VILNIUS UNIVERSITY
BUSINESS SCHOOL

DEEPTECH ENTREPRENEURSHIP PROGRAMME

Domantas Mincė

THE FINAL MASTER'S THESIS

„Alternatyvi logistika: naujausių technologijų įtaka verslo modeliams“	**„Disruptive Logistics: Examining the Impact of Emerging Technologies on Business Models“**

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Supervisor_____

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Name, surname, academic title, scientific degree of supervisor

Vilnius, 2023

SUMMARY

VILNIUS UNIVERSITY BUSINESS SCHOOL

DEEPTECH ENTREPRENEUSHIP STUDY PROGRAMME

DOMANTAS MINCĖ

DISRUPTIVE LOGISTICS: EXAMINING THE IMPACT OF EMERGING TECHNOLOGIES ON BUSINESS MODELS

Supervisor – Jurgita Petrauskienė

Master's thesis was prepared in Vilnius, in 2023

Scope of Master's thesis – 75 pages.

Number of tables used in the FMT – 1 pc.

Number of figures used in the FMT – 19 pcs.

Number of bibliography and references – 202 pcs.

The FMT described in brief:

The main goal of this study is to investigate if emerging technologies such as artificial intelligence, sustainable technologies (such as electric vehicles) and telematics are already changing logistics business models.

Problem:

Logistics sector and whole supply chain had to go through a lot of challenges in the past years. Impact of new technologies and the effect of these technologies on logistics business models and resilience to challenges has received little examination.

Objectives:

1. Perform thorough literature analysis about aforementioned technologies and their impact for logistics.
2. Analyze annual reports of various companies working in air, maritime and integrated logistics sectors to see if investments in technology improves financial performance and operational efficiency.
3. Perform interviews with sector's professionals to understand real situation.
4. Provide recommendations based on literature, annual reports analysis and interviews.

Research methods:

1. Systematic scientific literature review.
2. Quantitative analysis of annual reports.

3. Qualitative analysis of interviews with sector's professionals.
4. Developing conclusions based on literature, annual reports analysis and interviews.

Research and results obtained:

Research proved that analyzed technologies (AI, electrification, and telematics) play very important role in all branches of logistics. Introduction of technologies is mandatory and some companies are raising a risk on technology and IT – if not implemented, business can be disrupted. However, technologies do not yet seem to be drastically changing business models – there are some changes happening, although, the main purpose to implement technologies is to optimize costs and increase work efficiency.

Conclusions and recommendations:

Main factor driving logistics businesses to implement disruptive technologies is sustainability that is being imposed by governments and various institutions. Due to that companies are investing in sustainable fuels, AI, etc. Business models are not yet changing a lot or companies are not enclosing it to keep the competitive advantage. Big changes are expected in 5-10 years with the technological advancements.

SANTRAUKA

VILNIAUS UNIVERSITETO VERSLO MOKYKLA

AUKŠTŲJŲ TECHNOLOGIJŲ VERSLO STUDIJŲ PROGRAMA

DOMANTAS MINCĖ

ALTERNATYVI LOGISTIKA: NAUJAUSIŲ TECHNOLOGIJŲ ĮTAKA VERSLO MODELIAMS

Darbo vadovas/ė – Jurgita Petrauskienė

Darbas parengtas – 2023 m. Vilniuje

Darbo apimtis – 75 puslapiai.

Lentelių skaičius darbe – 1 vienetas.

Paveikslų skaičius darbe – 19 vienetų.

Literatūros šaltinių skaičius – 202 vienetai.

Trumpas darbo aprašymas:

Pagrindinis šio tyrimo tikslas – ištirti, ar naujos technologijos, tokios kaip dirbtinis intelektas, tvarios technologijos (pvz., elektromobiliai) ir telematika, keičia logistikos verslo modelius.

Problema:

Logistikos sektorius ir visa tiekimo grandinė per pastaruosius metus patyrė daug iššūkių. Naujų technologijų ir šių technologijų įtaka logistikos verslo modeliams ir atsparumui iššūkiams buvo mažai ištirta.

Uždaviniai:

1. Atlikti išsamią literatūros analizę apie minėtas technologijas ir jų įtaką logistikai.

2. Išanalizuoti įvairių įmonių, dirbančių oro, jūrų ir integruotos logistikos sektoriuose, metines ataskaitas.

3. Atlikti interviu su sektoriaus specialistais, kad suprasti tikrąją situaciją.

4. Pateikti rekomendacijas remiantis literatūros, metinių ataskaitų analize ir interviu.

Tyrimo metodai:

1. Sisteminė mokslinės literatūros apžvalga.

2. Metinių ataskaitų kiekybinė analizė, kad suprasti ar investicijos į technologijas gerina finansinius rezultatus bei veiklos efektyvumą.

3. Kokybinė interviu su sektoriaus specialistais analizė.

4. Pateiktos išvados remiantis literatūros, metinių ataskaitų analize ir interviu.

Tyrimo rezultatai:

Tyrimai įrodė, kad analizuojamos technologijos (DI, elektrifikacija ir telematika) vaidina labai svarbų vaidmenį visose logistikos šakose. Technologijų diegimas yra būtinas, o kai kurios įmonės technologijas ir IT vardina kaip riziką – jei jos nebus įdiegtos/atnaujintos, verslas gali būti sutrikdytas. Tačiau kol kas neatrodo, kad technologijos drastiškai keičia verslo modelius – kai kurie pokyčiai vyksta, nors pagrindinis technologijų diegimo tikslas yra optimizuoti veiklos kaštus ir didinti darbo efektyvumą.

Išvados:

Pagrindinis veiksnys, skatinantis logistikos įmones diegti trikdančias technologijas, yra tvarumas, kurį pristato vyriausybės ir įvairios institucijos. Dėl to įmonės investuoja į tvarų kurą, dirbtinį intelektą ir kitas technologijas. Verslo modeliai kol kas labai nesikeičia arba įmonės to neatskleidžia, kad išlaikytų konkurencinį pranašumą. Po 5-10 metų tikimasi didelių verslo modelių pokyčių susijusių su technologine pažanga.

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2. LIST OF ABBREVIATIONS

AI – artificial intelligence

DL – deep learning

ML – machine learning

ANN – artificial neural network

R&D – research and development

EV – electric vehicle

BEV battery electric vehicle

PEV – pure electric vehicle

PHEV – plug in hybrid electric vehicle

CFS – clean fuel standard

ICEV - internal combustion engine vehicle

IoT – internet of things

PdM - predictive maintenance

ROI – return on investment

GPS - global positioning system

GPRS - general packet radio service

ICT - information and communications technology

VR - virtual reality

AR - augmented reality

CPS - cyber-physical systems

GPU - graphics processing units

GHG - greenhouse gas

ILP - integrated logistics provider

SAS – Scandinavian airlines systems

CNG - compressed natural gas

LNG - liquefied natural gas

IAG - international airlines group

SAF - sustainable aviation fuels

WSY - Western Shipyard Group

RFID – radio frequency identification

INTRODUCTION

Disruptive technologies bring both challenges and opportunities to transform existing business models into the fast-changing robust and competitive global logistics sector. This research aims to investigate the impact of disruptive technologies on the logistics sector mainly air, maritime, and integrated logistics providers.

This topic has been chosen due to the fact that even though technologies chosen for analysis are existing for a long time and are being thoroughly analyzed, there is not much analysis made of how they affect business models of logistics sector. There are a lot of articles on the application of technologies, however, the impact for business models was not evaluated. By combining both qualitative and quantitative research methods, this study offers a new perspective on the resilience and adaptation of logistics business models in the face of challenges such as COVID-19 pandemic or war in Ukraine and shows how important technologies are.

The main problem of this thesis is to understand the extent and nuances of how AI, electrification, and telematics are impacting logistics business models. By concentrating on the opportunities and problems created by technological breakthroughs, it aims to reveal the complexity of this connection with the main objective to methodically assess the impact and provide thorough understanding on currently used technologies and future strategies of logistics.

To achieve this, extensive literature analysis of challenges and future outlooks of analyzed sector were performed, as well as technologies - AI, EVs, and telematics – were analyzed. Furthermore, analysis of fifteen logistics companies' annual reports ranging from 2018 to 2022 were performed. Finally, six interviews with professionals working in integrated, air, and maritime logistics sectors were conducted. Having all this information, conclusions and recommendations were formulated.

Objectives:

1. Perform thorough literature analysis about the aforementioned technologies and their impact on logistics.
2. Analyze annual reports of various companies working in air, maritime and integrated logistics sectors to see if investments in technology improves financial performance and operational efficiency.
3. Perform interviews with sector's professionals to understand the real situation and current practices.

4. Provide recommendations based on literature, annual reports analysis and interviews.

Research questions:

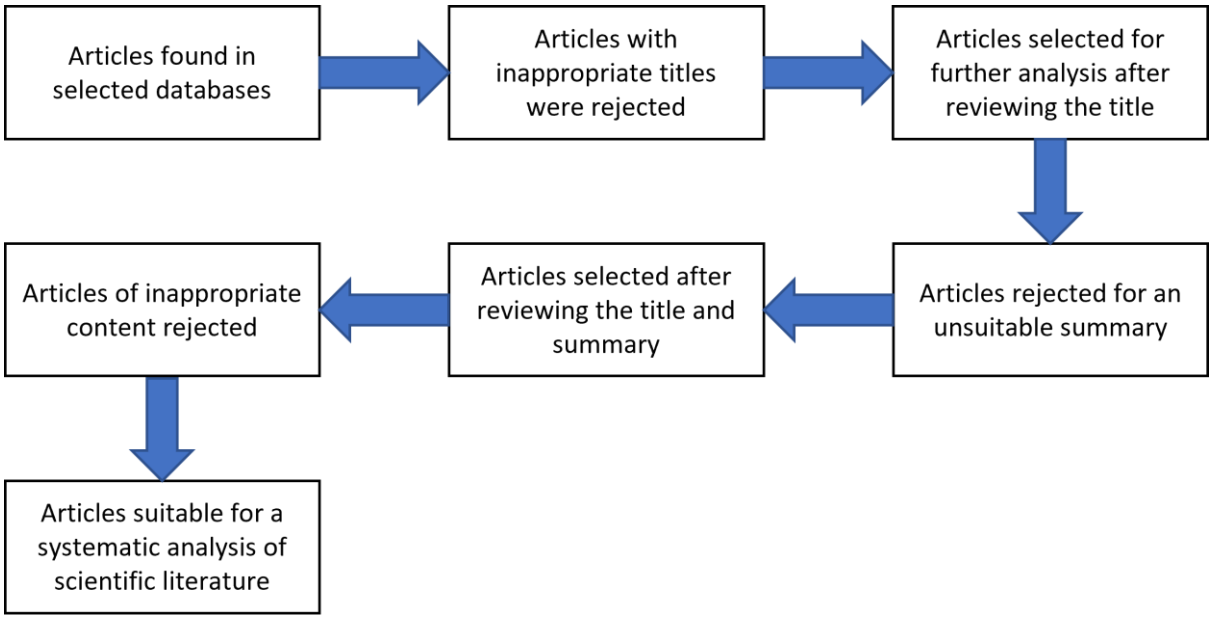
1. Does the investment in technologies correlate with the financial performance of logistics companies?
2. How does the investment and implementation of technologies impact the operational efficiency and sustainability of logistics business models?
3. Is there an impact for employees due to the integration of technologies?
4. What is the relationship between the investment to environmentally friendly practices, and reduction of GHG emissions?
5. Is it worth from the cost perspective to implement disruptive technologies in logistics operations? How do these investments impact overall financial performance?
6. Which branch of logistics (integrated, maritime, air) is advancing the most and which technologies help to achieve that?

1. LITERATURE ANALYSIS

The theoretical part of this master's thesis is based on the scientific literature analysis by analyzing selected scientific articles and papers published between 2018 and 2023. As the sector under analysis has already been established for a long time, some basic knowledge might be taken from the articles written earlier than 2018. The selection of the scientific publications analyzed was based on the relevance to the objectives of the thesis and the key problem. The selection also respected the requirements for the latest scientific literature available. Afterwards, sequential title review, summary review and full text review was performed (see **Figure 1**).

Figure 1

Stages of literature analysis



Source: compiled by Mincė based on Oželienė, 2022.

1.1 Challenges and future of logistics

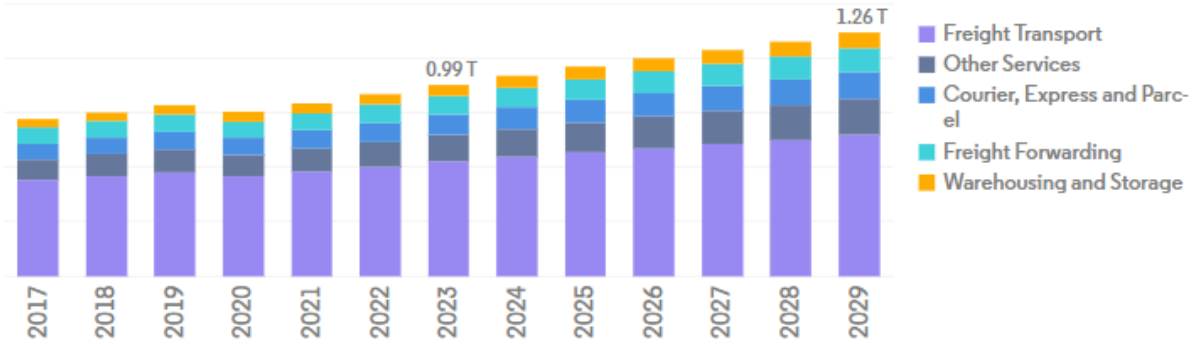
Logistics exists for a few thousand years already in different sectors such as military, art, science, however, it largely expanded as a sector and diversified in different forms not that long time ago (Tien et al., 2019). Based on the historical evolution of logistics it is possible that people had a natural need to travel. The earliest indications of logistics appeared when this need was combined with the economic events of products or services. For example, the silk and spice road involved moving products and services to markets where their value differs. Logistics recently became popular because it's one of the fundamental pillars of commerce and the economy (Erdoğdu, 2021). With the big recent rise of the e-commerce, especially during

COVID-19 pandemic and afterwards, the logistics expanded. Nowadays, society could not even imagine a situation where one could not get the goods they want in days or even hours. Logistics plays crucial part and are essential for supply chain to work. The Council of Supply Chain Management describes logistics management as a part of supply chain management that plans, implements, and controls the efficient, effective forward and reverses flow and storage of goods, services and related information between the point of original and the point of consumption in order to meet customers' requirements. In other words, Springer (2000) describes it as a process to deliver the right product, in the right quantity and the right condition, to the right place at the right time for the right customer at the right price.

Nonetheless logistics sector is expanding and growing, as every sector. As one can see in **Figure 2**, it is constantly growing in Europe and is planned to almost reach 1 trillion USD worth by 2023 and grow by more than 200 million in a few upcoming years (Mordor Intelligence). While there were some ups and downs in between 2017 and 2021, constant growth is visible due to the rise of e-commerce and other technologies of industry 4.0. It should not be forgotten that logistics is also facing lots of challenges, which will be discussed in the next sub-chapters.

Figure 2

Value of freight and logistics market by logistics function, USD, Europe, 2017-2029.



Source: Mordor intelligence.

1.1.1 Challenges

This sub-chapter is dedicated to review challenges that logistics, as every other sector, faces. Past few years were extremely stressful for the whole world. Back in 2019, global COVID-19 pandemic started followed by a global lockdown. It made the whole world stop and caused huge disruptions for the logistics and whole supply chain. Furthermore, in 2022, a terrible war in Ukraine started, shocking the whole world. It has called out sanctions on Russia

and the countries that support it. Both events contributed to fuel, especially diesel, price increase which is one of the biggest factors for costs of logistics. Also, we should not forget global actions taken to reduce emissions and efforts to stop global warming. All these factors have huge impact on logistics.

1.1.1.1 Impact of COVID-19

Without a doubt, COVID-19 pandemic touched the whole world. Before the pandemic, it was estimated that the global logistics market will reach 8 trillion dollars (Park and Lee 2015). Many countries in the world understood the importance of global logistics providers and have implemented lots of policies to support their activities. The global pandemic slowed down whole world and to stop further spread, governments around the world imposed some restrictions (Loske, 2020):

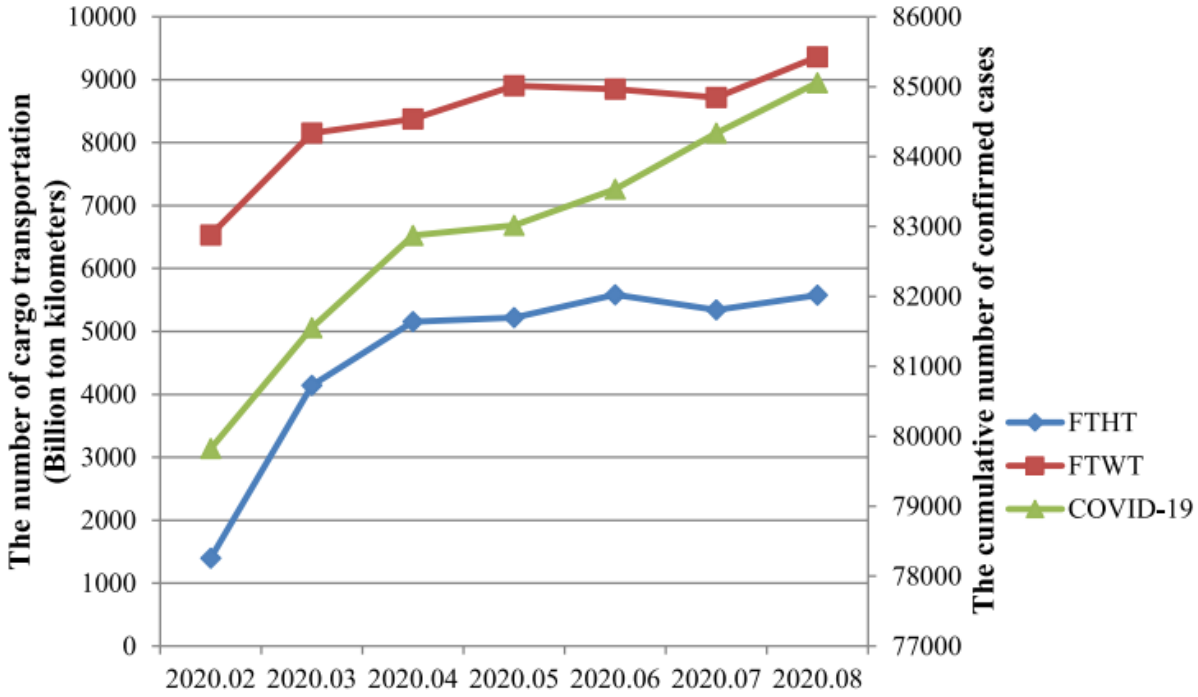
- Contact restrictions and the distance rules.
- Temporary closure of trade and service companies, as well as gastronomy, hotel business, and leisure facilities.
- Travel restrictions within a country and especially for non-essential travel.
- The obligation to wear a mouth-and-nose cover when using public transport.

These measures have had an important effect on the global economy and transportation of goods.

The impact of COVID-19 on freight transport was well examined by Ho et al. (2020) with a focus to China. He finds that the epidemic has changed people's consumption behavior, increasing the demands for the delivery services and online shopping, which has increased the use of mobile payment. This relates to the increased volume of road freight transport during the epidemic and the high demand for supplies (see **Figure 3**).

Figure 3

Trends on the Covid-19 and China's freight traffic volumes. Turnover of road freight transport (FTHT) and turnover of water freight transport (FTWT).



Source: Ho et al., 2020.

This example shows that some global challenges, can be financially beneficial for certain types of businesses. At the beginning, everyone all the restrictions seemed to be a showstopper for transportation businesses, however, it turned out differently. By not being able to travel or even leave home, people started ordering goods online and increased the turnover for the logistics companies. However, it was not only good for the sector. Due to huge demand to transport goods, transportation sector faced capacity challenges. One of good examples is in maritime logistics where at the beginning of pandemic in 2020 shipping companies and exporters began to worry about the shortage of shipping containers (Aguilar-Mäkelä, 2022). According to Dominguez (2022), the foundation of international trade, freight, marine transportation is the shipping container sector. Due to the Covid-19 outbreak, the global supply chain issue that has slowed the transportation of commodities throughout the world has brought attention to the shipping container business. Due to widespread industrial delays and bottlenecks, there were not enough ships available in the right number at the right time. This situation grew worse when shipping ports overstocked containers, preventing the delivery of extra cargo.

1.1.1.2 Impact of war

Once the world just started recovering from COVID-19 pandemic, another crisis happened – Russia's war on Ukraine which started on February 24th, 2022. The invasion and subsequent Ukraine war have disrupted Ukrainian supply to the EU. Also, Russia is heavily sanctioned by the EU and USA except for energy trade (Simmons et al., 2022).

Unfortunately, not only Russia is suffering from the sanctions. Ukraine became non-flying zone, Black and Azov Sea routes are dangerous, and ports occupied, it makes export from Ukraine tough as 70% of Ukraine's exports are transported by ships (Ngoc et al., 2022). One of the most exported goods of Ukraine is iron ore and iron products, some metals and semi-finished metal products, which used to feed the value chains of different European countries (Caramuta et al., 2023). On the other hand, Russia provides around 90% of neon used in lithography and 60% of it is refined by a company in Odessa (Ngoc et al., 2022). Alternatives to can be found, however, it's a long and expensive process that is influencing the way we live all around the globe. Similarly, to how unexpected physical war is in 21st century, it also challenged logistics sector by surprise. To keep the economy of Ukraine alive and people in Europe fed, different countries and logistics companies had to find new export channels. Fortunately, it was agreed quite fast that grains will be exported via ships and will be protected by Turkey's military ships. Also, lots of production were started to be moved via trains to reach Europe.

While people could survive without the metals or microchips, food is vital for us and both aforementioned countries are playing a big role in it. Both Russia and Ukraine account for more than a quarter of wheat exports, fifth of corn exports and 80% of global sunflower oil exports. Due to that (of course including other factors like COVID) raised the prices of food to the highest level in 10 years (Ngoc et al., 2022).

One more important factor is the workforce. 14.5% of worldwide shipping workforce are covered by Russians and Ukrainians (Ngoc et al., 2022). Also, other workers are afraid to travel to the waters near countries in war as there already were reports of commercial ships attacked. Additionally, a lot of truck drivers comes from Ukraine. According to statistics, back in 2022 Polish transportation companies employed around 100,000 Ukrainian workers and Germany was experiencing deficit of more than 70,000 professional drivers. Shortage of workforce increases transportation and goods costs and delays of delivery.

1.1.1.3 Impact of fuel price increase

According Gao et al., (2019), the cost of fuel is normally the largest of all the transportation costs. As everything is counted in the price of product, it has impact on every single person who is buying goods, thus it is important to understand how it affects logistics sector.

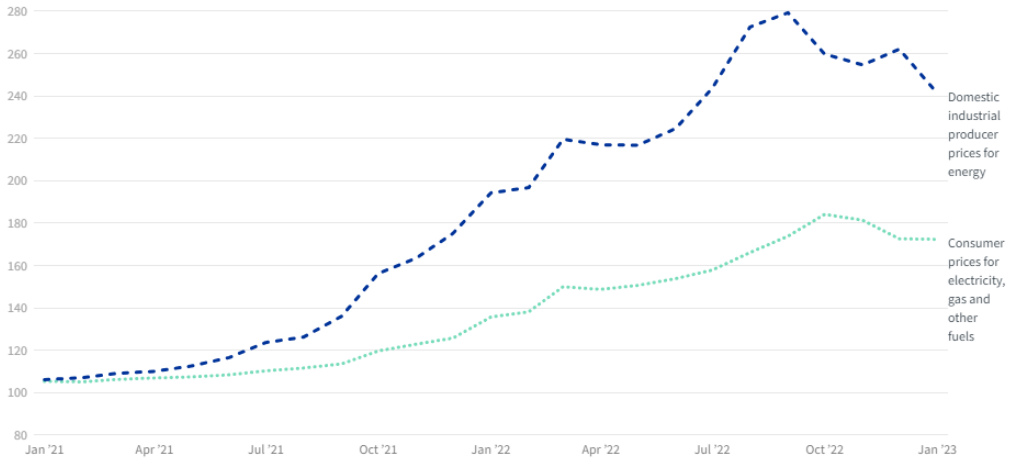
According to Kalghatgi (2018), transport is almost entirely powered by internal combustion engines (ICEs) burning petroleum-derived liquid fuels and the global demand for transport energy is large and is increasing. While the rails can be electrified, road transportation is completely dependent on fossil fuel – especially diesel since they generate more torque than gasoline engines. Future growth in freight transport is thought to be even more rapid than that of passenger travel (Ribeiro et al., 2007). As mentioned, fuel is one of the largest components of transportation cost and is directly impacting a cost of good for customers.

The price of crude oil is the main factor influencing the retail price of diesel fuel. Gohari et al. (2017) analyzed historical crude oil price and diesel price in Malaysia. This work proved that the diesel price is completely dependent on crude oil prices, for example, the price of crude oil in May 2008 was at its maximum price between 1997 and 2017 in Malaysia, the diesel price also experienced its maximum price at the same time.

The recent rise of fuel costs in EU dates to already mentioned COVID-19 pandemic and Russian invasion of Ukraine. According to European Council (2023), between December 2020 and December 2021, the import price for energy in the euro area more than doubled. This rise was quite unprecedented, as energy import prices, while rather volatile, do not generally change by more than around 30% in the course of a year, see **Figure 4**.

Figure 4

Producer and consumer energy prices in the EU.



Source: European council, 2023.

1.1.1.4 Impact of global sustainability initiatives

Even though the logistics is a vital process to people to survive, it is also causing life-threatening challenges like global warming. Decarbonization, sustainability, green course are the buzzwords that became popular a few years ago which all have one common goal – to stop global warming which is mainly caused by the emissions of carbon dioxide (CO_2). As mentioned in section 5.1.1.3, all types of logistics (road, rail, marine, air) are dependent on burning fossil fuel which is generating CO_2. Between 1970 and 2004, carbon dioxide emissions increased by 70%, with the transport sector accounting for 13.1% of the emissions. Also, greenhouse gas (GHG) emissions from the transport sector also account for the fastest growing source of GHG emissions (Mariano et al., 2017). More recent studies shows that road freight alone accounts for about 7% of the world's energy related carbon dioxide emissions. It's obvious that with these numbers of emissions, the sector should be controlled globally (Ghisolfi et al., 2022).

According to Ghisolfi et al. (2022), Only a combination of many solutions and top-down policies will result in the decarbonization of the transportation industry, such as:

- Reducing freight transport demand.
- Shifting freight to lower-carbon transport modes.
- Improving assets utilization.
- Increasing energy efficiency.
- Switching to lower-carbon energy.

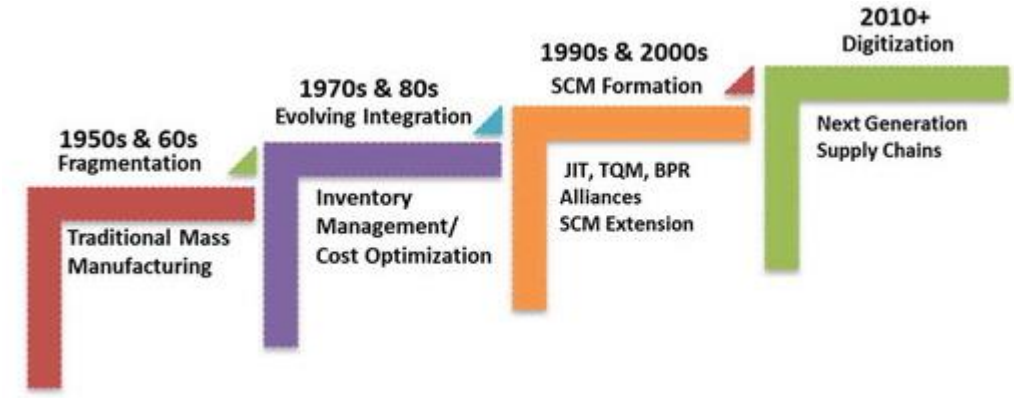
European Union has a commitment to reach climate neutrality by 2050 which has impact on the logistics sector. One of the recent examples is an introduction of Euro VI standard which includes more stringent emission limits for hydrocarbons, PM (particulate matter) and NOx, while for the first time a limit for solid PN (particle number) emissions was set (Grigoratos et al., 2019). The new standard introduction led to the lower emissions across all Europe. However, at the same time, looking from the perspective of logistics companies all older vehicles (not meeting Euro VI standard) could not enter EU which led to changes in fleet requiring lots of investments.

1.1.1.4.1 Adjustability to change

New global initiatives affecting logistics industry are being released and review often especially in recent times in the wake of sustainability. Also, technologies are evolving faster than ever with the digitization currently leading the way (see **Figure 5**). It is both a challenge and possibility for the logistics sector to grow.

Figure 5

Supply chain management evolution.



Source: Attaran, 2020.

Since 2010, digitization is driving supply chains to become transform. In current economy, value is produced by the connections between individuals, devices, channels, and organizations which is made possible by technology. Digital platforms such as social media, mobile networks, and e-commerce enable consumers to do their own research and make purchases. Customers may customize their requests to their exact requirements, order it whenever they want, and have it delivered in a few days. Traditional supply networks have to undergo major transformation as a result of the digital age (Attaran, 2020). The impact of disruptive technologies on logistics will be examined more deeply in the upcoming chapters.

1.1.2 Future outlook

We are living in the 21st century where technologies are evolving every day making it impossible not to change – you either evolve, adapt, or get out of the business. In this sub-chapter we will dive into the future of logistics and key drivers for future changes of the sector.

It is not unexpected that most advancements are being achieved in the technology layer as, according to IBM, we are already witnessing fourth industrial revolution. Industry 4.0 is all about automation, smart devices and factories, cloud technologies and data. Also, Gartner (2023), listed top 8 strategic supply chain technology trends for 2023:

- Smart operations.
- Actionable AI.
- Composable application architecture.
- Supply chain integration services.
- Cyber-resilient supply chains.
- Industry cloud platforms.
- Mobile asset optimization.
- Employee engagement.

According to Liachovičius and Skrickij (2020), road freight transportation was considered as very traditional business for a long time. R&D and other technological advancements were not popular in this sector until recently. Introducing of a few innovative technologies can have significant effect on the business and most usually it is associated with the digitalization. Authors have specified a few technologies that they think will have an impact on logistics:

- 3D printing – might change types of goods to be transported.
- Autonomous driving – might solve drivers shortage issue.
- Big data and analytics – will improve decision making decreasing lags.

Furthermore, technological developments like artificial intelligence and machine learning are transforming and disrupting the status quo of the FTL sector (Wang and Sarkis, 2021). Not only autonomous but also electric vehicles should not be forgotten when talking about the future of logistics sector. In previous chapter we have already had a chance to get acquainted with different kind of regulations that are being imposed on this sector and one of the most important ones is the CO2 emission rates. Rietmann et al. (2020) did the research which results shown that 30% of the worldwide passenger vehicle fleet will be EVs in 2032. Of course, the passenger vehicles are mostly used in the cities for short trips or between the cities not like the trucks that are driving hundreds of thousands if not millions of kilometers every day, thus we might not expect to have every third EV truck, however, it will have an impact on the business models of logistics companies especially that are operating road freight forwarding.

To summarize, it’s clearly visible that the logistics sector is undergoing major changes due to evolving technologies. All the businesses in the world are moving towards data-driven

decision making, automated planning and manufacturing with the help of disruptive technologies like artificial intelligence, machine learning, etc. Furthermore, sustainability is key nowadays if you want to grow your business as people are becoming more responsible about the pollution and chooses to pay more to get ‘greener’ goods or services. These are all the things that we will overlook in the upcoming chapters.

1.1.3 Summary of challenges and future of logistics

The past few years have been challenging for the whole world. In 2019, the global COVID-19 pandemic began, followed by a worldwide lockdown, causing disruptions to logistics and the entire supply chain. Additionally, in 2022, the devastating Ukraine war erupted, increasing global challenges.

COVID-19 pandemic had an impact on the whole world. Governments were implementing various measures to stop the spread of the virus. These included contact restrictions, business closures, travel bans, etc. The measures had big impact on the global economy and the transportation sector as well. However, the pandemic boosted e-commerce and delivery services, leading to increased demand for road freight transport showing that global crisis might have a positive impact on certain sectors of business. The Russia-Ukraine war became another challenge for logistics. It disrupted Ukrainian supply routes to the EU. Also, sanctions against Russia were imposed. Ukraine became a no-fly zone, sea routes in the Black and Azov seas became dangerous or unusable at all, ports were occupied. These disruptions affected Ukraine’s exports, including metals and iron products, critical for Europe’s value chains.

