 | 644,464 | 566,814 |
| 14 | Agility | 4,122 | 740,000 | 415,000 |
| 14 | Yusen Logistics/NYK Logistics | 4,410 | 775,000 | 335,000 |
| 15 | DACHSER | 7,400 | 520,000** | 330,000 |
| 16 | Hitachi Transport System | 6,472 | 538,000 | 260,000 |
| 17 | Damco/Maersk Logistics | 5,965 | 577,084 | 158,405 |
| 18 | Toll Group | 6,260 | 527,200 | 111,600 |
| 19 | Logwin | 1,280 | 690,000 | 180,000 |
| 20 | CJ Logistics | 7,173 | 309,851 | 43,954 |
| 21 | Mainfreight | 2,038 | 342,741 | 127,418 |
| 22 | XPO Logistics | 12,144 | 127,200 | 70,200 |

Source: Armstrong& Associates A&A

**Digital Freight Forwarders Market share.** Digital freight forwarders are pushing traditional logistics companies to become more digital, as they aim to ease the process of selling capacity to their customers in order to be able to compete against the rising threat of digital forwarders.(“Digital Freight Forwarders: The Future of Logistics?” 2021)

Digital Freight Forwarder market is segmented into Large Enterprises and SMEs. Leading Vendors of the Digital Freight Forwarder Market Report are:

- iContainers
- Forto (Freighthub)
- Flexport
- FreightAmigo Services Limited
- Maersk (Twill)
- CMA CGM
- Kuehne + Nagel
- Shypple
- Zencargo
- Expeditors (FLEET)

In terms of quality and price, the global market is highly concentrated, with just a few players competing: Forto (Freighthub), Flexport, Maersk (Twill), Kuehne + Nagel, and Zencargo are the leading providers of Digital Freight Forwarder services, with Flexport having the largest market share in 2019 with approximately 55%.(More, 2021)

## 1.6. UAE Freight Market

This subchapter reviews the UAE freight market. And a position where UAE and particularly Dubai stands with Fourth Industrial Revolution. What are the projections in the Industry and future strategy to become the first blockchain-powered government? UAE is specifically focused on the technologies such as AI, Big Data, Cloud computing and IoT. Innovation is part of the pillar 'United in Knowledge' of Vision 2021, which focuses on innovative Emiratis building a competitive economy and more. (The UAE Government n.d.) Expo 2020 coming this year; it is the first World Expo to be held in the Middle East. It will magnify the development of innovations in the UAE.

The United Arab Emirates geographical location is strategically convenient for the developing logistics sector. Besides Emirates strategic location, major influencers to the impact of

becoming a leading logistics hub in the MENA region and one of the leading logistics countries in the world were DP World and Emirates Airlines. Flexibility to quickly respond to market demands and customers' requests by still delivering world-class service UAE, particularly Dubai, established themselves as a world-class leader in logistics infrastructure.

Besides a well-developed infrastructure of logistics, Dubai is making an excellent base for e-commerce development. According to TBY analytics, according to pre-coronavirus estimates for the MENA region, the retail e-commerce market is expected to grow by 20% in the next five years, reaching USD26 billion by 2022. "To take advantage of e-commerce fully, Dubai can leverage its dedicated e-commerce free zones to capture this potential. Located within Dubai South's enormous logistics free zone, EZDubai is set to become a world-class e-commerce hub, showcasing Dubai's ability to stay ahead of the curve in logistics and supply chain solutions as technology changes the way goods move and the services they require."(Pheiffer 2020)

Globalization has led to rapid growth in the industry of logistics in the United Arab Emirates. Outsourcing of goods to the Far East has brought a great deal of complexity into the supply chain systems. In addition, new products are being launched faster than ever before; the life cycles of products are significantly decreasing, increasing demand for customers and companies looking to reduce their inventory. These changes are massive and need to be handled efficiently by the logistics and supply chain teams to maintain the companies' financial health.(Digital Logistics 2018)

The Logistics industry across the UAE is one of the highest 5 logistics markets around the world, provided the favorable location of UAE at the crossing of Asia, Africa & Europe. Growth in the industry has been encouraged due to the high effortlessness of doing business in the Emirates, owing to which the country is home to a lot of worldwide and multi-national brands.(Ken Research 2021)

The UAE freight and logistics market has been growing steadily, mainly driven by the consistent and fast growth of e-commerce across the region and rising international trade. The United Arab Emirates is trying to position itself as the region's e-commerce hub by encouraging new businesses and startups and attracting global talent and investment through ambitious projects such as Commerce City in Dubai. The Emirate is building a Dhr 3.2 billion e-commerce city, which would be spread over 2.1 million square feet.

Dubai's strategic location between Asia and Europe serves both the East and the West, providing optimum Emirate trading conditions. To facilitate the trade and e-commerce market, Dubai has implemented initiatives to develop its infrastructure and technology, to implement a

well-integrated transport system and excellent logistics infrastructure. As a result, demand in the industrial and logistics sector throughout 2019 has been driven by the manufacturing, technology, general trading, food and beverage, engineering and construction, and oil and gas sectors. On average, these sectors accounted for up to 64% of demand for 2019. During COVID-19, with lockdown being implemented worldwide, the United Arab Emirates has also witnessed a negative impact on its logistics market but is expected to recover quickly by 2021". (Mordor Intelligence LLP 2021)

Sultan Ahmed Bin Sulayem Group chairman & CEO, DP World in The Business Year interview responded to the question, which is: What are the key initiatives you would like to highlight as examples of DP World's disruptive innovation strategy to stay ahead of the curve as we move into the era of smart trade? - As a progressive end-to-end logistics solutions provider, we continue to invest in new technologies and disruptive innovation, always seeking the edge that will help us lead the future of world trade through innovative trade solutions. We enable trade around the world, creating and embracing the latest technologies and innovations. For ports and logistics operators like us, the key is to maximize efficiency further, ensuring innovations coming on the stream can lower costs, increase productivity, and move goods arriving in vast quantities from enormous ocean carriers quicker and more cost-effectively than before. In opinion of Sultan Ahmed Bin Sulayem, to stay ahead of the curve, we should constantly upgrade our systems, as the internet and technology have revolutionized the way we do business. It was a brief capture from the Interview itself. But innovation and technologies do revolutionize the way the business world is operating, and logistics companies are taking the main lead in using those innovations. (Pheiffer 2020)

What are technological solutions integrated to leverage this phenomenon and named as a critical driver of the logistics and freight industry? According to the TBY Analytics report, the driving cutting-edge technologies are:

- Artificial Intelligence,
- Cloud Solutions,
- Blockchain,
- IoT and,
- Data Storage.

According to KenResearch.com in 2021, the Logistics market has been substantially impacted by the overview and usage of new technologies. Some of fresh technologies in UAE logistics market are:

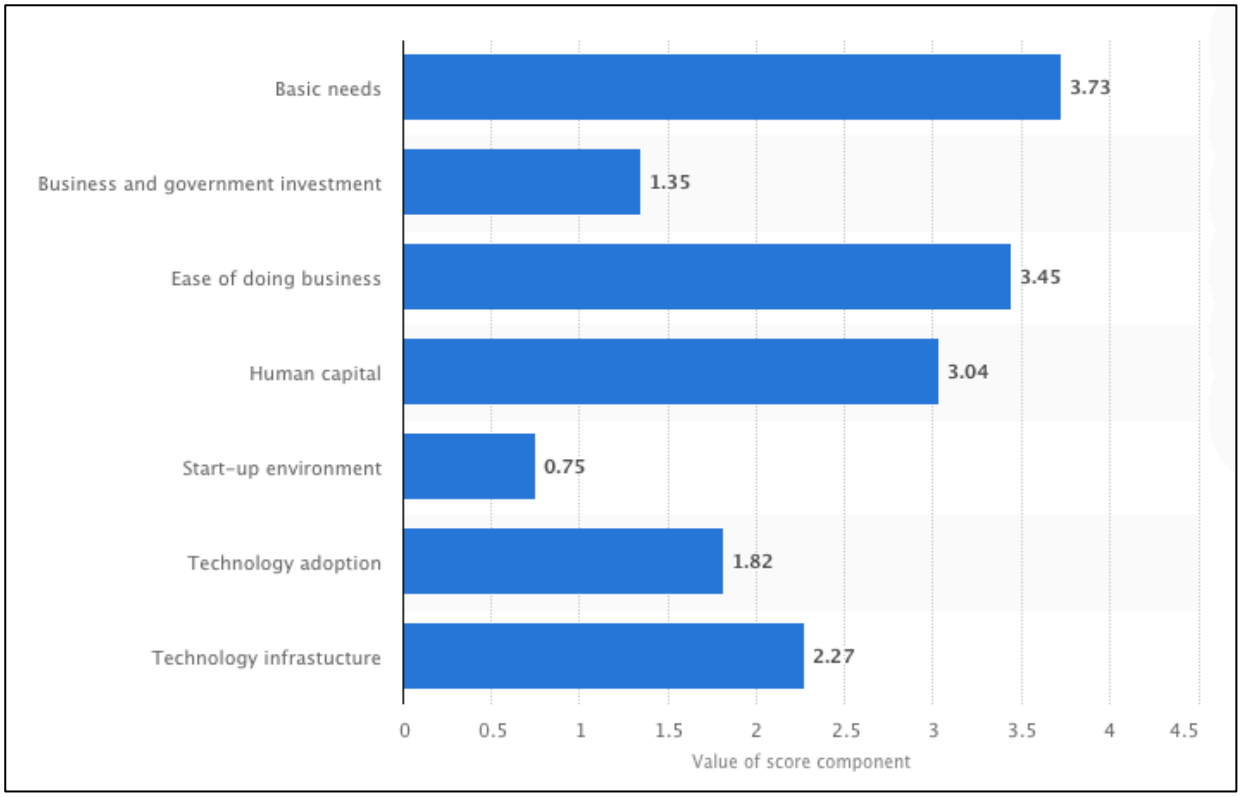
- worldwide positioning system (GPS),
- order entry systems,
- warehouse management systems,
- transmitting communication system,
- the Internet of Things,
- automated transportation
- comparable futuristic innovations
- transportation management system (TMS)

### 1.6.1. Digital readiness of UAE

In 2019, the United Arab Emirates reached a total digital readiness score of 16.42 out of 25, indicating that the country is in the Amplify stage (see Fig. 15.). This stage includes countries that have made significant advances in their digital journey. The digital readiness score measures seven key components that enhance the country's digital journey.

The UAE is on track in transforming into a knowledge-based economy, by recognizing the importance of digitization, and the role of information and communication technologies in digitalizing the economy. This has been a work in progress since 2000 when Dubai Internet City (DIC) was established. The national strategy ever since was focused on transforming the country digitally with the support and motivation of their national leaders and clarity of the multiple strategies that have been set into place, many of which have come to fruition. Those strategies included the UAE Artificial Intelligence Strategy 2031, the Emirates Blockchain Strategy 2021, the UAE National Innovation Strategy, the UAE National Strategy for Higher Education 2030, and the UAE Centennial 2071 Plan.

**Fig. 15. UAE Digital readiness score in the UAE in 2019**




Source: statista.com

The UAE today provides multiple services online and as a result, the UAE was ranked 6th globally in the online services index and 17th in the e-participation index according to the UN's E-Government Development Index 2018 covering 193 countries.

In 2020, the UAE was one of the top ten most competitive countries worldwide. With its digital vision, the UAE has announced its aspiration to go beyond the region and compete at a global level. The largest digital technology investments in the MENA region in 2018 were in the transactional business models, with a value exceeding two billion U.S. dollars. ("UAE: Digital Readiness Score by Component 2019 | Statista" 2020)

In such an increasingly dynamic environment, success for businesses relies on pushing on cutting-edge technologies and innovations. The UAE is ranked 33rd globally and 1st regionally in the Global Innovation Index 2021. Index and is considered as one of the top innovative economies. ("Innovation" 2021)

### 1.6.2. Competition overview

The UAE freight and logistics market is very competitive, and it is fragmented with many international and local players actively competing for market share. It fragmented with more that 11 000 Freight Forwarding players. UAE market players can be categorized on the basis of

different service sectors involving Freight Forwarding, Contract Logistics (Warehousing) and Express Delivery.

International players likewise Kuehne + Nagel, DB Schenker, DHL, Agility were recognized to be overriding when it comes to Air Freight and Sea Freight, simply owing to the great MNC accounts managed by such corporates and the strong capacities they transport from international markets to the UAE. When it comes to the Land Freight, local corporates such as Avalon, Allied Transport, ATS, Mohebi Logistics and NTDE were acknowledged to be most dominant, owing of their trucking fleet across the Emirates.

While the International Express market around the UAE is concentrated amongst the majorly worldwide players such as DHL, FedEx and UPS, the Domestic Express market is more fragmented owing to weighty competition amongst local players such as Zajel Courier Services, Skynet, and Time Express. Emirates Post is a government possessed body that leads the Domestic Express market. (Ken Research 2021)

The technology integration in the logistics sector is high and the emergence of digital players in the competition pool is increasing too. New national Digital Freight Forwarders such as DF Alliance by DP World, Qafila, FreightBro, Saloodo! and Naklat are the newest and largest IT platforms in region enabling shippers, brokers and carriers to digitally list, quote and book shipments online.

E-commerce growth has also helped in the emergence of digital players in the region. With the overall logistics infrastructure in the country developing rapidly the rivalry within the industry is expected to be fueled further. Capacity expansion and infrastructure investment are expected to strengthen the competitiveness of a list of logistics companies in the country. (Mordor Intelligence Pvt. Ltd. 2021)

## 1.7. Summary of theoretical part

The theoretical part has identified key aspects such as: Who are freight forwarders? Key takeaways about the Freight Forwarders – they are the middlemen or the go-between representatives and they act as a principal to the transport contract or as an expert in the logistics network. It is widespread, that Freight forwarding is a “relationship business”.

There are two types of business models- Traditional freight forwarder and Digital. Traditional – a person or a company - the “true architects” of transport. Contrarily, Digital Freight Forwarder is an IT platform, and in most cases, without owning assets – such as the Uber model.

The chapter provided clear differences between transport specialists and why freight forwarders exist. Objective of the research regarding customer service evaluation and the

importance of customer service is reviewed and analysed by gathering different professionals' opinions and literature. Customer service is vital for company's survival and achieving "service excellence" is a key priority. "In the age of the customer, executives don't decide how customercentric their companies are – customers do." Kate Leggett, VP and Principal Analyst, Forrester Research. (The Freightos Group 2018)

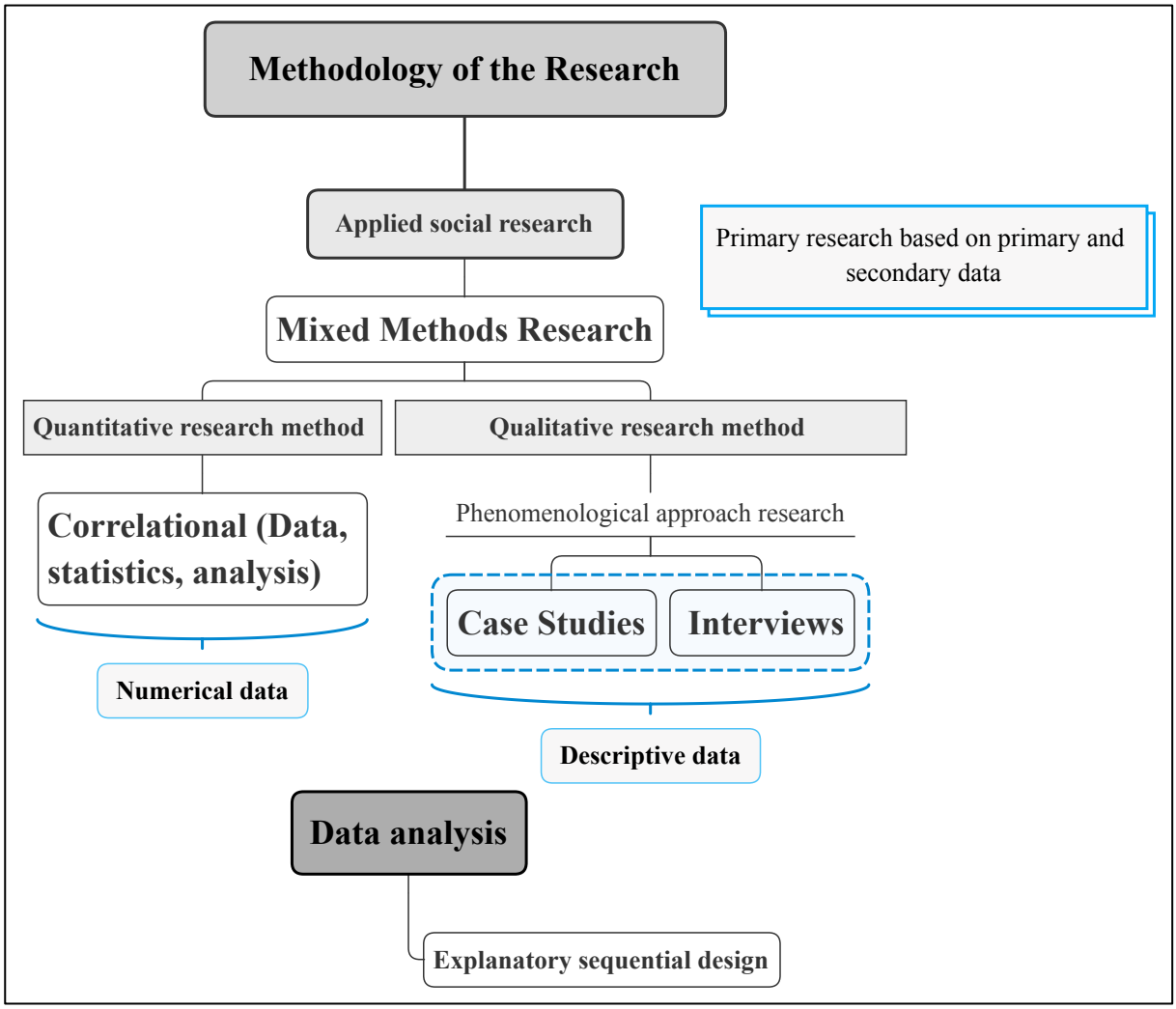
What are the reasons businesses lag? Digital transformation is one of the answers. And digitization is the answer to many challenges the logistic sector is facing. Growing communication technologies and IoT are the main drivers for Business Digitalization. The progress of technologies created a new base, a new map of how businesses navigate the processes. This statement supports Klaus Schwab's opinion about digitization: "Society is headed toward adopting even faster machines that will allow users to perform complicated tasks on the go. Most likely, the number of devices that each person uses will grow strongly, not only with new functions performed but also with specialization of tasks."(Schwab 2017)

UAE's future strategy to become the first blockchain-powered government is a massive boost for digitizing the freight market and improving customer service excellence. But there are certainly challenges of Digital transformation, such as people with low awareness or acceptance and interest. Or organizational challenges such as time and budget, lack of collaboration, or organizational structure of the company. As presented in this chapter, the freight market is immense, and leading market players take substantial parts of it. That means big companies or corporations with large amounts of people and processes. It was established long ago, and changes, like digitalization, could be challenging for those companies as could be another one to speed with the progress.