Looking to the future, the logistics industry is undergoing fast technological advancements. Industry 4.0, which is based on automation, smart devices, and data-driven operations, has a big impact on the sector. Technologies like 3D printing, electric vehicles, big data, and analytics are also expected to drive innovation and efficiency in logistics operations.

To summarize, the logistics sector faces a number of challenges and opportunities. It must adapt to evolving technologies and prioritize sustainability in a changing landscape. Data-driven decision-making, automation, and green initiatives will be key factors shaping the industry’s future.

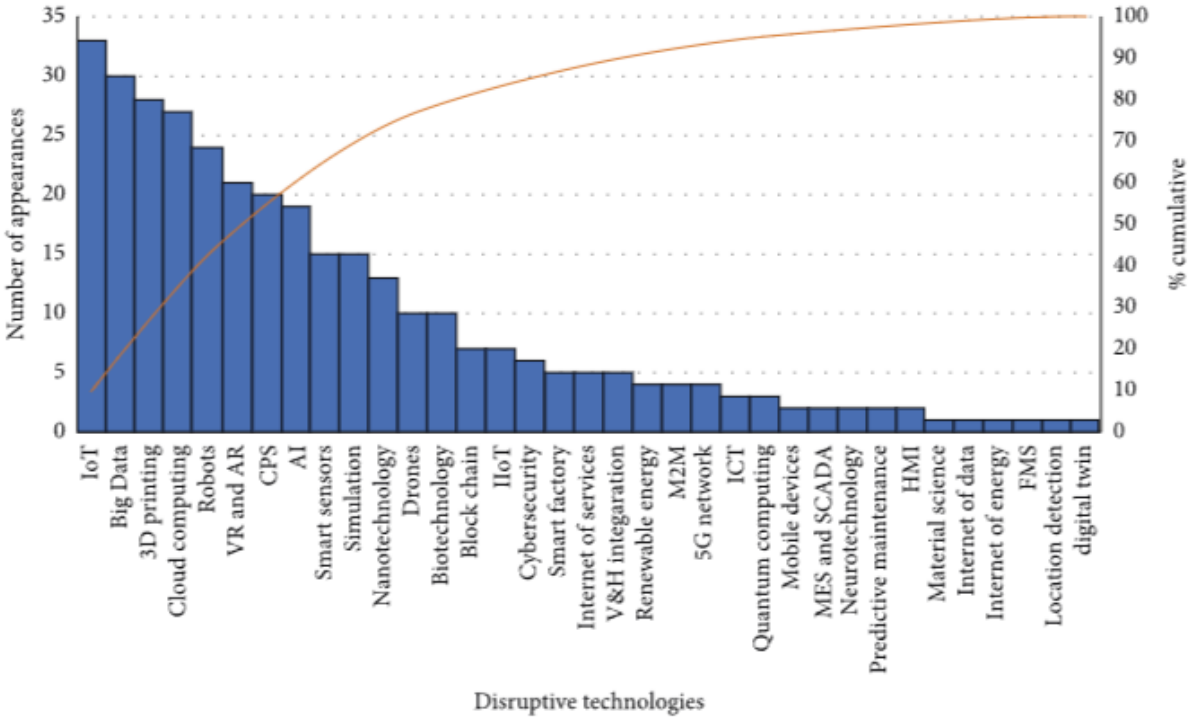
1.2 Disruptive technologies

Oxford reference describes disruptive technology as a specific technology that can fundamentally change not only established technologies but also the rules and business models of a given market, and often business and society overall.

Some things that we are not using in our daily life anymore, like compass, looking backwards was a disruptive technology at the time. It is not used anymore because most of the people are having smartphones with the Internet – both of which are quite recent disruptive technologies even though we are considering them as simple. This shows how fast the technologies changes in 21st century. Bongomin et al., (2020) did the scientometric survey and have identified 35 disruptive technologies in 70 publications (see **Figure 6**). Ranking was done based on the number of their appearances in the selected publications.

Figure 6

Key disruptive technologies of industry 4.0.



Source: Bongomin et al., 2020.

As we can see, top 10 analyzed technologies of 21st century and industry 4.0 are: Internet of things, big data, cloud computing, robots, virtual reality (VR) and augmented reality (AR), cyber-physical systems (CPS), artificial intelligence (AI), smart sensors and simulation. In the sub-chapters below, we will overview the *artificial intelligence* with its sub-parts (deep learning, machine learning and neural networks) and sustainability (electric vehicles,

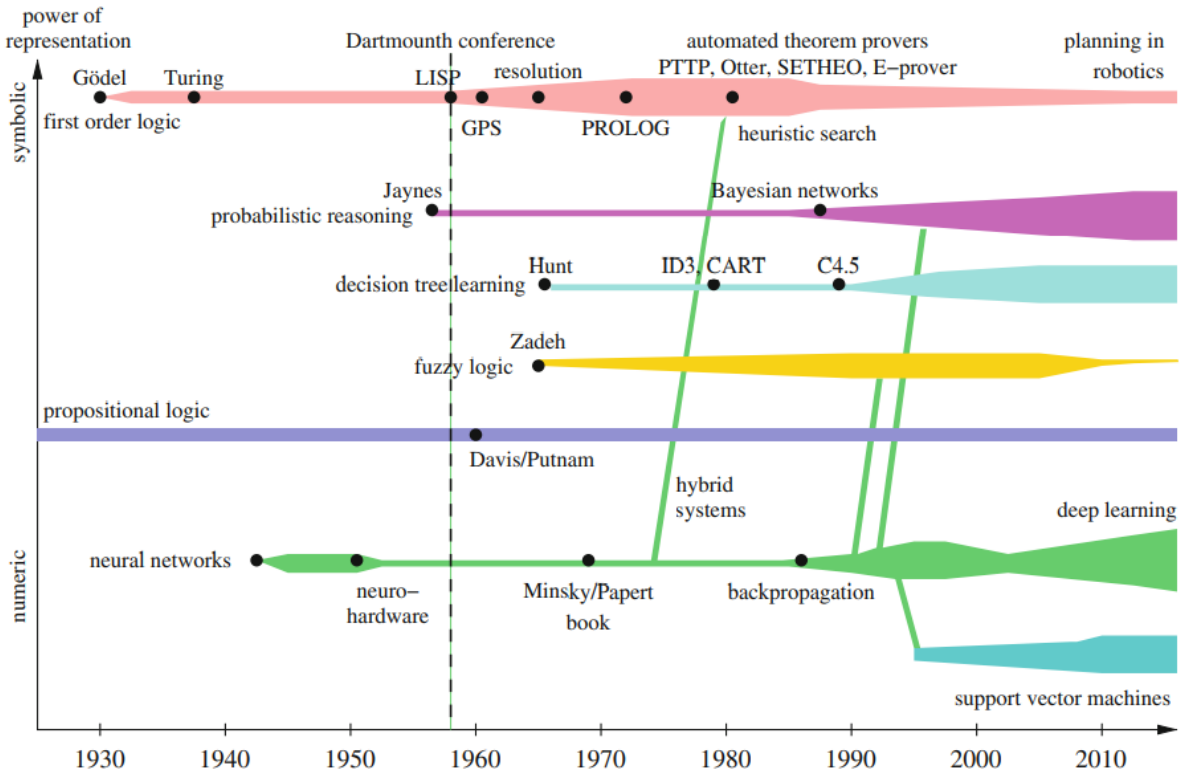
alternative fuels, and telematics (*smart sensors, internet of things*) as they are mostly revolutionizing logistics sector and are also used in variety of other sectors.

1.2.1 Artificial intelligence

Artificial intelligence is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable McCarthy (2004). John McCarthy was the computer scientist and is called as one of the founders of artificial intelligence. Even though the term was introduced in the middle of the 20th century, artificial intelligence Is still called a disruptive technology and is evolving faster than ever (see **Figure 7**)

Figure 7

History of different AI areas. The width of the bars represents the frequency of use of the procedure.



Source: Ertel, 2018

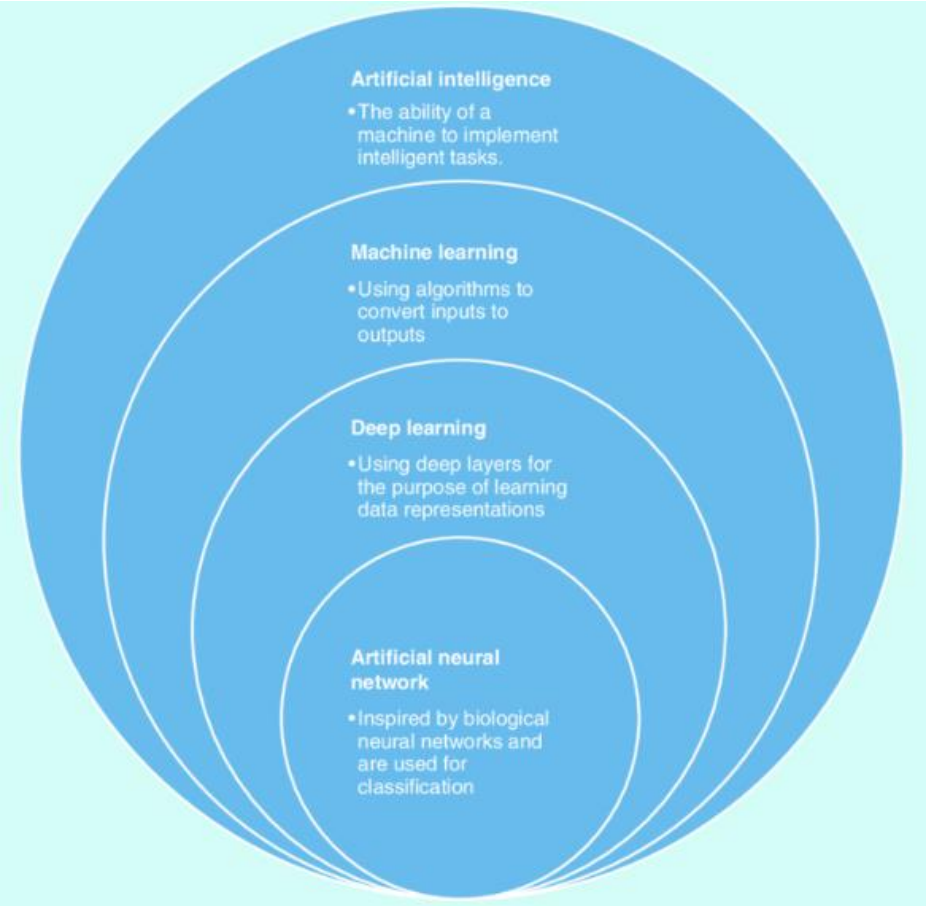
Nowadays, artificial intelligence is used in different kind of industries like medicine, transport, smart cities, agriculture. One of the fields where AI is actively researched and used in medicine is gastroenterology. Main benefit is that AI can analyze images of and help to

recognize or even predict diagnosis and deep learning is most promising in this sector (Yang and Bang, 2019). Transport sector is using AI tools for predicting future traffic conditions after an accident or simple road planning (Abduljabbar et al., 2019). In smart cities everything is built on internet of things (IoT) technology which is all about data being accessible real time. Machine learning is playing a vital role in detecting and safeguarding against possible cyber-attacks (Ullah et al., 2020). In agriculture, AI is used to control diseases in different kind of crops, estimate soil moisture, pest management, and so on (Bannerjee et al., 2018).

Artificial intelligence is the most frequently used term talking about data science, however, it's far away from being the only tool to do the job. AI consists of machine learning (ML), deep learning (DL), and artificial neural networks (ANN), machine learning consists of deep learning and artificial neural networks and so on (see **Figure *8***). According to Goswami (2021), most of the times AI represents the simulated intelligence, ML – trains the machine to gather data for the decision making, DL – solves complex problems for which use of ML would be inefficient and ANN are algorithms for automatic discovery of data patterns.

Figure 8

AI relationship to ML, DL and ANN.



Source: Ramanuj, 2021.

In the upcoming sub-chapters, we will review artificial intelligence, machine learning and deep learning not focusing into artificial neural networks as it's purely technological and is realized through deep learning. Artificial intelligence enables huge variety of capabilities. It is mostly used to analyze data and make decisions or even predictions, recognize images, generate text (chatbots) and so on.

1.2.1.1 Machine learning

As we already know from sub-chapter 5.2.1 and **Figure *8***, machine learning is a part of artificial intelligence. ML is responsible to analyze huge amounts of data, learn and identify patterns in short period. By doing this, machine learning finds associations that humans might not even think of and using this data AI can predict or make decision. It is important to understand how this disruptive technology works and what impact does it have on logistics and other business models.

The phrase *intelligent machinery* appeared in the 1950s and introduced the public to a different field in which machines were aiming to become as clever as people. *Paper and pencil* chess was invented in 1948 by Turing and Champernowne. It was the first chess-playing computer software ever created. Only 4 years later, 1952 Christopher Strachey created first checkers algorithm which could have played an entire session of checkers at a decent speed (Shinde and Shah, 2018).

According to more recent years, Mohri et al., (2018) defines machine learning as computational methods using experience to improve performance or to make accurate predictions. Here, experience refers to the past information available to the learner, which typically takes the form of electronic data collected and made available for analysis. This data could be in the form of digitized human-labeled training sets, or other types of information obtained via interaction with the environment.

Machine learning is applied in lots of various sectors for different kind of problems. As we already know, to make ML effective, it needs to become *experienced* or otherwise – process historical data and learn from it. Let's review the methods that are used to teach machine learning and where is it applied in the sections.

1.2.1.1.1 Scenarios of learning

In this section, a short overview of the key mechanisms through which machine learning achieves ”smartness” will be presented, enabling a deeper exploration of its applications later. There are quite a lot of differentiation of machine learning, but we will review three most popular: supervised learning, semi-supervised learning, and unsupervised learning. All of them differs in the data received and how they are processing the data.

Supervised learning – As training data, the learner receives a set of labeled instances and generates predictions for all unknown points. It is frequently utilized for classification issues like spam filtering (Mohri et al., 2018). For the sake of easier explanation let’s take a medical example. Imagine that you have a database with 1000 records of blood tests of patients with nine features and one label. In this case features are the blood indicators results e.g., amount of natrium, kalium, hemoglobin, etc. The label is result – ill or not ill. Then, we feed all this data for the supervised machine learning algorithm, and it classifies which combinations of blood indicators are more likely to tell that person is ill or not. After the model is taught, unlabeled data (only blood indicators results) are provided, and the algorithm predicts whether person is ill or not.

This type can be considered as traditional teacher and student situation where student is firstly learning from the teacher and then takes the test. If the student fails, teacher helps to learn from these so that they wouldn’t repeat (Argade et al., 2021).

Semi-supervised learning – the learner receives a training sample consisting of both labeled and unlabeled data and makes the predictions for all unseen points. When unlabeled data is freely accessible, but labels are expensive to generate, semi-supervised learning is frequently used. It is used in tasks involving classification, regression, or ranking. It may be used with the hope that the available data is widely distributed and lots of it is available (Mohri et al., 2018). As an example, in order to choose semi-supervised learning, imagine that you have fully anonymized database with 9 features (blood indicators results) available but only your own and a few of your family members blood test with the label (ill or not ill). You create one dataset with both unlabeled and labeled data and hope that it learns correctly and will be more accurate than supervised learning.

Unsupervised learning – the learner produces predictions for all unknown points using just unlabeled training data. It can be challenging to correctly assess a learner’s performance in that situation because there aren’t any labeled examples accessible (Mohri et al., 2018). A very good and simply understandable example of unsupervised learning is provided by Argade et al., 2021) – suppose you have never watched a cricket match and your friends invites you to

watch one. At first, you have no idea what's happening, but your friends are enjoying and cheering one certain player plays and then you start analyzing available information and making observations when to cheer. From knowing nothing you now know fundamentals and have a good time. You did not have any teacher just the TV and a few friends cheering on certain occasions and by having that received all necessary information to learn about the sport.

To understand how logistics business models are impacted by artificial intelligence it is crucial to know how ML algorithms become experienced because different learning method enables different applications and innovations. For example, supervised learning using only labeled data is used for demand forecasting, route optimization, and improving last mile delivery. Semi-supervised learning is helping with resource allocation and decision making and unsupervised learning is used to discover new patterns and relationships in huge databases with potential to find new business strategies.

1.2.1.1.2 Machine learning application

Machine learning is very widely used in different sectors. Below, a short review of ML application in medicine and agriculture sectors is reviewed.

In **medicine**, machine learning can help with prognosing the diseases from the available data. Medical institutions have vast databases of patients' information, and the model can learn the patterns of health trajectories. Using information that goes well beyond the doctor's practice experience, this facility can assist doctors in correctly predicting future events. The same kind of forecasting may accurately identify people who will soon have serious illnesses or higher levels of healthcare services at the population level. With this knowledge, more resources can be proactively allocated to help these patients (Rajkomar et al., 2019).

In **agriculture**, let's see ML usage in yield prediction. Yield prediction is critical topic to understand how much harvest one will have, increase productivity and so on. In one case, an algorithm that counted the coffee fruits on a tree automatically was developed. It also divides the coffee fruits into three categories: those that can be harvested, those that cannot, and those whose maturity stage is ignored. The approach also calculated the weight and maturity rate of the coffee fruits. Another example is an early yield mapping technology for locating immature green citrus under outdoor settings in a citrus grove (Liakos et al., 2018). Using this technology, it is not required to go anywhere to count beans or check the maturity of citruses. It enables saving on the workforce and having same or even better predictions results.

Machine learning, as discussed above about medicine and agriculture, is as well promising for the logistics sector. In medicine, machine learning is able to analyze vast patient databases and predict future health events. In logistics ability to crunch huge databases can be used to forecast and plan demand. Similarly, in agriculture, machine learning is used in yield prediction and automated data collection. Same features are vital if transportation companies are looking into predictive maintenance (PdM) processes. These applications in different sectors shows how machine learning can also change logistics and reshape business models.

1.2.1.1.3 Summary of machine learning

Machine learning is a subset of artificial intelligence and has a rich history going back to the 1950s. Early achievements include the creation of chess-playing computer software and checkers algorithms. Modern machine learning, as defined by Mohri et al. (2018), involves computational methods that use past data, often in the form of electronic datasets, to enhance performance and make accurate predictions.

Machine learning is flexible and applicable in different sectors. Key processes are supervised learning, semi-supervised learning, and unsupervised learning. Labeled training data is used for supervised learning and it is commonly used for classification tasks, such as spam filtering. Semi-supervised learning incorporates both labeled and unlabeled data. Unsupervised learning uses only unlabeled data and produces predictions without having historical data to learn from. Machine learning is used in medicine to help prognosing disease and helping doctors predict future patients' health events. In agriculture, machine learning is instrumental in yield prediction.

Machine learning's adaptability and predictive power make it a valuable tool in lots of fields, transforming processes, and decision-making across various industries including logistics. As mentioned in 5.2.1.1.2 sector, ML has the capabilities to transform logistics sector. Ability to forecast demand is helping to fight challenges like Covid-19, however, is also helpful in business as usual as demand increases throughout a year (Christmas, Easter, back to school etc.). Predictive maintenance recused operating costs and downtimes of vehicles. All these capabilities will be further analyzed in chapter 5.3 looking specifically in logistics improvements.

1.2.1.2 Deep learning

Deep learning is a subset of machine learning and has neural networks as a part of it. It is actively used in natural language processing, speech recognition, image processing and so on.

Shortly explaining, deep learning uses a series of multiple levels of nonlinear processing units to extract and transform features. Higher layers learn more complex features derived from lower layer features, whereas lower layers closest to the data input learn simpler features. Scientists lost interest in neural networks in late 1990s because only ‘shallow’ neural networks were available and ‘deep’ – very complicated and computationally expensive (Zhang et al., 2017).

Deep learning experienced a renaissance in the early 2000s due to a couple of facts that made it easier to train ‘deep’ networks. Firstly, the graphics processing units (GPU) emerged, which contains large number of cores and enables more efficient calculation of several simultaneous tasks. Secondly, different large datasets become available to train neural networks (Bengio et al., 2018). Deep learning can be trained using the methods mentioned in 5.2.1.1.1 sub-chapter, however, as it is using a few layers of neural networks, it requires substantially more data to work accurately. However, DL has enough data to learn from, it becomes irreplaceable in domains as image and speech recognition. This capability of technology can be applied in various sectors and for various reasons, thus it is important to understand how it’s affecting logistics and other businesses.

1.2.1.2.1 Deep learning application

In this sub-chapter, a review of deep learning application in food, ecology and medicine sectors is presented.

In **Food** industry deep learning is used for food recognition and classification and quality detection. Diets and eating habits have an impact on a person’s health. Especially for those with diabetes, allergies, and other conditions, they should closely monitor and regulate their eating behavior (Zhou et al., 2019). Deep learning provides a possibility to simply upload an image know immediately if the food one’s about to eat has allergens or not. Another application in food industry is to detect the quality of fruits. During the production, storage sales and other stages, fruits face a lot of challenges like pests, diseases, mechanical damage, and other effects (Zhou et al., 2019). For example, Rodriguez et al., (2018), did the research to automatically recognize early-maturity plum types. The method is made up of two stages: a

first step for capturing and segmenting plum photos, and a second stage for classifying the previously processed images using a deep learning. The accuracy varies from 91 to 97% which is good understanding how challenging this work is at the early stages of maturation. It helps farmers to plan their harvest times and quality of the production they will provide.

In **ecology** sector, the deep learning is promising a lot. Datasets of ecological data is growing exponentially, thus there is a lot of data to learn from. DL can be used in behavioral studies – different kind of wild animals' activities such as feeding or resting can be recognized from the pictures with the body stance and haze. Scientists were even able to train the DL model with the GPS and time and depth recorder data to predict diving activities from the GPS data. It is also used in population monitoring, distribution, and density (Christin et al., 2019).

In **medicine** industry, artificial intelligence, and especially deep learning due to its image and language processing capabilities is appreciated and used a lot. As the popularity of deep learning has increased recently, it did not go around medicine field. Images from the retina, the chest X-ray, and the brain MRI show processed by deep learning are promising outcomes in the medical area (Panwar et al., 2020).

One of the analyzed examples of DL usage is already mentioned COVID-19 infection. According to World Health Organization (WHO) as of 27 September 2023 there are already 6,969,316 deaths in the world caused by COVID-19 infection. Given that the signs of the illness are challenging to identify and there are just a few diagnostic kits accessible, researchers must develop alternative methods of detecting it. Researchers decided to look for a faster way to diagnose if a patient has the disease or not – it takes 9-28 days to produce antibodies and 4-6 hours to get results from RT-PCR testing. Alternatively, researchers had an open-source database with 337 lungs X-Ray images out of which 192 were positive. They have created and taught a deep learning model to recognize COVID-19 out of lungs image in 5 seconds with 97.62% accuracy (Panwar et al., 2020)! Taking into account the vast and severe the epidemic was, knowing in 5 seconds instead of 4 hours or a few days may save a lot of lives.

Another **medical** field where deep learning is getting its way is the dermatology and ophthalmology. A number of studies have shown that deep learning model can identify harmless wounds from cancerous ones just as effectively as licensed dermatologists can. The field has been evolved to include differential diagnosis of numerous skin disorders, including hereditary problems and non-neoplastic lesions like rashes (Esteva et al., 2021).

Ophthalmology might be disrupted even more. Usually, the initial tests do not require any interventional measures, thus pop-up clinics and telemedicine may be utilized to disperse testing locations to underprivileged areas because the equipment needed to examine the eye is

portable. Deep learning can reliably identify a variety of diseases, including diabetic retinopathy, which causes blood vessels in diabetes patients' eyes to leak and can result in blindness. A recent US FDA-cleared approach is the result of consistently shown physician-level grading from fundus pictures. Furthermore, DL can be used to identify or forecast the development of many conditions, including manifest visual field loss, childhood blindness, age-related macular degeneration, glaucoma, and center-involved diabetic macular edema (Esteva et al., 2021).

As the main topic of this work is to see impact on logistics, it is important to mention that same technologies used in these sectors are also used in logistics for similar purposes. Quality control and detection in food industry ensures that people are eating food that is not yet spoiled, similarly in logistics quality of packaging on distribution belt in a warehouse can be automatically evaluated without human intervention. Additionally, same as in ecology sector, use of devices like GPS trackers or other indicators from the vehicles can help logistics companies to plan routes or even predict when maintenance of certain car is required. Such technologies create completely new opportunities for the fields like medicine to actually save lives, understand our nature better in ecology and in business to reduce operational costs and reduce pollution of environment.

1.2.1.2.2 Summary of application of deep learning

Deep learning is a subset of machine learning. It is being applied in various domains such as natural language processing, speech recognition, and image processing. This technology is extracting complex properties using numerous layers of nonlinear processing units, where higher layers learning complicated characteristics from simpler in lower tiers.

Deep learning is important in a number of applications. It helps with dietary limitations by offering food recognition, quality detection, and allergy identification. Additionally, it aids in determining fruit quality and resolving issues like pests and illnesses throughout production and storage. In ecology it helps to analyze animal behaviors, predicts activities like diving using GPS data, and aids in population monitoring, distribution, and density studies.

The influence of deep learning can be seen in most sectors, especially those that heavily rely on visual data. It is promising in ecology, nutrition, and medicine, all of which are essential to human well-being and the sustainability of the world. In logistics sector, these technologies offer unique advantages. By using the power of advanced deep learning and data-driven

insights, logistics companies can revolutionize their supply chain management, improving efficiency, reducing costs, and minimizing their environmental footprint.

1.2.2 Sustainability technologies

Many countries around the world are adopting sustainability practices (Sodiq et al., 2019). It is considered to be a megatrend (Ciriminna et al., 2019). According to Modak et al. (2020), sustainability is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

All the world is buzzing about sustainability–- from ordinary people who look in the way they are consuming to businesses who are moving to 'greener' offices and are investing lots of money to reduce their carbon footprint and fight the climate change. As already mentioned in section 5.1.1.4, global on local governmental institutions are not sitting doing nothing – the regulations are constantly coming out imposing big fines for the companies that are ignoring the harm they are doing for the planet. In 2015, 196 parties adopted the Paris agreement which is legally binding international treaty on climate change with the main goal to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels (UNFCCC). Also in 2015, United Nation member countries also adopted the 2030 agenda for sustainable development – a comprehensive global plan of action for 'people, planet and prosperity' comprising 17 SDGs and 169 targets to be achieved by 2030 (Nerini et al., 2019), see **Figure 9**.

Figure 9

Sustainable development goals.

Source: United Nations, 2023.

The combustion of fossil fuels (coal, petroleum, and natural gas) is the major source of both air pollution and the greenhouse-gas emissions driving climate change (Perera and Nadeau, 2022). As the electric vehicles became popular again not so long time ago, most of transportation logistics companies are still operating using fossil fuel in their vehicles. By doing that, they are contributing heavily to CO_2 and other pollutants emission. One of the ways to reduce it is to move to alternative fuels, for example, electric vehicles. There are different kind of electric vehicles architecture which has its own benefits and disadvantages, thus it's important to analyze and understand the differences. Overall, it is a big challenge for the logistics sectors as already discussed in chapter 5.1.1.4, however, it brings opportunities to reduce operating costs and introduce new lines of businesses in organizations.

Similarly, telematics enables companies to have real time data from their vehicles and make decision based on accurate information to adjust routes based on incidents on the roads or even upcoming traffic lights. It also helps to meet the new regulations, thus it is important to understand how they are working and helping to fight climate change. Let's review these technologies in upcoming sub- sections.

1.2.2.1 Electric vehicles (EV)

The automotive sector has grown to become one of the most significant global fields, both economically and in terms of R&D. More technology components are being added to automobiles to increase the safety of both passengers and pedestrians. Unfortunately, nearly 28% of all carbon dioxide (CO2) emissions are related to the transportation industry, with road transport causing more than 70% of those emissions. In order to reduce the concentration of air pollutants, CO2, and other greenhouse gases, the governments of the majority of developed countries are promoting the usage of electric vehicles (EVs) (Sanguesa et al., 2021).

China, the biggest vehicle market in the world, is dedicated to developing new energy vehicles in order to lower oil imports and consumption. Germany suggests installing a million EVs in Europe by 2020 to cut CO2 emissions. By 2040, France and the UK similarly want to prohibit local sales of conventional cars. Interestingly, even though EVs are still considered as disruptive technology and is getting popularity only now, it already has quite long history—Thomas Parker invented the first workable electric vehicle in 1884. The 1899 German-made electric automobile designed by Ferdinand Porsche is another well-known example of an early electric vehicle. In the 1920s, when 28% of all cars built in the U.S. were electric, EV

manufacturers saw some degree of success before Henry Ford created the Model T with a revolutionary mass manufacturing method. (Sun et al., 2019).

1.2.2.1.1 Types of electric vehicles

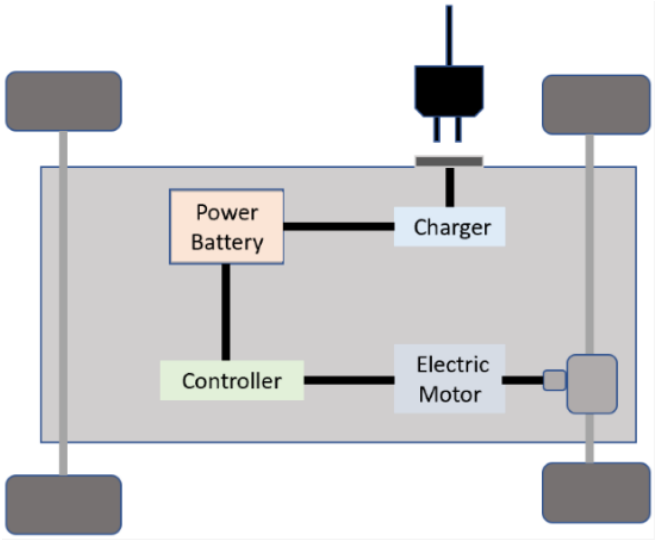
Let's dive review the types of electric vehicles. Mainly, EVs are classified as battery electric vehicles (BEV) also known as pure electric vehicle (PEV), hybrid electric vehicles (HEV) and plug-in hybrid electric vehicles (PHEV) (Matthews et al., 2017).

Battery or pure electric vehicles provide unmatched advantages over conventional vehicles in terms of energy conservation, no emissions and assuring the security of the oil supply. This has resulted in interest from a variety of manufacturers and governments. PEVs use the electricity kept in batteries as a source of power, and its motor drive system converts the battery's output power into the rotational energy of the wheel, allowing the electric vehicle to run. The ordinary engine and the associated parts like fuel tank, etc. are replaced by an electric motor and battery, respectively. The energy source of the vehicle is recharged as it is used to replenish its energy source (Karki et al., 2020). See simplified pure electric vehicle design in **Figure *10***.

Main advantages for the logistics sector are that using pure electricity the only emission is water, thus it helps to become more sustainable business. Also, by using electricity which can be produced using sun and wind reduces dependency on oil and that might help to mitigate the challenge discussed in 5.1.1.3 chapter – jumping fuel prices. On the other hand, very limited range compared to traditional vehicles is a challenge that requires big effort when planning route and delivery times. Furthermore, well advanced charging infrastructure all over the world is required for long distance travels. Not having good infrastructure might lead to operational issues and even downtimes of PEVs.

Figure 10

Simplified design of pure electric vehicle.



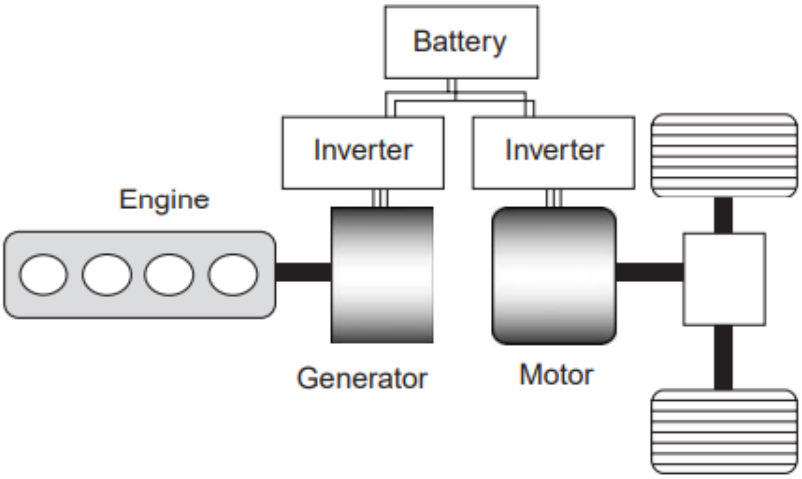
Source: Sun et al., 2020.

Hybrid electric vehicle on the contrary to BEV or PHEV does not require to have electric motor and rely only on kinetic energy and energy from gasoline (Matthews et al., 2017). The main difference from plug-in hybrid electric vehicle and pure electric vehicle is that HEVs cannot be charged using electricity (does not have the socket) and are using internal combustion engine to generate power which is charging batteries. There are two types of such engines: series hybrid system and parallel hybrid system.