# 2. METHODOLOGY OF THE RESEARCH

This chapter is about the overall understanding – the design of the study and research- a "blueprint of the research". A detailed explanation of how empirical research was done, implemented, described, and justified to the reader. Furthermore, how methods and research data have been correlated, mind maps are beneficial for the reader to visualize and see the clear picture and plan how the research was done. A step-by-step guide is presented with timelines and the design of the study (see Fig.16).

**Fig. 16. Methodology of the research**

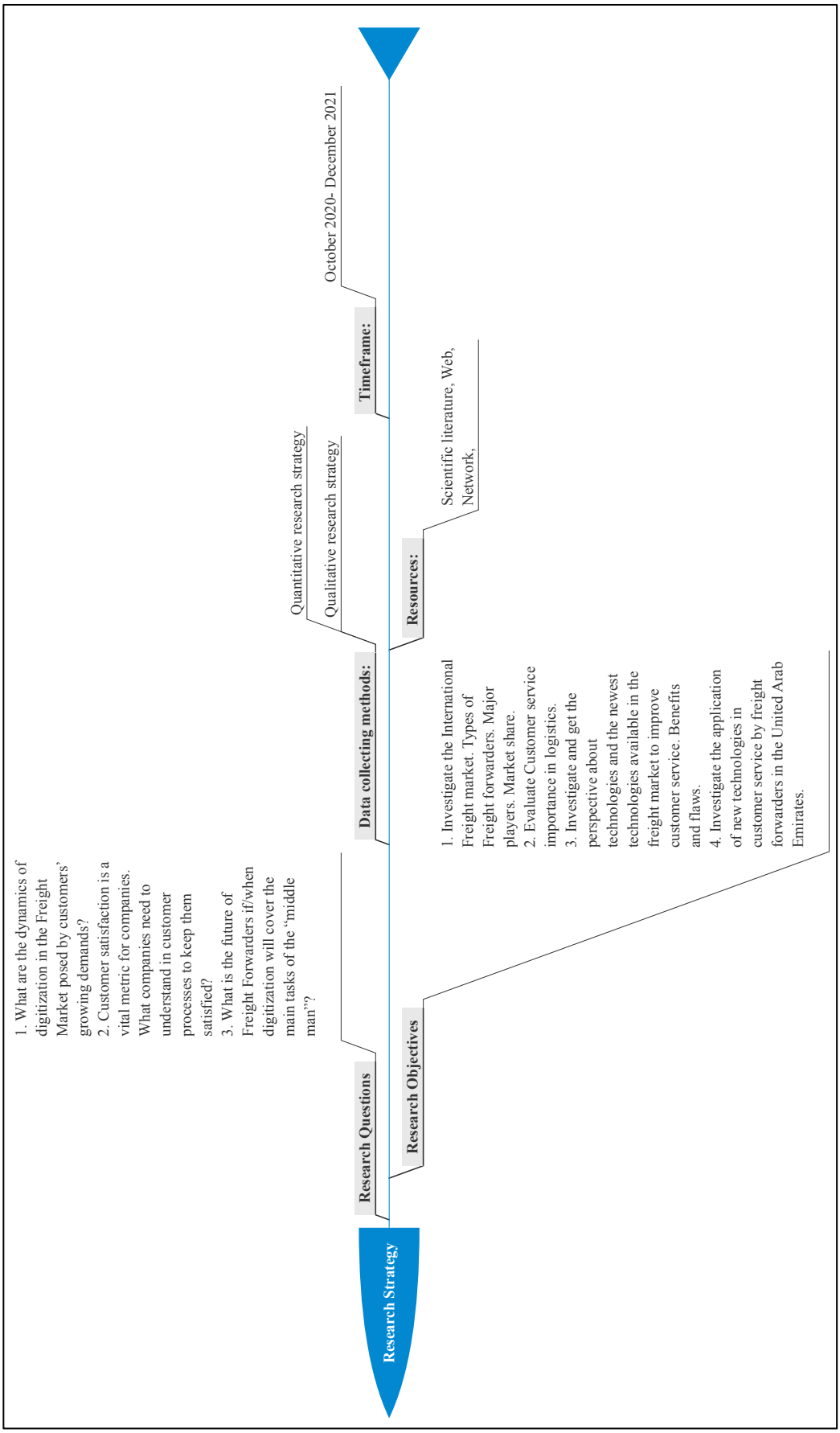



Source: Prepared by the author.

## 2.1. Research strategy

The aim and objectives of the thesis were approached by rising the research questions and by proving hypothesis. In order to do that the following research strategy was chosen (see Fig.17).

**Fig. 17. Research strategy**




Source: Prepared by the author.

To meet goal and objectives of the study Quantitative research was done and it was augmented by Qualitative analysis to make conclusions.

## 2.2. Research gap and design

### 2.2.1. Key aspects of the research analysis

Main key aspect of the research was - **APPLICATION OF NEW TECHNOLOGIES IN CUSTOMER SERVICE BY FREIGHT FORWARDERS.** How challenges such as technological advancement and customer service which freight forwarders are facing interconnected. And what are the trends in the United Arab Emirates.

### 2.2.2. Goal and objectives/ tasks of the study

The research focus was to study **the relationship between Technological progress and Customer service.** What technologies Freight forwarders are using to improve customer service and operations. What are the trends in the market?

This research will contribute new information about the Freight Forwarders and how Industry 4.0 or Logistics 4.0 technological pillars are shaping the industry and how digitalization of the business is regarded from the practical point of view. Have the Customers expectations changed – is there need for digitalization to get quality and swift service or, if we take Freight Forwarding business- it is people-to-people relationship business?

Following goals and objectives were met by conducting ( see Table 5):

**Table 5. Goals and Objectives in Mix Method research**

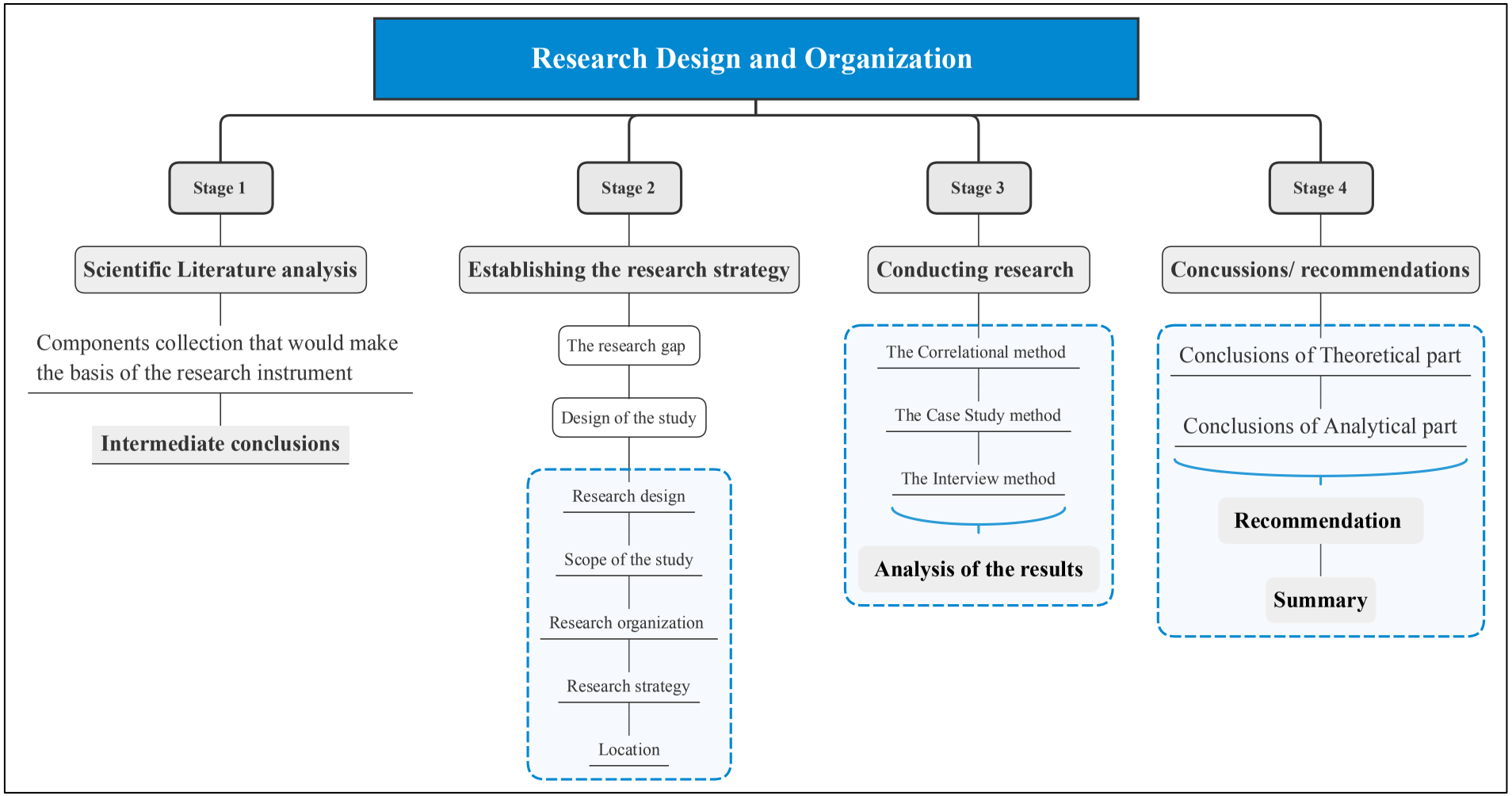
| Quantitative research | Qualitative research |
|---|---|
| Theory testing | Theory building |
| Gathered Numeric indicators | Gathered Non-numeric indicators |
| Statistical analysis represented by charts and graphs | Non-statistical analysis represented by transcripts |
| General Findings of chosen research field | Specific to a field of research findings, professional group focus |
| Online based research | Field-based research |

Source: prepared by the author.

## 2.3. Research design and organization

This subchapter presents the research design and plan. Separate stages of the research are presented (see Fig. 18.) and each stage's role described in respect to the main objective. Research design in Qualitative research is flexible and in Qualitative research is systematic. Both methods contributed to build the theory and test it.

**Fig. 18. Research design and organization**




Source: Prepared by the author.

### 2.3.1. Methodological basis and Conceptual approach

#### Methodology and methods

This section explains a way empirical research has been implemented. It describes and justifies the following:

- Type of research
- Data collection methods
- Sampling procedure, sample size and sampling types
- Research participants
- Data collecting instruments
- Research location
- Data analysis methods
- Writing strategies and ethical considerations

#### Type of research

Primary research is conducted based on primary and secondary data such as various scientific literature source, publications, and statistics in Logistics, Supply Chain and Freight forwarding, Logistics Customer service, Customer Service, Freight Service, E-Service, and Digitization of Logistics fields.

The primary research involves interviews and analysis of the opinions provided by the primary respondents. The primary research starts with identifying and approaching the primary respondents, the primary respondents are approached include professionals and participants from the industry.

Secondary research involves extensive exploring through the secondary sources of information available in both the public domain and paid sources. Each research study was accompanied by primary research. The information obtained through the secondary sources was crosschecked on various data sources.

The secondary sources of the data are following: Company reports and publications, Government/institutional publications; Databases such as WTO, World Bank, Public data; Websites and publications by research agencies.

To answer the question why this approach is the best to answer research questions? In this particular scientific paper gave a broad spectrum of variety of recently developed or created

software programs or platforms to achieve the goal – to improve customer experience and service. Furthermore, it gave the opportunity to learn this information by conducting the Interviews due to it is very new in contrast and there is not yet available a whole plethora of sources to analyse it how it is in reality.

## Data collecting methods

**Mixed methods research** is chosen for this study. Accompanied by analysis of secondary statistical data.

"Mixed methods involve combining or integration of qualitative and quantitative research and data in a research study. Qualitative data tends to be open-ended without predetermined responses, while quantitative data usually includes closed-ended responses such as questionnaires or psychological instruments. Early thoughts about the value of multiple methods—called mixed methods—resided in the idea that all methods had bias and weaknesses, and the collection of both quantitative and qualitative data neutralized the weaknesses of each form of data. "(John W. Creswell 2014)

The framework of research methods in Qualitative research – by conducting the Interviews and chosen Case studies. This method gave the opportunity to evaluate the gathered and presented data and results in non-bias opinion, but from the professionals in the field and industry.

To understand why is this particular method was chosen and why other methods were not suitable for my objectives, John W. Creswell explains it very thoroughly:

"Certain types of social research problems call for specific approaches. For example, if the problem calls for (a) **the identification of factors that influence an outcome**, (b) the utility of an intervention, or (c) understanding the best predictors of outcomes, then a **quantitative** approach is best. It is also the best approach to use to test a theory or explanation.

On the other hand, if a concept or phenomenon needs to be explored and understood because little research has been done, it merits a qualitative approach. **Qualitative** research is especially useful when the researcher does not know the important variables to examine. This type of approach may be needed because the topic is new, the subject has never been addressed with a certain sample or group of people, and existing theories do not apply with the particular sample or group under study (Morse, 1991)." (John W. Creswell 2014)

In this scientific research, only a quantitative approach would not be enough due to identifying factors that influence new technologies used to implement customer service. Quantitative data and its results would not be able to answer the following research questions about:

- Customer satisfaction is a vital metric for companies. What companies need to understand in customer processes to keep them satisfied?
- What is the future of Freight Forwarders if/when digitization will cover the main tasks of the "middle man"?

In other hand, it was not enough data to support the hypotheses and make conclusions of the research with only Qualitative data. It cannot be used as stand-alone due to it needs to be supported by Quantitative data. "A **mixed methods design** is useful when the quantitative or qualitative approach, each by itself, is inadequate to understand best a research problem and the strengths of both quantitative and qualitative research (and its data) can provide the best understanding […]"(John W. Creswell 2014)

By writing questions and hypothesis, it narrowed the purpose statement into specific questions and predictions that was examined in the study.

John W. Creswell suggests that, in a mixed methods study, three types of questions—qualitative, quantitative, and mixed methods—are useful to present.

**Representativeness of the study.**

**Sampling. Justification for the type of sampling of the respondents.**

1. **Correlational**

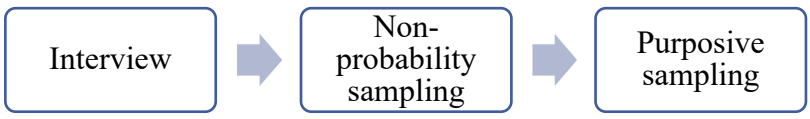
    - **The sample size** -Data, statistics, analysis.

2. A **case study** of two major market players (one local and one international) compares approach and differences.

    - **The sample size for the Case studies**- a minimum of two case studies will be conducted. Requirements for a company: one local company owned by Emirati, and one International which headquarters in the country of origin.

3. **Interviews** conducted by the thesis author of Freight Forwarding companies representatives based in the United Arab Emirates.

    - **The sample size for the Interview** – a minimum of seven freight professionals in different companies.
        - **Sampling types- Non-probability sampling- Purposive sampling**



Theoretical justification of sampling choices, sample frame and type in this research is to see the impact of the participants on the results of the study. The essential reason for the selection of the participants is:

1) Data, statistics and analysis performed by the research and statistics companies is a good sample for Quantitative data and make solid support base for entire research.
2) For the case study, Freight companies selected to see hands-on implementing Digital solutions strategy to improve customer service. These companies are major market players and are good example for the study.
3) For the interview, field professionals have been interviewed with great experience and expertise levels. Purposive sampling used when a diverse sample is necessary or the opinion of experts in a particular field is the topic of interest. Interviewing field profesionals it is unique opportunity to gather information where it is not available elsewhere.

Based on results obtained from a three types of sample, it was possible to draw conclusions with a certain level of confidence, and non-bias opinion.

**Research participants**

As mentioned previously, research sampling is purposive, and for the Interview participants, specific criteria are applied.

- Freight and logistics industry professionals
- Professionals with experience in MENA or GCC regions.
- Different levels of management and operations.

For the case study, two freight and logistics companies were chosen.

- National company with freight operations.
- Multinational company with freight operations.

**Data collecting instruments**

A) **The correlational method** (Data, statistics, analysis) is selected to collect Quantitative data.
B) **The case study method** is chosen to collect Qualitative data.
C) **The interview method** is selected to collect Qualitative data.

Type of Interview:

- Face-to-face, phone call and web interviews via e-mail.
- Conducted as a one-time occurrence.
- Semi- structured.

### 2.3.2 Data collecting instruments strategy and timeline

**A) Correlational research method**

"Non- experimental form of research is the correlational design in which investigators use the correlational statistic to describe and measure the degree or association (or relationship) between two or more variables or sets of scores (Creswell, 2012). Multiple forms of data drawing on all possibilities. (Creswell, 2014)

The aim of correlational research design is to determine the relationship between variables as they exist.