Series hybrid system is using the generator, which is attached to the engine and provides power to the motor and charges the battery. Only the electric motor is providing power to drive the wheels (see **Figure 11**). When driving slowly in rush-hour traffic, this setup emits very little pollution and performs superbly. However, it needs an enormous, massive battery pack, which raises costs considerably and impairs vehicle performance. Due to inefficiencies in the process of converting the mechanical power from the engine to electrical and in the charging and discharging of the battery, it is also significantly less efficient while traveling at high speeds (German, 2004).

Figure 11

Simplified view of series hybrid system.

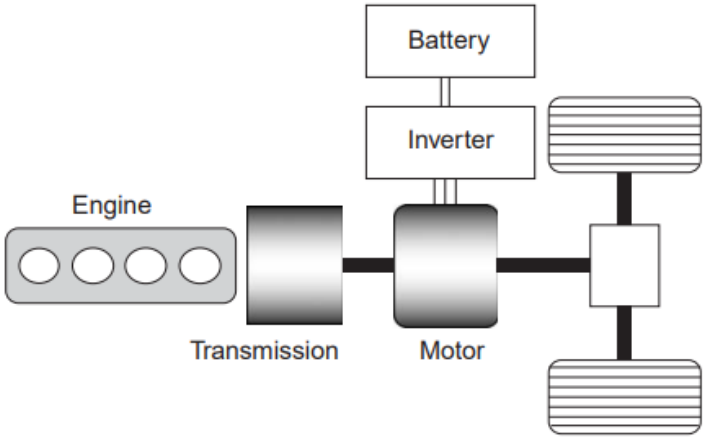


Source: German, 2004.

Parallel hybrid systems are using both engine and a motor which are directly coupled to the drivetrain (see **Figure 12**). The integration of the two power sources creates more problems than in a series system. The main benefit is that even with a rather compact and lightweight battery pack, significant efficiency increases may be achieved. By doing this, the battery pack's additional cost and performance hit are reduced to a minimum (German, 2004).

Figure 12

Simplified view of parallel hybrid system.



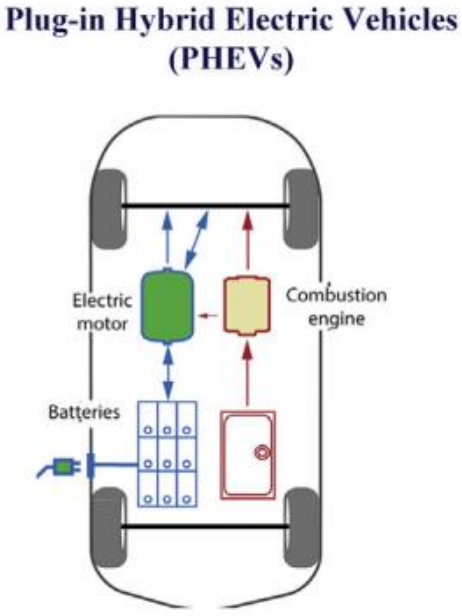
Source: German, 2004.

Main advantages for the logistics sector are that using hybrid electric vehicles is helping to enhance fuel efficiency and reduce environmental impact. Comparing to battery electric vehicles, HEVs are better for long trips because they are running on both electricity and fossil fuels, thus it's way easier to plan the trip. On the other hand, while HEVs are helping to become more sustainable, it's nothing close comparing to pure electric vehicles. On the other hand, there are also disadvantages like limited range to use only electricity and the complexity of maintenance. Even though it's easier to plan the long trips such vehicles due to short range of driving on electricity might not be able to enter urban areas with zero-emission zones. Also, having both electric and internal combustion engine creates more complexity. It can lead to higher maintenance costs because having two engines there are bigger changes that some parts will break.

In plug-in hybrid vehicles both regenerative braking (plugging in) and an external electrical charging outlet are used to charge the battery system. The petrol engine occupies the majority of the area and increases the car's range. Additionally, the battery arrangement enables greater electric vehicle range than that of conventional automobiles (Gandoman et al., 2021). For example, with its 12-kWh battery, the Mitsubishi Outlander PHEV can go about 50 km on its electric powertrain alone (Sanguesa et al., 2021). See simplified design of PHEV in **Figure 13**.

Figure 13

Simplified design of plug-in hybrid vehicle.



Source: Gandoman et al., 2021.

The main advantages and disadvantages of plug-in hybrid vehicles are almost the same as of hybrid electric vehicles. The only difference is that most of the times, PHEVs have a little bit bigger electric-only range comparing to HEVs, but the maintenance is also complex and expensive.

1.2.2.1.2 Benefits of electric vehicles

Everyone is speaking how the planet needs to be saved by reducing emissions, lowering fossil fuel usage, and so on where the electric vehicles are helping a lot. However, that is not the only area where EVs are helping. By not having internal combustion engine, they are not only lowering CO_2 emissions but also does not emit other harmful particles that are killing people. Also, it's changing the maintenance sector and reduces operating costs of the vehicles which are quite high having engine with lots of pats that can break down. Let's deep dive into these two topics in this sub-chapter.

Cleaner air and healthier people are sometimes disregarded topic once talking about electric vehicles benefits. EVs reduce ambient levels of air pollutants that have been responsible for hundreds of thousands of early deaths each year from cardiovascular and respiratory diseases, cancer, and other illnesses by removing the particles and gases like NO_2 spewing from car tailpipes and truck exhausts (Carey, 2023).

In the United States quite a big group of initiative companies that are rooting for electrification of transportation, including such giants as American Airlines, started **DriveClean** initiative and are trying to push through a national clean fuel standard (CFS) – to gradually reduce the carbon within transportation fuel over time to decarbonize the entire transportation sector. A CFS would level the playing field and create markets for new clean energy options that can be employed in transportation applications including automobiles, trucks, aircraft, and ships. A CFS with good design will:

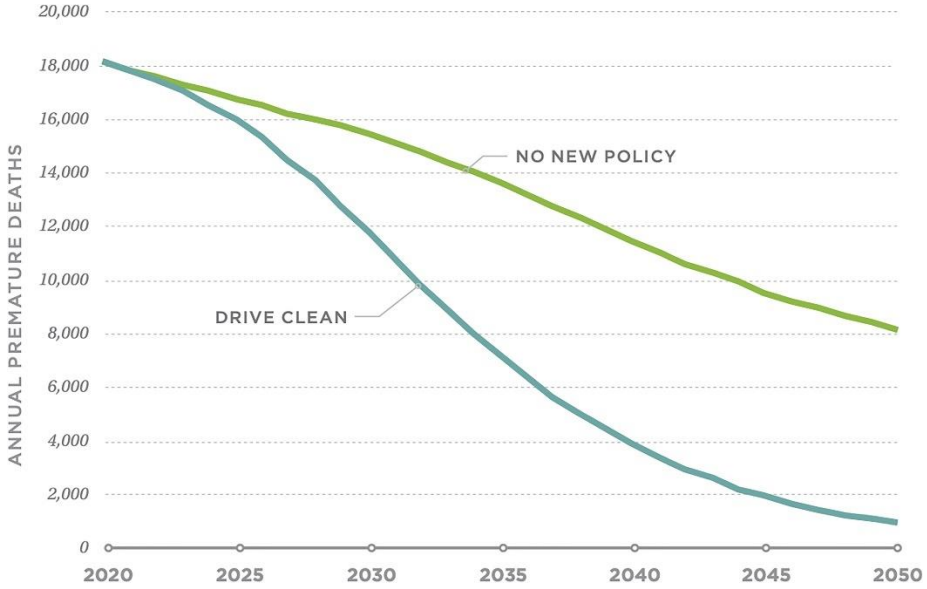
- Help to promote **cleaner air** and **reduce pollution** in the environment.
- Insulate Americans from the price shocks of geopolitical events like the war in Ukraine.
- **Improve health** in marginalized communities by helping fund programs that improve access to public transit, electric and other clean vehicles, and low-carbon mobility options.

They are dedicated to a national energy strategy that boosts employment, distributes economic growth throughout the United States, and puts children's generation and the rest of the globe on the road to a decarbonized economy. CFS will make it easier to reach net-zero

emissions by 2050 (Drive Clean). According to Carey (2023), if drive clean would be implemented, it would prevent 150,000 premature deaths brought on by air pollution until 2050, see **Figure 14**.

Figure 14

Impact of drive clean to premature death numbers.

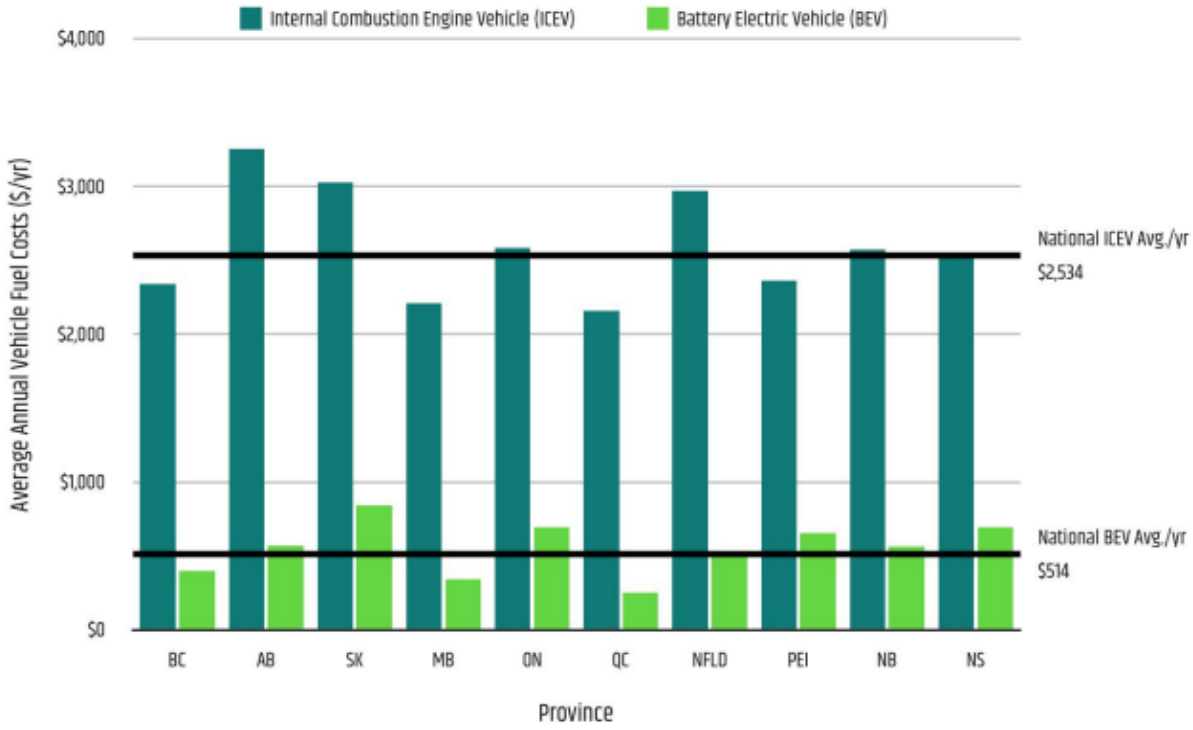


Source: Carey, 2023

Additionally, compared to conventional internal combustion engine cars, electric vehicles have a number of alternatives to **lower running expenses**. Logtenberg et al., (2018) did great research in Canada by comparing the operating costs of pure electric vehicles versus internal combustion ones in different provinces. Firstly, they found that between 77% and 82% of the energy consumed to power an electric car is utilized to propel it down the road, depending on the ratio of city to highway travel. In comparison, only 16% to 25% of the energy in the fuel is converted into motor power by internal combustion engine. Also, electricity is generally cheaper than oil. It was found that in various Canadian provinces driving a battery electric vehicle is almost 5 times cheaper than using fossil fuels on yearly average (see **Figure 15**).

Figure 15

Fuel costs comparison in different Canadian provinces.

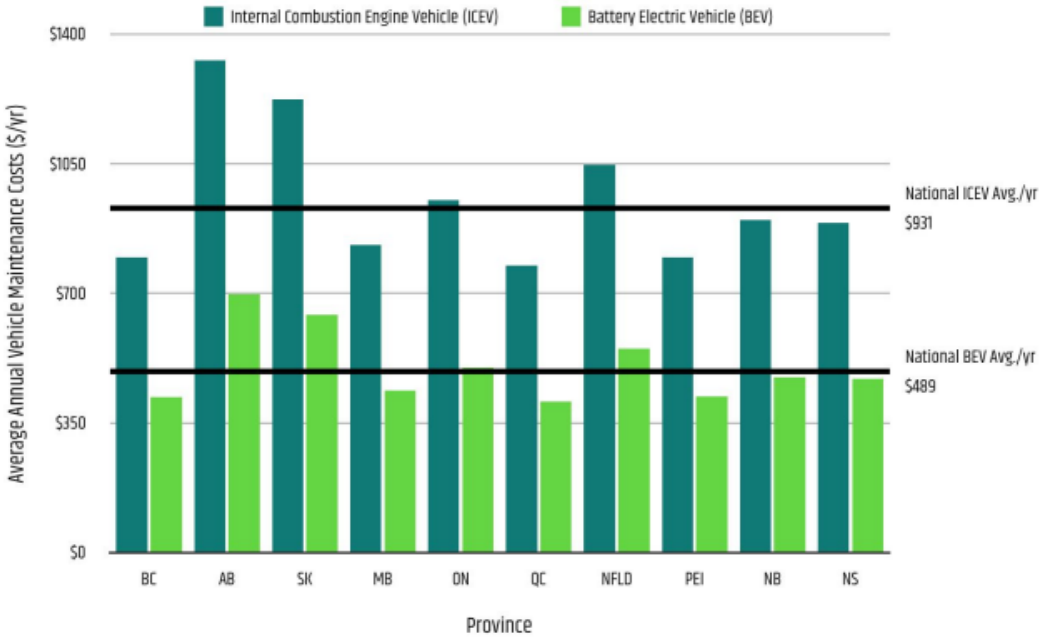


Source: Logtenberg et al., 2018.

Another costly thing is **maintenance** of the vehicle. It is also different when comparing BEVs and traditional cars. Both vehicles have parts like tires, brakes, suspension, etc. which needs to be maintained, however, battery electric vehicles do not have an engine which maintenance is usually the most expensive. Logtenberg et al., (2018) found that on average it's almost twice cheaper to maintain BEV than internal combustion engine vehicle (ICEV) yearly – see **Figure 16**.

Figure 16

Vehicles maintenance costs comparison in different Canadian provinces.



Source: Logtenberg et al., 2018.

All in all, it's obvious that operating costs of BEV is way cheaper comparing both fuel and operating costs. It was found that in 10 years, people in Canada, can save almost $27000 (see **Table 1**) on average choosing to drive BEV instead of ICEV (Logtenberg et al., 2018).

Table 1

Average savings on fuel and maintenance per 10 years

Province	Average ICEV costs			Average BEV costs			**10 yr savings**
	Maint.	Fuel	Total	Maint.	Fuel	Total	
British Columbia	$8,724	$25,616	34,340	$4,587	$4,376	$8,963	**$25,377**
Alberta	$14,562	$35,597	50,159	$7,640	$6,211	$13,851	**$36,308**
Saskatchewan	$13,413	$33,128	46,541	$7,045	$9,206	$16,251	**$30,290**
Manitoba	$9,102	$24,163	33,264	$4,791	$3,743	$8,534	**$24,730**
Ontario	$10,419	$28,288	38,707	$5,480	$7,600	$13,079	**$25,628**
Quebec	$8,495	$23,616	32,112	$4,469	$2,785	$7,254	**$24,857**
Newfoundland	$11,476	$32,519	43,996	$6,031	$5,686	$11,717	**$32,279**
PEI	$8,736	$25,876	34,611	$4,605	$7,192	$11,797	**$22,814**
New Brunswick	$9,847	$28,181	38,028	$5,186	$6,190	$11,375	**$26,652**
Nova Scotia	$9,757	$27,673	37,43	$5,138	$7,598	$12,736	**$24,695**

Population-weighted national average	$10,189	$27,745	$37,934	$5,357	$5,629	$10,987	**$26,947**

Source: Logtenberg et al., 2018.

As for the logistics sector, one clear benefit is the reduced emissions. It's important not only from the perspective our air quality but also from the financial point of view. According to Tax Foundation (2023), Finland was the first country in the world to introduce a carbon tax back in 1990. Afterwards, another 20 European countries followed Finland. The tax varies from less than 1 euro per metric ton in Ukraine to more than 100 euros in Sweden, Lichtenstein, and Switzerland. Operating battery electric vehicles is reducing emissions to zero and saves money for transportation companies. Also, operating pure electric vehicles reduces cost of maintenance. On the contrary to PHEVs and HEVs, pure electric vehicles do not have expensive and complex internal combustion engine, does not require to periodically change oil etc. and the electricity is cheaper than traditional fuel. All in all, battery electric vehicles can help logistics companies to save money on taxes, maintenance and fuel enabling them to direct saved money to new initiatives.

1.2.2.1.2 Summary of electric vehicles (EV)

Most of developed countries are working hard towards sustainability, understanding its importance in meeting present needs without compromising the future. This global tendency extends from individual consumers to businesses. The commitment to sustainability is also emphasized by governments and international accords like the Paris Agreement and the 2030 Agenda for Sustainable Development. These programs highlight how important it is to stop climate change by reducing global temperature increases and accomplishing a variety of sustainable development

Usage of fossil fuels remains a major contributor to air pollution and greenhouse gas emissions, thus the world requires solutions like electric vehicles. EVs are a critical response to the transportation sector's contribution to emissions. They come in various forms such as: battery electric vehicles (BEV), hybrid electric vehicles (HEV), and plug-in hybrid electric vehicles (PHEV). EVs also requires lower costs to operate, as electricity is generally cheaper than gasoline, resulting in noticeable savings over time. Moreover, EV maintenance costs are significantly lower than ICEVs, mainly due to the absence of an engine that is expensive to fix.

Finally, the global sustainability movement affects every aspect of life. In line with the underlying objective of sustainability in transportation sector, EVs are important technologies fostering a future that is greener, healthier, and more cost-effective.

1.2.2.2 Telematics

The advent of GPS allowed for telematics data to become more precise, and correspondingly, the market grew alongside the use of the new technology (Ghaffarpasand et al., 2022). Telematics enables car owners to employ wireless communication features to share and convey information as well as provide drivers and passengers with tailored information services by integrating the systems of wireless communications, information management, and in-vehicle computers. Word telematics consists of words telecommunications and informatics. (Neumann, 2018). Simply speaking, telematics enables to gather real-time data of different parameters of a vehicle or machine such as speed, consumption, GPS, etc. and make decisions based on that.

As telematics is basically a technology, a question might rise why is it analyzed under sustainability topic? It was chosen like that due to the fact that telematics provides great visibility of where and how vehicle is going, and the data is used e.g., to optimize route, promote eco-driving practices and reduce emissions. Furthermore, asset-based transportation companies are using telematics to effectively manage their fleet. Both of these things are contributing to sustainability and will be reviewed under upcoming sub-chapters.

1.2.2.2.1 Telematics for eco-driving and emission reduction

To control distant items, telematics does send, receive, and store data via telecommunications equipment. This information can then be used to evaluate individual vehicles and drivers as well as the environmental effects of urban freight transport on a much larger scale (Hu et al., 2022).

By giving the driver feedback on their driving, recent developments in telematics devices provide a low-cost option to improve driving behavior. Driver behavior has been found to be a significant contributor to irregular driving, which raises fuel consumption and vehicle emissions. It is proposed that encouraging efficient driving, which includes keeping a steady pace, utilizing the best gear, accelerating smoothly, using less brakes, and predicting traffic flow to reduce braking, may significantly reduce fuel consumption and vehicle emissions. Eco-driving is the term used to describe this kind of driving. Simply put, eco-driving is a method of

making informed driving decisions that reduces fuel consumption and exhaust gas emissions (Singh and Kathuria, 2021).

Telematics data gives information on the driving behavior of cars, which may be utilized to develop new approaches for lowering air pollution emissions together reducing fuel usage. The best path to any site can be evaluated in terms of a variety of conflicting factors, including how quickly, cheaply, safely, directly, and environmentally friendly a path is. When it comes to fuel usage and the effects on the environment, taking the shortest path isn't always the greatest option. In one case, several commuter routes across a start/end destination pair in the Northern Virginia region of the US were analyzed. It was shown that picking longer routes with less traffic and taking more time to travel might result in fuel savings of about 20% every trip. In another case, the shortest distance and shortest duration route with the least amount of fuel consumption was determined using real-time traffic congestion data and topographical characteristics of the road network, such as the slope of each road. For light-duty cars, the results shown that traveling along a level road has an overall fuel economy advantage over traveling along a sloping route of about 15 to 20%, although the projected value might be substantially larger for heavier vehicles. As for the CO_2 emissions reduction, simulated situation where a vehicle was given the time information for the nearest traffic light and then would change its speed as it passed through a signalized corridor shown an initial 12% decrease in CO2 emissions and fuel economy (Ghaffarpasand et al., 2022).

1.2.2.2.2 Telematics for fleet management

Fleet management systems work to cut down on overhead expenses, fuel use and emissions, wear and tear on vehicles, and increase driver and passenger safety. The cost of gasoline is a major contributor to a logistics company's overall operating expenses. It has been shown that the fuel usage of good and bad drivers differs by 35%. By rewarding fleet drivers for safe driving, operation costs may be significantly reduced. These fleet management systems use driver behavior profiling as an essential input, classifying drivers according to their driving behaviors. Additionally, drivers receive active feedback based on their behavioral profile to encourage safe and environmentally friendly driving. There were 8% fewer accidents once feedback systems were installed in vehicles. Also, by giving drivers feedback, a reduction of 3–10% in fuel use was seen (Singh and Kathuria, 2021).

1.2.2.2.3 Summary of telematics

Telematics is a technology using precise GPS data and wireless communication capabilities and is playing an important role in sustainability within transportation sector. It enables transportation companies to collect real-time data on vehicle parameters like speed, fuel consumption, and GPS location, which are required for informed decision-making. Telematics contributes to sustainability by generating insights into vehicle operations, optimizing routes, promoting eco-driving habits, thus reducing emissions. By providing drivers with feedback on their type of driving, it enhances driving practices, characterized by maintaining a steady pace and minimizing braking which helps to save costs. Furthermore, innovative features of telematics assist to reduce air pollution and fuel consumption, revealing that the shortest route isn't always the most environmentally friendly option.

1.3 Technologies impact on logistics

In this chapter let's review artificial intelligence including machine learning and deep learning impact on logistics not forgetting sustainability – electric vehicles and telematics part. In previous chapters a common overview on the technologies and its application in various fields were analyzed, however, the main objective is to understand how it impacts the logistics industry. It is important to mention that term logistics is a broad one and does not only mean delivery of goods from point A to point B. The idea is to analyze a broad variety of different fields of logistics and see how they are impacted by disruptive technologies. Due to this fact it was chosen to analyze impact on logistics from predictive maintenance of vehicles to warehouse management in the sub-chapters below.

In 2015, nearly 1,19 million enterprises could be recorded in the transportation and storage service sector for the 28 EU countries, employing nearly 11 million people with 556 billion EUR value added (Winkelhaus & Grosse, 2019). And that's only in 28 EU countries. According to Placek (2023), logistics industry worldwide was worth over 8,4 trillion. The logistics sector can be called as the oxygen of global economy and is important for every business and individual. Also, more than ever, the logistics industry is experiencing a significant change that is encouraged by AI technology and environmentally friendly practices.

Artificial intelligence as a whole has all the abilities to process enormous amounts of data, learn from patterns and past mistakes and make decisions which is transforming logistics sector.

On the other hand, sustainability cannot be ignored in the logistics as it is responsible for better part of CO_2 and other particles emission in transportation sector. As we know, electric vehicles were existing back in 1920s, however, effective ones were seemed futuristic for a long time are now a casual thing that provides a cleaner substitute for regular fossil-fueled transportation. Adoption of EVs not only supports international initiatives to lower greenhouse gas emissions but also results in measurable cost savings due to lower fuel and maintenance costs. Additionally, telematics provides logistics organizations with up-to-date information and insights about the operation of vehicles, driver behavior, and fuel usage in real time. A more informed decision-making process is made possible by this technology, which results in better routes, decreased fuel consumption, and reduced environmental effect.

The partnership of AI and sustainability technologies increases the potential of a more flexible, economical, and environmentally friendly logistics.

1.3.1 Impact of artificial intelligence on logistics

The rapid pace of developments in artificial intelligence (AI) is providing unprecedented opportunities to enhance the performance of different industries and businesses, including the transport sector. Considering the availability of a huge amount of quantitative and qualitative data and AI, addresses these concerns in a more efficient and effective fashion has become more plausible (Abduljabbar et al., 2019). Artificial intelligence as a cutting-edge technology is offering new capabilities that has never been imagined in logistics sector. By crunching data and learning it enables features as predictive maintenance and demand forecasting as well as route planning and optimization. AI driven robots and other systems are used to perform various tasks in warehouses working 24/7 without getting tired. Let's review these technologies in upcoming chapters.

1.3.1.1 Predictive maintenance

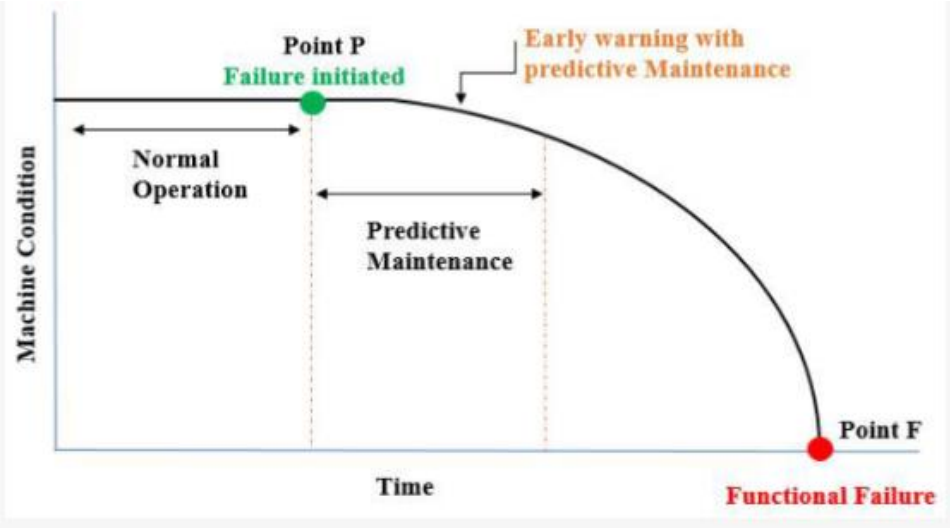
Most of the biggest transportation logistics companies are operating on their own or rented fleet independently if it's road, air, or maritime logistics. The main purpose of these machines is to deliver goods from one side of the world to another meaning enormous number of kilometers travelled every day. It's clear as day that if it would be possible to foresee when some parts need to be changed or fixed, it might save lots of money for the companies as one failure often leads to another, and unexpected downtime costs a lot. According to Milojevic and Nassah, (2018) research, 90% of their respondents says that the major pain point in their

existing maintenance processes are unplanned downtime and emergency maintenance caused by sudden failures.

Predictive maintenance is the latest form of maintenance, offering the longest life and highest reliability of equipment, and the most environmentally sound and cost-effective solutions. The maintenance method used to troubleshoot by going down to the source is called proactive maintenance. This maintenance method, which is very effective when applied in conjunction with predictive maintenance, is becoming increasingly popular (Achouch et al., 2022), see **Figure 17**.

Figure 17

Machine condition over time.



Source: Achouch et al., 2022.

The Internet of Things (IoT) is a key component of predictive maintenance since it enables the conversion of mechanical movements into the digital signals needed for PdM. It continuously streams data from sources including machine programmable logic controllers, manufacturing execution system terminals, computerized maintenance management systems, or even enterprise resource planning (ERP) systems, as well as sensors like temperature, vibration, etc. The foundation for establishing PdM techniques is provided by these devices and software (Compare et al., 2020). Availability of this real-time data enables artificial intelligence and machine learning algorithms to continuously analyze it, look for irregularities and compare it with the historical data of vehicle in good shape, also, to predict and inform asset owners when they might fail.

Many industrial resources, including machinery and equipment, as well as transportation vehicles like trains, aircraft, and cars, are used by the transportation industry.

Along with the considerable cost for purchasing them, significant expenses occur for maintaining them, which significantly affects their lifetime and usage rate, thus businesses must ensure that all processes go without any problems in order to maximize the availability of their fleets (Milojevic and Nassah, 2018). In the same research based on interviews with more than 230 senior business and technology decision makers in Europe, authors found that:

- 93% of companies describe their maintenance processes as not very efficient.
- 55% of the companies are at least piloting PdM initiatives while 23% are generating a tangible business impact.
- 49% have already invested in predictive maintenance and plan to invest in near future.

Also, worth mentioning that transportation companies are the ones that are adopting this AI-enabled feature most eagerly as 72% of interviewed transport operators are already piloting PdM solutions and 25% already feels business impact. They are also investing leaders with 63% having already invested and plans on doing it in the future (Milojevic and Nassah, 2018).

All in all, predictive maintenance is changing the business models of logistics, offering improved equipment reliability and substantial cost savings. By utilizing the Internet of things to collect real-time data, PdM enables AI and ML algorithms to predict and prevent maintenance issues. This approach is particularly crucial for transportation logistics, where machinery covers vast distances daily. According to Milojevic and Nassah (2018), investment in predictive maintenance initiatives creates tangible return on investment (ROI). Their research shows that PdM initiatives enables 2-6% increased availability, 10-40% lower rates of reactive maintenance and 5-10% inventory reduction costs. This results in not only a significant cost savings but also the chance to research new business models.

1.3.1.2 Demand forecasting

Demand forecasting is utilized to predict upcoming sales. Different demand forecasting techniques enable the prediction of likely scenarios based on historical data and current trends, in addition to production planning, inventory management, market entrance tactics, and study of consumer behavior. A detailed demand prediction gives a true picture of future demand and assists in preventing excessive overproduction and overstock (Hofmann and Rutschmann, 2018). In the era of e-commerce, the impact of e-commerce on logistics and distribution cannot be ignored. Also, the indicators related to the development of e-commerce need to be taken into account when making regional logistics forecasts (Huang et al., 2023). Accurate and

reliable demand forecasts provide vital intelligence for supply chain managers to support their planning and decision making (Abolghasemi et al., 2020).

Planning the capacity of the warehouse is a crucial component of supply chain management. Warehouse sizing becomes a challenging problem due to the uncertainty of required space. The efficiency of the business might be significantly impacted by poor warehouse size design. A surplus of storage space raises the cost of storing goods because unused warehouse space. On the other side, a shortage of storage capacity might result in a lengthier reaction time and more costs associated with employing an overflow warehouse (Shi et al., 2018). By implementing artificial intelligence algorithms for demand planning businesses can optimize their inventory and ensure that enough stock is always available. It also helps to avoid overstocking which leads to additional costs. Additionally, it can help securing right amount of workforce. By knowing peak times, more staff can be ensured to reduce the delays.

To summarize, e-commerce is driving the need for demand forecasting in logistics industry. Knowing the peak times, it enables businesses to plan their workforce or storage space accordingly. However, there is not a lot of research done on how it affects business models of logistics companies.

1.3.1.3 Route planning and optimization

Machine learning may assist in effectively resolving issues including choosing delivery routes, supplying raw materials, forecasting demand, and organizing logistics (Keeble et al., 2020). By coordinating the position of the carrier with existing or forthcoming traffic conditions and then advising them in real-time of the optimum path, ML may be used to handle the delivery route challenges. By doing this, it is simpler to supply consistent orders and even handle issues like running out of delivery agents or late deliveries by assuring efficient and fast delivery. Additionally, by utilizing ML, the volume of data that is gathered grows over time and can then be examined using various artificial intelligence-based algorithms to create a more intelligent system. Such analysis could be performed using more advanced AI-based techniques such as deep learning that provides an added advantage over the competitors (Kumar et al., 2021).

As we already know from chapter 5.2.2.3.1 shortest route isn’t necessarily always the best one. An example of UPS is complementing that well. According to Harvard Business Review (2014), an estimated 90% of the turns made by UPS delivery trucks are right turns.

Left turns are seen as inefficient because they leave trucks sitting in traffic longer. The logistics company says a policy of minimizing left turns has helped it save more than 10 million gallons of fuel over the past decade. Logistics companies can utilize AI to plan and optimize routes of their vehicles in real time and even predict in the future.

According to Abduljabbar et al., (2019), one research used field data from a 1.5 km section of a highway and was able to predict speed for 5 minutes into the future with 90-94% accuracy. Another example provided by the author is based on traffic flow data collected across California – a deep neural network was able to predict traffic flow up to 60 minutes into the future. Additionally, human-written manual reports about the incident on the road may take longer to discover issues and be less economical. On the other hand, algorithms can analyze data gathered from sensors placed along the route to compare the features of the flow before and after the occurrence (Abduljabbar et al., 2019).