This method presented the data regarding logistics and freight companies' digital capabilities, comparison between surveys and published statistics. Business strategies regarding digital technologies and the readiness for digitization.

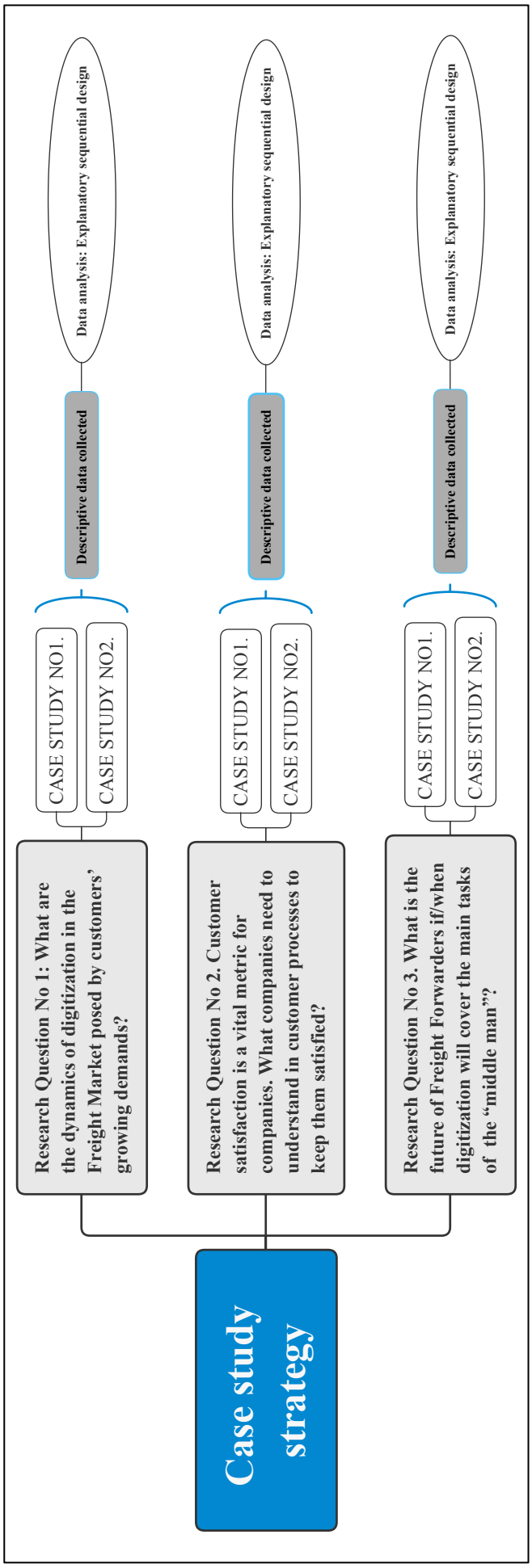
**B) Case Study**

In order to approach the aim of scientific paper and answer research questions, two case studies have been conducted. Companies reviewed and analyzed are Expeditors and Al-Futtaim Logistics.

The case study examines both companies Digital Solutions Strategies to improve customer service. Information was collected by doing desk research. Methods of desk research include collecting information from websites, press releases, newspapers, social media and advertising. The goal here was to discover the evidence information and to make conclusions that Freight Forwarders are moving towards Digitization.

Case study strategy presented (see Fig.19.).

**Fig. 19. Case study strategy**




Source: prepared by the author.

### C) Interviews

In this research paper the aim of the Interviews was to gather Qualitative data from field professionals and use it as supporting data for Quantitative data. This data helped to explain Quantitative data if specific details and elaborate the results.

Main requirements for the Interviews were:

1. To make sure the research question is clear.
2. Line of the questioning prepared in unbiased and clear manner.
3. Interviewees had clear information prior the Interview about conducted research and the purpose of the interviews.

Interview method is the best used when we want to learn detailed information from a few specific people. And particularly useful if it is the experts of the studied field and learn their opinions.

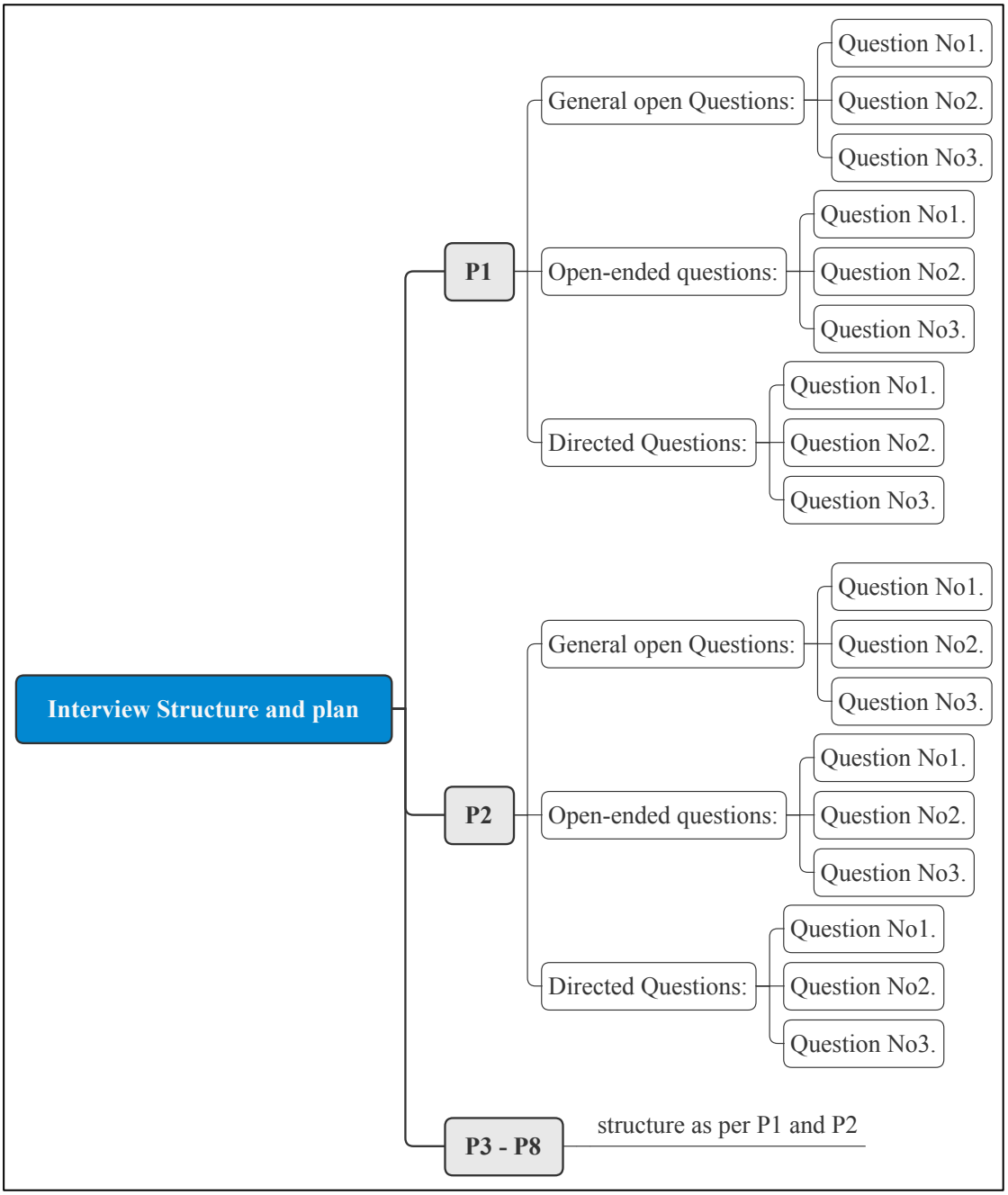
To approach the project, **aim and objectives** of the study, Interview was conducted and questions were asked to answer posed **research questions** and **prove hypotheses**.

#### Interview Data collection

Interview "Funnel method" was chosen to conduct the interviews. This particular method aims to collect a lot of information by starting with general questions, then narrowing the gap by asking open-ended questions and slowly getting to the point with directed questions. Semi-structured interviews were conducted. This type of interview is proper when collecting attitudinal information on a large scale or when it is not possible to draw up a list of possible pre-codes because little is known about the subject area. With semi-structured interviewing, the open-ended nature of the question defines the topic under investigation but also provides opportunities for the interviewer and interviewee to discuss some issues in more detail. (Mathers, 2000)

Fig. 20 and Fig. 21 present detailed Interview structure and plan and, line of questioning.

**Fig. 20. Interview structure and plan**




Source: prepared by the author.

**Fig. 21. Line of Questioning**

*Introduction : Could you please provide as much information as possible about yourself concerning the topic of the study? Position, experience.*
*How much experience do you have in freight forwarding?*

| Line of Questioning | |
|---|---|
| | Question No1. — What would be your assessment of today's logistics and freight market on digitalization status? |
| | Question No 2. — How do you define digitalization concerning freight forwarding?<br>*What are the management system trends in freight market?* |
| | Question No 3. — Could you please give your opinion on why there is resistance to digitalization? |
| | Question No 4. — What kinds of problems regards to customer service are being faced in logistics and freight fields today?<br>*Where do you see the search for solutions to these problems going?* |
| | Question No 5. — In your opinion, how digitization has changed the customer expectation when it comes to logistics? |
| | Question No 6. — Could you please comment on why digitalization is good or bad for freight forwarding?<br>*Do you think it is essential to change towards digitalization?* |
| | Question No7. — In your opinion, where will all these digital developments take the freight industry in the distant future?<br>*Do you believe the industry will be in crisis if companies will not go with Technological pillars side by side? Why or why not?* |
| | Question No 8. — Are Digital Freight Forwarding companies ( IT companies) posing a threat to more traditional service providers, and can they compete with established freight companies?<br>*What are the opportunities for them?* |
| | Question No 9. — Do you think logistics and freight companies have what it takes to move towards digitalization?<br>*In your opinion, when the traditional business model is going to struggle?* |

Source: prepared by the author

## Research location.

The research was conducted in the United Arab Emirates, Dubai.

## Data analysis methods

**Explanatory sequential mixed methods** design was used to analyze data and make conclusions. Mentioned methods design commonly referred to as "two-phase model". The goal is to explain Quantitative results with Qualitative Data support. The first step is collecting the Quantitative data, and Qualitative information plays the supporting role.

The data collection procedures in the explanatory sequential design involve collecting quantitative data, analyzing the quantitative data, and using the results to inform the follow-up qualitative data collection. Thus, sampling occurs at two points in this design: the quantitative and the qualitative phases. In this design, the quantitative and qualitative data collections are related to each other and not independent, and one builds on the other. The emphasis on data collection may favour either quantitative or qualitative data. Most commonly, an emphasis is placed on the initial, substantial quantitative data collection with a smaller emphasis on the qualitative follow-up. The data collection decisions for the explanatory sequential design focus on making a strong connection between the two phases. (Creswell, 2014)

### *Content analysis*

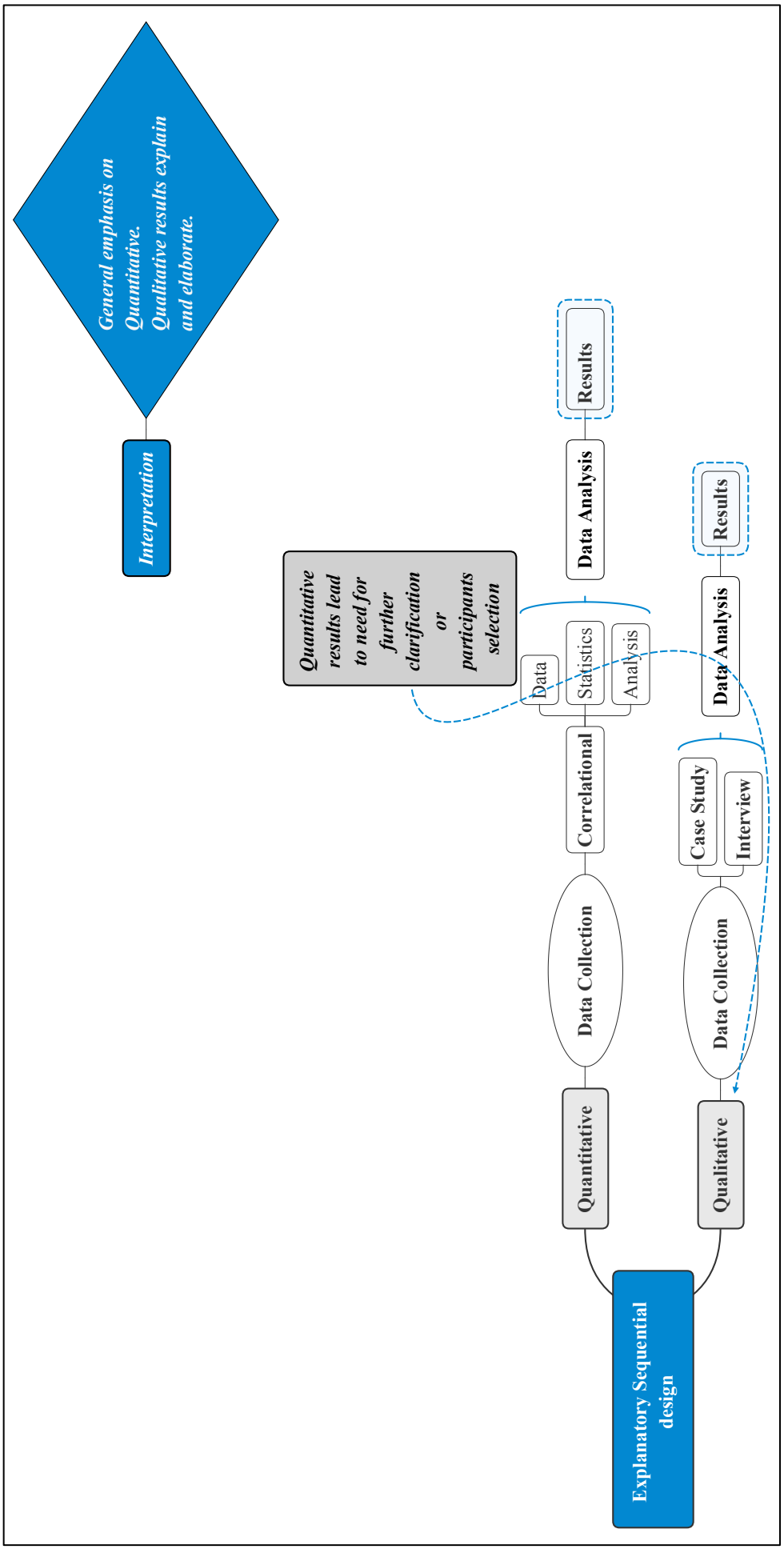
For the Qualitative data, Content analysis was applied. Case studies and interviews transcripts were analyzed to quantify patterns and trends and coded and summarized to provide interpretation of Qualitative data and make a conclusion. In this case, direct quotations were used to support analysis and to bring gathered information to the reader as it is in reality. The coding method was based on the research questions. Mixed methods research also allows the use of both inductive and deductive approaches for reasoning the data.

The content analysis allowed for the researcher to be unassuming regarding qualitative data collection and analysis. And was not influencing the results.

Content analysis might have had some subjective interpretation when focusing on words and phrases.

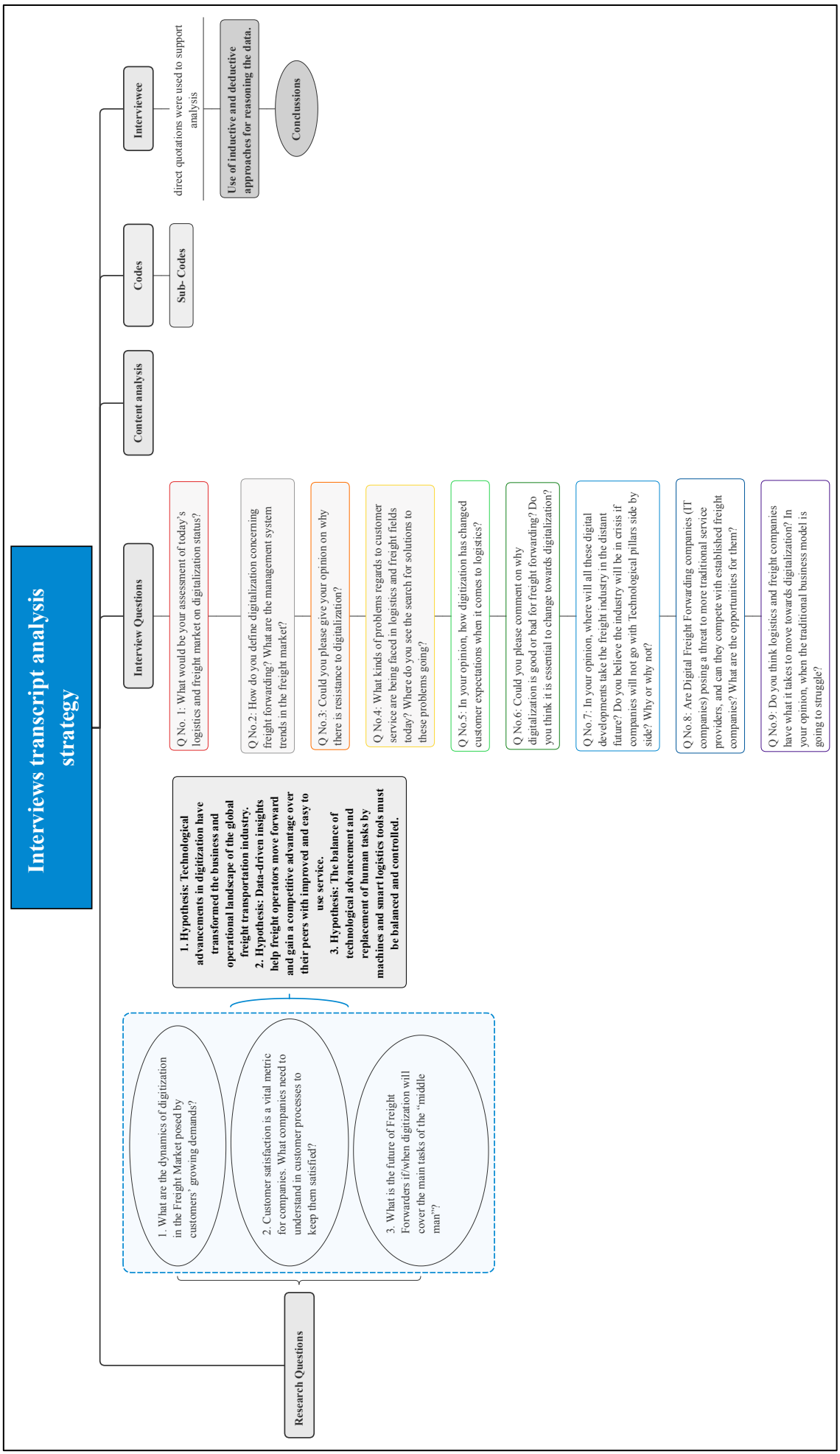
Explanatory Sequential design method mapping and design and Interviews transcripts analysis strategy presented (see Fig.22 and Fig 23).