All in all, artificial intelligence enables logistics businesses to use data to plan delivery routes without human intervention. It is even possible to use traffic lights, road sensors and other data to predict traffic conditions in the future. Unfortunately, there is not a lot of research done on how route planning is affecting logistics business models.

1.3.1.4 Warehouse management and automation

Warehousing is a storage repository that enables the goods and the cargo to be stored and handled properly when requested for. They take a vital role in the enhancing the success of an organization. The major operation of the warehouse involves the storage of goods, protection of goods, risk bearing, financing, processing, grading/branding, and transportations (Pandian, 2019). Numerous AI warehousing applications have already been presented in previous chapters. For example, AI can be used to understand and predict sales trends for storage planning and replenishment management. AI also has the ability to automate a number of manual operations and procedures when human employees are physically limited. As a result, integrating AI with human workers in work processes is seen as an efficient way to get around labor force and workload constraints (Zhang et al., 2021). It is quite likely that the way warehouses operate will undergo a significant transformation as a result of the adoption of new technologies like the Internet of things, blockchain, big data analytics, artificial intelligence, machine learning, deep learning, and robots (Geest et al., 2021).

Let’s take on of the biggest companies in the world – Amazon – warehouse as an example. The company use a variety of robot arms to grip and move objects as required based

on Kiva – company purchased by amazon.com in 2012. The smaller robot, called a "palletizer" takes items off conveyor belts and places them on pallets. The Robo-Stow, a six-ton robotic arm that can move pallets of products 7.3 meters between floors, is the biggest robot. The carrying capacity of the Robo-Stow is 1360 kg. Another technology used is called CANVAS and was founded in 2015 in order to more efficiently move items through a warehouse. Firstly, Amazon launched the CANVAS cart, an autonomous industrial cart, as their first product in 2017. It can move by continually creating a 3D map of its surroundings and transmitting the information to the other carts in the fleet. They are also using technologies like CMC CartonWrap for packaging enabling them to pack 600 to 700 boxes per hour, which is 4-5 times the speed of the average human worker (Laber et al., 2020). Big investments in AI and other smart technologies enables Amazon to reduce the workforce required and make their delivery process probably the most effective in the world.

To summarize, warehouses play a vital role in organizations, involving functions like goods storage, risk management, and transportation. Integrating AI applications in warehousing has redefined the sector by enabling the prediction of sales trends and automating manual operations. Warehousing is heavily affected by disruptive technologies, however, most research is focused more on the technologies used rather than how the adoption is changing the business models of companies having these processes and technologies.

1.3.2 Impact of sustainability technologies on logistics

Globally, there are still many obstacles to overcome in the areas of sustainable mobility governance and implementation. In addition to increased energy consumption and related emissions, traffic congestion is a direct result of the transportation sector's ever-increasing demand (Zawieska and Pieriegud, 2018). A transition of this sector towards sustainable one is facing many challenges in terms of suitable technology and energy resources. The shift is expected to be particularly difficult for heavy-duty, long-distance cars and aircrafts (Dominković et al., 2018). As analyzed previously, let’s deep dive into impact of electric vehicles and telematics on logistics and what opportunities it brings for the businesses.

1.3.2.1 Impact of electric vehicles on logistics

Integrating electricity, heating and transport sectors enables higher penetration of renewable energy sources while battery electric vehicles (EVs), usage of more efficient forms

of transport and introduction of alternative fuels can significantly decrease transport sector's dependence on fossil fuels (Dominković et al., 2018).

Electric vehicles are becoming a more and more attractive option due to lower emission of pollution comparing to traditional cars. EVs are more environmentally friendly than traditional gasoline-powered cars since their energy source is often renewable, including solar and wind power. EV adoption has been very gradual in distribution logistics, despite all the advantages they provide. There are two causes: the price of EVs is much greater than traditional gasoline-powered automobiles and a completely charged battery in an EV only extends its range by around 100 to 200 miles, therefore it is not effective for long-distance delivery. Of course, there is a recharging possibility – using alternating current (AC) charging takes 3-20 hours which is long in the transportation business. On the other hand, direct current (DC) charging might be used which takes around 30 minutes but harm the health of the battery long-time. As the customers most usually has time windows to accept deliveries, it might create challenges for transportation businesses (Verma, 2018).

The main question is where electric vehicles can be used in logistics? Firstly, it can be well equipped in last mile delivery. Last-mile delivery, i.e., all logistics activities related to the delivery of shipments to private customer households in urban areas. In the wake of e-commerce and its successful diffusion in most commercial activities, last-mile distribution causes more and more trouble in urban areas all around the globe (Boysen et al., 2021). For business stakeholders, using EVs in city logistics, especially for last mile delivery, looks to be a highly attractive possibility. However, the effectiveness of this approach must meet significantly higher demands due to the unique characteristics of city delivery systems, such as frequent stops over small distances and the weight of the load (Iwan et al., 2021). Usage of electric vehicles for last mile deliveries in urban areas will help to reduce air pollution as they don’t emit any toxic particles, noise pollution and operating costs as EVs do not have a loud engine which is making noise and is expensive to repair.

One of the most important sectors of the transportation business is rail-truck intermodal transportation, which combines the accessibility advantage of trucks with the scale efficiencies of railways. It has shown extraordinary expansion over the past forty years and incorporates truck shipment and intermodal rail haul operations. According to the most current figures, intermodal railroad traffic surged from 5.6 million containers and trailers in 1990 to 13.7 million in 2019, and it now represents around 25% of the income for the main U.S. railroads (Ke and Verma, 2021). With nowadays technologies, it is possible to swap trucks with electric ones. As we know, EVs reduce pollution, noise and are even cheaper to operate. As intermodal

business is, simply speaking, picking up a cargo, driving it to the rail or ferry/ship and picking it up in destination city/country, short range of EVs might not be a problem anymore and might open new opportunities for logistics business. According to Čižiūnienė et al., (2022), with the advancement of technology, the "damaging of the environment" problem can be minimized by creating autonomous electric trucks in the near future. Multimodal transportation can lower transportation costs and improve environmental sustainability by allowing for potential for the integration of electric and autonomous vehicles.

All in all, the integration of electric vehicles in logistics is a promising tendency driven by the need to reduce environmental footprints and improve operational efficiency. EVs offer environmental benefits compared to traditional internal combustion engine vehicles, due to lower pollution emissions and the use of renewable energy sources. EVs adoption has been slow in logistics, particularly due to higher upfront costs and range limitations, their application in last-mile delivery presents a good case. By using EVs in urban last-mile delivery, businesses can reduce air and noise pollution, leading to more sustainable and cost-effective operations. Additionally, the rail-truck intermodal transportation sector can benefit from EV adoption, as it provides cleaner and more economical alternatives to traditional vehicles.

1.3.2.2 Impact of telematics on logistics

Telematics systems based on the global positioning system (GPS) and general packet radio service (GPRS) have emerged as a key instrument in road transport, enabling the planning, monitoring, coordinating, and optimization of motor vehicle operations, with a focus on continuous delivery and distribution processes. Technologies related to telematics and data processing are becoming more and more significant components of transport control and management systems, which serve as the foundation for supply chains' competitive advantages. Electronic fee payment systems, rolling stock and goods management, traffic management and supervision, road monitoring infrastructure, accident and road rescue services, and operating systems in vehicles are just a few of the examples that telematics systems are used for. Using a wireless information and communications technology (ICT) network, telematics also gives road transport companies the chance to leverage technology and techniques for remote access to cars or goods (Osinska and Zalewski, 2020).

Telematics are utilized as one of the main tools in logistics to enhance productivity and profitability on the transportation industry. It enables businesses to create databases, assist traffic control, and enhance transportation safety. The time it takes to deliver goods may be

greatly reduced by employing telematics to optimize vehicle transit routes. Transporting dangerous products and items having high rates of excise tax requires extra precision, thus telematics technology is used to track these vehicles and goods. The advancement of telematics systems and the adoption of their use in transportation promote the flexibility of freight transportation, enhance the service portfolio of carriers, increase level of competitiveness, implement new intermodal solutions in transportation, and thereby stimulate regional economies (Osinska and Zalewski, 2020).

All in all, telematics systems, based on technologies like GPS and GPRS, are integral tools in modern logistics. It is considered to be the key technology used to manage transportation of different types of cargoes. Also, it encourages new intermodal solutions to appear in transportation which should definitely have an impact on traditional logistics business models. Unfortunately, there is not a lot of literature analyzing the impact of such technologies and how they are transforming logistics business.

1.4 Summary of literature analysis

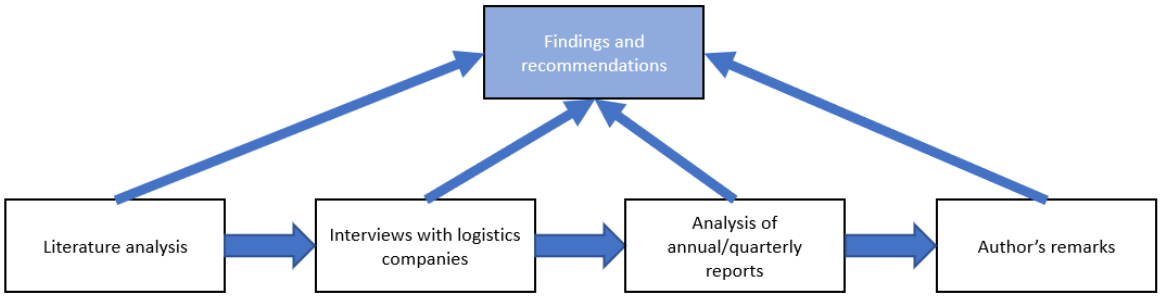
In past few years, the logistics industry has faced a lot of challenges starting from the COVID-19 pandemic to the war in Ukraine, emphasizing the need for flexibility and resilience. While these challenges have been painful, they have also revealed opportunities such as the increase in e-commerce and the growing demand for road freight transport. However, despite these changes more research and analysis are required to examine how emerging technologies like AI, machine learning, deep learning, electric vehicles, and telematics are transforming the standard business models of logistics companies. Also, it is required to better understand how these disruptive technologies are changing day to day logistics operations. Artificial intelligence shows its ability to improve innovation and efficiency in logistics processes. Furthermore, the adoption of EVs is a potential step towards sustainable transportation, with the emphasis for last-mile deliveries, however, how does these technologies change companies' way of working has not been well studied. Similarly, telematics has the ability to improve driving habits, optimize routes, and cut emissions and is an important tool for increasing sustainability, but its impact on business models has to be examined more closely.

2. METHODOLOGY

The methodological part of the work has been implemented by performing thorough literature review, conducting interviews with different companies working in different branches of logistics (integrated logistics providers (ILP), air, maritime), analyzing annual reports of selected logistics companies and, finally, developing authors insights to offer recommendations and findings (see **Figure 18**). To get better understanding how deep technologies are affecting different kind of logistics businesses mixed methods research was chosen – qualitative interviews with sector professionals allows to understand perspective and experience adopting new technologies and thorough quantitative analysis of annual reports provides conclusions that are based on statistics.

Figure 18

Design of the research process.



Source: Compiled by Mincė.

2.1 Data gathering

As mentioned previously, mixed approach was chosen to analyze the impact of technologies on different branches of logistics. Firstly, analysis of companies' financial results over the years (2018-2022) were performed by analyzing publicly available data – webpages, annual reports, strategies, etc. Recognizable companies with substantial revenue and available annual reports from different locations were selected for analysis. Integrated logistics providers – DHL, UPS, FedEx, DSV, Keuhne+Nagel. Maritime logistics providers: Maersk, DFDS, Stena line, Hapag-Lloyd, Cosco shipping group. Air logistics providers: Lufthansa group, IAG group, Scandinavian airlines system (SAS), Finnair, Turkish airlines.

To perform analysis 8 indicators were selected based on which ratios to financial impact, investments, GHG emissions and impact for employees were calculated: revenue, total

costs, net profit, capital expenditures, personnel expenses, earnings per share, number of employees and greenhouse gas (GHG) emissions. Also, additional 7 ratios were derived from selected indicators: capex to revenue, capex to expenses, revenue per employee, profit margin, GHG to revenue, staff costs to revenue, earnings per share (EPS) growth rate.

Parallelly, more data will be gathered by interviewing each sector's professionals physically and virtually as according to Thunberg and Arnell (2021), COVID-19 has changed the way research can be conducted. The interviews will be semi-structured to enable interviewees to think deeper and provide broader answers rather than list of used technologies and processes they are affecting. The purpose of these carefully planned interviews with pre-defined questions, is to promote open and comprehensive conversations on the impact of innovative technologies on their company strategies. To guarantee data accuracy, participants will give consent before participating, interviews will be transcribed, and audio recorded. To allow for a thorough examination of the participants' view and experience, each interview is expected to last between thirty and sixty minutes. Questionnaire was compiled based on literature analysis and can be found in Annex 1. Questionnaire for interviews.

Based on the information above, questions were developed:

1. Does the investment to technologies correlate with the financial performance of logistics companies?
2. How does the investment and implementation of technologies impact the operational efficiency and sustainability of logistics business models?
3. Is there an impact for employees due to the integration of technologies?
4. What is the relationship between the investment to environmentally friendly practices, and reduction of GHG emissions?
5. Is it worth from the cost perspective to implement disruptive technologies in logistics operations? How do these investments impact overall financial performance?
6. Which branch of logistics (integrated, maritime, air) is advancing the most and which technologies helps to achieve that?

3. RESEARCH

3.1 Analysis of integrated logistics companies

In the below sub-chapters, analysis of integrated logistics providers – DHL, UPS, FedEx, DSV and Keuhne+Nagel – will be described. Analysis of annual reports can be found in Annex 2. Analysis of annual reports All the information in below sub-chapters is based on analysis of companies' annual and sustainability reports.

3.1.1 DHL

Analysis of DHL annual reports from 2018-2022 shows lots of interesting trends. Company shows stable positive trend in revenue growing by 53% from 61,55€ billion in 2018 to 94,44€ billion in 2022 This increase is also visible in profit margins which are also positive growing from 3,77% in 2018 to 5,67% in 2022. Earnings per share also grew heavily. On the operational side, DHL consistently allocates resources to technological advancements. As evidence, stable capital expenditures to revenue ratio can be taken which is floating between 4,30% to 5,71% over analyzed years. Also, capex to operating expenses is also steady – fluctuating between 4,45% to 5,08% which indicates a smart allocation of capital. These investments are paying off already – revenue per employee increased from 112,43€ in 2018 to 157,32€ in 2022 and staff costs to revenue decreased from 33,83% in 2018 to 27,57% in 2022 meaning more effective work. Also, revenue per employee kept increasing and costs decreasing while number of employees kept growing! On the sustainability side DHL is relatively stable except for increase in 2021 which rose due to COVID-19 pandemic, and everyone required more and more home delivery. However, in 2022 the GHG emissions started to decrease again. that the decrease of DHL's GHG emissions can be associated with the fact that in 2020 DHL financed a start-up called Greenplan which has launched powerful algorithm for route optimization to lower CO2 emission, predict arrival and travel times, and saves up to 20% of costs lots of GHG. Also, back in 2020, 18% of DHL's fleet was already composed of EVs and the company aims to reach 60% by 2030. According to 2022 DHL annual report (Deutsche Post DHL Group, 2023), company is planning to invest 7€ billion to expand the usage of sustainable fuels and technologies in their buildings and fleets. Also, digital transformation is considered as a key lever for business growth. DHL is doing that by upgrading IT infrastructure and utilizing new technologies.

All in all, analysis of DHL's financial reports shows steady growth in revenue, as well as in net profit. Operationally, consistent investments in technology - stable capital expenditures to revenue ratios and capex to operating expenses - indicates strategic capital

allocation. Revenue per employee is increasing and costs of staff are decreasing which improved efficiency. Also, the number of employees continues to grow, highlighting the scalability of technological enhancements. On the sustainability side, as there is a pressure from various institutions like EU, DHL maintains relative stability in GHG emissions, with a temporary increase in 2021 due to the COVID-19 pandemic which increased demand for in home deliveries. DHL's investment in Greenplan in 2020 for advanced route optimization and the ambitious plan to invest 7€ billion to achieve 60% EVs in its fleet by 2030 aligns with sustainability goals, promising a greener future. Digital transformation being considered as a key role shows the importance of technology in today's business environment.

3.1.2 UPS

Based on the numbers from 2018 to 2022 UPS annual and GRI reports, company shows interesting trends, firstly, a big, almost 40%, growth in revenue, moving from 71,86$ billion in 2018 to 100,34$ in 2022. This growing trajectory is also visible in profit margins which increased from 6,67% in 2018 to 11,51% in 2022. On the operational side, UPS is committed to advance their technology as their capex to revenue ratio is jumping between 4,31% and 8,74% over 5 analyzed years! Capex to operating expenses is also high, ranging from 4,69% to 9,69% which also shows smart allocation of capital. The investments are paying off as revenue per employee rise from 149.40$ in 2018 to 178.22$ in 2022, simultaneously with a decrease in staff costs to revenue from 51.82% in 2018 to 47.62% in 2022. Same as in DHL's case – all these positive trends were accompanied by growth in the number of employees showing more efficient work for employees. Sustainability wise, UPS are relatively steady in decreasing their carbon footprint expect from slight increase in 2020 due to COVID-19 pandemic and increased demand for delivery. The constant decrease of GHG emissions is a clear indicator that UPS is moving towards a greener future. According to 2022 annual report (United Parcel Service, 2023), UPS strategy is to reach carbon neutrality by 2050 and by 2035 cut CO2 emissions by 50%. Based on the same report, UPS already has over 15,600 vehicles running on alternative fuels and advanced technologies including all-electric, hybrid electric, hydraulic hybrid, ethanol, compressed natural gas (CNG), liquefied natural gas (LNG) and propane vehicles which shows clear dedication to greener future, and they have invested over a billion euros in 2022 and 807 million euros in 2021 to the vehicles. Additionally, even though other technologies like telematics or AI are not mentioned in the report, UPS spent 727 million euros on information technology in 2022 and almost 200 million on transformation strategy

which means that UPS is looking forward to technological advancements and business transformation. One of the pillars of UPS's strategy is called 'Innovation Driven'. It is about getting more productivity from owned assets. It consists of initiatives like 'Total Service Plan' – smart package and smart facility RFID and more automation which led to more efficiency and flexibility. Due to the innovation driven strategy, in 2022, UPS saw adjusted return on invested capital of 31,3% - 50 basis point higher than in 2021 (United Parcel Service, 2023).

All in all, UPS's annual and GRI reports from 2018 to 2022 shows a consistent growth pattern in revenue and net profit. Operations wise, UPS is dedicated to advancing its technology, capex to revenue ratio is stable or increasing over analyzed period. The capex to operating expenses ratio also remains high, reaching almost 10% indicating a strategic allocation of capital. From sustainability perspective, UPS demonstrates a consistent decrease in its GHG emissions, with a slight increase in 2020 attributed to the COVID-19 pandemic's heightened demand for delivery services. However, due to pressure from institutions UPS is investing a lot to newer and greener fleet and information technology which leads the company to sustainable growth. Having innovation driven as a part of the strategy shows how important innovations and introduction of new technologies are for company's business model.

3.1.3 FedEx

FedEx's financial results from 2018 to 2022 shows that the company is resilient in facing challenges and have demonstrated 43% growth in revenue from 65,45$ billion to 93,51$ billion. Profit margins also shown resilience after dropping dong to 0,77% (0.54$ billion) in 2019 to 4,09% (3,83$ billion) in 2022 showing company's flexibility in uncertain circumstances. While net profit was jumping up and down, earnings per share was growing significantly from the dip in 2019, achieving enormous 302,24% growth in 2021. Operations wise, growing revenue increases operating expenses, however, FedEx constantly increases capital expenditures as well. Actually, out of all analyzed integrated logistics provides, FedEx has highest average of capex to expenses ratio reaching 8,37%. However, in FedEx case return on investment is not that clear as in previously analyzed companies. Revenue per employee kept jumping up and down, bigger increase only visible in 2022 once revenue per employee grew from 149,13$ to 170,95$. Situation is similar with staff costs to revenue ratio – slowly but constantly decreasing. On the sustainability topic no significant jumps are visible, even though COVID-19 pandemic increased the demand, GHG emissions did not increase significantly and comparing to revenue trend is positive. However, sustainability is an

important topic for FedEx. According to 2022 annual report, FedEx has announced the goal to achieve carbon neutrality by 2040 and they are investing over 2$ billion in vehicle electrification, sustainable energy, and carbon sequestration. Additionally, FedEx plans to have 50% of FedEx express global pickup-and-delivery vehicle purchases to be electric already by 2025 and reach 100% by 2030. In 2021 FedEx also agreed to purchase 500 electric vehicles from General Motors and in beginning of 2022 extended agreement to 2000 electric vans. Regarding technologies not related to electric vehicles, according to the same 2022 annual report, information technology costs in 2022 reached 851$ million comparing to 816$ million in 2021. FedEx already uses artificial intelligence solutions for their customer support to answer customer shipping questions. Also, in 2022 FedEx enhanced tracking capabilities based on advanced machine learning and artificial intelligence model developed by FedEx Dataworks. According to 2022 annual report (FedEx Corporation, 2022), one of the operating principles of FedEx is to innovate digitally – uses technology and data to improve the intelligence of supply networks. Through the implementation of data driven offers, sustainability solutions, and organizational infrastructure modernization, they are using the technology to improve supply chains for the benefit of all parties. Additionally, they are committed to invest appropriately in the assets and technologies required for each operating company in order to maximize cash flow and long-term profits success and being flexible in current uncertain transportation market.

All in all, FedEx have shown great resilience during the challenges of past few years with consistent growth of revenue and net profit bouncing back from dip in 2019. They keep investing a lot into the technology and modernization of their assets being the leaders out of all analyzed integrated logistics providers. FedEx's investments to innovations to make supply chains smarter and more flexible in face of current challenges shows that to remain competitive in current uncertain business landscape technological investments are mandatory.

3.1.4 DSV

Based on the DSV's annual reports dating from 2018 to 2022, the company experienced significant – 298% - growth in revenue, growing from DKK 79,05 billion in 2018 to DKK 235,67 billion in 2022, demonstrating consistent upward trajectory. Net profit shown a similar growth rising from DKK 3,99 billion in 2018 to DKK 17,67 billion in 2022. Operational costs remained proportional to revenue despite increasing trend. Notably, DSV's capital expenditures were managed consistently, with a spike in 2020 due to acquisition of Panalpina,

Prime Cargo and Globeflight companies. The capex to revenue and capex to expenses ratios indicate consistent financial allocation, however, way lower comparing to other ILP. Despite the fact, earnings per share shown substantial growth, reaching DKK 77,30 in 2022 same as revenue per employee reaching 3,908.35 DKK in 2022 comparing to 1,668.00 DKK in 2018. Moreover, staff costs to revenue ratio decreased which is showing efficient operational management. On the sustainability topic, DSV shows increasing trend in greenhouse gas emissions. However, the growth of emissions between 2021 and 2022 was way lower than comparing previous years. This is due to the ambitious sustainability targets that were announced in 2019 annual report to reduce carbon footprint by at least 30% until 2030. The company is taking this initiative seriously and in 2022 annual report, green logistics is already integrated part of freight forwarding services process! Technologies wise, even though the investments are lower than other analyzed companies', the adoption and usage of technologies is quite impressive. According to DSV A/S (2021), at 2020 DSV was already **tracking and assessing** augmented reality, self-driving vehicles, blockchain and 5G network. Also, they were **testing**: drones, alternative fuels, 3D printing and **adopting**: hybrid computing platform, visibility platform for live tracking, automated storage systems, machine learning and automated guided vehicles. This shows that company is thinking ahead and adopting technologies to optimize their business.

All in all, in the period from 2018 to 2022, DSV demonstrated a remarkable growth trajectory in both revenue and net profit. Operational costs, despite the rise, remained proportional to revenue, showing effective cost management. Also, DSV's strategic handling of capital expenditures, with a jump in 2020 related to acquisitions, reflected smart financial resources allocation. The capex to revenue and capex to expenses ratios indicated a constant financial approach, even though lower than some competitors in the integrated logistics provider sector. The staff costs to revenue ratio decreased, emphasizing efficient operational management. DSV is actively tracking and assessing emerging technologies, while also engaging in testing and adoption of various technological solutions. DSV keeps supply chains flowing and helps to deliver sustainable growth. It is a result of combination of latest technologies and talent from all around the world which makes supply chains leaner and greener (DSV A/S, 2021).

3.1.5 Keuhne+Nagel

Analysis of Keuhne+Nagel company's financial results from 2018 to 2022 shown similar trend as other integrated logistics providers. Company's revenue went up and down during the period starting at 2018 with 24,83 billion CHF, dropping to 23,81 billion in 2020 and shooting almost twice at 2022 – 43,03 billion CHF showing the resilience in face of challenges. Net profit moved in the same pattern with revenue going up and down and finally growing 3 times comparing to 2020, reaching 2,81 billion CHF in 2022. The growth rate of earnings per share showed several swings, but in 2021 it increased significantly by 156,75%, indicating a favorable trend and stayed positive in 2022 with 30,91%. The operational expenditures showed a modest increase in 2021 but were largely steady, indicating good cost control. With a capex to revenue ratio ranging from 0,54% to 1,27%, Kuehne+Nagel's capital expenditures were generally low (comparing to other companies in same sector), showing a cautious attitude to financial investments. However, a notable increase in revenue per employee is visible, rising from 303,11 CHF in 2018 to 535,69 CHF in 2022, as well as staff expenses to revenue dropping from 19,08% in 2018 to 11,95% in 2022 indicating increased productivity and efficiency with low investments required. The profit margin had a positive trend, resulting in a 6,53% in 2022. The business shows commitment to sustainability by significantly lowering its greenhouse gas emissions between 2019 and 2022. The GHG to revenue ratio, which demonstrates a continuous commitment to environmental responsibility decreased from 72,74% in 2018 to 32,92% in 2022! This closely correlated with Keuhne+Nagel's strategy to decarbonize its truck fleet and achieve 60% of zero-emission vehicles by 2030 which is already being piloted by the company. According to 2022 annual report (Keuhne+Nagel, 2023), company's contract logistics unit implemented more than 150 new projects in 2022 mostly on large storage facilities with state-of-the-art technology and robotics. They also say that the evolution of technologies might have an impact on future cash flows and result in recognition of impairment losses. This means that Keuhne+Nagel sees the importance ant possible impact of technologies and are investing to it. Constantly decreasing personnel costs to revenue ratio and increasing revenue per employee while number of employees keeps increasing shows that the investments to technology works.

To summarize, resilience and flexibility are clear in Kuehne+Nagel's financial results from 2018 to 2022, as revenue nearly doubled and net profit increased by three times. Also, earnings per share increased by a noteworthy 156,75% in 2021. Operational costs were kept under control, and a low ratio of capital expenditures to income suggested cautions financial management all at the same time boosting revenue per employee and decreasing staff

expenditures to revenue. Reduced greenhouse gas emissions and a constant commitment to environmental responsibility are the ways that Keuhne+Nagel demonstrates its commitment to sustainability. These efforts are in line with the company's objective to decarbonize its truck fleet. Company understands importance and the impact technologies have on businesses models and invests to stay competitive in the market.

3.1.6 Summary of integrated logistics providers

Summarizing analysis of integrated logistics providers, several similar patterns appear from an analysis of the financial performance and operational strategies. Throughout the period from 2018 to 2022, all companies showed increase in net profit and revenue, demonstrating their resiliency and flexibility in the face of challenges. Capex to revenue ratios remained steady or increased indicating that significant investments in technology and sustainability were made with operational efficiency as a priority. Due to regulations imposed on logistics sector, analyzed companies are constantly investing in ‘greener’ future which is reached via help of technology – electric vehicles, other alternative fuels, route optimization via help of AI, etc. Although there are variances in the capital expenditures and technology investments, there appears to be a common focus on implementing innovative strategies to optimize operations and prepare for any changes in the sector. For example, DSV is one company that prioritizes technical efficiency more than other analyzed companies introducing variety of disruptive technologies and having highest increase in revenue.

All in all, the integrated logistics provider industry has a dynamic environment in which employee productivity, acceptance of new technologies, expansion, and sustainability are critical factors for long-term success.

Sustainability is the key factor mentioned by everyone due to worldwide regulations. Companies are working towards carbon neutrality through investment to technology which is changing the way the operate. Also, most of the analyzed companies trusts that innovation and emerging technologies will have a huge impact on their businesses in the future as they are adding it to their strategy. Due to uncertainty after disruptions like COVID or war in Ukraine, businesses working to become more flexible in volatile times by digitalizing their businesses and investing to disruptive technologies.

3.2 Analysis of maritime logistics companies

In the below sub-chapters, analysis of maritime logistics providers – Maersk, DFDS, Stena Line, Hapag-Lloyd and Cosco shipping group – will be described. Analysis of annual reports can be found in Annex 2. Analysis of annual reports All the information in below sub-chapters is based on analysis of companies' annual and sustainability reports.

3.2.1 Maersk

A review of Maersk's financial results from 2018 to 2022 identifies a number of important patterns. The company's revenue increased by 201%, going from 39,02$ billion in 2018 to 81,53$ billion in 2022, demonstrating its ability to deal with challenges in the business. Significant swings in net profit were seen, going to negative side in 2019 and a gain of 29,32$ billion in 2022, demonstrating adaptability and durability. Also, earnings per share showed significant growth, with a 70,03% increase in 2022. Maersk demonstrates operational efficiency by controlling operating expenditures and keeping them at a consistent level to revenue. Investments are being done regularly - capex to revenue ratio ranged from 3,33% to 7,43%, demonstrating its dedication to infrastructure and technology development. Due to this, Maersk's revenue per employee keeps growing, almost doubling comparing 2019 and 2022. Same situation is with staff costs to revenue – it keeps decreasing since 2020, going down from 13,11% to 8,69% of revenue in 2022. On the sustainability side Maersk is not the leader – the emissions keep growing constantly, however, GHG emissions to revenue ratio shows positive trends from 2020 going down from 134,78% to 95,59%. However, Maersk is investing a lot into making their operations 'greener'. According to A.P. Møller - Mærsk A/S (2021), they are prioritizing biodiesel, methanol, lignin fuels and ammonia fuels to make reach net zero emissions in their shipping operations (no electrification of maritime transport in sight). Also, in 2022, Maersk ordered six large ocean-going vessels that can sail on green methanol, in addition to the thirteen vessels ordered last year (A.P. Møller - Mærsk A/S, 2023)). Looking into technology implementation, in 2022 Maersk launched a global training programme covering the four principles of its data ethics (transparency respect, security and innovation). The company is implementing data management procedures to ensure that risks from emerging topics such as artificial intelligence and machine learning are identified and mitigated early (A.P. Møller - Mærsk A/S, 2023). According to A.P. Møller - Mærsk A/S (2023), they believe that technology and data are key to connect and simplify supply chains. Also, Maersk is aiming to digitize, integrate and decarbonize global supply chains by contributing to technological

solutions. Part of company's strategy is to build a world class technology organization by modernizing and standardizing technologies, digitizing assets, and democratizing data to create customer value.

To summarize, Maersk's financial performance demonstrated durability and growth between 2018 and 2022. The company's revenue increased significantly, indicating its capacity to adapt to difficult business situations. Despite certain swings, net profit increased significantly in 2022. Maersk's stable regular investments and managed operating costs demonstrated the company's operational efficiency. Since 2020, this commitment has resulted in increasing revenue per employee and decreasing staff expenditures relative to revenue. Similarly to integrated logistics providers, sustainability is one of the key trends to be compliant to regulations on emissions. Maersk is investing a lot to sustainable technologies – alternative fuels and modern vessels that can run only on biofuel. Furthermore, company sees the value of technologies and are investing to digital transformation and technologies as they see change as an opportunity to create customer value altogether increasing their revenue (A.P. Møller - Mærsk A/S, 2023).