**Fig. 22. Explanatory Sequential design method**




Source: Prepared by the author. Adapted from several online sources.

**Fig. 23. Interviews transcripts analysis strategy**




Source: Prepared by the author.

## Writing strategies and ethical considerations

The author should do any type of communication concerning the research with honesty and transparency.

**Ethical Considerations**

1. Research participants should not be subjected to harm in any way whatsoever.
2. The author should prioritize respect for the dignity of research participants.
3. The author should obtain full consent from the participants before the study.
4. The anonymity of research participants has to be ensured. The interviewer must reassure the respondent of their **confidentiality** or **anonymity** and inform them that their identities will not be revealed in the aggregated findings.

*Researcher bias.* Bias might be presented in the way Interview questions have been asked, notes have been introduced in the paper, and conclusions have been drawn from the collected data.

## 2.4. Scope of the study

**The scope of the study:**

- The study will cover the overview of technological development in systems and technologies in the freight and logistics sector.
- What technologies or new technologies do international freight forwarders apply in customer service? First, a brief overview worldwide will be conducted and followed by the central pivot of the United Arab Emirates freight market.
- Local and multinational freight forwarders in the UAE. Market share, digitization standing.

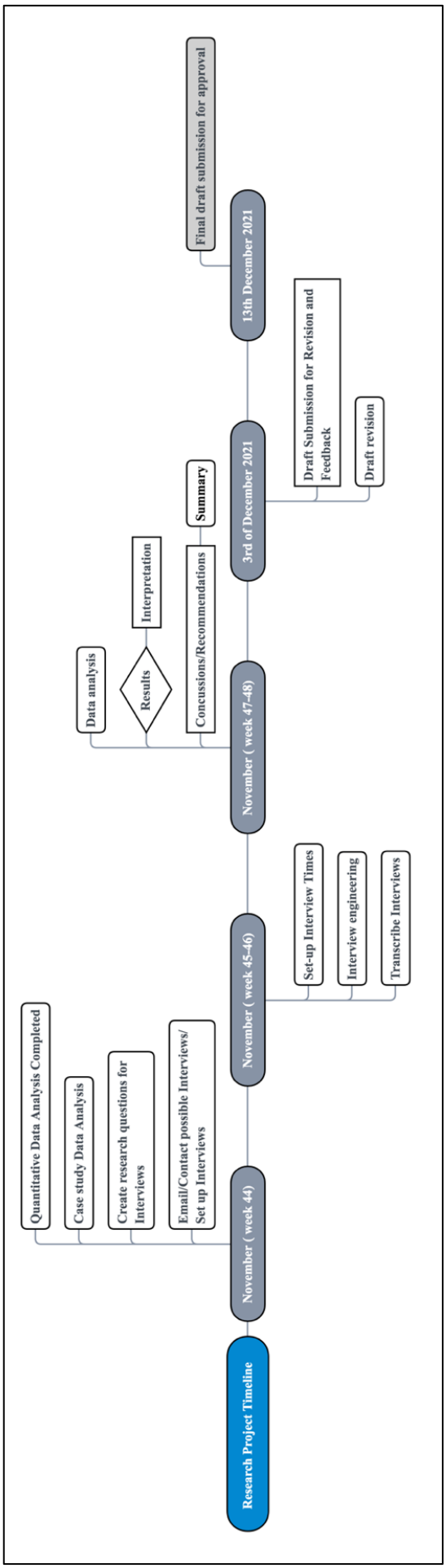
**Duration of the study**: October 2020- December 2021.

**This thesis did not cover:**

1. Deep understanding of the technologies from an IT perspective.
2. The market share and ratings of the applications and software used and applied in the logistics and freight industry.

Research project plan and timeline is presented (see Fig. 24).

**Fig.24. Research project plan and timeline**




Source: prepared by the author

# 3. ANALYTICAL PART. EMPIRICAL DATA ANALYSIS

This chapter analyzed data collected during empirical research. Data is presented in a way to describe, analyze and make an interpretation. Data were analyzed using the Explanatory Sequential Design method, for Qualitative data Content analysis was applied. The general emphasis is based on Quantitative results, and Qualitative results were used to explain and elaborate.

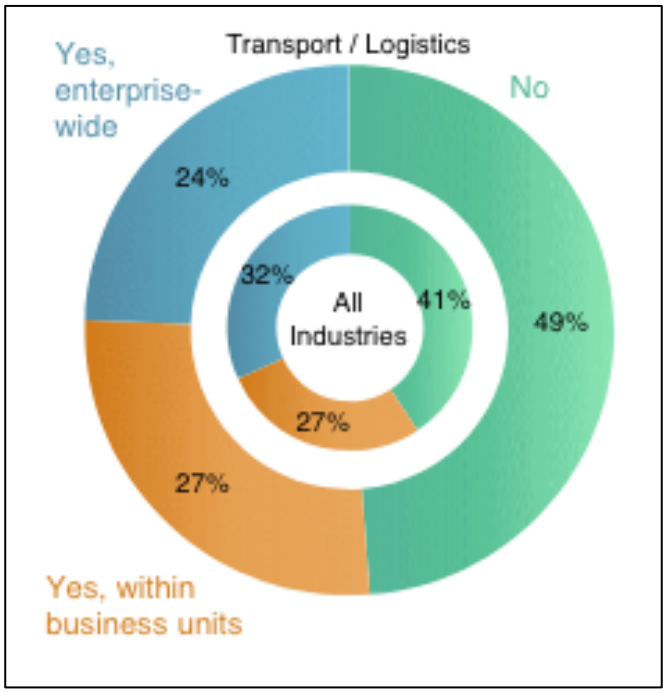
## 3.1. Quantitative results

A 2018 IT survey by consulting firm KPMG revealed that while transport and logistics companies lagged in their digital capabilities, they were highly effective in using digital tools to enhance the overall customer experience. Some of the survey snapshot questions and supporting data stats are following:

**Q: Does your organization have a clear digital business vision and strategy?** (see Fig.25)

Transport / Logistics companies are less likely to maintain an enterprise-wide digital business strategy than others (24% vs. 32% for all industries). Overall, only half have a clear digital strategy of any sort.

**Fig.25. Survey about digital vision and strategy**

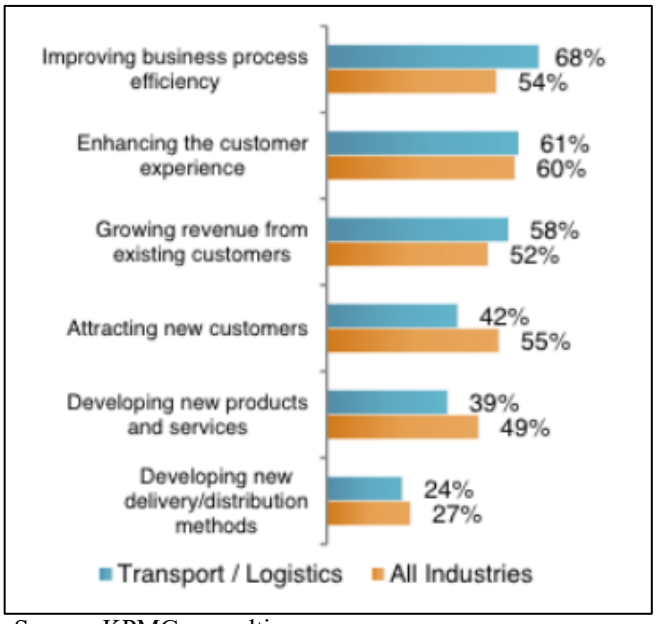



Source: KPMG consulting

**Q: Which are the most important goals when prioritizing digital technology initiatives in your organization?** (see Fig.26)

When prioritizing digital investments, Transport / Logistics companies heavily focus on improving business process efficiency (68% vs. 54% for all industries) and enhancing the customer experience (61% vs. 60%)

**Fig.26. Survey about digital technology initiatives in the organization**

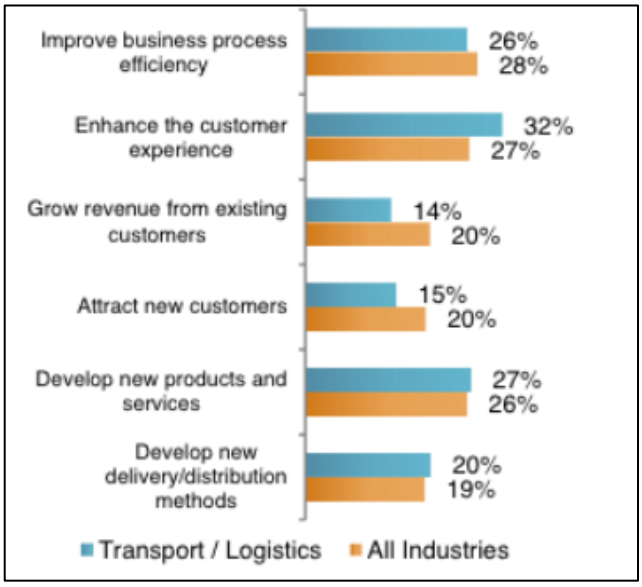



Source: Source: KPMG consulting

**Q: How effective has your organization been in using digital technologies to advance the following goals? (Very/Extremely Effective)** ( see Fig.27)

While Transport / Logisticsslightly trails cross-industry peers in its effectiveness in using digital technologies to improve business process efficiency(26% vs. 28% for all industries), it leads others in using it to enhance the customer experience (32% vs. 27%).

**Fig.27. Survey about the use of digital technologies**

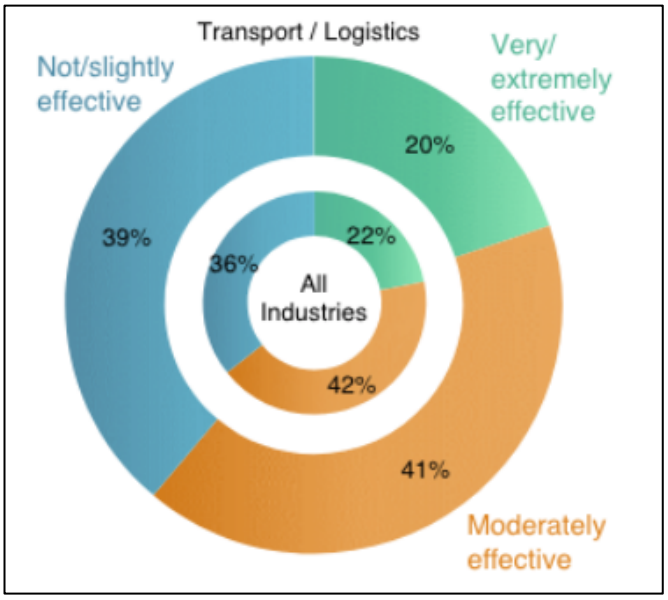



Source: Source: KPMG consulting

**Q: Overall, how effective has your organization been in using digital technologies to advance its business strategy?** ( see Fig. 28)

Similar to other industries, Transport / Logistics companies report low overall effectiveness in using digital technologies to advance business strategy, with just 20% describing their digital strategy as very effective or better, and 39% describing it as slightly effective or not effective.

**Fig.28. Survey about digital technologies usage effectiveness**

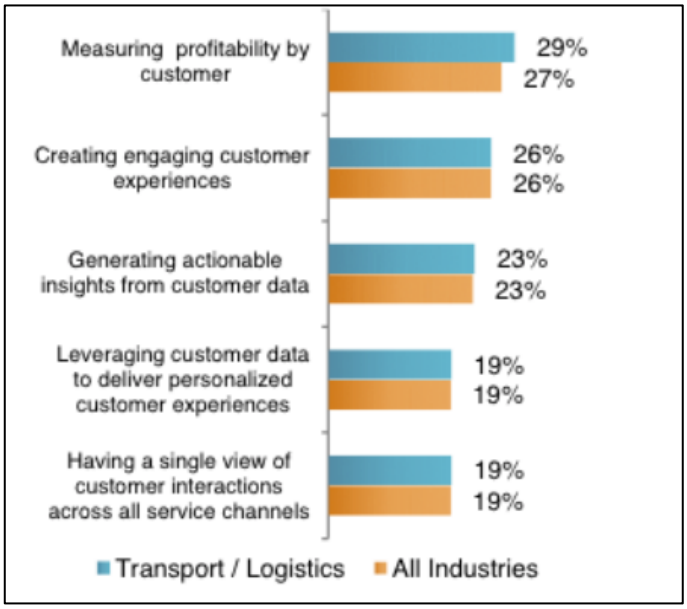



Source: KPMG consulting

**Q: How effective is your organization at each of the following capabilities? (Very/Extremely Effective)** (see Fig.29)

Like other industries, Transport / Logistics companies lack effectiveness in five critical customer-focused capabilities, with no more than 29% rating themselves very effective in a specific capability. Despite investment in enhancing the customer experience, Transport / Logistics companies rate themselves weakest at leveraging data to deliver personalized experiences and having a single view of interactions across all service channels (19%)

**Fig.29. Survey regarding the organization effectiveness in selected capabilities**

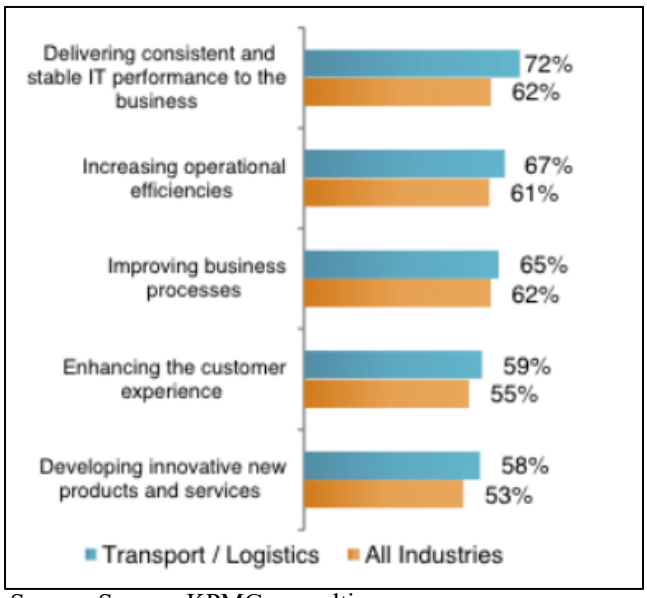



Source: Source: KPMG consulting

**Q: What are the key business issues that your management Board are looking for IT to address? (top 5)** (see Fig. 30)

Compared to priorities in other industries, Transport / Logistics management Boards more heavily emphasize “core” IT goals such as delivering consistent and stable IT performance (72% vs. 62% for all industries), increasing operational efficiencies (67% vs. 61%) and improving business processes (65% vs. 62%).

**Fig.30. Top 5 key business issues for IT to address**

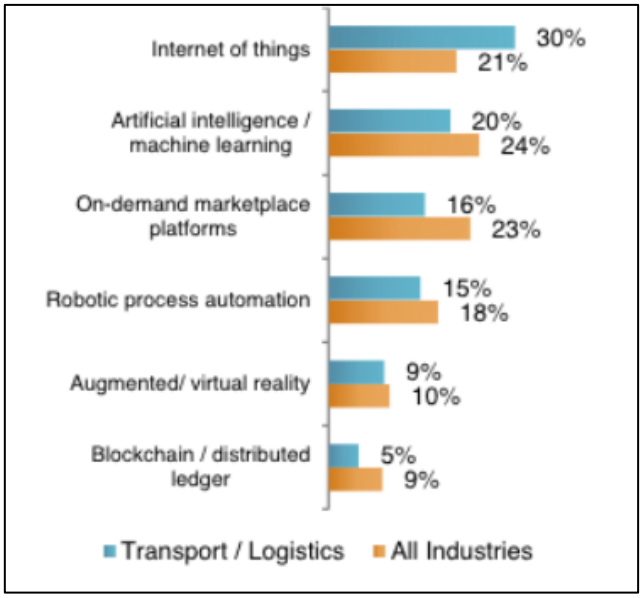



Source: Source: KPMG consulting

**Q: How would you characterize your investment in the following technologies? (Moderate/Significant Investment)** ( see Fig.31)

Of next-generation technologies, Transport / Logistics companies have invested significantly more in the Internet of Things than others (30% vs. 21% for all industries), with modest investments in most other technologies. Transport & Logistics sector companies are accelerating their investment in digital at pace, responding to a variety of push and pull factors including: keeping pace with significant advances in Artificial Intelligence and Automation (e.g., Autonomous Vehicles), competition from digital disruptors, meeting constantly-evolving customer expectations in delivering digital experiences; and, delivering more capacity without building extra infrastructure or procuring new fleet.

**Fig.31. Investment significance in the following technologies**



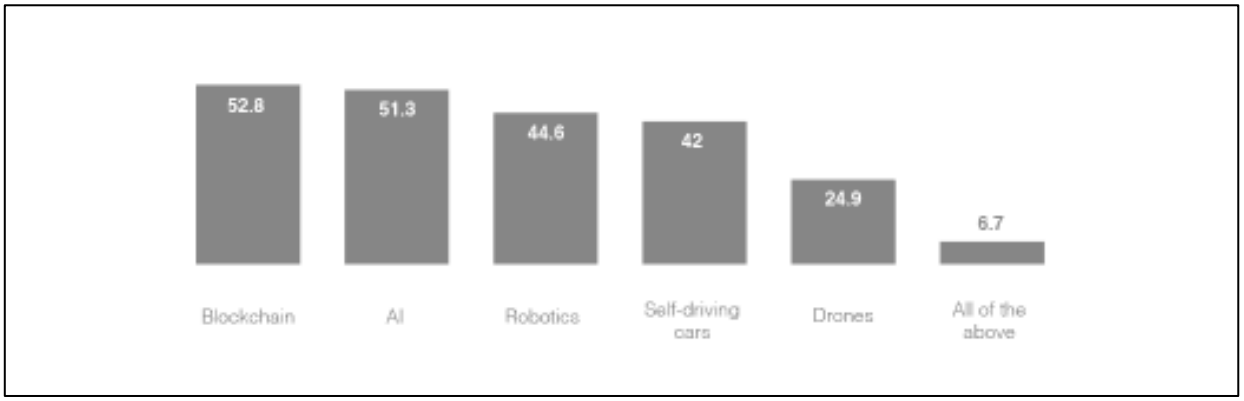

Source: KPMG consulting

There is a clear need for enterprise-wide digital strategies to deliver pan-organizational benefits. Investments in platforms and apps also require investment in capabilities to exploit the generated data (e.g., creating singular views of customers and designing & delivering personalized experiences). This said investment in technology by Transport / Logistics sector companies is now being recognized in the market, changing the paradigm on the ability to recruit and retain the best digital skills. (Foulser, 2018)

Statista survey in 2018 indicates that the supply chain is an excellent source of structured and unstructured data. Following that, the Internet of Things, Artificial Intelligence, and blockchain are considered the key drivers of Digital Transformation in logistics, supply chain management, warehousing, and transportation. By gathering the information generated by connected equipment and logistics software and matching the data against Machine Learning models implemented in the cloud, businesses can achieve greater supply chain transparency and dramatically reduce operating expenses. (Klubnikin, 2019)

According to the Survey performed by Statista in 2018 (see Fig.32), Internet of Things, Artificial Intelligence and Blockchain are considered the key drivers of Digital Transformation in logistics, supply chain management, warehousing and transportation.

**Fig. 32. Disruptive Technologies in Logistics (% of respondents)**




Source: Statista Survey 2018 (Klubnikin 2019).

- 65% of logistics, supply chain and transportation executives acknowledge the necessity to revamp existing models and add flexibility to business operations in order to ensure omnichannel delivery, reduce costs and meet the ever-shifting consumer demand.
- 72% of enterprises involved in planning, executing and monitoring the flow of products from the point of origin to the point of consumption consider improved customer experience the key benefit of business transformation.
- 62% of business leaders surveyed by Forbes 2019 in admitted that their companies were undergoing Digital Transformation at the time.
- Over 20% of businesses involved in logistics and supply chain management work with IoT software companies to fast-forward their Digital Transformation initiatives.
- 10% of logistics companies rate their data processing and analytics capabilities as advanced. (Klubnikin, 2019)

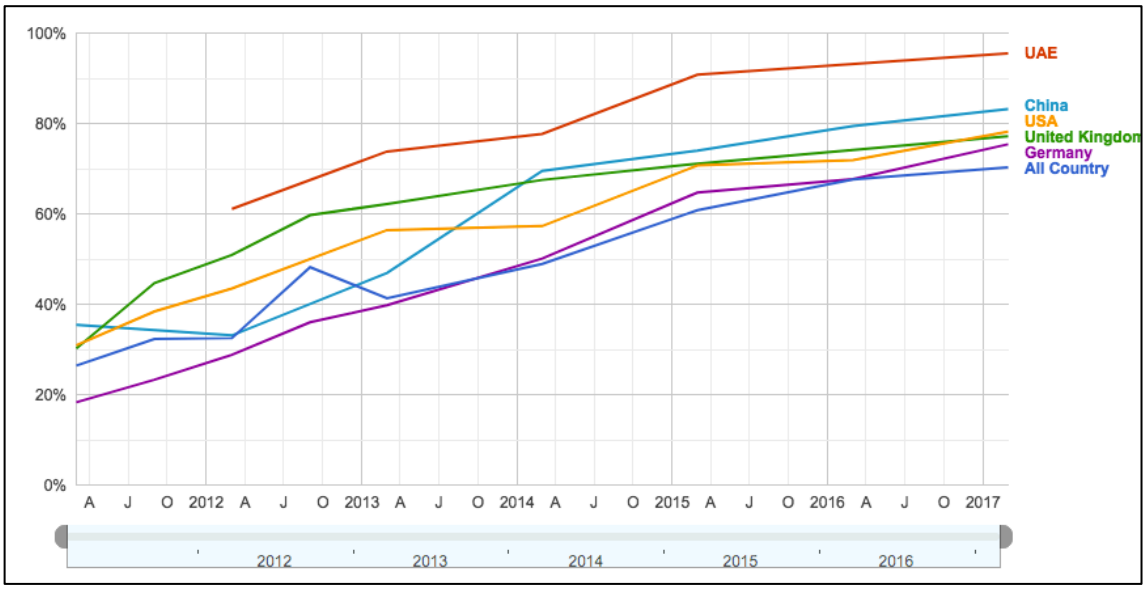
As presented previously, the Logistics Industry is no longer legging in digitization in current market trends. With COVID-19 massive impact on the industry, the digital revolution was fueled by it.

The slow embrace of new digital technologies by the freight forwarding industry has inevitably become something of a cliché. With industry competition intensifying, the race to establish market-leading positions built on the latest technologies and innovations is now well and truly on, with key players going head to head to deliver the optimal customer experience.(DHL 2020)

Statista survey in 2020 indicates, that 57 % of supply chain industry professionals revealed that they already integrated cloud computing and storage technologies into company operations fully. Inventory and network optimization tools have the highest rate on the adoption list of supply chain companies in one or two years from now.

**UAE readiness for digitization.** Statistics with regards to the UAE, that the percentage of Adult population using smartphones. (See Fig. 33). It indicates that 95.5% of the UAE adult population is using smartphones. China is just above 80% and the USA, Germany and United Kingdom below 80%.

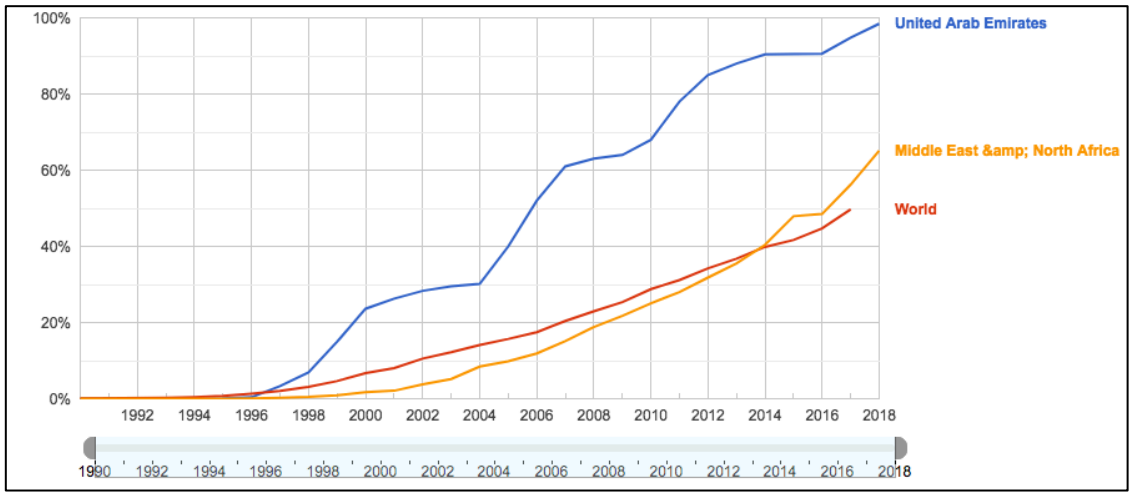
**Fig.33. Adult population using smartphones**




Source: Kantar TNS Germany, 2019, Google public data.

Adult population using the internet in UAE, where 98.45% using the Internet, where the World is only 49.72%. (see Fig. 34) These figures also support is a clear reflection of the level of technological advancement in the country. It also demonstrates the stated fact mentioned previously by Klaus Schwab that nearly everyone will soon have a literal supercomputer in their pocket.

**Fig.34. Individuals using the internet (% of population)**




Source:World Bank, 2020, Google public data.

FedEx Express Study in October 2021 Reveals that the UAE is ready to embrace a dynamic, experimental, and sustainable future. With the pandemic accelerating the country's digital transformation. From healthcare to education, banking to manufacturing, technology is transforming every sector, giving rise to a future full of possibilities.

According to the study, which surveyed more than 750 respondents across the UAE:

- 96% stated that they believe the country is prioritizing technology like Artificial Intelligence (AI), the Internet of Things (IoT), and Blockchain to deliver a future-ready world.
- Approximately 96% also believed technology they'd seen in science fiction movies is either already a part of their daily lives or likely to be in the next few years.
- 96% of respondents believe that the e-commerce sector will need to be more technologically driven to meet their needs better in the future.
- 93% consider tech-enabled logistics necessary in a futuristic world.
- Approximately 90% of respondents stated that companies demonstrated their ability to understand 'What's next?' and present possible solutions over the past year.
- A majority of 95% of those polled in the FedEx survey believe that organizations, communities, or individuals who experiment and adopt change are better equipped to navigate future challenges.

The response from the study participants is clear: organizations must continue to reevaluate and revamp their sustainability strategies to ensure relevance to their customers and resilience for the long term. As the world keeps evolving, technology and trends will likely drive changes in lifestyle, behaviours, and attitudes. (FedEx Express Study 2021)

When surveying carriers and brokers in the UAE, 95% of the surveyed businesses indicated that they would prefer to work on one platform and download a single app; not only will this improve the likelihood of moving shipments on time, but also minimize the time spent on finding that next shipment allowing all stakeholders to focus on business. This means more driving time for carriers and a better operation flow for brokers.(DIFC 2020)

In November 2021, the UAE announced the adoption of the Smart Industry Readiness Index (SIRI) to identify the level of technology adoption within industrial players.

The Ministry of Industry and Advanced Technology (MoIAT) said in a statement that the index, recognized by the World Economic Forum as a global standard for Industry 4.0, "is an essential tool in the development of an accurate, customized roadmap for each company to successfully integrate advanced technologies to increase efficiency, reduce costs and increase the

competitiveness of the production process.

The index will help companies understand their current digital maturity and contribute to increasing their awareness of 4IR applications. It also provides them with high-level recommendations to enable them to take the next step toward their digitalization journey. (John, 2021)

## 3.2. Qualitative results

### 3.2.1. Case study analysis

**Expeditors**

In 1991 Expeditors formalized an internal quality program called EXCEL (Expeditors Commitment to Excellence and Leadership), built on a goal of 100% customer satisfaction 100% of the time.

In 2013 Expeditors set up Customer Solutions Center at the corporate office, demonstrating the Information Technology capabilities to customers, carriers, and investors. Expeditors IT capabilities have helped keep the company at the forefront of those who benefit from it most.

A year of strong innovation, 2017 was kicked off with the appointment of a Chief Strategy Officer to establish and oversee a Strategy group of highly experienced individuals to explore new areas of opportunity. Later the company announced the launch of a new subsidiary, Cargo Signal. It brings new supply chain control and visibility levels through digital services powered by a proprietary, sensor-based logistics system. A 24x7x365 Global Command Center staffed with seasoned professionals trained in risk management, logistics, and supply chain security.

Continuing the innovation streak, in 2018, in collaboration with Walmart, Expeditors announced the launch of a new cutting-edge carrier allocation platform to provide an advanced level of the forecasting and planning to revolutionize supply chains and transportation efficiency.

During unprecedented market conditions in 2020, Expeditors remains adaptable and resilient and exceed 10 billion dollars in revenue for the first time. Investment in software as a service technology is accelerated, and there is a need for Digital Solutions Strategy. (“Our History - Expeditors” n.d.)

Order Management is all about connecting your internal data and processes with your external supply chain partners to provide strategic insight and value.

Tradeflow® is trade management. The software is designed to help importers and exporters manage the data necessary to move goods. The secure, web-based platform not only improves

visibility and control but accomplishes this with strong collaboration and integration capabilities to connect with your supply chain partners around the world.

When it comes to damaged or lost cargo, filing a claim with a provider can be pretty taxing. To help tackle this issue, ECIB, a wholly-owned subsidiary of Expeditors, has a cargo claims app designed to simplify the claim filing process. This innovative technology allows our customers to submit a claim when damage or loss is discovered, therefore avoiding the hassle of processing extensive information, documents, and images.

To unlock the full potential of visibility, it is not enough to simply see what has happened, is happening, or will happen in the supply chain – one must also fully understand. To that end, a digital representation of the supply chain Digital Twin, constructed in a virtual environment that allows for ongoing examination, validation, and projection of future states, can be an invaluable tool. (Expeditors International 2020)

In 2020, Expeditors acquired Fleet Logistics' Digital Platform. The purchase will support Expeditors' online LTL shipping platform, Koho (gokoho.com), and align with Expeditors' strategy and focus on Digital Solutions. ("Expeditors Acquires Fleet Logistics' Digital Platform | Business Wire" 2020) Expeditors is a global logistics company, and the Fleet platform enabled the company to become a Digital Freight Forwarder.

"Expeditors has proven invaluable in providing the advanced technology suite required to drive operational decision making. This high-level visibility provides detailed milestones for our internal business managers, giving them information otherwise they would not have access to.

(Sheri Kerestman, Senior Operations Procurement Manager, The Goodyear Tire and Rubber Company)

**Al-Futtaim Logistics**

Through the latest sophisticated technology, Al-Futtaim Logistics can create innovative solutions, ensuring complete visibility of stock at every operational stage, which means that customers enjoy efficient and high-quality services. ("About Al-Futtaim Logistics," n.d.) In addition to mentioned technologies to improve customer service and be competitive in the market, in Dubai, Sea Freight online processing of customs declarations and port handling charges is done directly via the Dubai Trade web portal, ensuring seamless and fast customs clearance processing. Internet-based shipment tracking capabilities and real-time information provide complete visibility of the transportation process and transaction details. [48]

[48] https://www.aflogistics.com/our-services/freight-forwarding-and-customs-clearance//

Al-Futtaim Logistics has rolled out several digital initiatives like their Yard Management System for better automotive logistics operations. The company has also deployed new technologies in their systems for contract logistics, general transport and last-mile deliveries. During the pandemic, Al-Futtaim Logistics has seamlessly integrated technology solutions into its day-to-day operations to achieve greater levels of efficiency and customer satisfaction. ("Transport and Logistics Industries Enter Expo 2020 Hyperdrive Tomorrow" 2021)

According to the Managing Director of Al-Futtaim, Dr Raman Kumar, technology has increased the transparency of the entire supply chain and enabled logistics companies to achieve record delivery times.

Case study analysis completed by the author between Expeditors and Al-Futtaim Logistics and presented in Annex 2.

This research showed that the dynamics of digitization is very present in both companies. (see Table 6) Suppose we take a multinational player or national player. Digitization is here, and it is made visible to the customer when selecting your shipment order or tracking it.

Both companies are presenting a robust Digital solution strategy on their company websites and social media. Nevertheless, it is only the front view of the operations. How the back-office operations are organized and what digitization level of the back-end operations are not precise due to the limitation of this study.

**Table 6. Case study data analysis**

| | **Research questions:** | **Expeditors** | **Al-Futtaim Logistics** |
|---|---|---|---|
| 1 | What are the dynamics of digitization in the Freight Market posed by customers' growing demands? | Order management | Web Track and Trace |
| | | Trade Management Software | Stock Status Tracking |
| | | Cargo Claims App | Self service tool for booking a truck |
| | | Digital Twin | |

Continuation of Table 6

| | Research questions: | Expeditors | Al-Futtaim Logistics |
|---|---|---|---|
| 2 | Customer satisfaction is a vital metric for companies. What companies need to understand in customer processes to keep them satisfied? | Built on a goal of 100% customer satisfaction 100% of the time.Customer Solutions Center to demonstrate the Information Technology capabilities to customers, carriers, and investors. Expeditors IT capabilities have helped to keep company in the forefront of those who can benefit from it most. | Through the latest sophisticated technology, Al-Futtaim Logistics is able to create innovative solutions, ensuring full visibility of stock at every operational stage, which means that customers enjoy efficient and high quality services. |
| 3 | What is the future of Freight Forwarders if/when digitization will cover the main tasks of the "middle man"? | x | x |

Source: prepared by the author

### 3.2.2. Interview analysis

Interview transcripts are presented in Annex 3.