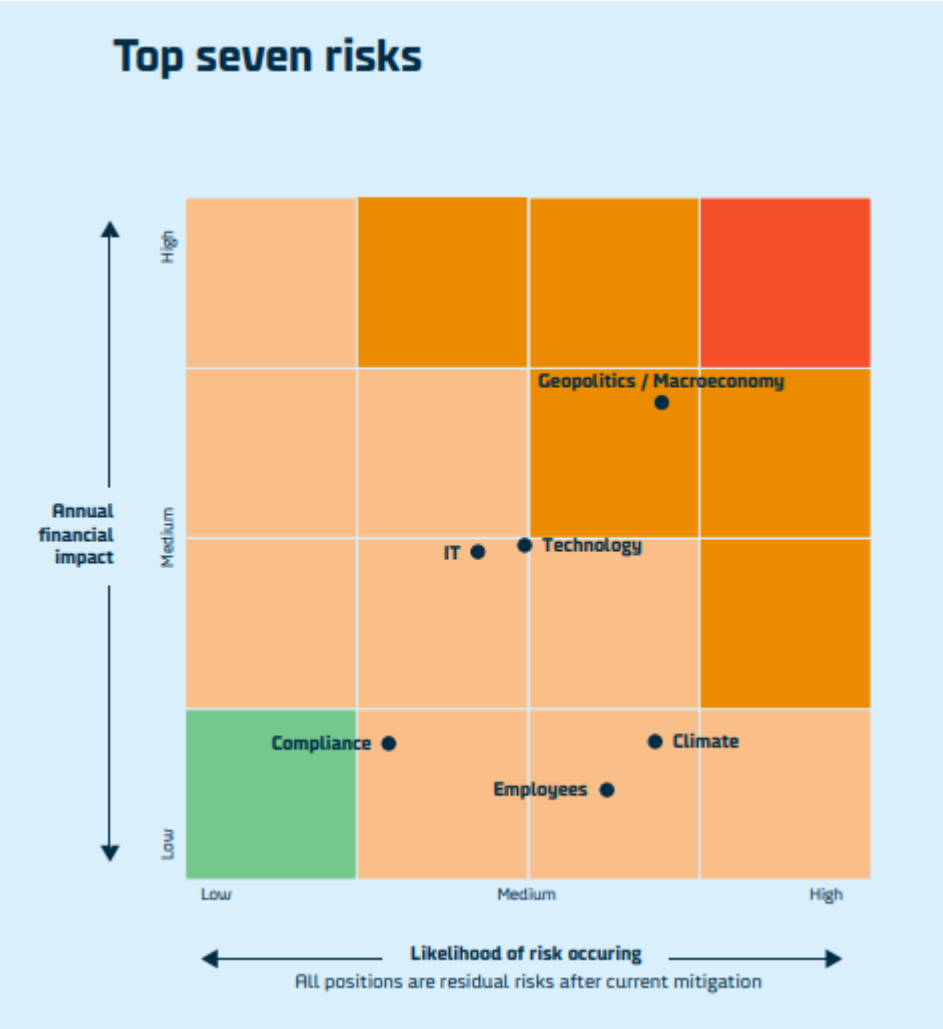
3.2.2 DFDS

DFDS financial reports from 2018 to 2022 shows the ups and downs that logistics sector had during past few challenging years. The company had revenue swings, with 15,72 billion DKK in 2018 and 13,97 billion DKK in 2020 reaching 26,87 billion DKK in 2022 representing a substantial increase. Net profit and profit margin showed similar trends, reaching 2,02 billion DKK in 2022 (profit margin – 7,51%) comparing to 0,44 billion DKK in 2020 (profit margin – 3,16%). Capital expenditures were strategically differentiated, with a spike in 2018 due to acquisition of largest Turkish freight operator U. N. Ro-Ro. After 2018 spike, DFDS continued to invest heavily as evidence capex to revenue ration never went below 10% reaching 23,03% in 2021 showing that management is looking forward to coming technologies to increase company's operational efficiency. As a consequence of investments since 2020 revenue per employee keeps increasing reaching 2334,75 DKK in 2022 and staff costs to revenue decreasing from 20,49% in 2020 to 17,60% in 2022 although number of employees keeps growing. Unfortunately, DFDS is not shining on environmental perspective – greenhouse gas emissions keep growing constantly. According to 2020 annual report (DFDS, 2021), DFDS with partners are funding the development of a hydrogen test vessel and other alternative fuels such as green ammonia, however, in further reports no progress is reported. However, based

on 2022 annual report (DFDS, 2023), DFDS is running projects related to utilizing artificial intelligence and smart data and according to the company – transport and logistics has one of the highest potentials of impact from AI. This shows that company is technology-focused and is investing into the future. According to DFDS (2023), new emerging technology might cause a disruption to the current business model. Regarding the ferry route and logistical operations, there are no apparent potential digital threats. Longer term, automation, artificial intelligence (AI), the internet of things (IoT), and new emerging technologies like autonomous cars, ships, and terminals could disrupt the current business model. Technology and IT are identified as medium risk that might have financial impact (see **Figure *19***).

Figure 19

DFDS top seven risks.



Source: DFDS, 2023.

The revenue of the company experienced ups and downs, with a notable increase in 2022. DFDS carefully controlled its capital expenditures, with a jump in 2018 as a result of an acquisition. The capex to revenue ratio was constantly over 10%, demonstrating the company's futuristic attitude to technology adoption. The beneficial impact of investments made since 2020 on operational efficiency is seen in the increase in revenue per employee and the decrease in staff expenses relative to revenue. With greenhouse gas emissions steadily rising, environmental sustainability is still a problem. Although DFDS funds alternative fuel initiatives, there aren't many updates in later reports. In recent years, DFDS invested to in house capabilities in technologies to partly counter risks posed by such new technologies and business models, and partly to be able to develop own solutions based on such technologies and to pursue possible business opportunities (DFDS, 2023).

3.2.3 Stena line

Based on the numbers from 2018-2022 annual reports, Stena Line's revenue fluctuated from 33,34 billion SEK in 2020, reaching 53,41 billion SEK in 2022 which is a sign of progress and adaptation. Net profit fluctuated, considerably decreasing in 2020 to -4,84 billion SEK (profit margin - -14,50%) before rising to 1,87 billion SEK (profit margin – 3,50%) in 2022. Overall operational costs showed good cost control as they stayed constant. Stena Line has a track record of investing - the capex to revenue ratio varies, but it always remains high, never going below 15% of revenue, indicating a dedication to technology and infrastructure or acquisitions. The rise in revenue per employee which went from 2,193.62 SEK in 2020 to 3,105.47 SEK in 2022 and decrease of staff costs to revenue (21,46% in 2020 and 16,30% in 2022) reflects that the investments are paying off as number of employees keeps growing (might be impact from acquisitions). On the sustainability side, Stena Line is not showing progress as greenhouse gas emissions are constantly growing since 2020 (only reported in 2021 and 2022 annual reports). This shows lack of commitment to sustainability topic as no information about initiatives for emissions reduction can be found in their reports as only in 2022 all business units adopted targets and KPIs withing the four focus areas – environment, safety, security, and people (Stena Line AB, 2023). Unfortunately, information about investments to technology is not enclosed in any of the reports as well, meaning high capital expenditures are mostly associated with expansion of the business through acquisitions, according to Stena Line AB (2023), Stena Line bought a large investment facility near Holyhead Port in North Wales and Voigt Travel Holding.

All in all, the financial performance of Stena Line from 2018 to 2022 showed flexibility and progress, with revenue varying but eventually rising. Significant fluctuations were seen in net profit, which dropped substantially in 2020 before rising back in 2022. The business kept overall operating expenses unchanged by practicing efficient cost control. With a capital expenditure to revenue ratio regularly above 15%, Stena Line is investing a lot in infrastructure, technology, and/or acquisitions. However, since 2020, the company's greenhouse gas emissions have been steadily rising, posing sustainability problems – company is behind comparing to peers in the sector as they only introduced KPIs for sustainability in 2022. The annual reports do not enclose information regarding technological investments or efforts to reduce GHG emissions indicating that high capital expenditures are most probably related to acquisitions. Possibly due to that, Stena Line has the lowest average net profit of -1,24% (2018-2022).

3.2.4 Hapag-Lloyd

Financial data from 2018-2022 annual reports reveals Hapag-Lloyd's resilience and futuristic view. The revenue of the company kept increasing without any dips throughout all 5 years – from 11,51€ billion in 2018 to 34,54 € billion in 2022 – 300%! Not surprisingly, net profit and profit margin had same pattern with net profit growing from 0,46 € billion in 2018 (profit margin - 3,99%) to 17,44 € billion in 2022 (profit margin – 50,47%). Hapag-Lloyd's strong earnings per share growth highlights its ability to generate shareholder value, particularly in 2021 and 2019 where EPS grew over 850%. Operating expenses remained at steady levels with slightly increasing trend together with revenue. Hapag-Lloyd’s capital expenditures shows increasing trend moving from 0,90% of revenue in 2018 to 11,77% in 2022. This suggests a dedication to technology implementation and infrastructure maintenance of the company. The revenue per employee increased from 902,08 euros in 2018 to 2,424.41 euros in 2022, together with a constant decrease in staff costs to revenue (decreased twice over 5 years period!), reflects improved efficiency and productivity which is associated to introduction of disruptive technology. Sustainability wise, Hapag-Lloyd does not look bad as well, since the dip in GHG emissions in 2020 due to COVID-19, the emissions grew to 15,58 million tons in 2022, however, during the same period, the revenue of the company increased almost 3 times. Also, comparing 2022 to 2021, emissions decreased. If we look into GHG to revenue ratio, we can see constantly decreasing trend – from 119,33% in 2018 to 45,09% in 2022. This is closely related to the strategic vision of a company which is to reduce CO_2 by

30% until 2030 (comparing to 2019). According to Hapag-Lloyd (2023), the company is moving towards zero emissions and from 2023 they have added 4th pillar to their core objectives strategy – sustainability. As mentioned previously, one of the goals is to reduce $C0_2$ by 30%, another is to completely decarbonize the fleet until 2045. Also, they were the first liner shipping company to equip its entire container fleet with real-time tracking technology (telematics). Furthermore, company has R&D department which is responsible for development and implementation of technical solutions such as new propellers designs. They are testing alternative fuels and propulsion technologies to reduce emissions, as well as, with the ongoing digital transformation utilizing artificial intelligence, robotic process automation, cloud-based solutions and blockchain platforms. As mentioned in 2022 annual report (Hapag-Lloyd, 2023), rapid adoption of disruptive transport technologies and technological advancements, as well as the capability to address customer demands for enhancements and technical advancements, are crucial success factors. Also, according to CIO & CHRO of Hapag-Lloyd Donya-Florence Amer – *supply chains are developing and technology is becoming more and more a competitive advantage. Today, we offer already more than 20 digital products that add value for our customers and are designed to make working with us as convenient as possible.*

To summarize, the financial performance of Hapag-Lloyd shows a steady rising trend from 2018 to 2022. The trend for net profit and profit margin is similarly increasing. Over time, capital expenditures have risen, demonstrating a dedication to infrastructure and technological adoption. Increased productivity and efficiency, most probably increased through the use of technologies, is visible in the increase in revenue per employee and the decline in staff expenses relative to revenue. In terms of sustainability, Hapag-Lloyd shows promise as its greenhouse gas emissions are trending downward in relation to income, with a projected 45,09% in 2022. With the objective of completely decarbonizing its fleet by 2045 and reducing CO2 emissions by 30% by 2030, the corporation has established high standards for sustainability. Company understands the importance of introducing technologies to stay competitive and be resilient in face of challenges as they already have 20+ digital products and names technological innovations and process improvements a critical success factor.

3.2.5 Cosco shipping group

Cosco shipping group is a great example on how important investment and adoption of technology is for the success of the company. The capital expenditures of the company never reached 1% of revenue. The revenue of the company went down from 9,52 billion HKD in

2018 to 3,96 billion HKD in 2022. Also, staff cost to revenue kept increasing from 4,02% in 2018 to 10,22% in 2022 as well as revenue per employee – decreased from over 10000 HKD in 2018 to 4656,87 HKD in 2022 showing decrease of personnel efficiency. Even though profit margin heavily, it might have increased more with the investments to technology. On the sustainability side, GHG emissions of Cosco shipping group keeps decreasing since 2019 as well as GHG to revenue ratio decreasing from 202,88% in 2019 to 113,13% in 2022 which is a positive trend. The company does not provide any information about new technologies being adopted, which is expected according to the investment rates. Only interesting thing related to technology and sustainability was found in 2022 annual report – Jotun Cosco introduced hull performance solution which is supported by sophisticated big data analysis, real-time ship hull monitoring system and high-tech antifouling coating technology to optimize hull performance. Since 2011, more than 2,000 vessels have used the solution, resulting in a decrease of more than 60 million tons of CO_2.

All in all, Cosco shipping group is a great example how lack of investments decreases the revenue of the company and efficiency/productivity of the workforce. The only technology that was found is related to coating of the ships which reduces CO_2 emissions, however, any other technologies like artificial intelligence, machine learning, telematics, etc. were not mentioned.

3.2.6 Summary of maritime logistics companies

Several common patterns and conclusions within the sea logistics market are visible by analyzing the financial performance and strategic directions of the five maritime logistics providers. First off, there are noticeable variations in revenue among all businesses, indicating the industry's vulnerability to outside influences. Almost all of the businesses (except Cosco Shipping Group) show an upward revenue trend despite variances, highlighting their ability to recover from the market setbacks and remain resilient. Second, a constant capital expenditure commitment, despite the apparent different degrees of strategic investments in technology and infrastructure, is vital to keep the company growing and even to stay in the market. This indicates the industry's understanding of how crucial operational effectiveness and technology breakthroughs are to long-term success (again the example of Cosco). Thirdly, sustainability is clearly emphasized by the sector, especially in the use of alternative fuels and initiatives to reduce emissions, possibly due to imposed regulations to reduce the emissions and pollution. Lastly, the higher revenue per employee and lower staff expenses overall in relation to revenue

demonstrate how technology adoption affects company's operational efficiency. All companies investing into the technology shows positive trends.

Electrification is not a trend in maritime logistics, however, sustainability initiatives is increasing investment to technology, in maritime logistics case, investment to alternative fuels. It seems that the future is with the alternative fuels like hydrogen, ammonia, and other rather than electricity. Positive trend is that maritime logistics companies understand the importance of digitalization and keeps introducing new disruptive technologies, even considering technology and IT as a medium level risk for with impact to financial results. Even though significant change of maritime logistics business models not felt heavily yet, it might be a disruption in the future, thus companies investing to technology are preparing not to be surprised.

3.3 Analysis of air logistics companies

In the below sub-chapters, analysis of maritime logistics providers – Lufthansa Group, International Airlines Group, Scandinavian Airlines System, Finnair, and Turkish Airlines – will be described. Analysis of annual reports can be found in Annex 2. Analysis of annual reports All the information in below sub-chapters is based on analysis of companies' annual and sustainability reports.

3.3.1 Lufthansa group

From the first glance into the annual report of Lufthansa Group, it's noticeable that air logistics, especially airline companies, were mostly affected by the COVID-19 pandemic. Looking into the revenue, until the pandemic, company shown positive trend having – 35,84€ billion in 2018 (2,16 € billion net profit) and 36,42€ billion in 2019 (1,21€ billion net profit). However, in 2020 it dipped to 13,59€ billion in revenue and staggering -6,73€ billion net profit. Despite the fact that 2021 were also negative in net profit, Lufthansa have shown resilience and in 2022 went back up to more than doubled revenue – 32,77€ billion and 791€ million in net profit. By modifying operational costs and capital expenditures to reflect the difficult market circumstances in 2020, the company showed that it could control costs. Even though capex to revenue ratio decreased (from 10,88% to 6,66%) due to obvious reasons, Lufthansa did not stop to invest into key areas showing strategic vision. The company's growth in revenue per employee, from 123,46 euros in 2020 to 299,24 euros in 2022, demonstrates its ability to balance operational efficiency and the return on investments made. Constant decrease in staff

costs to revenue also shows positive trends on the investments made by Lufthansa – employees are working more efficiently. Sustainability wise Lufthansa shows continuously decreasing trends since 2018. The biggest dip is in 2020 when the airlines did not have the clients, however even though it increased over 2021 and 2022, the GHG to revenue emissions shows decreasing trend since 2018 – revenue in 2022 was very similar to 2018, however, during 2022 Lufthansa emitted almost 30% less GHG showing that investment to sustainable technologies is paying off. According to 2022 annual report (Lufthansa Group, 2023), sustainability is already integral part of group's strategy. As expected, electrification is not a trend in aviation mainly due to the weight required, however, similarly to maritime other alternative fuels are. Lufthansa is closely monitoring alternative fuels, new propulsion system based on hydrogen and electricity and new aircraft designs to lower their emissions. Additionally, they started regularly using fuel-saving surface technology called AeroSHARK. It imitates the characteristics of sharkskin which is very hydrodynamic which leads to usage of less fuel. Artificial intelligence can also be found in the radar of Lufthansa. Firstly, they are using it for flight tracking analysis and was applied for the first time in 2022 in Frankfurt airspace which is also helping to reach sustainability goals. Another interesting appliance is food waste monitoring using AI. It helps to plan what quantities needs to be taken and it reduces wasting – in 2022 by 45% (Lufthansa Group, 2023). Also, Lufthansa is intensively using predictive maintenance for the better maintenance of its fleet. In order to **generate more revenue, reduce expenses, and improve customer experience**, Lufthansa is investing more in technology. Additionally, this presents **new business opportunities** and **revenue increase** in the pre-order/pre-select and onboard retail markets (Lufthansa Group, 2023).

All in all, Lufthansa Group's numbers emphasizes how resilient the airline was in the face of the COVID-19 outbreak. A significant net loss and a decline in revenue made the financial impact clear, but in 2022, the business made a significant comeback and doubled its total sales. Throughout the crisis, Lufthansa effectively controlled operating expenses and carried out significant investments. Growth in revenue per employee shows a balance between returns on technological expenditures and operational effectiveness. Since 2018, there has been a steady decline in greenhouse gas emissions due to sustainability activities. The airline uses AI apps for flight tracking, reducing food waste, and predictive maintenance, as well as unique technology like AeroSHARK. Lufthansa's example shows that in order to introduce new way to make money (business models), the technological advancements are unavoidable, and the change is happening already.

3.3.2 International airlines group (IAG)

The severe impact of the COVID-19 on the airline sector is also seen in the financial reports of International Airlines Group (IAG). 2020 shows a decrease in sales to 7,81 billion euros and a net loss of -6,92 billion euros, however IAG showed resiliency by recovering with revenue of 23,07€ billion and a moderate although positive net profit of 0,43€ billion in 2022, despite ongoing issues in 2021. IAG's flexibility is demonstrated by its effective control of operational expenditures, which - in face of the challenges - dropped from 15,23€ billion in 2020 to 11,22€ billion in 2021. The capex to revenue ratio showed signs of strategic investment planning as it varied, peaking at 24,84% in 2020 before stabilizing at 16,80% in 2022. Due to constant high investments, revenue per employee dipped during the COVID in 2020 reaching pre-COVID volume of 349,25€ in 2022 (same situation with staff costs to revenue – decreased to 2018 level in 2022). With a heavy drop in the ratio of greenhouse gas emissions to revenue from 183,40% in 2020 to 115,53% in 2022 company's dedication to sustainability is clear. Sustainability is also one of the components of IAG strategy – it envelopes all other priorities meaning that every initiative is also considered from sustainability perspective. According to 2022 annual report (International consolidated airlines group, S.A. and subsidiaries, 2022), IAG made investment in ZeroAvia – a company that works in short haul hydrogen-electric options for the industry. Also, IAG introduced artificial intelligence and machine learning to modernize their call centers. Additionally, the company is able to lead the airline industry in innovation and sustainability thanks to the IAG central platform, which supports and scales emerging travel and aviation technologies. Company is planning to continue growing their business in the future through investments to people, **technology,** and improved customer propositions.

To summarize, with a substantial drop in revenue and a big net loss IAG displayed resilience, recovering positive net profit in 2022. Effective cost control was demonstrated by reducing operational expenditure. Also, consistent capex to revenue ratio indicates strong strategic investment planning. Sustainability is integral to IAG's strategy, with investments in ZeroAvia for hydrogen-electric options and the integration of artificial intelligence and machine learning to modernize call centers, aligning with their dedication to a more future proof and sustainable future. Technological investments are the measure which IAG will use to keep growing their business in the future.

3.3.3 Scandinavian airlines system (SAS)

Examination of SAS's financial results from 2018 to 2022 reveals the same trend that highlights the difficulties the airline sector has encountered - COVID-19 epidemic. However, SAS has a bit different trend in comparison to Lufthansa and IAG – they are not able to recover to positive net profit since 2019 and seems that issues are going deeper as the average profit margin for 2019-2022 is -22,66%. The revenue is also going down from 44,72 million SEK in 2018 to 31,82 in 2022. According to Birkebaek and Gronholt-pedersen (2023), the airline, which in its glory days in the 1980s was named the world's best airline by an industry group, has for more than a decade struggled to compete with low-cost rivals in Europe's fragmented aviation sector. It has recently been bought with the majority (19,9%) going to Air France-KLM. Even though capital expenditures are relatively high averaging 12,90% of revenue over 5 years, all the investments are going to new aircrafts, buildings, or acquisitions – technological investments or research and development are not mentioned. According to 2021 annual report (Scandinavian Airlines Systems, 2021), in 2020 SAS launched a new efficiency program costing 4 billion SEK which seems to be successful as revenue per employee grew from 2710,49 SEK in 2020 to 3557,74 SEK in 2022 as well as staff cost to revenue was cut in half while number of employees increased – from 38,85% in 2018 to 17,30% in 2022. As all of the analyzed companies, SAS is committed to sustainability with the goal to reach net zero carbon emissions by 2050. They are using sustainable aviation fuels (SAF), introduced 10 new more fuel-efficient aircrafts, also, company has signed a letter showing interest to buy electric aircraft from Heart Aerospace (Scandinavian Airlines Systems, 2023), thus big capital expenditures are giving back in this area.

All in all, SAS is a different case and is hard to evaluate due to the financial struggles they were facing. However, looking from the disruptive technology perspective looks similar – investment to sustainable/alternative fuels which are mandatory due to governmental regulations. However, they were the first ones to show interest in buying electric aircraft which might be just a populistic step. There is no sensible information suggesting that technologies are changing how SAS business model except from addition of sustainability initiatives and increase in workforce efficiency.

3.3.4 Finnair

Analysis of Finnair financial results from years 2018 to 2022 did not provide any big surprises. Company was heavily hit by COVID-19 pandemic with a big dip in revenue from

2,84 billion euros in sales in 2018 to 0,83 billion euros in revenue in 2020 and net profit going down to -0,52€ billion euros. 2021 were not easier, however, Finnair managed to get back up in 2022 with revenues going back to pre-COVID level – 2,36€ billion. Despite high increase in revenue, company still made recorded profit loss with -0,48€ billion and profit margin -20,20% (-55,34% in 2021). From the investments perspective, Finnair is showing stability with the capital expenditure varying from 0,2€ billion to 0,52€ billion. During 2020 and 2021 it respectively made 62,23% and 51,88% of revenue. However, mainly investments are oriented in renewal of the fleet or new leases. Looking into revenue per employee and staff costs to revenue ratios positive trend can be seen (revenue per employee growing and staff costs to revenue decreasing), however, number of employees decreased since the start of the pandemic. Sustainability-wise, Finnair, as all other companies, is committed to reduce it due to global regulations. Comparing 2022 to 2018, revenue is on the similar level, however, GHG emissions differs noticeably – 2,48 million tons in 2022 and 3,79 million tons. Finnair's strategy towards sustainability is to become carbon neutral by 2045. They are trying to reach it through usage of affordable sustainable aviation fuels and are committed to achieve 10% level in SAF uptake by 2030 (2022 annual report). On the technological perspective, barely any information except for distribution technologies can be found.

All in all, as mentioned earlier, capital expenditures are mostly dedicated to assets purchase or leasing, thus it is possible that Finnair is not investing implementation of technologies. Looking into trends, only SAS and Finnair did not recover to positive net profit in 2022. Also, both companies are more focused to the more or newer fleet rather than technological advancement which shows that innovations in technology if not disrupting the business models at least increases productivity and makes companies more competitive.

3.3.5 Turkish Airlines

Financial results from 2018 to 2022 of Turkish Airlines shows similar pattern to the one we already seen by Lufthansa and IAG. Company have shown great resilience coming out of the dip caused by pandemic during 2020 generating almost a billion $ in net profit in 2021 and almost 3$ billion in 2022 surpassing pre-COVID levels 3 times. The company's capital expenditures fluctuate, peaking in 2022, which may indicate an emphasis on fleet growth and technological improvements. However, capex to revenue did never go below 4% of revenue even in toughest times showing Turkish Airlines management maturity in understanding the importance of technology for the sector. Improved worker productivity is evident, as revenue

per worker reaches 457,63 euros in 2022. At the same time, staff expenses as a proportion of revenue drop significantly to 14,79 in the same year. From sustainability perspective, increase during 2022 is visible comparing to previous years due to demand coming back. Sustainability data from 2018, 2019 and 2020 cannot be evaluated as scope 3 emissions were not accounted back then. However, looking to differences in revenue between 2021 and 2022 (almost 8$ billion), GHG emissions to revenue ratio decreased by 30% which shows lower emissions rate. This can be explained by higher capital expenditures over 2021 and 2022 which helped to modernize the fleet. Also, since February 2nd, 2022, Turkish Airlines started using sustainable aviation fuel, also, together with scientific institutions they are supporting research for green biofuel. On the technological perspective, Turkish Airlines are also advanced similarly to IAG or Lufthansa. One of the strategic focuses of the company is to embrace innovation. Company is already leading innovative projects activities with the Internet of things, virtual reality, and artificial intelligence. One very well example is a project that Turkish runs is to increase the on-time departure at Istanbul Airport by 1%. They are ensuring with the help of artificial intelligence supported image recognition that services given to the aircraft, equipment and personnel are automatically detected according to 2022 annual report (Turkish Airlines, 2023). Also, on-time departure makes the customers happy which brings them back.

To summarize, Turkish Airlines as one of the leading airlines shows example in technological advancements. They have also shown great resilience to one of the biggest crises that disturbed the whole world in 2020 already next year. The advancements are also seen in the work efficiency as revenue per employee is growing rapidly and staff costs comparing to revenue are decreasing. Daughter companies like Turkish Cargo is closely monitoring current technologies and integrates them into processes in line with their strategy – to be the pioneer of sector in terms of technology as per Turkish Airlines annual report 2022 (Turkish Airlines, 2023).

3.3.6 Summary of air logistics companies

The air logistics sector was impacted the most out of all analyzed sectors due to a clear reason – demand went down as people could not travel. However, out of 5 analyzed companies, a clear trend can be seen – companies that are investing into modern technologies are more resilient in face of such challenges. SAS and Finnair both focuses only to fleet modernization rather than technology despite the fact that they are among the leaders on capital expenditures out of analyzed companies and they did not make profit since 2019. On the contrary –

Lufthansa, IAG and Turkish are investing same amount or even less but with the focus on technologies were all recovered to positive net profit by end of 2022 (Turkish Airlines already in 2021). Sustainability requirements makes it mandatory for everyone to put efforts and companies are adding it to their strategy due to the pressure from worldwide organizations. It's not only bad thing as due to the pressure, companies are investing into disruptive technologies such as sustainable fuels or coating technologies. Electrification is not a trend in air logistics for obvious reasons – batteries have high weight and does not operate well in low temperatures, thus way to go is other biofuels (sustainable aviation fuel).

All in all, digitalization and technologies are the way to go according to the analysis of companies. Every company that invests into their future are showing growing results and better operational performance. Lufthansa believes that technologies introduce additional sources of income and saves costs. However, there are no clear signs yet that business models are changing but investment to technology is mandatory to remain competitive.

3.4 Analysis of integrated, maritime and sea logistics providers

Technology is a major force behind change in the dynamic field of logistics. However, as the sectors and operations differ heavily, the adopted technologies differ as well. Comparing the numbers from annual reports per sector, the leading sector in capital expenditures is air logistics with average 15,28% capex to revenue ratio (maritime – 10,60%, ILP – 4,86%). However, it is so high due to SAS and Finnair both having financial issues. The leaders in the sector are Lufthansa and Turkish both presenting very innovative technologies such as Aeroshark – coating for better efficiency when flying or image recognition based on AI to automatically recognize services provided for aircrafts, crews etc. Maritime logistics are also investing a lot to different innovative technologies. Lots of focus is given to alternative fuels – green methanol, biodiesel, lignin, and ammonia fuels (electrification is not a trend). Also, companies in the sector are investing in AI, machine learning while not forgetting the ethics – Maersk is having global data ethics programme for their employees. Also, real-time tracking technology was introduced by Hapag-Lloyd in all of its fleet. Integrated logistics providers on the other hand shows strong but expected trend in electric vehicles. They are also strongly investing into artificial intelligence to plan and track their vehicles. Global trend that all sectors are following is sustainability.

All in all, it's hard to separate which sector is improving the most as all of the sectors tend to invest into the technology which makes their operations more efficient. The Global

trend of sustainability is the most mentioned as it's a must for all the companies to have it. Also, if the strategy does include technological advancements, business will be inefficient as we can see SAS, Finnair and Cosco examples.

3.5 Sector's professionals' view

In below sub-chapters information received from professionals of each sector will be described. 6 interviews with executive leaders or managers were conducted (2 with each sector) to understand how technologies are impacting their sectors. Questionnaire that was used can be found in Annex 1. Questionnaire for interviews and transcripts in Annex 3. Transcript from interview

3.5.1 Integrated logistics providers

In the integrated logistics providers sector two interviews were conducted with CEO of Girteka Group and business development manager of DPD Baltics. Both companies are operating mostly on vehicles operating on roads, thus it is a good comparison.

Electric vehicles are a clear trend in road transportation. However, on Girteka case, electrification is only starting as the main business is in long-distance transportation. It is due to the limited capacity of current lithium batteries. On the other hand, DPD focusing on last-mile delivery are actively investing in the electrification of their fleet. This requires significant investments to charging infrastructure, etc. but lowers future expenses.

Moving on, it's important to mention that COVID pandemic heavily increased the demand for transportation, thus companies in this sector faced challenge how to handle the volumes. Both companies are investing but still experimenting with AI. Commonly, the AI is already used to predict demand and plan routes. Girteka has to plan routes for over 6000 vehicles daily and they already managed to get over 60% of that done by AI. Telematics is also integral part of both companies for planning. Both companies are utilizing telematics data to know where their vehicles are, what cargo do they have in Girteka's case – what temperature is in the trailer. If something goes wrong with the car and the cargo needs to be moved by other car, the updates of estimated time of arrival is done in real time providing full visibility for the client.

Both companies have lots of partnerships and are looking for ways how to innovate all the sector. Both Girteka and DPD see autonomous vehicles usage in the future as a solution to

workforce shortages. Furthermore, qualified white-collar workers shortage is felt, and there are high expectations that AI will be able to perform routine tasks.

Regarding the impact on business models - DPD sees technologies as enabler to become more efficient, reduce operational expenses and become ‘greener’ but in near future it will have way more impact. From Girteka perspective, change in business model is slowly happening already, however, once it will be possible to perform long trips with fully electrical vehicles business model will change drastically – maintenance periods of EVs are longer, longer truck lifetime, sales of trucks will also change, thus the change will be massive.

3.5.2 Maritime logistics providers

In the maritime logistics providers sector two interviews were conducted with CIO of Western Shipyard Group and former executive from Maersk who worked there for over 13 years. According to annual and sustainability reports analyzed in previous sectors, maritime logistics are also heavily improving their technologies.

COVID-19 did not have a huge impact for maritime logistics sector as the demand was still there and was increased. Interestingly, Western Shipyard Group's IT managed to do 2 years’ worth of work in couple of months during the COVID thus it seems that the pandemic encouraged digital transformation.

On the technological perspective, Maersk as way bigger/leading company has been using and keeps investing into AI in all aspects of business. Customer service sales are supported by AI and large language models and using it especially in marine services. The other interviewed company also started to use generative AI, however, had to stop it temporarily for security issues.

On electrification topic, WSY won the contest to build electric river ship, however, the future of electric vessels is unclear. Maersk uses a lot of electric vehicles in ports for loading/unloading of containers which is heavily reducing their emissions. Additionally, in most of the ports, it’s already forbidden for the vessels keep running on diesel as they are docked so nowadays after arriving to port, vessels are ‘plugged-in’ to socket and do not need auxiliary engine to be working. Overall, sustainability as a topic is important for maritime logistics due to the regulations coming from institutions like European Union. It enforces companies to invest into ‘green’ technologies, however according to interviewees, electrification is not the future of maritime logistics. Other alternative fuels like ammonia for long, and hydrogen for medium distance trips.

Telematics are also used a lot. In road transportation it helps to choose the most efficient route according to traffic, landscape etc. In maritime logistics they help to plan the trip according to sea currents which helps to save fuel and emit less.

On the key question if technologies we discussed are changing maritime business models both respondents answered similarly. Firstly, having data is a prerequisite to introducing disruptive technologies. Secondly, there are signs already that businesses are changing slowly, however, substantial changes will be felt in the future.

3.5.3 Air logistics providers

In the air logistics providers sector two interviews were conducted with vice president of operational excellence of Smartlynx airlines and COO of Avion. The sector was heavily affected by COVID-19 and the consequences can still be felt. Key topic encouraging air logistics (and all other sectors) to change is sustainability that is becoming mandatory. Air logistic companies are investing a lot into investigation and introduction of sustainable aviation fuels (not electricity!) to reduce emissions, and all have targets to go carbon neutral until 2050 or earlier.