**Content analysis**

Content analysis was applied to analyse Qualitative data collected by performing the Interviews. Interview data coding and analysis is presented in Annex 4. Content analysis conclusions please see Table 7:

**Table 7. Interview analysis conclusions**

| |
|---|
| ***Q No1. What would be your assessment of today's logistics and freight market on digitalization status?*** |

Continuation of Table 7

| |
|---|
| **Digitization status** |
| In general opinion, today's logistics and freight market on digitization status are counted as advanced. Digitization is leading the way. The opinions of the industry professionals with heavy experience and expertise are different. After accumulating the results, it is clear that digitization status and digitalization of the business advancement is different with the size of the company. The tendency is that smaller 3PL tend to digitize at a slower pace.<br>In the UAE freight and logistics industry, digitization status is a bit different perspective - taken opinions from industry professionals. There is very little digitization of logistics and freight that is implemented in this region. Emirates developed at a very fast pace; it took a very short time for the country to become one of the most competitive countries worldwide. Small and big companies grew too fast, and now they have grown too big to adapt quickly to digitalization. Digitalization costs loads of money and needs financial recourses that only the most international or stock listed companies can afford. A lot of the smaller and medium-sized freight forwarding companies are still far behind on digitalization. The reason for this is labour cost, which is very cheap compared to the EU as an example. And there is no need to invest in R&D or hire IT solutions talents. Furthermore, COVID-19 impacted the industry with disruptions and accelerated the digitalization of businesses. Still, it will take time for freight and logistics companies to embrace digitalization to its full potential.<br>Digitization gives the opportunity of power of transparency to control the costs, efficiency. Need less human resources to perform efficiently. These opportunities also get downed with the posed obstacles from the customer side because they are afraid of the cost and management decisions for not executing 100% of digitization of the operations. The economy of scale plays a crucial role to embrace business digitalization. Besides, new disruptors such as Digital freight forwarders entering the market and traditional business models need to keep the pace of competition with such players. |
| ***Q No2. How do you define digitalization concerning freight forwarding? What are the management system trends in the freight market?*** |
| **Dynamics** |
| Dynamics regarding the digitization in freight business is covering a lot of talks about the current status and moving forward. Digitization is the heart and soul of the operations and lifeline of the business. To get a perspective regarding the adoption, it shows the use of software to improve the business, to collect data from point to point and improve the delivery of services to the final customer. Tendency eliminates phone updates and manual processes and has an e-platform to transform their business into an agile, transparent and competitive model.<br>Technologies mostly used to give customers customized information are AI, IoT, CRM, ERP, Blockchain technology, SAP and Oracle software. Most of it is for “trace and trucking” due to customer requirements and need to be able to see where is the shipments, what's the status and have real-time information available 24/7. |

| |
|---|
| It is beneficial for customers when they get customized information about billing and processes. Everything is available online. The problem of the full potential and usage lies in customers' education; only 10% of the customers use the platform possibilities to 100%. |
| ***Q No3. Could you please give your opinion on why there is resistance to digitalization?*** |
| **Resistance** |
| Resistance is certainly present at any point of change. The same refers to the freight industry. It is people, and it is cost, age group, fear of change. For the freight industry, in particular, in most cases, it is a cost, time and training.<br>Bigger companies see it as an enabler. Nobody sees it as a threat.<br>When we talk about this region, the labour is very cheap, and companies tend to make only front view platform digital, whereas in the back office is fully manual processes till now. |
| ***Q No4. What kinds of problems regards to customer service are being faced in logistics and freight fields today? Where do you see the search for solutions to these problems going?*** |
| **Customer service** |
| Problems in regards to customer service in the freight industry are to provide visibility and update the customer on the shipment status. That is the main target of every freight forwarder. Nevertheless, there are certain constraints regarding the digitization of these processes. It poses some limitations such as education and training, availability of resources to have the right platform for that, as well it takes human interactions, and naturally, it takes one person's job.<br>In addition, the location, the country plays a role in it too. Politics and restrictions make processes slower, and entering certain markets can put limitations on operations. And at last, it is people and clients who wish to have updates, as before, as they are used to, on emails or phone calls. And, in some cases, there are no real complaints from the customer due to the lack of the platform.<br>To make processes digitized and the company can benefit from it, business digitalization must be put in front of the business ethos. Education and training, elimination of manual processes and additional tasks, provide as much information as needed to end the resistance. Continuous improvement of the processes and operations. Introduction of new technologies, such as IoT and Blockchain, to increase visibility and tracking. These are the search solutions in regards to customer service problems faced these days in the freight industry. |

Continuation of Table 7

| |
|---|
| ***Q No5. In your opinion, how digitization has changed customer expectations when it comes to logistics?*** |
| **Customer expectations** |
| Digitization has changed customer expectations by bringing fast information, visibility, and efficient delivery service, allowing customers to see updates and status of the shipment when they want to see it. Making ordering and buying online easy and automatic, such as Amazon, added some pressure for the freight and logistics industry so that everything is visible now. And with it, customer expectation has increased, at the same time exceeding the level of what freight forwarders can do to meet them. Customers are asking for capabilities greater than they can receive due to the benchmark of Amazon offerings.<br>Digitization is bringing fast information, visibility, and efficient service delivered. Consumers expect the logistics industry to deliver to the same standards as e-commerce. In the logistics sector, there are many constraints like budget, people and capacity. And many companies are struggling to reach that level. Multinational large market players keep their customers satisfied by implementing blockchain technology. Customers know that is no doubt the true version of what is happening, real-time events, it is not outdated, and they can watch it in real-time. Yet, you have to go through the system, and it is one for all. So, you are kind of losing that personal touch. This point is the negative side. You are not treated uniquely unless algorithms say that. |
| ***Q No6. Could you please comment on why digitalization is good or bad for freight forwarding? Do you think it is essential to change towards digitalization?*** |
| **Need for change** |
| Digitization equals agile processes and operations for freight forwarders. The faster companies move towards digitizing operations, the faster they move their operations. Without digitization, you will not service your customer if you don't digitize and integrate your whole operations simultaneously with your customer. Customers want to see how fast, agile and digitized you are. A new generation of customers and market professionals is coming, and the expectations are far greater than before. Digitization is essential to be able to compete with market disruptors such as Amazon and Flexport because their platform can offer overall cost reduction to the consumer.<br>The cause for change is significant because companies that are not aligned with this strategy will be out of the market. If logistics and freight companies do not digitize, they will have no room to service this industry because they will be much slower than their customers. And to continue to keep up with new competitors in the market. Along with it, it offers the opportunity to automate reparative, low skilled tasks. A different opinion regards Dubai is that running a business in Dubai is different since they have abundant, low-cost labour available and applies less pressure on change and upgrading digitalization. There is a lack of digitization in the back office. The front platform is digitized to serve customers, but the back office lacks digitization, and manual processes are present. |

Continuation of Table 7

| |
|---|
| ***Q No7. In your opinion, where will all these digital developments take the freight industry in the distant future? Do you believe the industry will be in crisis if companies will not go with Technological pillars side by side? Why or why not?*** |
| **Industry future** |
| With 5G and IoT, freight industry must align with future developments. Everybody has to move towards digitization, and it is not a threat for the companies. There is still a gap in the industry where certain players only want to deal with digitally and tech sound companies, and there is less tech-savvy, less developed. There is space for everyone for now. A new trend for the ocean carriers is that they are also starting to offer Freight Forwarding services and buying companies in this field. Global ocean carriers wish to offer door-to-door services globally.<br>For the freight industry with digitization, it's harder to build relationships. In the UAE market, certain players, traders, manufacturers, and smaller businesses are genuinely not interested in that side of things at the moment. And these players will be in crisis if not go along with the digitalization pace and won't be able to compete on information updates and price. Digitalization will be a must if a company wants to compete on a global level. |
| ***Q No8. Are Digital Freight Forwarding companies (IT companies) posing a threat to more traditional service providers, and can they compete with established freight companies? What are the opportunities for them?*** |
| **Future of digital freight forwarders** |
| For digital freight forwarders, there is a certain competitive advantage against the traditional model. These are usually small or medium companies, not big plants. They don't have very complex operations, and they do all their business online. They only do administrative processes and no physical delivery. And as long they have the expertise and make everything in the house and are able to deliver, they have a place in the market. They can compete, be suppliers or clients. For the time being, digital freight platforms cannot take over the traditional business model and run the freight business in the front lines. As they grow, at a larger/ global level, IT companies can and will compete against many freight traditional business models.<br>Demand in the freight industry is immense, and the opportunity for IT platforms here is that they are different and serve a certain segment of customers. They work very well when there is logistics infrastructure |
| behind, with assets and connections. Organizations such as Flexport will be competing with traditional service providers in the next ten years once they have established a proven track record with a larger base of SMEs. They will have the experience and skill set to operate and run the freight business successfully for a particular market segment. Because in the freight industry, you are always going to need some level of expertise, a personalized approach. |
| ***Q No9. Do you think logistics and freight companies have what it takes to move towards digitalization? In your opinion, when the traditional business model is going to struggle?*** |

Continuation of Table 7

| Traditional business model transformation |
| --- |
| Logistics and freight companies do have what it takes to transform and embrace the full potential of Industry 4.0. Industry professionals know what it takes, what is required and what needs to be done, and they move towards digitization. It is the way to build a larger base and the volume of business. A customers' demand also drives transformation.<br>The traditional business model is struggling right now because digitization requires heavy investment and time, human resources and talents. Companies know that, and only most global players can develop their platforms and operations. Some companies will struggle, and the reason will be the management, the leadership and the budget. |

Source: prepared by the author

## 3.3. Interpretation of the results

Good customer service is a way to make complex processes easy. In this case, we are talking about Freight forwarders and how they make complex processes easy by implementing the newest technologies.

The environment freight forwarders operate in is finding the lowest prices for the customer and delivering the highest standards of service.

Transport and logistics companies are highly effective in using digital tools to enhance the overall customer experience. Quantitative and qualitative researches support this statement.

Industry professionals have confirmed, that platforms and applications require investment and capabilities. And small and medium businesses not always are able to transform due to financial capabilities. According to Foulser, the Investment in technology is now being recognized in the market, changing the paradigm to recruit and retain the best digital skills.

COVID-19 became an accelerator of digitization worldwide, and 2020 became the peak year for business digitalization. With UAE being digitally advanced prior to the pandemic, from 2020 onwards, businesses would prefer to work on one platform and simplify operations using Industry 4.0 technologies. With the country prioritizing technology like Artificial Intelligence (AI), the Internet of Things (IoT), and Blockchain to deliver a future-ready world, companies have to adjust their Digital solution strategy to compete with market players and new digital entrants, such as digital freight forwarders.

In the UAE Labour Law, there are no guidelines on the basic salary, and it is at the employer discretion to decide this amount and the employee accept it or not. That's why there is a gap in the

digitization processes of the back end-office. In some cases, the investment in IT solutions is much greater than paying a salary to an employee to perform manual tasks/processes.

Tech-enabled logistics is important in a futuristic world. And UAE announcement regarding the adoption of the Smart Industry Readiness Index, the Industry 4.0, will help identify the lagging behind players and promote the business digitalization of the front and the end operations.

The UAE freight and logistics market is very competitive, and digitization has transformed the businesses and operational landscape. New digital market entrants- digital freight forwarders- also shape traditional business models and benchmark customer service levels. But there is space for everyone for now, and customers can choose how they would like to do business.

There are specific groups of customers, and they choose either personalized service, either the traditional model, relationship model, face-to-face model or easy and new one-stop-shop service.

Logistics and freight companies do have what it takes to transform and embrace the full potential of Industry 4.0. And together with it, the customer also navigates with his demands and expectations which way to take.

In technologically advanced and leading country, such as UAE, the businesses are lacking digitization, in some cases by their own choice. They do not see the need to upgrade, if it's cheaper to hire a person to perform manual tasks.

Now, with Digital Government strategy and strategy become the first blockchain-powered government, businesses in the UAE have to keep pace by adopting open and inclusive processes, accessibility, transparency and accountability. This involves leveraging the emerging technologies to build capabilities, together with strategic plans to help to execute the transformation agenda. Leaders must engage, motivate, build commitment, and mobilise resources for the successful implementation of a digital strategy. (adapted from The United Arab Emirates' Government portal n.d.)

The things that worked in the past cannot work the same way in the future due to there being a constant change in processes, and we need to learn how to adapt. The "new normal" is a constant and going forward change. COVID-19 was a major accelerator for this change. Businesses had to transform overnight and continue to deliver services.

Freight forwarding, after all, is a "relationship business". And there has to be a balance of technological advancement and replacement of human tasks and interactions by Industry 4.0 offered technologies.

The ongoing pandemic disrupted supply chains, worldwide, and exposed the weak links in the logistics sector. Many countries are still trying to come to terms with the supply chain

challenges posed by the pandemic in an effort to calm anxious consumers. Dubai, however, is trying to convert new challenges into fresh opportunities by investing in futuristic technologies.

According to (Jain, 2020), that unlike many other countries, Dubai or the UAE did not experience large-scale shortages of essential goods due to Covid-induced supply chain disruptions. What helped them weather the crisis was a mixture of good foresight, swift action and the significant investments in multimodal facilities and infrastructure made over decades.

# CONCLUSIONS

This research aimed to identify the relationship between technological advancement and customer service in Freight Market. Based on a quantitative and qualitative analysis of the freight market and digitalization of the business to improve processes and customer service, it can be concluded that digitization or smart logistics is imperative for the freight forwarders and cutting-edge innovations allow them to meet growing customers' needs and expectations , and increase the velocity of the operations.

The results indicate that:

1) With industry competition and e-commerce success, digitization allowed the new concept of Freight Forwarder – a Digital Freight Forwarder. It relatively new business model and this concept of service is growing.

"Uberization of freight" ignited big multinationals to digitize their marketplaces, and platforms such as Fleet by Expeditors or Twill by Maersk emerged among the others. These platforms enable the shippers and forwarders to instantly search or submit orders and requests. New players such as Flexport and Freightos develop new business models and lean on the latest technology to improve customer service and make complicated processes easy. That is the primary goal of good customer service.

2) Top 5 key business issues to address regarding the business digitalization is to enchase customer expectations. Clear digital business strategy needs to be in order to meet increasing customer expectations. Communication with the customer is critical in this industry because a customer wants to know where is the shipment, the condition of the shipment and the estimated arrival time.

Communication 24/7/365 with a customer was achieved by implementing technologies such as "Track and Trace", one of the first technologies in the logistics and freight industry. Software programs to collaborate with customers, such as CRM and ERP. Blockchain technology for transparency and real-time data. AI to anticipate customers' needs and make processes easy. IoT Sensors and actuators set in physical objects to see shipment status, the temperature inside the container and the network to accumulate big chunks of data. It is about creating engaging customer experience.

3) Digital Freight Forwarder gives Transparency, Agility, cost beneficial and better Customer service. It makes complex processes for customers easy.

The digital freight forwarder has a specific group of customers, companies with specific requirements on how they want to do their business. In this digitized world, it is true "that some do not like to talk to people, just want to do business online" (quote from P2). With Industry 4.0

here, it must be platforms like this on the market to offer a variety of service possibilities to the customers.

4) Digitization of freight enabled market players to track, monitor, and see real-time data about the shipment. Digitization of freight makes processes easy and accessible at any location, at any time, any device. It falls into sub-categories such as software, service, end-user and deployment. Industry 4.0 pillars, in some cases, are used only for the front view operations, for customers use, but not for the functions in the back-end, where processes are still manual, time and resources consuming.

Dynamics in digital solutions offered to freight and logistics companies are diverse—a variety of complexity and price. CRM and ERP have high demand for customer better experience and to gather data to enhance the customer experience. After performing desk research and interviewing industry professionals, the widely used are AI-powered systems, IoT, Blockchain technology and tracking systems.

5) Freight industry and freight operations are very complex, involving many parts running altogether, and often there are delays, documentation problems, cargo-specific, etc. Previously mentioned issues cannot be solved online via one single platform, for now, at least. And this is the case where IT platforms cannot keep pace and struggle. This is where traditional freight forwarders' expertise is needed. Although it is one of the treats for conventional businesses, when IT platforms or digital freight companies achieve that level, they will take the expertise from traditional "middlemen". And this comes to the point where traditional companies must understand the status of their digital maturity and tag along with digitalization and its benefits.

6) UAE is one of the top competitive countries worldwide with its digital vision. Freight and logistics markets are very competitive too. International and national players are fragmenting market share and prices. International players such as K+N, DB Schenker, and DHL are overriding everyone else in terms of market share and technology wide.

7) UAE digital readiness score proves that country and business have the resources, willingness and ability to digitalize the industry; nevertheless, qualitative research proved wrong, and 3PL companies in UAE are slower to adopt technologies, and they mostly rely on relationship business rather than an electronic interface. Digitization status is far from ideal due to multiple factors - budget, people, "old school mentality", company size, and bargaining power of labour.

8) The difference between the companies tech-savvy and traditional is not too noticeable due to a different business digitization model. The customer uses the e-platform, but operations are still manual with loads of paperwork, printing, stamping, etc. Processes still are not digitized. This positions a gap here for future research.

## Recommendations

Based on the research study and analysis, the results are not presenting the full picture of technological advancement from the customer perspective. Future research is recommended to achieve the results and conclusions regarding:

- The use of new technologies and benefits from a customer perspective. How do customers benefit from Industry 4.0?
- Can it complicate the process of booking or making an order for different types of customers (B2C, B2B, etc.)?

The additional survey, focus groups need to be conducted in order to support/ agree with interviewed industry professionals' opinions. And represent the full community. A higher research sample can prove potential bias.

In addition, to the UAE region case study, further research is recommended to see how bargaining power of employers and economy can affect technological development and business digitalization. The scope of this study and sample was not able to research this particular gap, which was raised during the study.

## Practical implications

Based on the performed analysis, it is on the record that technology gives companies the ability to compete. For business strategy, it is a must to go along with the technological strategy to succeed and gain a competitive advantage. Industry 4.0 and Logistics 4.0 make one's way and interconnect in multiple ways. Integration of Industry 4.0 into logistics has an enormous impact on business processes. But with all the benefits, there are specific negative impacts companies should be aware of, such as accountability, liability, job losses, processes elimination, network structure change, cybercrimes and many more. (Froland, 2021)

Technology has been the key driver of recent changes in the travel and logistics industries and will be so in the future. However, today's pace of technological development and adoption can make that future hard to predict. Consider this: it takes 23 minutes on a 3G network to download 1.25 GB. With 5G, it will take just one second. What new and as yet unimagined business models will that unleash? (McKinsey&Company 2018)

## Limitations of the research

Following limitations are presented, which could have impacted or influenced the application or interpretation of the results of the study.

i. The scope and depth of the discussion can be compromised due to the limitations of the researcher, such as experience and expertise in logistics and freight.
ii. Due to limited access to information where companies might not want to disclose the software and application they operate.
iii. Interviewees might have limited answers due to confidentiality agreements and non-disclosure of sensitive information to third parties.