Interesting thing has been pointed out during interview with Avion. Europe is pushing companies to emit less, move to more sustainable fuel (which is obviously more expensive) while they have no impact on companies operating in the East where oil is the main business of the country. Regional differences will limit the effectiveness of sustainability measures if not implemented globally potentially making Europe lose business in aviation sector.

Electrification as mentioned previously is not a big topic in aviation, some companies are investing in electric short-range planes, however, it might be a populistic move as the trend is hydrogen and other alternative fuels.

AI is being introduced into the aviation sector for customer facing technologies – support chatbots, etc. however aviation is very heavily regulated, thus, as emphasized by Smartlynx representative, it’s really hard to introduce anything that might risk people’s lives.

Telematics as a solution exists in aviation for a long time as you can always see real time information about all aircrafts on https://www.flightradar24.com/. However, interesting observations were provided by both interviewees – similarly to route planning in road transportation based on hills, traffic, etc. and in maritime logistics based on currents, airlines are planning flight route based on winds. The issue with telematics in airplanes is the poor internet connection flying high, however, it can be solved by satellite internet providers.

Due to the fact that airlines are very heavily regulated, introduction of new technologies is tougher in this sector. Both interviewees have similar opinion – airlines business models are not yet changing due to the technologies. Bigger companies like Lufthansa or Turkish Airlines have the capacity and resources to implement more modern changes which are reducing their operating costs, helps with lower emissions and so on, however, the core principles of running the business are still the same.

CONCLUSIONS AND RECOMMENDATIONS

The 21st century is the technology century. We see new technologies being introduced every day and it's impossible for businesses to stay competitive without investments into technology. The logistics sector is not an exception – technological advancements are vital to stay ahead of the competition.

Analysis of integrated, maritime and air logistics providers have shown that all the logistics sectors are heavily affected by disruptive technologies and are gradually transforming by adoption of AI, electrification, and telematics. Currently, these technologies are being introduced to increase resilience against challenges like COVID or war. The strategy to invest into technologies enables logistics companies to adapt faster to changing circumstances and to be ready for future demands.

The examination of integrated logistics companies provides many interesting revelations. This sector has shown great adaptability and resilience during the challenges which is visible by their constant improvements in revenue and net profit. Constantly increasing capex to revenue ratios shows a strategic vision companies have towards technologies, with telematics and artificial intelligence improving operational effectiveness by performing manual tasks.

Growing regulatory pressure on CO_2 emissions makes sustainability a key topic. Consequently, companies are already incorporating sustainability into their strategy and are investing in disruptive technologies such as electric vehicles or other alternative fuels, especially for last mile deliveries. Long distance fleet electrification is in the future, as current technologies and infrastructure are insufficient to serve the number of vehicles driving around. Overall tendency from the analysis of annual reports and interviews shows that to stay competitive, ILP are investing into technologies to make supply chain smarter, operate more efficiently, and be more flexible in face of challenges e.g., demand increased demand during COVID pandemic. Even though, no major changes to business models were identified during financial and sustainability reports analysis and interviews with leaders from companies operating in integrated logistics sector, it can be stressed that adaptation of new technologies is inseparable part of future logistics.

Maritime logistics sector is also constantly improving the way they operate, especially the big players like Maersk. This sector was not affected heavily by COVID, however, had to deal with challenges like higher demand and container shortage as well as reduce in workforce as quarter of world's maritime workers comes from Ukraine and Russia. However, analyzed

companies have shown consistency in their investing activities and the results are already visible in increased revenue per employee, which leads to more effective work for employees. Sustainability wise, maritime companies are forced to change due to regulations imposed by the European Union and other institutions. Interestingly, in the last COP 28 conference, largest maritime logistics companies were voluntarily expressing the need to be more controlled on emissions and pollution side emphasizing that the regulations should be worldwide as if it will only impact companies in Europe – the business will go to the East. However, sustainability makes companies invest in technologies - the key trend in vessels is alternative fuels like ammonia, green methanol, biodiesel, lignin, etc. Electrification is seen only in ports when loading/unloading ships. The business models of maritime companies are disrupted by technology, although, there is no significant evidence that business models have already been changed due to technology. Companies that are introducing new technologies are staying on top as their operations are becoming more efficient and there is a visible increase in revenue and profits. Most of the companies are introducing innovation to their strategies, which is also a sign of how important technologies are for the sector.

It's a different case with air logistics companies. During the analyzed period, a significant decrease in all the analyzed companies' revenues and profit was seen due to a huge decrease in demand because of the pandemic. Firstly, pressure to become more sustainable is evident in the air logistics sector as well and it's forcing companies to invest into technologies. The most popular investment made to become more sustainable is into alternative fuels (not electricity). All companies are investigating and investing in sustainable aviation fuels. Secondly, bigger companies like Lufthansa Group, IAG or Turkish Airlines sees technology as integral part to remain competitive in their sector and are investing in different technologies to make their operations more efficient, flexible, and ready for change. Thirdly, heavy regulation on air logistics companies not to risk people's lives and time required to develop new technologies makes some changes in aviation sector impossible at the moment. Aircraft that was made 15-20 years ago is considered to be relatively new. Only big airlines can afford flying only on new fleet. Additionally, engines' development also takes decades with all the testing and getting approvals from different kind of commissions, not to have a Boeing 737-MAX case again, thus it's tougher to innovate. Due to the regulations and time required to develop new, business models of air logistics companies are affected but not yet changing. Focus is on operational efficiency, sustainability, and flexibility.

To summarize, sustainability initiatives imposed by governments, European Commission and other international forums is the main driver of change in logistics.

Companies must invest in sustainable fuel, electric vehicles or other technologies that reduces emissions. Secondly, to become more efficient, logistics companies need technological solutions that can perform basic tasks, optimize work and increase Lastly, supply chain disruptions like COVID-19 and war in Ukraine showed how fast the situation can change. Most of the analyzed companies are investing into digitalization and other technologies in order to be prepared for high increase in demand or loss of workforce (maritime logistics).

Investments in technologies positively correlates to with financial performance. Analysis shows that companies investing into technologies improves their operational efficiency as well as reports increased revenue and profit. Introduction of such technologies streamlines processes, reduces manual activities and enhances technological competences of staff. Furthermore, environmental sustainability which, as mentioned, is a key focus for logistics, improves radically due to the investments to technology. Sustainable fuels and electric vehicles in different sectors help to substantially reduce greenhouse gas emissions. Despite the fact that initially these technologies require high capital expenditures, long term benefits justify the costs as they lead to reduced emissions and improvements in financial performance.

Comparing different branches of logistics, each one shows different progress. ILP companies leads in implementation of AI and telematics, maritime focuses on alternative fuels, and air logistics – sustainable aviation fuels and efficiency technologies (slower due to regulations). Overall, it is not possible to emphasize one sector that is improving most as all are investing into the technologies. Even though the business models are not yet changing heavily due to the technologies, all analyzed sector knows that without it the competitiveness will be lost. Some small changes can be seen already, and big changes are predicted for near future.

The research also shows that academic and scientific papers analyzed in literature analysis chapter are being applied in real-world in logistics industry. Visible improvements in operational efficiency, environmental impact, and financial performance across various logistics companies demonstrate the practical implementation of these research backed technologies.

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ANEXES

Annex 1. Questionnaire for interviews

1. Did the challenges of few past years (COVID-19, war in Ukraine, increasing fuel prices, regulations) forced logistics sector to change? Did it have impact on technologies adoption?
2. Are you implementing AI, ML, and DL technologies, and if so, how have they improved the effectiveness, reduced costs, etc. of logistics operations?
3. Can you provide examples of how your logistics processes (e.g., demand forecasting, predictive maintenance, route planning, etc.) are optimized using AI and machine learning?
4. Are you using any technologies to automate or optimize warehouse operations? E.g., robots, smart sorting systems, etc.?
5. Do electric vehicles (pure, hybrid, plug-in) play any role in your logistics fleet? How have they impacted sustainability and cost-saving initiatives, what challenges does it bring?
6. How do you see electric vehicles impacting logistics business in the next 5-10 years?
7. Does telematics play any role in logistics operations? Since introduction, did it improve fleet management operations, driver safety, and overall company's efficiency?
8. What were challenges in integrating telematics technology into logistics operations?
9. Did the data driven decision making have impact on supply chain's resilience and adaptability, particularly during disruptions like the COVID-19 pandemic?
10. Do you collaborate with technology providers, startups, industry partners, scientific organizations to stay in the front of technological advancements in logistics?
11. Did disruptive technologies like AI, electric vehicles and telematics created new or substantially changed logistics business models? If possible to enclose – how?
12. Do you have any KPIs (key performance indicators) to measure the impact of disruptive technology on your business models? Are they changing frequently?
13. If operating in Lithuania – do you see any difference in adoption of technologies or overall, anything specific for the market of this country?

Annex 2. Analysis of annual reports

Analysis of DHL annual reports (2018-2022)

	2018	2019	2020	2021	2022
Revenue (€m)	61,55	63,34	66,72	81,75	94,44
Net profit (€m)	2,08	2,62	2,98	5,05	5,36
Total operating expenses (€m)	59,48	60,72	63,74	76,69	89,10
Capex (€m)	2,65	3,62	3,00	3,90	4,12
Personnel expenses (€m)	20,83	21,61	22,23	23,88	26,04
Number of employees	547459	546924	571974	592263	600278
Earnings per share (€)	1,69	2,13	2,41	4,10	4,41
GHG emissions (m Tons)	35,63	33,20	33,64	39,39	36,46
Capex to revenue	4,30%	5,71%	4,50%	4,76%	4,37%
Capex to expenses	4,45%	5,96%	4,71%	5,08%	4,63%
Revenue per employee	112,43 €	115,81 €	116,64 €	138,02 €	157,32 €
Profit margin	3,37%	4,14%	4,47%	6,18%	5,67%
GHG to revenue	57,89%	52,41%	50,42%	48,19%	38,61%
Staff costs to revenue	33,83%	34,12%	33,33%	29,21%	27,57%
EPS growth rate	-	26,04%	13,15%	70,12%	7,56%

Source: compiled by Mincė based on Deutsche Post DHL Group annual reports.

Analysis of UPS annual and GRI reports (2018-2022)

	2018	2019	2020	2021	2022
Revenue ($m)	71,86	74,09	84,63	97,28	100,34
Net profit ($m)	4,79	4,44	1,34	12,89	11,55
Total operating expenses ($m)	64,84	66,30	76,94	84,48	87,24
Capex ($m)	6,283	6,380	5,412	4,194	4,769
Personnel expenses ($m)	37,24	38,91	44,53	46,71	47,78
Number of employees	481000	495000	543000	534000	563000
Earnings per share ($)	5,51	5,11	1,55	14,75	13,26
GHG emissions (m Tons)	36,301	35,815	37,663	35,808	33,002
Capex to revenue	8,74%	8,61%	6,40%	4,31%	4,75%
Capex to expenses	9,69%	9,62%	7,03%	4,96%	5,47%
Revenue per employee	149,40 $	149,68 $	155,85 $	182,17 $	178,22 $
Profit margin	6,67%	5,99%	1,59%	13,25%	11,51%
GHG to revenue	50,52%	48,34%	44,50%	36,81%	32,89%
Staff costs to revenue	51,82%	52,51%	52,62%	48,01%	47,62%

EPS growth rate	-	-7,26%	-69,67%	851,61%	-10,10%

Source: compiled by Mincė based on United Parcel Service annual and GRI reports.

Analysis of FedEx annual and ESG reports (2018-2022)

	2018	2019	2020	2021	2022
Revenue ($m)	65,45	69,69	69,22	83,96	93,51
Net profit ($m)	4,57	0,54	1,29	5,23	3,83
Total operating expenses ($m)	60,58	65,23	66,80	78,10	87,28
Capex ($m)	5,663	5,490	5,868	5,884	6,763
Personnel expenses ($m)	23,80	24,78	25,03	30,17	32,06
Number of employees	417000	448000	493000	563000	547000
Earnings per share ($)	17,08	2,06	4,92	19,79	14,54
GHG emissions (mTons)	19,02	19,5	19,41	21,45	22,25
Capex to revenue	8,65%	7,88%	8,48%	7,01%	7,23%
Capex to expenses	9,35%	8,42%	8,78%	7,53%	7,75%
Revenue per employee	156,95 $	155,56 $	140,40 $	149,13 $	170,95 $
Profit margin	6,99%	0,77%	1,86%	6,23%	4,09%
GHG to revenue	29,06%	27,98%	28,04%	25,55%	23,79%
Staff costs to revenue	36,36%	35,55%	36,16%	35,94%	34,28%
EPS growth rate	-	-87,94%	138,83%	302,24%	-26,53%

Source: Compiled by Mincė based on FedEx Corporation annual and ESG reports.

Analysis of DSV annual and Sustainability reports (2018-2022)

	2018	2019	2020	2021	2022
Revenue (DKKm)	79,05	94,70	115,93	182,31	235,67
Net profit (DKKm)	3,99	3,71	4,26	11,25	17,67
Total costs (DKKm)	61,56	70,95	87,40	144,69	183,52
Capex (DKKm)	0,444	1,345	12,545	14,274	1,777
Personnel expenses (DKKm)	13,03	15,63	16,96	19,31	23,96
Number of employees	47394	61216	56621	77958	76283
Earnings per share (DKK)	22,00	18,70	18,70	49,30	77,30
GHG emissions ('000 tons)	7,265	8,887	11,465	15,373	15,93
Capex to revenue	0,56%	1,42%	10,82%	7,83%	0,75%
Capex to expenses	0,72%	1,90%	14,35%	9,87%	0,97%
Revenue per employee	1 668,00 DKK	1 547,00 DKK	2 047,51 DKK	2 338,52 DKK	3 089,35 DKK
Profit margin	5,04%	3,91%	3,67%	6,17%	7,50%
GHG to revenue	9,19%	9,38%	9,89%	8,43%	6,76%

Staff costs to revenue	16,48%	16,50%	14,63%	10,59%	10,17%
EPS growth rate	-	-15,00%	0,00%	163,64%	56,80%

Source: Compiled by Mincė based on DSV A/S annual and sustainability reports.

Analysis of Keuhne+Nagel annual and Sustainability reports (2018-2022)

	2018	2019	2020	2021	2022
Revenue (CHFm)	24,83	25,30	23,81	36,70	43,03
Net profit (CHFm)	0,77	0,80	0,79	2,16	2,81
Total operating expenses (CHFm)	6,55	6,25	5,71	6,22	6,60
Capex (CHFm)	0,315	0,320	0,177	0,197	0,239
Personnel expenses (CHFm)	4,74	4,88	4,44	4,92	5,14
Number of employees	81900	83161	78249	78087	80334
Earnings per share (1 CHF)	6,43	6,67	6,59	16,92	22,15
GHG emissions (m Tons)	-	18,4	13,5	16,8	14,168
Capex to revenue	1,27%	1,27%	0,74%	0,54%	0,56%
Capex to expenses	4,81%	5,12%	3,10%	3,17%	3,62%
Revenue per employee	303,11 CHF	304,17 CHF	304,31 CHF	469,98 CHF	535,69 CHF
Profit margin	3,11%	3,16%	3,31%	5,87%	6,53%
GHG to revenue		72,74%	56,69%	45,78%	32,92%
Staff costs to revenue	19,08%	19,28%	18,66%	13,41%	11,95%
EPS growth rate		3,73%	-1,20%	156,75%	30,91%

Source: Compiled by Mincė based on Keuhne+Nagel annual and sustainability reports.

Analysis of Maersk annual and Sustainability reports (2018-2022)

	2018	2019	2020	2021	2022
Revenue ($m)	39,02	38,89	39,74	61,79	81,53
Net profit ($m)	3,22	-0,44	2,90	18,03	29,32
Total operating expenses ($m)	35,37	33,13	31,80	37,75	44,88
Capex ($m)	2,898	2,035	1,322	2,976	4,163
Personnel expenses ($m)	4,80	4,96	5,21	6,13	7,09
Number of employees	80220	83512	83624	85375	104260
Earnings per share ($)	-10,00	23,00	145,00	941,00	1600,00
GHG emissions (1000 tons)	39,165	36,491	53,561	66,125	77,932
Capex to revenue	7,43%	5,23%	3,33%	4,82%	5,11%
Capex to expenses	8,19%	6,14%	4,16%	7,88%	9,28%
Revenue per employee	486,40 $	465,68 $	475,22 $	723,71 $	781,98 $
Profit margin	8,25%	-1,13%	7,30%	29,19%	35,96%

GHG to revenue	100,37%	93,83%	134,78%	107,02%	95,59%
Staff costs to revenue	12,31%	12,74%	13,11%	9,92%	8,69%
EPS growth rate	-	330,00%	530,43%	548,97%	70,03%

Source: Compiled by Mincė based on A.P. Møller - Mærsk A/S annual and sustainability reports.

Analysis of DFDS annual and CSR reports (2018-2022)

	2018	2019	2020	2021	2022
Revenue (DKKm)	15,72	16,59	13,97	17,87	26,87
Net profit (DKKm)	1,64	1,31	0,44	0,98	2,02
Total operating expenses (DKKm)	12,73	12,96	11,24	14,46	21,92
Capex (DKKm)	9,144	2,769	1,675	4,115	3,162
Personnel expenses (DKKm)	2,80	3,08	2,86	3,44	4,73
Number of employees	7791	8367	8213	8874	11510
Earnings per share (DKK 20 in DKK)	28,99	22,88	7,56	16,69	35,09
GHG emissions (1000 Tons)	1,879	2,196	2,02	3,46	3,908
Capex to revenue	58,18%	16,69%	11,99%	23,03%	11,77%
Capex to expenses	71,84%	21,37%	14,90%	28,46%	14,43%
Revenue per employee	2 017,33 DKK	1 983,03 DKK	1 701,08 DKK	2 013,64 DKK	2 334,75 DKK
Profit margin	10,42%	7,91%	3,16%	5,46%	7,51%
GHG to revenue	11,96%	13,24%	14,46%	19,36%	14,54%
Staff costs to revenue	17,79%	18,55%	20,49%	19,27%	17,60%
EPS growth rate		-21,08%	-66,96%	120,77%	110,25%

Source: Compiled by Mincė based on DFDS annual and CSR reports.

Analysis of Stena Line annual reports (2018-2022)

	2018	2019	2020	2021	2022
Revenue (SEKm)	34,73	37,14	33,34	38,99	53,41
Net profit (SEKm)	0,68	0,13	-4,84	0,98	1,87
Total operating expenses (SEKm)	22,26	23,55	23,20	25,43	34,01
Capex (SEKm)	7,827	5,602	6,169	7,069	8,911
Personnel expenses (SEKm)	6,45	7,00	7,16	7,18	8,71
Number of employees	11370	11800	15200	15400	17200
Earnings per share (1 SEK)	-	-	-	-	-
GHG emissions (Tons CO2)	-	-	74,423	87,46	98,732

Capex to revenue	22,54%	15,08%	18,50%	18,13%	16,68%
Capex to expenses	35,16%	23,79%	26,60%	27,80%	26,20%
Revenue per employee	3 054,53 SEK	3 147,63 SEK	2 193,62 SEK	2 531,88 SEK	3 105,47 SEK
Profit margin	1,96%	0,35%	-14,50%	2,51%	3,50%
GHG to revenue	-	-	223,20%	224,31%	184,84%
Staff costs to revenue	18,58%	18,83%	21,46%	18,41%	16,30%
EPS growth rate	-	-	-	-	-

Source: Compiled by Mincė based on Stena Line AB annual reports.

Analysis of Hapag-Lloyd annual and sustainability reports (2018-2022)

	2018	2019	2020	2021	2022
Revenue (€m)	11,52	12,61	12,77	22,27	34,54
Net profit (€m)	0,46	0,37	0,94	9,09	17,44
Total operating expenses (€m)	11,23	11,83	11,49	12,91	17,11
Capex (€m)	0,10	0,37	0,48	1,23	4,07
Personnel expenses (€m)	0,66	0,68	0,68	0,81	0,98
Number of employees	12765	12996	13117	14106	14248
Earnings per share (€)	0,21	2,06	5,27	51,63	96,89
GHG emissions (m Tons)	13,74	13,70	12,80	15,68	15,58
Capex to revenue	0,90%	2,93%	3,74%	5,53%	11,77%
Capex to expenses	0,93%	3,13%	4,16%	9,54%	23,76%
Revenue per employee	902,08 €	970,14 €	973,70 €	1 579,04 €	2 424,41 €
Profit margin	3,99%	2,96%	7,32%	40,79%	50,47%
GHG to revenue	119,33%	108,62%	100,22%	70,39%	45,09%
Staff costs to revenue	5,72%	5,42%	5,35%	3,64%	2,84%
EPS growth rate		880,95%	155,83%	879,70%	87,66%

Source: Compiled by Mincė based on Hapag-Lloyd annual and sustainability reports.

Analysis of Cosco Shipping Group annual reports (2018-2022)

	2018	2019	2020	2021	2022
Revenue (HK$'000)	9,52	3,27	3,44	4,53	3,96
Net profit (HK$'000)	0,29	0,33	0,35	0,30	0,37
Total operating expenses (HK$'000)	8,96	2,71	2,81	3,76	3,30
Capex (HK$'000)	0,014	0,018	0,011	0,014	0,010
Personnel expenses (HK$'000)	0,38	0,41	0,46	0,43	0,41
Number of employees	876	901	833	847	851
Earnings per share (HK cents)	18,67	21,57	22,08	18,81	22,74

GHG emissions (Metric tons)	6,251	6,626	6,374	6,397	4,642
Capex to revenue	0,15%	0,54%	0,32%	0,32%	0,26%
Capex to expenses	0,16%	0,65%	0,40%	0,38%	0,32%
Revenue per employee	10 869,86 HKD	3 624,86 HKD	4 133,25 HKD	5 353,01 HKD	4 656,87 HKD
Profit margin	3,06%	10,20%	10,11%	6,70%	9,26%
GHG to revenue	65,65%	202,88%	185,13%	141,09%	117,13%
Staff costs to revenue	4,02%	12,43%	13,22%	9,42%	10,22%
EPS growth rate		15,53%	2,36%	-14,81%	20,89%

Source: Compiled by Mincė based on Cosco Shipping Group annual reports.

Analysis of Lufthansa Group annual reports (2018-2022)

	2018	2019	2020	2021	2022
Revenue (€m)	35,84	36,42	13,59	16,81	32,77
Net profit (€m)	2,16	1,21	-6,73	-2,19	0,79
Total operating expenses (€m)	35,47	37,12	20,85	20,77	33,66
Capex (€m)	3,86	3,45	0,96	1,12	2,29
Personnel expenses (€m)	-8,81	-9,12	-6,44	6,33	8,11
Number of employees	135534	138353	110065	105290	109509
Earnings per share (1 €)	4,58	2,55	-12,51	-2,99	0,66
GHG emissions (m Tons)	32,60	33,10	11,40	13,70	23,10
Capex to revenue	10,77%	9,47%	7,08%	6,66%	6,98%
Capex to expenses	10,88%	9,29%	4,61%	5,39%	6,79%
Revenue per employee	264,47 €	263,27 €	123,46 €	159,66 €	299,24 €
Profit margin	6,03%	3,33%	-49,49%	-13,03%	2,41%
GHG to revenue	90,95%	90,87%	83,89%	81,49%	70,49%
Staff costs to revenue	24,58%	25,04%	47,36%	37,64%	24,74%
EPS growth rate		-44,32%	-590,59%	76,10%	122,07%

Source: Compiled by Mincė based on Lufthansa Group annual reports.

Analysis of IAG annual and non-financial reports (2018-2022)

	2018	2019	2020	2021	2022
Revenue (€m)	24,41	25,51	7,81	8,46	23,07
Net profit (€m)	2,90	1,72	-6,92	-2,93	0,43
Total operating expenses (€m)	20,73	22,89	15,23	11,22	21,81
Capex (€m)	2,80	3,47	1,94	0,74	3,88
Personnel expenses (€m)	4,35	5,63	3,56	3,01	4,65
Number of employees	71134	72268	57928	56658	66044

Earnings per share (€ cents)	142,70	86,40	-196,20	-59,10	8,70
GHG emissions (m tons)	-	39,03	14,32	14,24	26,65
Capex to revenue	11,48%	13,59%	24,84%	8,80%	16,80%
Capex to expenses	13,52%	15,14%	12,73%	6,63%	17,77%
Revenue per employee	343,10 €	352,94 €	134,75 €	149,23 €	349,25 €
Profit margin	11,87%	6,72%	-88,69%	-34,69%	1,87%
GHG to revenue	-	153,02%	183,40%	168,46%	115,53%
Staff costs to revenue	17,83%	22,09%	45,61%	35,64%	20,15%
EPS growth rate	-	-39,45%	-327,08%	69,88%	114,72%

Source: Compiled by Mincė based on International consolidated airlines group, S.A. and subsidiaries annual financial statements and consolidated statement of non-financial information.

Analysis of SAS annual and sustainability reports (2018-2022)

	2018	2019	2020	2021	2022
Revenue (MSEK)	44,72	46,74	20,51	13,96	31,82
Net profit (MSEK)	1,59	-2,26	-8,85	-6,52	-7,05
Total operating expenses (MSEK)	42,20	45,57	30,06	19,45	35,16
Capex (MSEK)	2,679	4,580	7,252	1,537	0,749
Personnel expenses (MSEK)	9,44	9,93	7,97	5,50	5,50
Number of employees	10146	10445	7568	5216	8945
Earnings per share (1 SEK)	-	-	-	-	-
GHG emissions (1,000 tons)	4,313	4,21	1,802	1,189	2,446
Capex to revenue	5,99%	9,80%	35,35%	11,01%	2,35%
Capex to expenses	6,35%	10,05%	24,12%	7,90%	2,13%
Revenue per employee	4 407,45 SEK	4 474,49 SEK	2 710,49 SEK	2 676,00 SEK	3 557,74 SEK
Profit margin	3,55%	-4,84%	-43,15%	-46,73%	-22,15%
GHG to revenue	9,64%	9,01%	8,78%	8,52%	7,69%
Staff costs to revenue	21,11%	21,26%	38,85%	39,43%	17,30%
EPS growth rate	-	-	-	-	-

Source: Compiled by Mincė based on Scandinavian Airlines System annual and sustainability reports.

Analysis of Finnair annual reports (2018-2022)

	2018	2019	2020	2021	2022
Revenue (€m)	2,84	3,10	0,83	0,84	2,36
Net profit (€m)	0,15	0,75	-0,52	-0,46	-0,48

Total operating expenses (€m)	2,43	2,67	1,13	1,36	2,71
Capex (€m)	0,33	0,44	0,52	0,44	0,20
Personnel expenses (€m)	0,43	0,54	0,28	0,23	0,45
Number of employees	6462	6788	6131	5041	5230
Earnings per share (1 €)	1,08	0,49	-0,51	-0,34	-0,36
GHG emissions (m Tons)	3,97	4,35	1,15	1,15	2,48
Capex to revenue	11,68%	14,33%	62,23%	51,88%	8,49%
Capex to expenses	13,60%	16,65%	45,66%	32,10%	7,38%
Revenue per employee	438,72 €	456,39 €	135,25 €	166,32 €	450,67 €
Profit margin	5,33%	24,05%	-63,07%	-55,34%	-20,20%
GHG to revenue	140,00%	140,45%	138,81%	136,81%	105,18%
Staff costs to revenue	15,27%	17,27%	34,25%	27,31%	19,09%
EPS growth rate	-	-54,63%	-204,08%	33,33%	5,88%

Source: Compiled by Mincė based on Finnair annual reports.

Analysis of Turkish Airlines annual and sustainability reports (2018-2022)

	2018	2019	2020	2021	2022
Revenue ($m)	12,855	13,229	6,734	10,686	18,426
Net profit ($m)	0,753	0,788	-0,836	0,959	2,725
Total operating expenses ($m)	10,136	10,928	6,378	8,322	14,036
Capex ($m)	0,69	0,66	0,28	2,326	2,948
Personnel expenses ($m)	1,772	2,067	1,097	1,298	2,140
Number of employees	35205	38849	37896	37394	40264
Earnings per share ($ cents)	0,55	0,57	-0,61	0,69	1,97
GHG emissions (m Tons)	16,700	17,867	9,095	16,591	22,983
Capex to revenue	5,38%	4,96%	4,22%	21,77%	16,00%
Capex to expenses	6,82%	6,00%	4,45%	27,95%	21,00%
Revenue per employee	365,15 €	340,52 €	177,70 €	285,77 €	457,63 €
Profit margin	5,86%	5,96%	-12,41%	8,97%	14,79%
GHG to revenue	129,91%	135,06%	135,06%	155,26%	124,73%
Staff costs to revenue	13,78%	15,62%	16,29%	12,15%	11,61%
EPS growth rate	-	3,64%	-207,02%	213,11%	185,51%

Source: Compiled by Mincė based on Turkish Airlines annual and sustainability reports.

Annex 3. Transcript from interview with Western Shipyard Group

0:0:0.0 --> 0:0:4.30

Domantas Mincė

OK, so it seems that transcription recording has started.

0:0:4.80 --> 0:0:5.650

Domantas Mincė

Yes, I can see it's starting.

0:0:5.660 --> 0:0:6.620

Domantas Mincė

So hello Laurynas.

0:0:5.580 --> 0:0:6.910

Laurynas Prikockis

Yes, fully working.

0:0:8.980 --> 0:0:9.140

Laurynas Prikockis

Hi.

0:0:7.670 --> 0:0:9.660

Domantas Mincė

Hello, my name is.

0:0:9.710 --> 0:0:10.880

Domantas Mincė

My name is Domantas.

0:0:10.890 --> 0:0:27.600

Domantas Mincė

I'm a student of Vilnius University Business School and I'm writing master's thesis about disruptive technologies impact for logistics business model and first of all, thanks a lot for giving your time to work with me and to answer the questionnaire I prepared.

0:0:28.110 --> 0:0:32.520

Domantas Mincė

So can you shortly introduce yourself and your company?

0:0:34.350 --> 0:0:34.660

Laurynas Prikockis

Yep.

0:0:34.670 --> 0:0:36.880

Laurynas Prikockis

So I'm CIO, Western shipyard.

0:0:37.790 --> 0:0:47.480

Laurynas Prikockis

The only one company who's building ships repairing those during heavy metal constructions, stevedoring activities engineering, design and ship agencies.

0:0:47.490 --> 0:0:51.420

Laurynas Prikockis

Those are six strategic parts of our entire group.

0:0:51.430 --> 0:0:56.560

Laurynas Prikockis

And then we have 14 different subsidiaries who are helping out in those companies.

0:0:56.570 --> 0:0:57.980

Laurynas Prikockis

So I'm getting.

0:0:58.200 --> 0:1:3.580

Laurynas Prikockis

I'm leading the role of overall centralized IT management.

0:1:5.440 --> 0:1:6.30

Domantas Mincė

OK.

0:1:6.460 --> 0:1:6.990

Domantas Mincė

Thanks a lot.

0:1:7.0 --> 0:1:9.210

Domantas Mincė

So let's begin the interview.

0:1:9.460 --> 0:1:13.710

Domantas Mincė

And the first question is about the challenges.

0:1:13.720 --> 0:1:17.270

Domantas Mincė

As we all know, the past few years were really challenging for a whole world.

0:1:17.320 --> 0:1:18.510

Domantas Mincė

We had COVID-19.

0:1:19.240 --> 0:1:28.890

Domantas Mincė

We have war in Ukraine due to that, fuel prices were increasing and especially nowadays we have lots of regulations on the logistics sector.

0:1:29.100 --> 0:1:30.290

Domantas Mincė

So what do you think?

0:1:30.440 --> 0:1:37.40

Domantas Mincė

Did it forced logistics sector to change and did it have any impact on technologies adoption?

0:1:38.880 --> 0:1:40.510

Laurynas Prikockis

Yeah, I would agree on that topic.

0:1:40.960 --> 0:2:2.940

Laurynas Prikockis

We were influenced by COVID the war, especially when one of our subsidiaries, if we look from the top of the group, not Western shipyard boat from the owners perspective, BLRT group who have a company in Ukraine and we were deeply touched in in metal export and import.

0:2:3.960 --> 0:2:12.720

Laurynas Prikockis

Uhm, way that when the war started, so almost half of our metal import has stopped.

0:2:12.730 --> 0:2:27.740

Laurynas Prikockis

So our prices rose and then it was a huge impact and still we're still feeling that impact with our existing customers trying to solve trying to sell the production on the previously agreed prices.

0:2:28.190 --> 0:2:34.280

Laurynas Prikockis

So this this is really felt in our business, the COVID as well.

0:2:35.920 --> 0:2:42.550

Laurynas Prikockis

Nevertheless, the war took on the logistical part, but the COVID more on the IT perspective.

0:2:42.860 --> 0:2:50.680

Laurynas Prikockis

When our company somehow magically, uh, in one month managed to do 2 years job.