# REFERENCES


1. *" Global Container Shipping: Market Size | Statista."* n.d. Accessed May 6, 2021. https://www.statista.com/statistics/1097059/global-shipping-containers-market-size/.
2. Branch A.E " Global Supply Chain Management and International Logistics ." 2008.
3. Rushton A, et al. "*The Handbook of Logistics and Distribution Management_ Understanding the Supply Chain*-Kogan Page." 2017
4. Alexopoulos, et al. "*A Concept for Context-Aware Computing in Manufacturing: The White Goods Case."* International Journal of Computer Integrated Manufacturing, 2016.
5. "*Artificial Intelligence in the Freight Transportation Industry, 2020-2025 - Featuring Cargofy, FERO and KONUX*." n.d. Accessed June 20, 2021. https://www.prnewswire.com/news-releases/artificial-intelligence-in-the-freight-transportation-industry-2020-2025---featuring-cargofy-fero-and-konux-300998740.html.
6. Aziz Z.A.et al., "*The Usage of Information and Communication Technology in the Freight Forwarding Industry: A Descriptive Analysis."* https://www.researchgate.net/publication/330495911., 2018.
7. Bäuml M., Hausmann L., *"Air-Freight Forwarders Move Forward into a Digital Future",* McKinsey, 2018. Accessed February 2, 2021. https://www.mckinsey.com/industries/travel-logistics-and-transport-infrastructure/our-insights/air-freight-forwarders-move-forward-into-a-digital-future#. n.d.
8. Van der Biest A., "*4 Differences between Traditional and Digital Freight Forwarders - Cargofive."* International Logistics. https://cargofive.com/4-differences-between-traditional-and-digital-freight-forwarders/, 2018.
9. Burnson P., *"Top 25 Freight Forwarders: Coping with the Great Unknowns - Logistics Management."* Logistics Management. https://www.logisticsmgmt.com/article/top_25_freight_forwarders_coping_with_the_great_unknowns., September 2020.
10. Christopher M., "*Logistics and Supply Chain Management : Creating Value-Added Networks".* FT Prentice Hall, 2005.

11. Christopher M., *"Logistics & supply chain management."* www.pearson-books.comwww.pearson-books.com., 2011.
12. Coyle J. J., *"Transportation : A Supply Chain Perspective*.", South-Western Cengage Learning, 2011.
13. Deloitte. "*Digitalization in Freight Forwarding-Beyond the Platform Hype."* 2019
14. DHL. 2020. *"The Digital Revolution of Freight Forwarding: Not a Matter of If, but When*", DHL Logistics of Things. 2020. https://lot.dhl.com/the-digital-revolution-of-freight-forwarding-not-a-matter-of-if-but-when/. Accessed November 20, 2021
15. DIFC. 2020. *"UAE Based FreightOn Technology Is Looking to Digitise the Logistics Industry and Join the Fight against COVID19*", DIFC. April 2020. https://www.difc.ae/newsroom/news/uae-based-freighton-technology-looking-digitise-logistics-industry-and-join-fight-against-covid19/.
16. Girteka Logistics,*"Digital Freight Forwarders: The Future of Logistics?*" September 2021. https://www.girteka.eu/digital-freight-forwarders-the-future-of-logistics/.
17. Digital Logistics, Industry News*,"Challenges Faced by Logistics Sector in Dubai",* Logistics Companies , UAE." 2018. https://www.qafila.com/challenges-faced-by-logistics-sector-in-dubai/.
18. Ding Y., et al. *"Smart Logistics Based on the Internet of Things Technology: An Overview."* International Journal of Logistics Research and Applications. https://doi.org/10.1080/13675567.2020.1757053 , 2020.
19. Business Wire , *"Expeditors Acquires Fleet Logistics' Digital Platform* ", 2020. https://www.businesswire.com/news/home/20200526005790/en/.
20. Expeditors International, "*Highlighting Our Digital Solutions*" , Enhanced Reader, Expeditors International of Washington. 2020. moz-extension://84692e25-c562-df47-8d7c-45a405df6752/enhanced-reader.html?openApp&pdf=https%3A%2F%2Finfo.expeditors.com%2Fhubfs%2FHorizon%2520Blog%2520Images%2520%2B%2520Social%2520Assets%2FUpstream%2520Fulfillment%2FUF%2520Social%2520Media%2FDigital%2520Logistics%2520You%2520Can%2520Trust%2FDLYCT%2520Highlights%2520072420.pdf.
21. FedEx Express Study. 2021. "UAE Is Future-Ready." Transport& Logistics Middle East. October 2021. https://www.transportandlogisticsme.com/smart-technology-innovation/fedex-express-study-reveals-the-uae-is-future-ready.

22. Foulser, Ben. 2018. “Harvey Nash/KPMG CIO Survey 2018 – Transport/Logistics Industry Findings.”
23. “Freight Forwarding Technology: The Freight Forwarder’s Tech Stack.” n.d. Accessed June 20, 2021. https://www.cargologik.com/freight-forwarding-technology/.
24. “Freight Management System Market by Solution (Freight Tracking & Monitoring, Cargo Routing & Scheduling, Security, EDI, TMS, Order Management), End-User (3PLs, Forwarders, Brokers, Shippers), Transportation Mode, and Region - Global Forecast to 2023.” 2018. Markets and Markets. 2018. https://www.marketsandmarkets.com/Market-Reports/freight-management-system-market-214631371.html.
25. “Freight Shipping (Import) to Amazon FBA Warehouses in Europe.” n.d. Accessed June 20, 2021a. https://orangeklik.com/freight-shipping-amazon-warehouses/.
26. “Freight Shipping (Import) to Amazon FBA Warehouses in Europe.” ———. n.d. Accessed April 25, 2021b. https://orangeklik.com/freight-shipping-amazon-warehouses/.
27. Freightquote. 2019. “Truckload vs. Less than Truckload Freight |.” 2019. https://www.freightquote.com/blog/less-than-truckload-vs-truckload-freight-whats-the-difference/.
28. Frese, Florian. 2019a. “Digital Freight Forwarders - A Huge Challenge for Traditional Forwarders?” Container-Xchange. January 2019. https://container-xchange.com/blog/digital-freight-forwarders/.
29. *“Digital Freight Forwarders - A Huge Challenge for Traditional Forwarders?”* January 2019. https://container-xchange.com/blog/digital-freight-forwarders/.
30. Goos G., et al., *“Lecture Notes in Computer Science 5174 Computer Communication Networks and Telecommunications,*Next Generation, PDF , 2008.
31. Grant D., et al., *“Sustainable Logistics and Supply Chain Management”* , 2017.
32. Hughes A., *“8 Major Logistics Trends Shaping Logistics Management in 2021”,* Cleo.” Accessed February 3, 2021. https://www.cleo.com/blog/logistics-management-trends, n.d.
33. *“Innovation.” 2021.* The Official Portal of the UAE Government. 2021. https://u.ae/en/about-the-uae/the-uae-government/government-of-future/innovation-in-the-uae.
34. Devanshu J., *“Dubai Redesigns Its Logistics Sector with an Eye on Future - The Economic Times.”* ET CONTRIBUTORS. September 2020.

https://economictimes.indiatimes.com/small-biz/trade/exports/logistics/dubai-redesigns-its-logistics-sector-with-an-eye-on-future/articleshow/78382862.cms.

35. Issac J., *"UAE Adopts 'Smart Industry Readiness Index."* Khaleej Times. November 2021. https://www.khaleejtimes.com/business/uae-adopts-smart-industry-readiness-index-2?amp=1.
36. Creswell J.W., *Research Design: Qualitattive, Quantitative, and Mixed Methods Approaches.* Edited by SAGE Publications. 4th edition., 2014.
37. Ken Research. 2021. "*Trends Of UAE Logistics Market Outlook."* January 2021. https://www.kenresearch.com/blog/2021/01/logistics-market-in-uae/.
38. Keshavdas, M. *"Top 10 Challenges Facing Logistics Companies In 2019."* Accessed February 9, 2021. https://fleetroot.com/blog/top-10-challenges-facing-logistics-companies-in-2019/., n.d.
39. Klubnikin A., *"Digital Transformation Technologies and Predictions!* - Supply Chain Game Changer™." R-Style Lab. 2019. https://supplychaingamechanger.com/the-digital-transformation-in-logistics-technologies-barriers-and-predictions/.
40. KPMG International. *"UAE - KPMG Global,"* November. https://home.kpmg/xx/en/home/insights/2020/09/uae.html., 2020.
41. Levinson M., "*The Box- How the Shipping Container Made the World Smaller and the World Economy Bigger.",* 2016.
42. Mathers N., et al., "*Using Interviews in a Research Project."* Research Gate. 2000. https://www.researchgate.net/publication/253117832_Using_Interviews_in_a_Research_Project., 2000.
43. McKinsey&Company. *"Travel and Logistics:Data Drives the Race for Customers."*, 2018.
44. Millar M., "*Global Freight Forwarding."*, 2018.
45. "*Overview on Global Freight Forwarding and Its Impact on Globalization."*, n.d.
46. Mordor Intelligence LLP. "*United Arab Emirates Freight And Logistics Market - Growth, Trends, COVID-19 Impact, and Forecasts (2021 - 2026) ,"* March 2021.
47. Mordor Intelligence Pvt. Ltd. 2021. "*UAE freight and logistics market."* www.mordorintelligence.com.
48. More A., *"Digital Freight Forwarder Market Size, Growth Analysis Report, 2021: Global Sales Revenue, Segmentation with Competitive Analysis, Trends, Rising Demands, Covid19 Impact by Manufactures, Forecast to 2027* - MarketWatch." Industry Research Biz. 2021. https://www.marketwatch.com/press-release/digital-

freight-forwarder-market-size-growth-analysis-report-2021-global-sales-revenue-segmentation-with-competitive-analysis-trends-rising-demands-covid19-impact-by-manufactures-forecast-to-2027-2021-08-09.

49. Mutreja S.,. "*Freight Digitization Market Size, Technology, Analysis by 2027 Sample Report."* Alied Market and Research. December 2021. https://www.alliedmarketresearch.com/freight-digitization-market-A11370.
50. Krugman P, et al., *International Economics - Theory& Policy*. Ninth Edition. Pearson, 2012.
51. Murphy, Jr. P.R., Knemeyer A.M., *"Contemporary Logistics* (Global Edition)-Pearson.", 2018.
52. Pheiffer E. "(T-The Business Year Dubai 2020-89080914." The Business Year , June 2020.
53. *"Qafila Launches UAE's First Digital Freight-Forwarder Platform* - LogisticsGulf." 2019. LogisticsGulf News . March 2019. https://logisticsgulf.com/2019/03/qafila-launches-uaes-first-digital-freight-forwarder-platform/.
54. Schwab K. The Fourth Industrial Revolution. World Economic Forum. 2017.
55. Stearns P.N. "*The Industrial Revolution in World History*." -Westview Press, 2012.
56. The Freightos Group*, Customer-Centric Freight.*, 2018.
57. The Strategists Network. "*The World's 5 Largest Ocean Freight Forwarders 2020."* 2021. https://the-strategists-network.com/the-worlds-5-largest-ocean-freight-forwarders-2020/.
58. The UAE Government "*Innovation - The Official Portal of the UAE Government.*" . n.d. Accessed June 21, 2021. https://u.ae/en/about-the-uae/the-uae-government/government-of-future/innovation-in-the-uae.
59. The United Arab Emirates' Government portal "*The UAE Digital Government Strategy 2025* - The Official Portal of the UAE Government." , n.d. Accessed November 28, 2021. https://u.ae/en/about-the-uae/digital-uae/uae-national-digital-government-strategy.
60. Thuermer K.E., "*Freight Forwarders: Managing the Storm with Technology - Logistics Management."* Logistics Management. 2021. https://www.logisticsmgmt.com/article/freight_forwarders_managing_the_storm_with_technology.

61. *"Top 7 Challenges Freight Forwarders Are Facing Today* - Asiana USA." n.d. Accessed April 25, 2021. https://www.asianausa.com/top-7-challenges-freight-forwarders-are-facing-today/.
62. "*Top 25 Freight Forwarders in 2018: Blending Art and Science* - Logistics Management." n.d. Accessed February 7, 2021. https://www.logisticsmgmt.com/article/top_25_freight_forwarders_in_2018_blending_art_and_science.
63. *"Transport and Logistics Industries Enter Expo 2020 Hyperdrive Tomorrow."* Transport&Logistics Middle East. 2021. https://www.transportandlogisticsme.com/smart-logistics/al-futtaim-logistics-deploys-smart-technology-for-greater-efficiency.
64. *"UAE: Digital Readiness Score by Component 2019* | Statista." 2020. Statista Research Department. November 2020. https://www.statista.com/statistics/1180845/uae-digital-readiness-score-by-component/.
65. Waters W. *"Top Forwarders Still Lack Online Quotation Capabilities - Lloyd's Loading List."* 2018. https://www.lloydsloadinglist.com/freight-directory/adviceandinsight/Top-forwarders-still-lack-online-quotation-capabilities/71664.htm#.YYjZQnlRWuU.
66. "Fero Freight Forwarders." n.d. Accessed June 21, 2021. https://fero.ai/freight_forwarders/.
67. By 24/7.,"*AI Virtual Assistant to Transform Traditional Freight Brokers - Supply Chain 24/7."* 2018. https://www.supplychain247.com/article/ai_virtual_assistant_to_transform_traditional_freight_brokers/cargofy. August 22, 2018.
68. *"Our History - Expeditors."* Accessed October 27, 2021. https://www.expeditors.com/about-us/history.,n.d.
69. "*About Al-Futtaim Logistics*." n.d. Accessed November 19, 2021
70. *"Al-Futtaim Logistics."* n.d. Accessed November 19, 2021
71. Froland I., *"Analysis of the interconnection between industry 4.0 and logistics 4.0.*" 2021. eISSN: 2029-8501 Whither our economies - 2021 : International scientific conference : conference proceedings. Vilnius : Mykolas Romeris University
72. Rüßmann M., et al., *"Industry 4.0: The Future of Productivity and Growth in Manufacturing Industries."* 2015.

https://www.bcg.com/publications/2015/engineered_products_project_business_industry_4_future_productivity_growth_manufacturing_industries.

73. Paksoy T.,et al., *Logistics 4.0 : Digital Transformation of Supply Chain Management.* Taylor & Francis Group, LLC, 2021
74. Rüßmann M., et al., *"Industry 4.0 The Future of Productivity and Growth in Manufacturing Industries.",* 2015.
75. Strandhagen J.O., et al.,"*Logistics 4.0 and Emerging Sustainable Business Models."* Advances in Manufacturing , 2017.
76. Wang K. "*Logistics 4.0 Solution-New Challenges and Opportunities."* 2016. Atlantis Press. https://doi.org/10.2991/iwama-16.2016.13.

Froland I. *Application of new technologies in customer service by freight forwarders (The United Arab Emirates case)/* Logistics management master's thesis. Supervisor Dr. Jusif Seiranov. – Vilnius: Mykolas Romeris University, Institute of business and economics, 2021.

# ANNOTATION

The master thesis conceptual framework of the freight market and application of new technologies in customer service by freight forwarders is analysed and assessed.

The first part of the thesis conceptual framework of freight market: forwarders, technologies, and customer service are analysed according to the attitude of scientists and industry professionals. The United Arab Emirates freight market is presented, together with digital readiness. UAE freight market analysis and tech readiness are discussed. Interconnection between Industry 4.0 and Logistics 4.0

In the second part, research and methodology are presented. Strategy and research project plan introduced and discussed. A methodological basis and conceptual approach are presented.

The third part is the analytical part of the thesis, where empirical data analysis is presented. It follows by an Interpretation of the results and conclusions. After conclusions, limitations of the research are identified.

Summary and recommendation for future research is the last part of the thesis.

**Keywords:** Freight market, freight forwarders, smart logistics, industry 4.0., logistics 4.0., freight e-services, customer service, new technologies, digitization, digitalization.

Naujų technologijų taikymas ekspeditorių klientų aptarnavime (Jungtiniai Arabų Emyratai)/ Logistikos vadybos magistro darbas. Vadovas Dr. Jusif Seiranov. – Vilnius: Mykolo Romerio universitetas, Verslo ir ekonomikos institutas, 2021 m.

# ANOTACIJA

Išanalizuota ir įvertinta konceptuali krovinių gabenimo rinkos ir naujų technologijų taikymo ekspeditorių klientų aptarnavimo sistema.

Pirmoje baigiamojo darbo dalyje nagrinėjama konceptuali krovinių gabenimo rinkos struktūra: ekspeditoriai, technologijos, klientų aptarnavimas, atsižvelgiant į mokslininkų ir pramonės profesionalų požiūrį. Pristatoma Jungtinių Arabų Emyratų krovinių vežimo rinka kartu su skaitmenine parengtimi. Aptariama JAE krovinių gabenimo rinkos analizė ir technologijų pasirengimas. Pramonės 4.0 ir logistikos 4.0 sąsaja

Antroje dalyje pristatomi tyrimai ir metodika. Supažindintas ir aptartas tyrimo projekto planas ir strategija. Pateikiamas metodologinis pagrindas ir konceptualus požiūris.

Trečioji dalis – tai analitinė darbo dalis, kurioje pateikiama empirinė duomenų analizė. Toliau pateikiamas rezultatų ir išvadų aiškinimas. Po išvadų nustatomi tyrimo apribojimai.

Santrauka ir rekomendacijos būsimiems tyrimams yra paskutinė darbo dalis.

**Raktiniai žodžiai:** Krovinių rinka, ekspeditoriai, išmani logistika, pramonė 4.0., logistika 4.0., krovinių e. paslaugos, klientų aptarnavimas, naujos technologijos, skaitmeninimas

Froland I. *Application of new technologies in customer service by freight forwarders (The United Arab Emirates case)/* Logistics management master's thesis. Supervisor Dr. Jusif Seiranov. – Vilnius: Mykolas Romeris University, Institute of business and economics, 2021.

## SUMMARY

This thesis aim was to investigate the relationship between technological advancement and customer service in the Freight market. Research questions were answered by performing and applying Mix methods strategies to approach the aim of the study.