0:2:50.810 --> 0:2:54.660

Laurynas Prikockis

So that was interesting to see to watch and to witness.

0:2:55.70 --> 0:2:57.750

Laurynas Prikockis

So this is interesting and another topic.

0:2:57.970 --> 0:2:58.660

Laurynas Prikockis

Uh.

0:2:59.390 --> 0:3:27.190

Laurynas Prikockis

A political one, probably this could be an aspect of our government and their position regarding China and et cetera, where we have also a logistical chains stopped from that perspective as well on the time when they announced that they, Taiwanese, umm, ambassador like embassy will be established in Lithuania.

0:3:27.500 --> 0:3:30.100

Laurynas Prikockis

So we do, we do face a lot of things here.

0:3:32.200 --> 0:3:32.480

Domantas Mincė

OK.

0:3:32.490 --> 0:3:32.730

Domantas Mincė

Thanks.

0:3:32.740 --> 0:3:36.460

Domantas Mincė

So does it have any impact on your technologies adoption?

0:3:36.470 --> 0:3:41.320

Domantas Mincė

You mentioned that IT was able to perform 24 times faster, right?

0:3:41.430 --> 0:3:45.530

Domantas Mincė

So is it some kind of proof that, you know, it was driven by these challenges?

0:3:46.680 --> 0:3:47.650

Laurynas Prikockis

It was interesting.

0:3:47.660 --> 0:3:47.910

Laurynas Prikockis

Uh.

0:3:47.920 --> 0:3:55.290

Laurynas Prikockis

From the IT perspective, let's say from the management managing of IT where more or less ready, we knew all the tools in the market.

0:3:55.300 --> 0:4:29.700

Laurynas Prikockis

We already adopted them into inside IT department whereas the business side was uh not involved or didn't want to work with the technology and the COVID aspect changed that a lot and helped us out with document electronic document signing which was never a huge deal to us and digitization of the OR becoming a paperless company or a group was also a future target in the in the long perspective.

0:4:30.70 --> 0:4:39.860

Laurynas Prikockis

But that time it was like a trigger and we changed document management signing of those.

0:4:39.870 --> 0:4:40.350

Laurynas Prikockis

We changed.

0:4:40.620 --> 0:4:41.680

Laurynas Prikockis

Umm.

0:4:41.720 --> 0:4:44.650

Laurynas Prikockis

Collaboration and other tools.

0:4:45.620 --> 0:5:0.240

Laurynas Prikockis

We removed a lot of paper processes and changed a lot of those as well, and now we're struggling, let's say with different aspects like AI and etcetera, how to implement that.

0:5:0.520 --> 0:5:8.720

Laurynas Prikockis

But it will be interesting to see, uh, because I'm I will be running a master diploma thesis on AI maturity level.

0:5:8.890 --> 0:5:12.510

Laurynas Prikockis

So couple of things I won't be able to answer.

0:5:13.440 --> 0:5:14.10

Domantas Mincė

OK.

0:5:14.80 --> 0:5:15.260

Domantas Mincė

And there's the thing. So.

0:5:17.70 --> 0:5:27.290

Domantas Mincė

Next question is actually already touching the technologies and I was interested if you are already implemented any AI machine learning or deep learning technologies.

0:5:27.750 --> 0:5:30.400

Domantas Mincė

So I assume that the in progress, right?

0:5:28.170 --> 0:5:31.480

Laurynas Prikockis

No, we're yeah, yeah.

0:5:31.490 --> 0:5:35.370

Laurynas Prikockis

No, we're only I would say that only a scratch of the surface.

0:5:36.0 --> 0:5:37.110

Laurynas Prikockis

Uh, where?

0:5:37.160 --> 0:5:46.260

Laurynas Prikockis

Our companies are building strategies or where they have AI in involved, or they're taking into account of AI.

0:5:46.270 --> 0:5:51.430

Laurynas Prikockis

They speak about it, but none of the management knows what it is.

0:5:52.360 --> 0:5:53.710

Laurynas Prikockis

How to tackle it?

0:5:53.950 --> 0:5:54.890

Laurynas Prikockis

Where to start?

0:5:55.620 --> 0:5:56.330

Laurynas Prikockis

Do we?

0:5:56.400 --> 0:6:2.610

Laurynas Prikockis

Do we have but umm I've conditions to start as such as well and?

0:6:4.360 --> 0:6:25.210

Laurynas Prikockis

Probably by the end of uh, February, we will have a maturity level or maturity assessment of our group of companies where we see ourselves in the eye perspective and this will give us huge leap into creating AI roadmap AI implementation roadmap.

0:6:34.30 --> 0:6:34.570

Laurynas Prikockis

Exactly.

0:6:26.860 --> 0:6:35.220

Domantas Mincė

OK, that's clear step by step towards the uh, implementing this AI and all the other activities, right.

0:6:35.270 --> 0:6:35.740

Domantas Mincė

OK.

0:6:36.170 --> 0:6:36.410

Domantas Mincė

Yeah.

0:6:36.420 --> 0:6:47.420

Domantas Mincė

So we will skip that next question then because it was, you know, related to the AI usage in the beginning when we started talking, you mentioned that one of the I had.

0:6:50.820 --> 0:6:51.80

Domantas Mincė

OK.

0:6:45.350 --> 0:6:53.680

Laurynas Prikockis

But Domantas let's maybe not skip that question because I have a couple of use cases where generic I is being used already in our in our group of companies.

0:6:53.890 --> 0:6:55.320

Domantas Mincė

OK, OK.

0:6:55.380 --> 0:7:3.820

Domantas Mincė

So in the in the theoretical part of my master thesis, I was especially analyzing a few logistics processes affected by the AI.

0:7:4.150 --> 0:7:8.380

Domantas Mincė

I was interested in demand forecasting, predictive maintenance, and route planning.

0:7:8.910 --> 0:7:11.40

Domantas Mincė

So as you mentioned, you might have a couple of cases.

0:7:11.50 --> 0:7:18.720

Domantas Mincė

Are these uh processes affected or optimized using this AI and machine learning?

0:7:19.590 --> 0:7:19.900

Laurynas Prikockis

Yes.

0:7:19.910 --> 0:7:22.480

Laurynas Prikockis

So one of our subsidiaries was then ship repair.

0:7:29.210 --> 0:7:29.420

Domantas Mincė

Mm-hmm.

0:7:22.490 --> 0:7:35.360

Laurynas Prikockis

Uh, they are repairing ships and they started using generic AI chat, GPT, the well-known for everyone, but nobody knows different other tools which are in the market.

0:7:35.770 --> 0:7:46.450

Laurynas Prikockis

So they started using that in logistic management in logistics processes where the materials are being managed and they wanted to get the help.

0:7:47.250 --> 0:8:4.600

Laurynas Prikockis

And interesting thing was that business people without IT knowledge started to using started using the chat GPT and wanted to create a special Excel spreadsheet with an executable code to help them or to ease them daily business processes.

0:8:4.950 --> 0:8:34.620

Laurynas Prikockis

So a couple of use cases are there, but with that comes also the security part, and since I'm also responsible for the security and we notice that our, umm, the proprietary data is going out, we had to shut down those activities and investigate more deep, more in depth because chat GPT is holding a lot of your companies data and this this this isn't allowed according our internal procedures.

0:8:34.810 --> 0:8:57.820

Laurynas Prikockis

So it's a mixed feeling, I would say from one side, you are in a way eligible to use the tools that are in the market, but from the other side, you need to you need you need to be prepared from the security part and then in most cases we are stopping the these activities and analyzing them and let's see where it takes us.

0:8:59.170 --> 0:9:0.520

Domantas Mincė

OK. Yeah.

0:9:0.530 --> 0:9:9.350

Domantas Mincė

So it's coming back to the policy now in the cases back backwards from the camera and so on might be leading to the similar situation, right.

0:9:9.810 --> 0:9:9.970

Laurynas Prikockis

Yeah.

0:9:11.600 --> 0:9:23.830

Domantas Mincė

OK, so in the beginning of the meeting, we discussed shortly that you have one of the one of the branches of your company says the warehousing right?

0:9:23.840 --> 0:9:25.850

Domantas Mincė

Do you have as like the whole subsidiary for that?

0:9:26.280 --> 0:9:30.950

Domantas Mincė

Are you using any technologies to automate or optimize warehouse operations?

0:9:31.60 --> 0:9:34.420

Domantas Mincė

Let's say robots some sorting systems and so on.

0:9:35.810 --> 0:9:36.180

Laurynas Prikockis

OK.

0:9:36.190 --> 0:9:47.760

Laurynas Prikockis

So we're not in very deeply in that cause our warehouse is very, I would say it's small, it's more from the huge material management like plates of steel and etcetera.

0:9:48.190 --> 0:10:6.380

Laurynas Prikockis

But one of these subsidiaries, as you are appearing, it's doing the purchase scenario and we have let's say from the software perspective more automized processes than from the physical warehouse management.

0:10:6.480 --> 0:10:7.30

Laurynas Prikockis

Yeah.

0:10:7.480 --> 0:10:16.550

Laurynas Prikockis

It will be a future deal if we will succeed in our strategic targets, if we will reach our strategic targets in seven years.

0:10:17.80 --> 0:10:18.220

Laurynas Prikockis

So it will be a huge topic.

0:10:19.840 --> 0:10:23.610

Domantas Mincė

The warehouse management itself using automation sensor.

0:10:23.620 --> 0:10:24.320

Domantas Mincė

OK understood.

0:10:22.450 --> 0:10:24.330

Laurynas Prikockis

Yes, exactly.

0:10:24.340 --> 0:10:25.820

Laurynas Prikockis

It will be a huge topic in the future.

0:10:26.450 --> 0:10:26.640

Domantas Mincė

OK.

0:10:27.630 --> 0:10:28.0

Domantas Mincė

OK.

0:10:28.10 --> 0:10:29.220

Domantas Mincė

Thanks. Yeah.

0:10:28.20 --> 0:10:31.470

Laurynas Prikockis

But it yeah, but at first we need to gather the data and then the stand.

0:10:31.480 --> 0:10:34.310

Laurynas Prikockis

What kind of data we have and where we could use that data?

0:10:36.590 --> 0:10:36.710

Domantas Mincė

Yeah.

0:10:34.320 --> 0:10:37.100

Laurynas Prikockis

So basically monetizing the data, in other words.

0:10:38.880 --> 0:10:44.110

Domantas Mincė

OK, so the next one is about the electrification.

0:10:44.200 --> 0:10:58.670

Domantas Mincė

I was more analyzing the vehicles that additional vehicles that we are using on the roads, but maybe you have some use cases or you or you are using in your companies as well some kind of electrification of the maritime fleet.

0:10:58.760 --> 0:11:0.210

Domantas Mincė

Is there any signs to that?

0:11:0.280 --> 0:11:1.330

Domantas Mincė

Is it going somewhere?

0:11:1.910 --> 0:11:2.380

Laurynas Prikockis

Yes.

0:11:2.590 --> 0:11:2.960

Laurynas Prikockis

Yeah.

0:11:2.970 --> 0:11:11.560

Laurynas Prikockis

We recently signed a contract with the Lithuanian Governmental organization where we will, where we will build, build a ship.

0:11:11.570 --> 0:11:16.880

Laurynas Prikockis

It will be a river ship which will be ran on electricity.

0:11:25.500 --> 0:11:25.820

Domantas Mincė

OK.

0:11:16.890 --> 0:11:29.540

Laurynas Prikockis

So basically on that theories and that's a future thing and probably the first one ever in Lithuania to be built, though there are use cases and the prototype will be will be built for Lithuanian governmental.

0:11:31.850 --> 0:11:37.230

Domantas Mincė

It's to add to the same question, so this will definitely affect sustainability, right?

0:11:37.240 --> 0:11:44.50

Domantas Mincė

As we are not using the fossil fuel then, but did you have any calculations about cost saving?

0:11:44.800 --> 0:11:45.190

Domantas Mincė

It does.

0:11:45.200 --> 0:11:48.940

Domantas Mincė

It does it bring some kind of cost saving or is it projected to bring cost saving?

0:11:49.900 --> 0:11:51.910

Laurynas Prikockis

But it will in, and it should.

0:11:52.40 --> 0:11:53.950

Laurynas Prikockis

I'm not very into those numbers.

0:11:55.910 --> 0:11:56.40

Domantas Mincė

Hey.

0:11:54.60 --> 0:11:57.590

Laurynas Prikockis

I'm not running that department, but we are very.

0:11:57.960 --> 0:12:10.280

Laurynas Prikockis

Let's say we're pressed from the government and ESG rules, so we have to obey and the maritime industry is undergoing are already two years in a row, uh.

0:12:10.780 --> 0:12:18.870

Laurynas Prikockis

Their the exhaust filters and etcetera and a lot of ship repairs are being done on that on that field.

0:12:19.180 --> 0:12:23.380

Laurynas Prikockis

So we have let's say we are on a huge pressure here.

0:12:24.480 --> 0:12:31.530

Domantas Mincė

OK, so how do you see the electrification impacting logistics in the next 5 to 10 years?

0:12:31.710 --> 0:12:32.830

Domantas Mincė

What is your projections?

0:12:33.660 --> 0:12:38.170

Laurynas Prikockis

Ohh, as a human being I have one opinion as a as a CIO there is another one.

0:12:38.370 --> 0:12:43.950

Laurynas Prikockis

Uh, I would say as a CIO that electric electricity isn't very.

0:12:44.890 --> 0:12:51.870

Laurynas Prikockis

Uh green as it is, and I would see hydrogen rise.

0:12:52.740 --> 0:12:56.330

Laurynas Prikockis

And this will be more interesting to see.

0:12:56.340 --> 0:12:59.960

Laurynas Prikockis

Nevertheless, currently we have an electricity hype.

0:13:0.900 --> 0:13:10.930

Laurynas Prikockis

And until nobody will solve the battery reuse, repair and retention.

0:13:11.240 --> 0:13:15.820

Laurynas Prikockis

Uh, things it will be hard to predict future.

0:13:16.740 --> 0:13:17.250

Laurynas Prikockis

Uh.

0:13:17.260 --> 0:13:24.570

Laurynas Prikockis

Nevertheless, umm, I would like to see the first person I've built.

0:13:25.120 --> 0:13:27.100

Laurynas Prikockis

And uh umm.

0:13:32.120 --> 0:13:32.480

Laurynas Prikockis

Umm.

0:13:34.920 --> 0:13:36.10

Laurynas Prikockis

And to do.

0:13:43.480 --> 0:13:45.60

Laurynas Prikockis

Just a second, I forgot the word.

0:13:44.780 --> 0:13:46.620

Domantas Mincė

Umm OK.

0:13:47.680 --> 0:13:48.580

Laurynas Prikockis

Go to words.

0:13:52.410 --> 0:13:53.60

Laurynas Prikockis

Do we have?

0:13:53.110 --> 0:13:54.160

Laurynas Prikockis

Do we have time or not?

0:13:54.920 --> 0:13:55.430

Domantas Mincė

Yes, yes.

0:13:57.670 --> 0:13:58.540

Laurynas Prikockis

OK, OK.

0:13:55.440 --> 0:13:59.490

Domantas Mincė

So, so we still have 20 minutes from our meeting and.

0:14:2.90 --> 0:14:3.690

Laurynas Prikockis

So basically the uh.

0:14:5.40 --> 0:14:7.900

Laurynas Prikockis

Electric vessel has to.

0:14:10.760 --> 0:14:14.80

Laurynas Prikockis

Has to justify its purpose and.

0:14:14.90 --> 0:14:16.450

Laurynas Prikockis

Uh, the environmental aspect.

0:14:16.460 --> 0:14:32.80

Laurynas Prikockis

So until that moment, until we will build it until it will go into production, let's say or on a heavy duty, uh, we won't be able to say what's the, what's the real, what's the future.

0:14:32.610 --> 0:14:41.80

Laurynas Prikockis

We can also witness the Rockets are not flying on the electric batteries there, basically running on rocket fuel and lots of other things.

0:14:48.920 --> 0:14:49.220

Domantas Mincė

OK.

0:14:41.450 --> 0:14:56.70

Laurynas Prikockis

So I I'm not very convinced in five year perspective that will move rapidly into an electric batteries basically maybe diesel fuel will diesel as such will be used less but not petrol.

0:14:58.470 --> 0:14:59.0

Domantas Mincė

OK.

0:14:59.10 --> 0:15:0.280

Domantas Mincė

Yeah, that's that makes sense.

0:15:0.290 --> 0:15:7.170

Domantas Mincė

I mean, I guess it will be interesting from my work perspective from this thesis it will be comparing also road and air logistics.

0:15:7.180 --> 0:15:14.700

Domantas Mincė

So then it will be interesting to see how other sectors sees the electricity future of the electrification.

0:15:15.480 --> 0:15:16.130

Laurynas Prikockis

Interesting.

0:15:16.140 --> 0:15:20.390

Laurynas Prikockis

Our battery would fit in a in Airbus 308.

0:15:20.870 --> 0:15:21.530

Domantas Mincė

Exactly so.

0:15:20.480 --> 0:15:21.790

Laurynas Prikockis

It's a small, small plane.

0:15:23.280 --> 0:15:25.750

Domantas Mincė

There are different kind of schools of thoughts, you know on that.

0:15:25.760 --> 0:15:28.420

Domantas Mincė

So we will see what experts in these fields will tell.

0:15:29.760 --> 0:15:30.190

Domantas Mincė

OK.

0:15:30.200 --> 0:15:30.590

Domantas Mincė

Thanks.

0:15:30.600 --> 0:15:33.840

Domantas Mincė

So then let's move to the other technology, the telematics.

0:15:34.750 --> 0:15:45.300

Domantas Mincė

So this telematics planning role in your logistics operations, maybe you are building in some kind of devices for your clients that are doing the purpose of this telematics purpose for them?

0:15:46.380 --> 0:15:49.90

Laurynas Prikockis

We're not building, we're basically a user in this.

0:15:49.100 --> 0:15:55.90

Laurynas Prikockis

In this aspect, we do have couple of vehicles or a fleet of vehicles.

0:15:55.100 --> 0:15:59.70

Laurynas Prikockis

One of our subsidiaries is a transportation company.

0:15:59.620 --> 0:16:7.190

Laurynas Prikockis

And they have different sorts of machineries for rent and for cargo carrying and et cetera.

0:16:7.420 --> 0:16:15.150

Laurynas Prikockis

And we are using telemetry data for a long time and recent project which is started recently.

0:16:15.560 --> 0:16:21.30

Laurynas Prikockis

It's showing that this telemetry is being built into, uh, internal used machines.

0:16:22.80 --> 0:16:23.380

Laurynas Prikockis

Uh, like forklift?

0:16:23.390 --> 0:16:26.140

Laurynas Prikockis

Hers and heavy lifters.

0:16:29.800 --> 0:16:30.280

Domantas Mincė

Umm.

0:16:26.200 --> 0:16:33.30

Laurynas Prikockis

I don't know bulldozer if there's such a word or whatsoever, or for cargo carrying or for grain and et cetera.

0:16:33.910 --> 0:16:35.710

Laurynas Prikockis

And not only that, we are.

0:16:35.720 --> 0:16:45.600

Laurynas Prikockis

We are trying to build as well uh video surveillance as a telemetry, basically combining those two things where the vehicle is going, what's the?

0:16:47.580 --> 0:16:48.590

Laurynas Prikockis

Uh, what?

0:16:48.660 --> 0:17:0.40

Laurynas Prikockis

In what kind of information can we get from idle, idle, engine running or location and etcetera and to map it with umm with other sorts of video surveillance?

0:17:2.800 --> 0:17:3.20

Domantas Mincė

Umm.

0:17:0.130 --> 0:17:13.410

Laurynas Prikockis

If there is a accident and as a use case, so this is, this is becoming a huge topic as well and I would say IoT will be will be one of the interesting topics to witness.

0:17:13.800 --> 0:17:15.500

Domantas Mincė

Yeah, definitely.

0:17:15.510 --> 0:17:19.60

Domantas Mincė

So the telematics basically is nothing without IoT.

0:17:19.450 --> 0:17:19.650

Laurynas Prikockis

Yep.

0:17:19.70 --> 0:17:20.140

Domantas Mincė

So yeah.

0:17:20.670 --> 0:17:25.340

Domantas Mincė

And so you said that you are using telemetry for quite some time already.

0:17:25.550 --> 0:17:29.560

Domantas Mincė

So since introduction, did it improve any fleet management operations?

0:17:30.280 --> 0:17:36.20

Domantas Mincė

Maybe driver safety or overall efficiency of a company cost savings fund that myself?

0:17:34.550 --> 0:17:38.200

Laurynas Prikockis

So yeah, I will talk from two company perspective.

0:17:38.210 --> 0:17:52.480

Laurynas Prikockis

One company is which is recently implementing the video surveillance and telemetry into its internal machinery, and the other one is uh, which has years of experience with telemetry, that transportation.

0:17:53.150 --> 0:17:55.400

Laurynas Prikockis

Ohm, we're not.

0:17:55.490 --> 0:18:0.760

Laurynas Prikockis

We're not having or let's say the competition is huge, but we're very small in that.

0:18:27.410 --> 0:18:27.610

Domantas Mincė

Umm.

0:18:0.770 --> 0:18:46.450

Laurynas Prikockis

So the efficiency is felt from the money perspective and I don't have now the numbers, but recent talks with the technical director of one of the companies said that even analyzing the data allows you to purchase a specific sort of car or a maker uh let's say Mercedes or whatsoever if the driver is very good then the company is investing in purchasing Mercedes or although other vehicles if not then more simpler solution could be could be selected, so different sorts of information can be gathered and decisions could be made.

0:18:48.740 --> 0:18:49.410

Domantas Mincė

OK.

0:18:49.720 --> 0:18:53.150

Domantas Mincė

Did you have any challenges integrating telematics into your operations?

0:18:54.180 --> 0:18:54.530

Laurynas Prikockis

Up.

0:18:53.200 --> 0:18:58.420

Laurynas Prikockis

Yeah, that was more the organizational challenges and the change of that.

0:18:58.730 --> 0:19:10.780

Laurynas Prikockis

And the interesting thing was when people understood that everything's being monitored and decision decisions are made on the actual data, then their behavior changed.

0:19:11.470 --> 0:19:17.430

Laurynas Prikockis

Nevertheless, they mean every system there is always a whole and they are here.

0:19:17.440 --> 0:19:19.560

Laurynas Prikockis

Let's say they're becoming more.

0:19:23.50 --> 0:19:26.350

Laurynas Prikockis

More wise and to how to use or if they would like to.

0:19:26.920 --> 0:19:27.850

Laurynas Prikockis

Uh.

0:19:30.10 --> 0:19:32.10

Laurynas Prikockis

Let's say the rate of.

0:19:35.210 --> 0:19:38.310

Laurynas Prikockis

Losses decrease, it decreased basically.

0:19:38.70 --> 0:19:40.30

Domantas Mincė

Hello. OK.

0:19:42.260 --> 0:19:46.370

Domantas Mincė

So now we are talking a lot about data you mentioned, even monetizing the data, right?

0:19:47.40 --> 0:19:51.330

Domantas Mincė

So I assume you are already in that path and you are working towards that.

0:19:51.600 --> 0:19:54.400

Domantas Mincė

So are you using data?

0:19:54.840 --> 0:19:55.530

Domantas Mincė

I guess you are.

0:19:55.550 --> 0:19:57.790

Domantas Mincė

But are you using data driven decisions?

0:19:57.860 --> 0:20:3.730

Domantas Mincė

Are you making decisions based on data and does it have any impact on your supply chains?

0:20:3.780 --> 0:20:10.60

Domantas Mincė

Resilience during disruptions like COVID and overall in the companies management basically.

0:20:10.860 --> 0:20:11.500

Laurynas Prikockis

Not overall.

0:20:12.630 --> 0:20:13.890

Laurynas Prikockis

Now that we're all but.

0:20:16.240 --> 0:20:16.650

Laurynas Prikockis

Uh.

0:20:16.680 --> 0:20:17.410

Laurynas Prikockis

In ways, yes.

0:20:18.390 --> 0:20:20.790

Laurynas Prikockis

So it depends on the company. Uh.

0:20:20.970 --> 0:20:21.220

Domantas Mincė

Umm.

0:20:23.850 --> 0:20:24.130

Laurynas Prikockis

Umm.

0:20:26.670 --> 0:20:33.80

Laurynas Prikockis

Sorry, just got a entry from from and could you repeat the question now?

0:20:34.370 --> 0:20:46.560

Domantas Mincė

Uh, the data driven decision making have does the data driven decision making has an impact on your supply chain strategy and resilience during disruptions like COVID-19 or war?

0:20:45.870 --> 0:20:47.620

Laurynas Prikockis

Yes, yes, for sure.

0:20:47.710 --> 0:20:52.500

Laurynas Prikockis

We started planning the leads times more and more in detail.

0:20:53.120 --> 0:21:12.160

Laurynas Prikockis

The contracts are being signed with more, more cautious, let's say, and then the risks are being managed more strictly as they as it were before and especially the planning process in the future changed an example from IT perspective.

0:21:12.670 --> 0:21:14.950

Laurynas Prikockis

If you need to get a specific machine or.

0:21:17.10 --> 0:21:23.650

Laurynas Prikockis

Routing equipment or whatsoever you need to plan like the half a year in front of you.

0:21:23.800 --> 0:21:33.280

Laurynas Prikockis

So forecasting a delivery or a forecasting, how your equipment will work in the future have become very, very increased let's say like that.

0:21:34.570 --> 0:21:34.790

Domantas Mincė

OK.

0:21:37.90 --> 0:21:37.510

Domantas Mincė

OK.

0:21:39.310 --> 0:21:51.920

Domantas Mincė

Moving to a bit different direction, do you collaborate with any technology providers, startups, industry partners, maybe scientific organizations to stay in front of the, you know, advancements of in logistics?

0:21:54.360 --> 0:21:55.450

Laurynas Prikockis

Myself not.

0:21:55.540 --> 0:22:5.510

Laurynas Prikockis

Uh, maybe other companies are doing that and I didn't heard of the those kind of such kind of, umm, umm, examples or.

0:22:6.510 --> 0:22:17.70

Laurynas Prikockis

I'm not like startup startups are a topic in our management on between our management, let's say, but not as a huge deal.

0:22:18.760 --> 0:22:19.210

Domantas Mincė

OK.

0:22:19.290 --> 0:22:19.660

Domantas Mincė

Understood.

0:22:21.430 --> 0:22:36.370

Domantas Mincė

So the overall topic and I guess the main question, so the disruptive technologies, we discussed AI electrification telematics, created a new business models or substantially changed the current ones that you have before.

0:22:37.770 --> 0:22:39.260

Laurynas Prikockis

I wouldn't say changed.

0:22:39.310 --> 0:22:54.840

Laurynas Prikockis

I think other initiatives that we are running or launching did or will change more than existing ones, but the technology you mentioned will shape the maritime sector for sure.

0:22:55.450 --> 0:23:7.640

Laurynas Prikockis

And I'm hoping that we will have enough data to run those technologies, otherwise it makes no sense to run something if you don't have on the core.

0:23:10.180 --> 0:23:10.330

Domantas Mincė

No.

0:23:9.410 --> 0:23:12.580

Laurynas Prikockis

But yeah, it will.

0:23:12.590 --> 0:23:14.690

Laurynas Prikockis

It will increase in that it will change.

0:23:12.630 --> 0:23:15.700

Domantas Mincė

So it's the future, right?

0:23:17.750 --> 0:23:18.70

Domantas Mincė

OK.

0:23:16.150 --> 0:23:18.420

Laurynas Prikockis

Yeah, that's the future data monetization.

0:23:19.980 --> 0:23:20.180

Domantas Mincė

Sure.

0:23:20.840 --> 0:23:24.410

Domantas Mincė

Uh, before going to the so this is next to the last one.

0:23:24.420 --> 0:23:25.440

Domantas Mincė

So do you have any KPI?

0:23:27.0 --> 0:23:35.910

Domantas Mincė

To follow up how these technologies are affecting your business model or overall operations in the not overall or just operations in the companies.

0:23:36.910 --> 0:23:39.980

Laurynas Prikockis

So in a way, yes, in a way, not the.

0:23:39.990 --> 0:23:45.140

Laurynas Prikockis

Yes, is when you run a project you do the ROI and other calculations.

0:23:45.670 --> 0:23:51.460

Laurynas Prikockis

But from if we will talk from the machine learning AI and etcetera, what's the?

0:23:51.890 --> 0:23:53.960

Laurynas Prikockis

What's the return out of it?

0:23:54.310 --> 0:23:56.20

Laurynas Prikockis

We are on a Greenfield now.

0:23:56.30 --> 0:23:57.270

Laurynas Prikockis

Basically, we're very green here.

0:23:57.990 --> 0:23:58.250

Domantas Mincė

Umm.

0:23:58.860 --> 0:24:3.130

Laurynas Prikockis

It's we're an early stages and this this will be a future deal.

0:24:5.840 --> 0:24:6.450

Domantas Mincė

Okay, thank you.

0:24:6.460 --> 0:24:7.850

Domantas Mincė

So the and last one.

0:24:8.420 --> 0:24:17.650

Domantas Mincė

So as I mentioned, the group is owned by the Scandinavian the main group holding owning this WSY you mentioned BLRT Group, right?

0:24:18.50 --> 0:24:18.580

Laurynas Prikockis

Estonian.

0:24:21.940 --> 0:24:22.130

Laurynas Prikockis

Yep.

0:24:17.660 --> 0:24:26.960

Domantas Mincė

It's working not only a story and it's not working only in Lithuania, do you see any differences in the adoption of technologies between different countries?

0:24:28.710 --> 0:24:29.620

Laurynas Prikockis

Yes and no.

0:24:29.670 --> 0:24:55.810

Laurynas Prikockis

No, umm, if we talk about like let's say eight years ago, there were huge differences into how we managed IT and then and the services service implementation and they now we are more or less on the same page regarding specific tools and specific data usage et cetera.

0:24:56.200 --> 0:25:11.860

Laurynas Prikockis

But since uh, the management is in Estonia and we are across Finland, Estonia, Latvia, Lithuania, Poland and Ukraine, it is very hard to compare.

0:25:12.290 --> 0:25:15.580

Laurynas Prikockis

Uh, different countries, different mentalities and etcetera.

0:25:15.590 --> 0:25:23.460

Laurynas Prikockis

Nevertheless, everyone understands that digitization is the future everyone's trying to go to be with the tech.

0:25:24.360 --> 0:25:27.640

Laurynas Prikockis

Otherwise there will be wiped from the uh map surface.

0:25:30.470 --> 0:25:31.840

Domantas Mincė

Yeah, that's clear.

0:25:31.850 --> 0:25:33.280

Domantas Mincė

So that's it.

0:25:33.330 --> 0:25:34.510

Domantas Mincė

I don't have anymore questions.

0:25:34.520 --> 0:25:37.220

Domantas Mincė

It was really interesting to have this interview and see your views on that.

0:25:37.310 --> 0:25:39.480

Domantas Mincė

It's nice that you are implementing.

0:25:39.650 --> 0:25:44.260

Domantas Mincė

I do not know about this ship that will be built, that electric ship that will be built.

0:25:44.270 --> 0:25:47.600

Domantas Mincė

It's really interesting to see how we will move forward.

0:25:48.220 --> 0:25:48.840

Domantas Mincė

Thanks a lot again.

0:25:49.880 --> 0:25:50.360

Laurynas Prikockis

You're welcome.

Annex 4. Transcript from interview with DPD

0:0:0.0 --> 0:0:0.140

Domantas Mincė

So.

0:0:5.900 --> 0:0:6.20

Dovilė Stasiūnaitė

Yes.

0:0:3.410 --> 0:0:10.640

Domantas Mincė

OK, I see that recording has started, so a lot of thanks a lot for having this interview with me.

0:0:10.770 --> 0:0:14.880

Domantas Mincė

So firstly I want to inform you that it is being recorded and transcribed.

0:0:14.890 --> 0:0:15.290

Domantas Mincė

Do you agree?

0:0:15.970 --> 0:0:16.590

Dovilė Stasiūnaitė

Yes, of course.

0:0:17.220 --> 0:0:17.750

Domantas Mincė

OK, good.

0:0:17.760 --> 0:0:18.120

Domantas Mincė

Thanks.

0:0:18.230 --> 0:0:19.470

Domantas Mincė

So my name is Domantas.

0:0:19.480 --> 0:0:21.910

Domantas Mincė

I'm student of Vilnius university Business School.

0:0:22.220 --> 0:0:27.90

Domantas Mincė

I'm studying deep tech entrepreneurship program and I'm doing master thesis on uh.

0:0:27.860 --> 0:0:33.420

Domantas Mincė

And I'm researching how disruptive technologies are affecting logistics business models.

0:0:33.760 --> 0:0:34.120

Dovilė Stasiūnaitė

Uh-huh.

0:0:33.980 --> 0:0:37.730

Domantas Mincė

I'm having interviews with the different companies in three sectors.