This scientific research was about applying new technologies by Freight forwarders to improve customer service, opposite of the general digitization of the logistics sector. The research focus was the relationship between Technological progress and Customer service, how it moves forward. What are the trends of technologies in customer service used by freight forwarders? How are these challenges which freight forwarders are facing interconnected?

This thesis investigated the international freight market and presented a conceptual framework of the freight forwarders and customer service importance. Chapter one gave the background for the reader and the opportunity to acquire a piece of knowledge and get perspective in regards to the size of the market, who are the major players of the market, diversity of freight forwarders, the importance of customer service and how vital it for the industry to be agile and transparent. The industrial revolution development and technological pillars' importance to business and operations and customer service are discussed.

Quantitative data gave a brief understanding of the logistics sector positioning regarding digitization by testing the theory.

Qualitative results build the theory about the actual situation regarding digitization of processes. Field-based research allowed analyzing how it is in reality.

Logistics business became technology and information business. Amazon Web Services is a great example. The company has developed from an online book store to the most significant logistics and delivery services company, and now it is the most prominent web services provider worldwide.

Business digitalization requires vast liquidity and the interviewed multiple industry professionals stated that this is the major obstacle for Digital business strategy. Small and medium enterprises are not able to afford digital platforms. Resistance of digitization also in lack of training, management, or people.

After conducting Qualitative research by Interviewing the industry professionals, another reason for digitization revealed is location. The location of the organization defines the need for

digitization by the market trends, competitiveness, customer needs, and quality required to be delivered.

Scientific research also opened the gap for analysis of Digital freight forwarders. The new incumbents of the market and disruptors of the traditional business model are putting pressure on conventional freight forwarders to digitalize business processes faster than was anticipated.

Hypothesis testing regarding the *Technological advancements in digitization have transformed the business and operational landscape of the global freight transportation industry.* That new incumbent's Digital freight forwarders are disruptors of the industry, shaping customers' expectations and experience. To gain a competitive advantage, they are lowering the cost and heading towards creating a one-stop-shop on digital platforms. By “Uberizing” the traditional business model, the customer gets self-service options, end-to-end visibility, digital invoicing and instant quotes.

The thesis assessed and analyzed the modern technologies, new tools, which improve customer service, sales, velocity and performance of freight forwarders. If we talk about Freight Sector, they cannot sell technology to the customer. To prove a hypothesis about the *Data-driven insights help freight operators move forward and gain a competitive advantage over their peers with improved and easy to use service.* Freight forwarders need to sell the service, the solution. Customers are looking for the benefits and its advantage, and this can be gathered only if the companies have enough data to see it. Big Data Analytics is the main component with CRM and ERP systems to create a base for agile operations and good customer service. AI and IoT are merging technologies and working together to interact with customers in a better way. These technologies are working to develop a better product, a solution, gather data, and create a vision of what customers want in the future and how to improve customer service and competitive advantage.

Industry 4.0 technologies are the essence in the near future. Cost reduction and better customer service are the main goals to achieve a competitive advantage.

Hypothesis posed about the future of Freight Forwarders if/when digitization will cover the main tasks of the “middle man”, there much has been said and written about the digital era we live in. It is a global phenomenon that affects every aspect of our private and professional lives. However, the most intriguing and challenging part of this era is not digitization, which transforms existing analogue processes into digital ones (Schallmo & Williams, 2018), but digitalization, which rather constitutes a restructuring of an entire status quo (Brennen & Kreiss, 2016). For the time being, the future of the freight forwarders is not set. There is a place for variety of service providers. In the nearest future, most Freight Forwarders might become fully digitized freight forwarders as Flexport, an example. But, at the current stage of research, it is only speculation.

Naujų technologijų taikymas ekspeditorių klientų aptarnavime (Jungtiniai Arabų Emyratai)/ Logistikos vadybos magistro darbas. Vadovas Dr. Jusif Seiranov. – Vilnius: Mykolo Romerio universitetas, Verslo ir ekonomikos institutas, 2021 m.

## SANTRAUKA

Šio baigiamojo darbo tikslas buvo ištirti ryšį tarp technologijų pažangos ir klientų aptarnavimo krovinių gabenimo rinkoje. Į tyrimo klausimus buvo atsakyta atliekant ir taikant Mix tyrimu strategija.

Šis mokslinis tyrimas buvo skirtas naujų technologijų taikymui ekspeditoriams, siekiant pagerinti klientų aptarnavimą. Tyrimo objektas buvo ryšys tarp technologijų pažangos ir klientų aptarnavimo, kaip jis juda į priekį? Kokios yra ekspeditorių naudojamų klientų aptarnavimo technologijų tendencijos? Kaip šie iššūkiai, su kuriais susiduria ekspeditoriai, yra tarpusavyje susiję?

Baigiamajame darbe buvo nagrinėjama tarptautinė krovinių gabenimo rinka ir pateikta konceptuali ekspeditorių ir klientų aptarnavimo svarbos struktūra. Pirmas skyrius suteikė skaitytojui pagrindą ir galimybę įgyti žinių bei pažvelgti į rinkos dydį, kas yra pagrindiniai rinkos dalyviai, ekspeditorių įvairovę, klientų aptarnavimo svarbą ir kaip labai svarbu, kad pramonė būtų judri ir skaidri. Aptariama pramonės revoliucijos raida ir atraminių sričių svarba verslui ir klientų aptarnavimui.

Kiekybiniai tyrimo rezultatai davė suprasti logistikos sektoriaus pozicionavimą skaitmeninimo atžvilgiu, testuojant teoriją.

Kokybiniai rezultatai sukūrė teoriją apie tikrą procesų skaitmeninimo situaciją. Tyrimai leido išanalizuoti, kaip yra iš tikrųjų.

Logistikos verslas tapo technologijų ir informacijos verslu. „Amazon Web Services“ yra puikus pavyzdys. Bendrovė iš internetinės knygų parduotuvės tapo didžiausia logistikos ir pristatymo paslaugų įmone, o dabar yra ryškiausia interneto paslaugų teikėja visame pasaulyje.

Kalbinti keli pramonės profesionalai teigė, kad pagrindinė skaitmeninio verslo strategijos kliūtis yra biudžetas. Mažos ir vidutinės įmonės negali sau leisti skaitmeninių platformų. Pasipriešinimas skaitmeninimui taip pat yra dėl mokymo, valdymo ar žmonių trūkumo.

Atlikus Kokybinį tyrimą, apklausiant pramonės profesionalus, paaiškėjo dar viena skaitmeninimo priežastis – šalis. Organizacijos vieta apibrėžia skaitmeninimo poreikį pagal rinkos tendencijas, konkurencingumą, klientų poreikius ir reikalingą pristatymo kokybę.

Moksliniai tyrimai taip pat atvėrė spragą skaitmeninių ekspeditorių analizei. Nauji rinkos dalyviai ir tradicinio verslo modelio griovėjai daro spaudimą įprastiems ekspeditoriams. Jie verslo procesus keičia greičiau, nei buvo tikėtasi.

Hipotezių tikrinimas dėl technologinės pažangos skaitmeninimo srityje pakeitė pasaulinės krovinių vežimo pramonės verslo ir veiklos aplinką.

Skaitmeniniai ekspeditoriai trikdo pramonę, formuoja klientų lūkesčius ir patirtį. Siekdami įgyti konkurencinį pranašumą, jie mažina sąnaudas ir siekia sukurti vieno langelio principą skaitmeninėse platformose. „Uberizavę“ tradicinį verslo modelį, klientas gauna savitarnos galimybes, matomumą, skaitmenines sąskaitas faktūras ir greitas kainas.

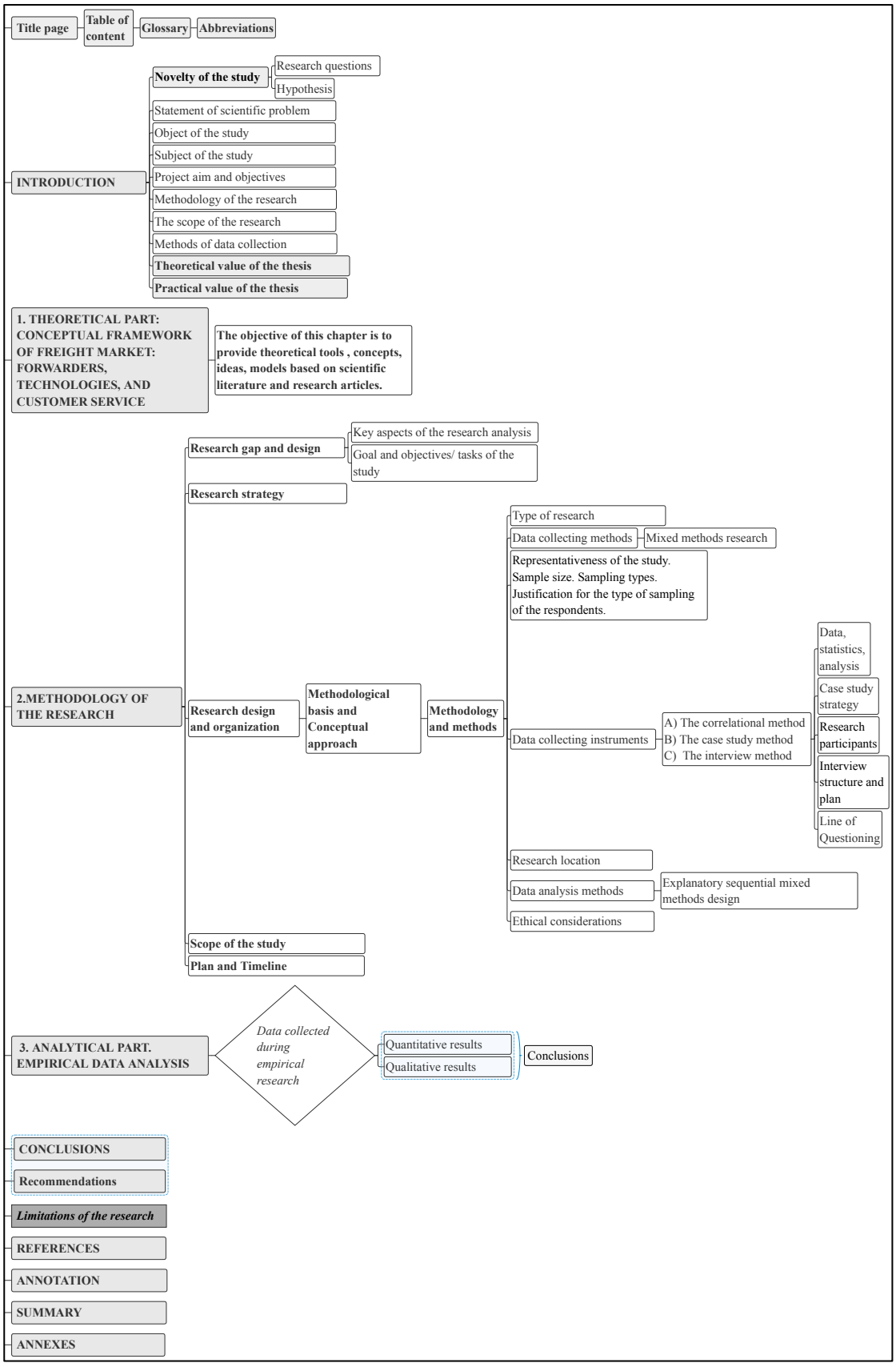
Baigiamajame darbe įvertintos ir analizuojamos šiuolaikinės technologijos, nauji įrankiai, gerinantys ekspeditorių klientų aptarnavimą, pardavimus, greitį ir našumą. Jei kalbame apie krovinių gabenimo sektorių, jie negali parduoti technologijų klientui. Norėdami įrodyti hipotezę apie duomenimis pagrįstą įžvalgą, krovinių gabenimo operatoriai gali judėti į priekį ir įgyti konkurencinį pranašumą prieš savo kolegas teikiant patobulintą ir lengvai naudojamą paslaugą. Ekspeditoriai turi parduoti paslaugą, sprendimą. Klientai ieško naudos ir jos pranašumo, o tai galima surinkti tik tuo atveju, jei įmonės turi pakankamai duomenų. „Big Data Analytics“ yra pagrindinis CRM ir ERP sistemų komponentas, skirtas sukurti greitų operacijų ir gero klientų aptarnavimo bazę. AI (dirbtinis intelektas) ir daiktų internetas sujungia technologijas ir dirba kartu, kad geriau bendrautų su klientais. Šios technologijos kuria geresnį produktą, sprendimą, renka duomenis ir sukuria viziją, ko klientai nori ateityje ir kaip pagerinti klientų aptarnavimą bei konkurencinį pranašumą.

Pramonės 4.0 technologijos yra ateitis. Sąnaudų mažinimas ir geresnis klientų aptarnavimas yra pagrindiniai tikslai siekiant konkurencinio pranašumo.

Iškelta hipotezė apie ekspeditorių ateitį, jei/kai skaitmeninimas apims pagrindines užduotis. Apie skaitmeninę epochą yra daug kalbėta ir parašyta. Tai pasaulinis reiškinys, turintis įtakos kiekvienam mūsų gyvenimo aspektui- asmeniniam ir profesiniam gyvenimui. However, the most intriguing and challenging part of this era is not digitization, which transforms existing analogue processes into digital ones (Schallmo & Williams, 2018), but digitalization, which rather constitutes a restructuring of an entire status quo (Brennen & Kreiss, 2016). Kol kas ekspeditorių ateitis nėra nustatyta. Rinkoje yra vieta visiems paslaugų teikėjams. Artimiausiu metu dauguma ekspeditorių gali tapti visiškai skaitmeniniais ekspeditoriais, pavyzdžiui, „Flexport“. Tačiau dabartiniame tyrimų etape tai tik spekuliacijos.

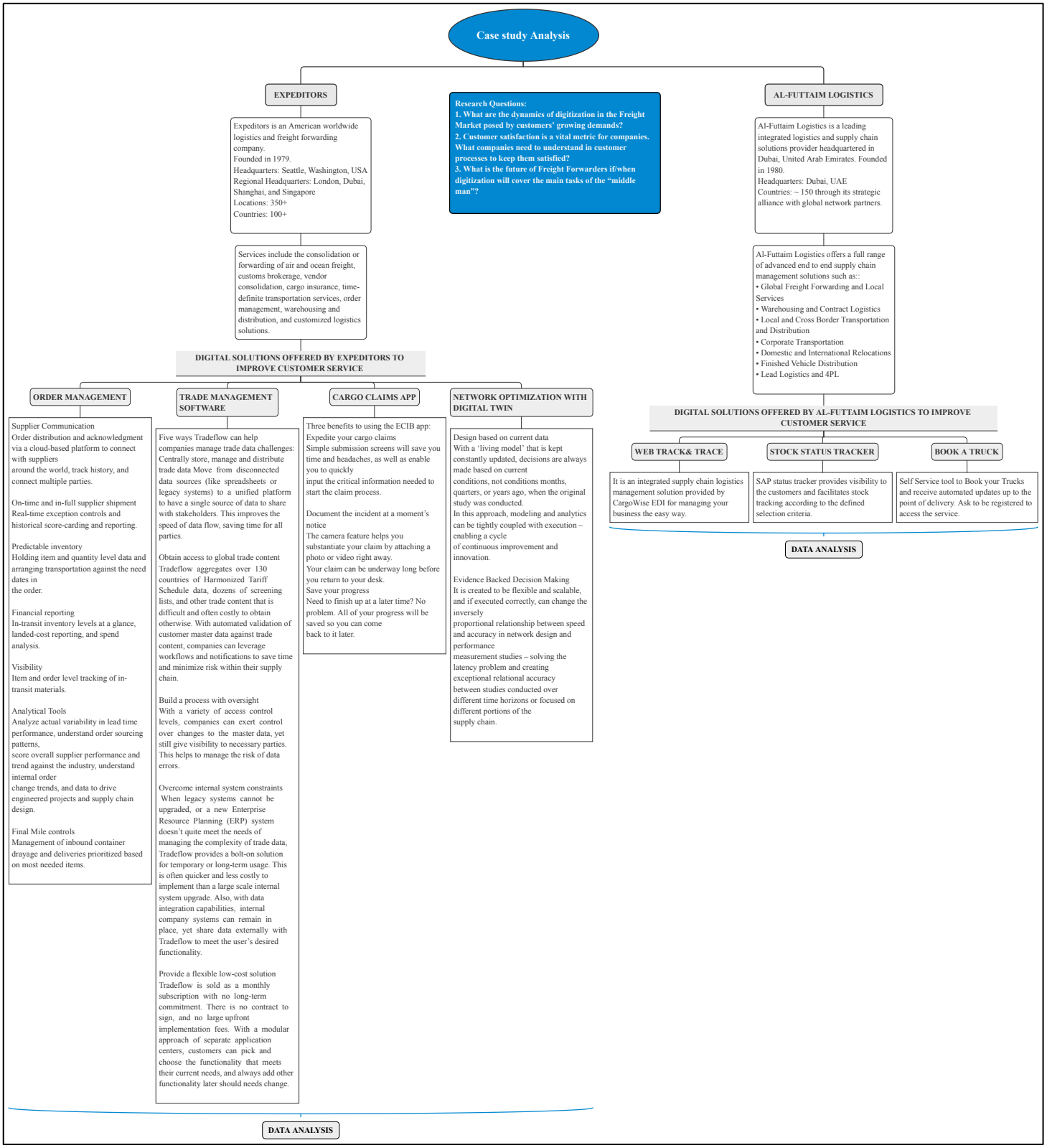
**ANNEX 1**

**Fig.35. Structure of the Master thesis**




Source: prepared by the author.

# ANNEX 2




Compelled by the author. Source: multiple sources.

**ANNEX 3**

# INTERVIEWS TRASCRIPTS

**Not open to public.**

**ANNEX 4**

# INTERVIEW DATA CODING AND ANALYSIS

**Not open to public.**

**ANNEX 5**

# ACADEMIC INTEGRITY PLEDGE

**Not open to public.**