0:0:38.580 --> 0:0:39.730

Domantas Mincė

Road transportation.

0:0:39.900 --> 0:0:41.790

Domantas Mincė

There is no pure road transportation, so I'm calling it.

0:0:43.470 --> 0:0:43.690

Dovilė Stasiūnaitė

Umm.

0:0:51.280 --> 0:0:53.390

Dovilė Stasiūnaitė

Mm-hmm. OK.

0:0:41.800 --> 0:0:54.910

Domantas Mincė

Integrated logistics providers see-maritime logistics and air logistics and seeing you know how different sectors react the to the changes, can you do short introduction from your side?

0:0:55.820 --> 0:1:2.810

Dovilė Stasiūnaitė

Yes, of course I am business development manager for Baltics, for the DPD, and there is no such legal entity as DPD Baltic.

0:1:2.820 --> 0:1:5.630

Dovilė Stasiūnaitė

So I officially the do work for DPD Lithuania.

0:1:5.640 --> 0:1:8.850

Dovilė Stasiūnaitė

However, I represent the Baltic structure here.

0:1:8.860 --> 0:1:16.20

Dovilė Stasiūnaitė

My team is responsible for the R&D part, which is like research and development, product development managers and the PMO.

0:1:16.680 --> 0:1:28.200

Dovilė Stasiūnaitė

We are mainly oriented towards the innovations and the company and the projects that are applicable just for all three countries and we also represent Baltics and the DPD group.

0:1:28.210 --> 0:1:31.30

Dovilė Stasiūnaitė

As you know, we do belong to the DPD group, which is La Poste.

0:1:31.40 --> 0:1:42.440

Dovilė Stasiūnaitė

Our job post group now, so we are very much connected and if we are talking about the initiatives or the innovations, so we are also very much sharing our best practices and experiences.

0:1:44.260 --> 0:1:46.440

Dovilė Stasiūnaitė

So that's very shortly about me and what we are doing.

0:1:47.150 --> 0:1:47.710

Domantas Mincė

That's good.

0:1:47.720 --> 0:1:48.10

Domantas Mincė

Thanks.

0:1:48.20 --> 0:1:48.280

Domantas Mincė

About.

0:1:48.290 --> 0:1:51.760

Domantas Mincė

So let's not waste any time and let's go to the question.

0:1:53.940 --> 0:1:54.370

Dovilė Stasiūnaitė

Umm.

0:1:51.770 --> 0:1:56.940

Domantas Mincė

So the questions are standard the same questions are being asked for all the all the companies.

0:1:56.950 --> 0:1:59.400

Domantas Mincė

So the first one is about the challenges.

0:2:2.890 --> 0:2:3.140

Dovilė Stasiūnaitė

Umm.

0:1:59.470 --> 0:2:4.440

Domantas Mincė

As we know, past few years were really and still is really challenging for the whole world.

0:2:8.890 --> 0:2:9.130

Dovilė Stasiūnaitė

Mm-hmm.

0:2:4.450 --> 0:2:20.80

Domantas Mincė

So in my work I was examining COVID-19, war in Ukraine, increasing fuel prices, which is more of a consequence of these two first ones and the regulations that are being imposed by different organizations like EU.

0:2:20.690 --> 0:2:26.380

Domantas Mincė

How do you see the challenges of past few years forced logistics sector to change?

0:2:26.850 --> 0:2:39.40

Dovilė Stasiūnaitė

This the impact of those two are like 2 polar opposites because when the COVID-19 hit us, we experienced significant demand for our services, especially which is contactless solutions.

0:2:39.150 --> 0:2:45.800

Dovilė Stasiūnaitė

So not immediately a Courier deliveries, but out of home, which is partial delivery lockers in our case.

0:2:45.850 --> 0:2:55.100

Dovilė Stasiūnaitė

So first, what we had to do, we need to we had to rapidly plan our expansions and invest quite a lot of money into this technology into this solution.

0:2:55.250 --> 0:3:2.130

Dovilė Stasiūnaitė

The second part was to improve contactless deliveries, which means no cash, so no COD solution.

0:3:2.140 --> 0:3:4.890

Dovilė Stasiūnaitė

As such, just contactless payment card payments.

0:3:5.320 --> 0:3:10.190

Dovilė Stasiūnaitė

Also, you know that usually when Courier delivers parcels, we must take the signature of the person.

0:3:10.200 --> 0:3:26.620

Dovilė Stasiūnaitė

So we had to develop a very fastly solution so that instead of the contact with the Courier and touching the screen of his device, you had to simply say the PIN code and that was approved as they deliver it to the precise person because that's our obligation when it comes to the legislation.

0:3:28.40 --> 0:3:32.930

Dovilė Stasiūnaitė

Another thing is the demand for the workforce and in our case also the fleet.

0:3:32.940 --> 0:3:36.770

Dovilė Stasiūnaitė

So we had to recruit rapidly new staff.

0:3:36.780 --> 0:3:43.310

Dovilė Stasiūnaitė

We had to expand also our IT team because a lot of developments were connected to the digital part of the business.

0:3:43.320 --> 0:3:47.0

Dovilė Stasiūnaitė

So digitalization was hitting us also very hard.

0:3:47.10 --> 0:4:0.160

Dovilė Stasiūnaitė

We had to adjust rapidly to those demands and of course it also opened the opportunities for the new niches like food delivery service, because we noticed it was already like a habit created for people to receive more and more goods at home.

0:4:0.170 --> 0:4:9.280

Dovilė Stasiūnaitė

So that was also a chance for us to discover this opportunity and now we are trying to raise this market further when the COVID we can say is gone, but it's actually not gone.

0:4:9.290 --> 0:4:9.880

Dovilė Stasiūnaitė

It's still here.

0:4:9.890 --> 0:4:15.40

Dovilė Stasiūnaitė

It's just not, you know, so much impacting our market and the situation. With the war in the Ukraine.

0:4:15.50 --> 0:4:20.160

Dovilė Stasiūnaitė

It was different situation because it kind of impacted consumption.

0:4:20.630 --> 0:4:27.740

Dovilė Stasiūnaitė

People started to evaluate better and risks of their lives, so they started saving more.

0:4:27.750 --> 0:4:38.670

Dovilė Stasiūnaitė

So if ecommerce boomed during the COVID and we didn't have to worry, you know about parcel volumes and the business, the war significantly impacted for us this part.

0:4:38.680 --> 0:4:46.690

Dovilė Stasiūnaitė

So if no parcels means that our business immediately becomes inefficient, and then of course the costs because you know the fuel prices.

0:4:46.700 --> 0:4:50.430

Dovilė Stasiūnaitė

And in general, all kinds of materials became more expensive.

0:4:50.640 --> 0:4:56.430

Dovilė Stasiūnaitė

But in our case, we can impact this and mitigate the businesses because we do have surcharge for our customers.

0:4:56.440 --> 0:5:3.50

Dovilė Stasiūnaitė

So we are asking them, you know, to cover the costs partially by the specific percentage every month that we are applying to them.

0:5:3.240 --> 0:5:6.420

Dovilė Stasiūnaitė

And here we are talking about if you will and are sold the workforce.

0:5:7.250 --> 0:5:15.920

Dovilė Stasiūnaitė

So if there is an increase in the wages that we pay for our stuff, it means that we are also increasing our charges and it's the same for the fuel.

0:5:15.930 --> 0:5:18.340

Dovilė Stasiūnaitė

So we simply apply that, but it was not easy.

0:5:18.350 --> 0:5:27.460

Dovilė Stasiūnaitė

Clearly, because suddenly the situation changed and definitely other costs for the business, the electricity, the power, everything, basically.

0:5:27.550 --> 0:5:33.620

Dovilė Stasiūnaitė

So we had to adjust all parts and including the pricing and including you know our staff.

0:5:33.690 --> 0:5:44.430

Dovilė Stasiūnaitė

So if we hired more staff, regardless of which one, is it an administration or in the warehouse, we simply had to reduce it because we had to adjust.

0:5:44.680 --> 0:5:51.450

Dovilė Stasiūnaitė

And of course the markets, because Russia was not the main market for us clearly same as the Ukraine or the Belorussia.

0:5:51.580 --> 0:5:54.450

Dovilė Stasiūnaitė

However, there were still some relationships, as in the Baltic.

0:5:54.460 --> 0:5:55.830

Dovilė Stasiūnaitė

Some businesses are more connected.

0:5:55.840 --> 0:6:1.450

Dovilė Stasiūnaitė

For example, Estonia and Latvia, this community is pretty much strong and very big in those countries.

0:6:1.640 --> 0:6:8.650

Dovilė Stasiūnaitė

So we also had to reevaluate that and especially lately as suffered a lot because they had to cut the cord with Russia, any kind of relationship.

0:6:9.80 --> 0:6:12.630

Dovilė Stasiūnaitė

But the business was connected with Russia. So for us it's immediate.

0:6:12.780 --> 0:6:14.410

Dovilė Stasiūnaitė

And like I said, polar opposites.

0:6:15.810 --> 0:6:24.780

Domantas Mincė

Yeah, but as I understood from the beginning of your answer, so you implemented this contactless PIN codes right, that you do.

0:6:24.670 --> 0:6:24.920

Dovilė Stasiūnaitė

Umm.

0:6:24.790 --> 0:6:28.660

Domantas Mincė

So although more post terminals, so it definitely had impact on adoption.

0:6:28.670 --> 0:6:32.230

Domantas Mincė

So it made you to adapt and implement these technologies?

0:6:31.510 --> 0:6:32.350

Dovilė Stasiūnaitė

Yeah, very, very.

0:6:34.640 --> 0:6:34.890

Domantas Mincė

Umm.

0:6:32.360 --> 0:6:36.640

Dovilė Stasiūnaitė

It was basically overnight, like in a month to deliver this pen solution.

0:6:36.830 --> 0:6:42.740

Dovilė Stasiūnaitė

Then overnight business case for the locals network expansions ordering, we kind of doubled our networks.

0:6:42.750 --> 0:6:44.570

Dovilė Stasiūnaitė

I think in the Baltics during that time.

0:6:44.670 --> 0:6:56.500

Dovilė Stasiūnaitė

So if we were pretty conservative in the market with this solution, we saw significant demand and I should also add the return solutions because previously people were very much used to that Courier is coming and they're turning the parcels.

0:6:56.570 --> 0:7:0.130

Dovilė Stasiūnaitė

So we also had to create return solutions for the parcel lockers.

0:7:6.760 --> 0:7:7.160

Domantas Mincė

Yeah.

0:7:7.210 --> 0:7:7.580

Domantas Mincė

Yeah.

0:7:1.450 --> 0:7:7.950

Dovilė Stasiūnaitė

So that it's also had to be compact list so everything else, contact list, everything. Mm-hmm.

0:7:7.990 --> 0:7:8.640

Domantas Mincė

OK.

0:7:9.390 --> 0:7:9.880

Domantas Mincė

Thank you.

0:7:11.790 --> 0:7:12.60

Dovilė Stasiūnaitė

Umm.

0:7:17.170 --> 0:7:17.430

Dovilė Stasiūnaitė

Umm.

0:7:20.780 --> 0:7:21.70

Dovilė Stasiūnaitė

Umm.

0:7:9.890 --> 0:7:21.80

Domantas Mincė

So let's move the second one about the technologies I'm analyzing artificial intelligence and subparts, machine learning, deep learning telematics and electric vehicles, electrification overall.

0:7:23.820 --> 0:7:24.110

Dovilė Stasiūnaitė

Umm.

0:7:21.90 --> 0:7:30.840

Domantas Mincė

So firstly about AI, ML, and DL are you implementing have implemented and did they improve effectiveness, reduced costs of your logistics operations?

0:7:31.520 --> 0:7:45.450

Dovilė Stasiūnaitė

I would say here we are still learning of what is actually applicable to us because we are small markets and everything for us is about the efficiency, how we can learn and improve our work and in general make it more efficient.

0:7:45.460 --> 0:7:53.910

Dovilė Stasiūnaitė

So for the big markets, we know that other business units like DPD, Netherlands, UK, France, Germany, they're dealing with more significant volumes.

0:7:53.960 --> 0:7:59.500

Dovilė Stasiūnaitė

Statically one hub is the size of the whole Baltics, so for them it's more advanced.

0:7:59.510 --> 0:8:5.590

Dovilė Stasiūnaitė

Of course they're utilizing all the robotic solutions, delivery robots, warehouse robots, OCR.

0:8:7.410 --> 0:8:13.440

Dovilė Stasiūnaitė

Robots for the data entry we do have already tactical planning, but it's like a common sense is business as usual.

0:8:13.590 --> 0:8:15.430

Dovilė Stasiūnaitė

We are optimizing our routes.

0:8:15.440 --> 0:8:17.80

Dovilė Stasiūnaitė

We are predicting our volumes.

0:8:17.330 --> 0:8:19.620

Dovilė Stasiūnaitė

We do have chat bots that are also helping for us.

0:8:19.630 --> 0:8:29.780

Dovilė Stasiūnaitė

Of course it depends on how we are teaching and training them, so the common solutions are the bot tactical planning for us all to plan our routes, we are testing our delivery robots.

0:8:30.410 --> 0:8:34.830

Dovilė Stasiūnaitė

We also have first solution, now implemented with an Internet of Things technology.

0:8:34.840 --> 0:8:42.880

Dovilė Stasiūnaitė

Now, because we delivered this food solution, so we are utilizing this one for the sensors that are just sending us the information, the data about the temperature.

0:8:43.460 --> 0:8:44.900

Dovilė Stasiūnaitė

Uh.

0:8:44.960 --> 0:8:58.80

Dovilė Stasiūnaitė

During the defined periods of time, so that was well that one was also implemented and we are now considering very heavily the warehouse robots and the sorting solution is already automated in our main hub, so it's pretty much advanced.

0:8:58.90 --> 0:9:2.770

Dovilė Stasiūnaitė

Everything is being sorted on the Courier to our level already so that that is here.

0:9:2.780 --> 0:9:11.60

Dovilė Stasiūnaitė

So I believe we have covered business basics, but now if we talk about the further thing is it's still under you know the investigation for vast majority of the cases.

0:9:11.490 --> 0:9:11.710

Domantas Mincė

OK.

0:9:12.520 --> 0:9:13.910

Domantas Mincė

OK, that's clear.

0:9:14.440 --> 0:9:19.770

Domantas Mincė

With this answer you answered question that will be a couple ones away.

0:9:18.460 --> 0:9:20.420

Dovilė Stasiūnaitė

Yeah. Umm.

0:9:19.780 --> 0:9:24.850

Domantas Mincė

So we will be able to skip that, but then you mentioned demand, you mentioned the routes.

0:9:24.960 --> 0:9:30.570

Domantas Mincė

You know it's tough for you to, you know, when you have that much of a demand to plan.

0:9:30.360 --> 0:9:30.660

Dovilė Stasiūnaitė

Umm.

0:9:30.580 --> 0:9:35.920

Domantas Mincė

So this and you have some beginnings in a AI and ML, right?

0:9:35.930 --> 0:9:42.130

Domantas Mincė

You have some IoT stuff, so there your logistics process is affected by that.

0:9:42.220 --> 0:9:42.960

Domantas Mincė

Or are you using?

0:9:43.290 --> 0:9:46.260

Domantas Mincė

Do you optimize like the man forecasting to see, you know, Christmas is coming?

0:9:47.490 --> 0:9:47.820

Dovilė Stasiūnaitė

Umm.

0:9:46.270 --> 0:9:49.230

Domantas Mincė

The demand will rise, you know, and then you need more trucks and so on.

0:9:50.960 --> 0:9:52.350

Dovilė Stasiūnaitė

I of course they are impacted.

0:9:52.360 --> 0:9:55.420

Dovilė Stasiūnaitė

It's impossible not to impact them, so why don't we are utilizing the technology?

0:9:55.430 --> 0:9:59.630

Dovilė Stasiūnaitė

We can do then everything manually by you know this simple workforce, of course.

0:9:59.690 --> 0:10:3.700

Dovilė Stasiūnaitė

So the most important thing for us, of course everything starts logistics from the parcel delivery.

0:10:3.710 --> 0:10:8.980

Dovilė Stasiūnaitė

So the roots, the root planning is the most important, that we will improve further.

0:10:8.990 --> 0:10:11.40

Dovilė Stasiūnaitė

The data is also our business driver.

0:10:11.250 --> 0:10:18.290

Dovilė Stasiūnaitė

So now we will also utilize AI to correct the addresses, because the quality of the addresses everything just we need to improve.

0:10:18.300 --> 0:10:24.440

Dovilė Stasiūnaitė

You know the success rate of the first delivery then parcel delivery forecasting also.

0:10:24.450 --> 0:10:34.620

Dovilė Stasiūnaitė

So when you are waiting for your parcel every time when there are some kind of significant changes, we need to update the delivery time and inform you in advance and you can expect for your parcel to come.

0:10:34.750 --> 0:10:45.640

Dovilė Stasiūnaitė

So this is also, you know, our business bread and butter and the forecasting when we are talking about such significant things as covered when you know there is no precedent for it, you cannot rely on any kind of data, it's useless.

0:10:45.650 --> 0:10:58.20

Dovilė Stasiūnaitė

Basically, you cannot analyze the year, but clearly we have a lot of information and lots of data and we utilize it for the predictions for our peak periods for the summer, for the standard situations, increases or decreases.

0:10:58.30 --> 0:11:0.520

Dovilė Stasiūnaitė

But we kind of already learned how our business is going.

0:11:0.530 --> 0:11:9.810

Dovilė Stasiūnaitė

So every time it's not like we need to do it from scratch, but those learnings are very much utilized on the daily basis for us and the parcel lockers utilization and everything.

0:11:11.510 --> 0:11:11.930

Domantas Mincė

OK.

0:11:12.410 --> 0:11:13.320

Domantas Mincė

That's.

0:11:13.330 --> 0:11:16.340

Domantas Mincė

That's good to hear that, you know, it's being well optimized.

0:11:17.110 --> 0:11:17.340

Dovilė Stasiūnaitė

Umm.

0:11:21.620 --> 0:11:21.860

Dovilė Stasiūnaitė

Umm.

0:11:25.600 --> 0:11:25.900

Dovilė Stasiūnaitė

No.

0:11:27.50 --> 0:11:27.520

Dovilė Stasiūnaitė

Yeah.

0:11:17.130 --> 0:11:28.90

Domantas Mincė

So we came to the question that I mentioned that you answered about the warehouse as I had the question, if you're using any technologies to automate or optimize warehouse operations like robots or smart sorting systems, so you have it.

0:11:27.630 --> 0:11:33.820

Dovilė Stasiūnaitė

So smart sorting system is there not in all of the warehouses just in the main hub where our international partners are coming.

0:11:33.830 --> 0:11:39.80

Dovilė Stasiūnaitė

And we are also working with the parcel lockers, parcels and the robots are being tested now.

0:11:39.90 --> 0:11:42.860

Dovilė Stasiūnaitė

DPD, Germany does have them already and we will investigate further.

0:11:42.870 --> 0:11:47.180

Dovilė Stasiūnaitė

Can be utilized them, at least in our main hubs because the volumes are more significant there.

0:11:49.780 --> 0:11:50.370

Domantas Mincė

Yeah.

0:11:47.250 --> 0:11:50.530

Dovilė Stasiūnaitė

But yeah, it is very much there. Umm.

0:11:55.810 --> 0:11:56.90

Dovilė Stasiūnaitė

Yeah.

0:12:5.750 --> 0:12:5.970

Dovilė Stasiūnaitė

Yes.

0:11:50.720 --> 0:12:6.710

Domantas Mincė

OK, let's move to the second technology, the electric vehicles, right, you have lots of last mile delivery and it's like it's considered to be the toughest part of logistics, right, to get it from the from the you know this terminals to the client so.

0:12:7.160 --> 0:12:16.680

Domantas Mincė

So the question is, do I electric vehicles play any role in your logistics fleet and how have they impacted your sustainability and cost saving initiatives?

0:12:18.0 --> 0:12:20.450

Dovilė Stasiūnaitė

Ohh actually it's vice versa.

0:12:20.460 --> 0:12:27.730

Dovilė Stasiūnaitė

It's not cost saving, it's cost increase for us and yes, we do have electric vehicles and we are increasing our fleet.

0:12:27.740 --> 0:12:35.330

Dovilė Stasiūnaitė

We are planning it the development for the next year because currently we have 15 vehicles operating in the Vilnius for the next year.

0:12:35.340 --> 0:12:43.610

Dovilė Stasiūnaitė

It will be another biggest Lithuanian cities and together with them we are also installing the charging stations, so we need to take care of all of the infrastructure for it.

0:12:43.860 --> 0:12:53.680

Dovilė Stasiūnaitė

For us, currently it's more like a pain point from the cost perspective, but we understand that our footprint of the, you know, carbon emission is also super significant.

0:12:53.690 --> 0:13:1.270

Dovilė Stasiūnaitė

We as the group have the strategy to decrease our carbon footprint significantly, together with out of home solutions, which is lockers.

0:13:2.220 --> 0:13:7.610

Dovilė Stasiūnaitė

So this is the strategy to go when it comes to the actual efficiency for the business.

0:13:7.620 --> 0:13:18.530

Dovilė Stasiūnaitė

They are not as efficient as our standard vans because they can deliver the less stops, so meaning the less parcels till they need to come back and to be recharged once again.

0:13:18.860 --> 0:13:27.980

Dovilė Stasiūnaitė

However, if properly planned, especially in more dense areas like for the urban part of the, it is or for the Lithuanian more urban uh parts.

0:13:34.930 --> 0:13:35.150

Domantas Mincė

OK.

0:13:27.990 --> 0:13:35.780

Dovilė Stasiūnaitė

Of course it can become efficient, but then you know it's just another challenge for us to do it wisely by utilizing our tools.

0:13:37.330 --> 0:13:39.490

Domantas Mincė

So I guess it's, yeah.

0:13:37.330 --> 0:13:41.520

Dovilė Stasiūnaitė

But yes, sustainability is still, you know, more important for us in this case.

0:13:41.530 --> 0:13:55.780

Dovilė Stasiūnaitė

So that's why we are expanding and for the future, of course it will impact us all and it will not be just the vans, it will be also the trucks for the line hauls and for international deliveries to clearly it's coming.

0:13:55.790 --> 0:13:57.270

Dovilė Stasiūnaitė

So it's just a question of the time.

0:14:2.270 --> 0:14:2.900

Dovilė Stasiūnaitė

Impacting.

0:13:58.760 --> 0:14:3.980

Domantas Mincė

The next question is how do you say electric vehicles impacting logistics businesses and next five, 5-10 years?

0:14:23.380 --> 0:14:23.580

Domantas Mincė

Umm.

0:14:5.20 --> 0:14:24.220

Dovilė Stasiūnaitė

Impacting significantly, like I said, if in our countries now we are very much all the small parcels delivery companies, very much focused on that and we are communicating our sustainability strategies, the shift will happen of course slowly, slowly, I believe in 10 years we should already have the trucks introduced for the long line hauls.

0:14:29.610 --> 0:14:29.890

Dovilė Stasiūnaitė

Umm.

0:14:25.960 --> 0:14:30.490

Domantas Mincė

I had the pleasure this Monday actually to check the Volvo full for the electric truck.

0:14:33.860 --> 0:14:34.40

Dovilė Stasiūnaitė

Yeah.

0:14:37.20 --> 0:14:37.290

Dovilė Stasiūnaitė

Mm-hmm.

0:14:30.570 --> 0:14:38.760

Domantas Mincė

So it's yeah, it's the future that has around 250 or 300 kilometers with one charge during winters, so it's like.

0:14:39.920 --> 0:14:40.150

Dovilė Stasiūnaitė

Umm.

0:14:41.260 --> 0:14:44.150

Domantas Mincė

OK, let's move on to the third technology about the telematics.

0:14:44.510 --> 0:14:44.860

Dovilė Stasiūnaitė

Mm-hmm.

0:14:44.240 --> 0:14:46.530

Domantas Mincė

So it's Internet of Things you already mentioned.

0:14:49.770 --> 0:14:50.10

Dovilė Stasiūnaitė

Mm-hmm.

0:14:46.540 --> 0:14:50.850

Domantas Mincė

So it's everything about the connection and getting data from in real time.

0:14:54.820 --> 0:14:55.20

Dovilė Stasiūnaitė

Mm-hmm.

0:14:50.860 --> 0:15:1.580

Domantas Mincė

So does telematics play a role in your logistics operations and since introduction did it improve fleet management operations, driver safety or overall efficiency?

0:15:2.340 --> 0:15:15.910

Dovilė Stasiūnaitė

Well, I believe driver safety, maybe it's more important if we are talking about long distance travels, especially the ones that are driving trucks and it's very much international as we are operating you know in very much domestic markets, yes, we have line holes but still it's not that significant.

0:15:16.50 --> 0:15:25.390

Dovilė Stasiūnaitė

So for us it's more important, you know, to take care of our domestic parcels and you know the couriers that are doing that, we do have our business bread and butter.

0:15:25.400 --> 0:15:35.580

Dovilė Stasiūnaitė

So basically all our courier devices, they do have GPS and GPS is not simply to track the routes and how they are delivering parcels, but also to ensure that they're being delivered to the right place and to the right person.

0:15:35.850 --> 0:15:40.770

Dovilė Stasiūnaitė

So it's like the security for us and ensuring that we are doing the right job according to the legislation.

0:15:41.360 --> 0:15:46.280

Dovilė Stasiūnaitė

Another thing we do have the DPD system which is utilized in the whole Europe.

0:15:46.290 --> 0:15:50.120

Dovilė Stasiūnaitė

So basically we are connecting our parcels with pallets and specific trucks.

0:15:50.130 --> 0:16:4.120

Dovilė Stasiūnaitė

So in case of the urgencies or something happening on the road, we can easily track which parcels were in which trucks and we can forecast and predict again when they will be delivered, how it's going to impact our customers and so on and so forth.

0:16:4.130 --> 0:16:7.780

Dovilė Stasiūnaitė

So those basics are definitely covered and we are utilizing them as well.

0:16:7.790 --> 0:16:12.500

Dovilė Stasiūnaitė

As you know, this is the data which is coming to us regarding the DPD foods solution.

0:16:12.510 --> 0:16:27.180

Dovilė Stasiūnaitė

And with this DPD fresh service that we have also, so those basics are here and I believe to this extent it's kind of enough and they can't see that it's an obstacle because for us it's understandable as like our business as usual, we cannot work without those aspects.

0:16:28.80 --> 0:16:28.420

Domantas Mincė

Yeah.

0:16:29.280 --> 0:16:29.510

Dovilė Stasiūnaitė

Umm.

0:16:28.480 --> 0:16:29.610

Domantas Mincė

OK, that's that.

0:16:29.620 --> 0:16:30.430

Domantas Mincė

Makes sense.

0:16:30.500 --> 0:16:34.30

Domantas Mincė

Did you have any challenges integrating telematics into logistics operations?

0:16:34.500 --> 0:16:35.770

Dovilė Stasiūnaitė

No, I believe no, no, no.

0:16:35.780 --> 0:16:38.510

Dovilė Stasiūnaitė

Like I didn't hear about any of them in the future.

0:16:38.520 --> 0:16:46.980

Dovilė Stasiūnaitė

Clearly there will be developments, but not, you know, such things that will be revolutionary or there is a big hesitance from someone, no.

0:16:47.620 --> 0:16:48.440

Domantas Mincė

OK. Yeah.

0:16:49.590 --> 0:16:53.140

Domantas Mincė

I do you collaborate with any technology providers?

0:16:53.150 --> 0:16:54.40

Domantas Mincė

Startups.

0:16:56.930 --> 0:16:57.160

Dovilė Stasiūnaitė

Umm.

0:16:54.230 --> 0:16:59.890

Domantas Mincė

Maybe scientific organizations like universities and trying to stand in front of technological advancements.

0:17:1.410 --> 0:17:8.360

Dovilė Stasiūnaitė

Uh, in the deeper group we have design, innovation board, the core role of Innovation Board is to gather the community.

0:17:8.370 --> 0:17:18.920

Dovilė Stasiūnaitė

The representatives from business units to exchange the best practices, the innovations that we are utilizing and also they have the relationships with the companies that are funding startups.

0:17:19.50 --> 0:17:27.700

Dovilė Stasiūnaitė

So basically, those companies have the catalogs of the startups and then we are capable to select from those catalogs the ones that are relevant to us.

0:17:27.750 --> 0:17:29.730

Dovilė Stasiūnaitė

And then we are having meetings with them.

0:17:29.740 --> 0:17:38.110

Dovilė Stasiūnaitė

They are kind of pitching their ideas to us and then if we see any relevance, how we can utilize them, then we are establishing the relationship.

0:17:38.120 --> 0:18:15.830

Dovilė Stasiūnaitė

So that is the specific body created within the group for us to always know field the polls of what is happening and about those innovations when it comes to local initiatives, as there is such a big volume of information always coming from other business owners in the group, we don't see big demand to establish something you know similar just locally here in Lithuania, especially when we see that in other business students, those technologies are even more developed and they are testing them much faster because like I said, they do have bigger reasons months in our case and vast majority of the cases still human forces cheaper in comparison to some technological solutions unfortunately.

0:18:17.660 --> 0:18:18.460

Domantas Mincė

Yeah, yeah.

0:18:18.570 --> 0:18:18.780

Dovilė Stasiūnaitė

Umm.

0:18:20.150 --> 0:18:21.980

Domantas Mincė

But that's good that you have a choice.

0:18:23.120 --> 0:18:24.870

Dovilė Stasiūnaitė

Yeah, we do. Yeah.

0:18:21.990 --> 0:18:25.20

Domantas Mincė

If there is some, you know, promising startup and yeah.

0:18:24.930 --> 0:18:25.390

Dovilė Stasiūnaitė

At least.

0:18:25.400 --> 0:18:25.660

Dovilė Stasiūnaitė

Yeah.

0:18:25.670 --> 0:18:31.330

Dovilė Stasiūnaitė

And we are capable to very much witness the tests that our colleagues are doing and to understand what we are.

0:18:31.340 --> 0:18:35.170

Dovilė Stasiūnaitė

You know, there are summations and to understand, would it be even applicable to us?

0:18:35.180 --> 0:18:37.50

Dovilė Stasiūnaitė

So that's again very good.

0:18:39.480 --> 0:18:39.780

Domantas Mincė

Good.

0:18:39.790 --> 0:18:45.150

Domantas Mincė

So let's move to the key question from my thesis at least, I think it's key.

0:18:45.210 --> 0:18:45.610

Dovilė Stasiūnaitė

Mm-hmm.

0:18:45.520 --> 0:18:55.70

Domantas Mincė

So did disruptive technologies like AI, electric vehicles, or telematics created new or substantially changed your business models that you had before them?

0:18:57.240 --> 0:18:58.40

Dovilė Stasiūnaitė

Hmm.

0:18:58.390 --> 0:19:0.50

Dovilė Stasiūnaitė

Hard to say for us.

0:19:0.60 --> 0:19:1.790

Dovilė Stasiūnaitė

The technology is an enabler.

0:19:2.80 --> 0:19:32.760

Dovilė Stasiūnaitė

It's an enabler from all possible aspects for us, because efficiency is the key and like the art of the efficiency that we are doing here in logistics and if we can utilize the technology for this matter to serve our business and our customers, that will come and that we will do more or less because like clearly what they already mentioned for us, properly planned resources, the volumes forecast, the addresses, that is our bread and butter and we speak clearly depend on our efficiencies dependent on that.

0:19:33.30 --> 0:19:35.740

Dovilė Stasiūnaitė

The two are how accurate we are with that.

0:19:35.870 --> 0:19:42.560

Dovilė Stasiūnaitė

Then the sorting again, significant human forces are needed now so that automation robotization is immense.

0:19:42.890 --> 0:19:55.600

Dovilė Stasiūnaitė

Again, the data and robots utilization for the data entry that we because we are dealing with lots and lots and lots of that electric cars and even autonomous vehicles in our case like robots that are delivering parcels, they are here.

0:19:55.710 --> 0:20:10.870

Dovilė Stasiūnaitė

So for us, those are opening opportunities to be more efficient and to maybe turn our services into the ones that will be more up to date to know with the future, less polluting, more efficient, more customer friendly, more flexible.

0:20:10.980 --> 0:20:13.10

Dovilė Stasiūnaitė

So those were clearly parcel lockers.

0:20:13.20 --> 0:20:14.890

Dovilė Stasiūnaitė

Now the next step is autonomous vehicles.

0:20:14.900 --> 0:20:19.820

Dovilė Stasiūnaitė

Clearly they will come to more or less extent, so it's coming, it's happening.

0:20:24.510 --> 0:20:24.650

Dovilė Stasiūnaitė

Yes.

0:20:20.920 --> 0:20:27.320

Domantas Mincė

So then the thing that we can say it's optimizing the business but not yet changing significantly the way we open.

0:20:26.420 --> 0:20:30.430

Dovilė Stasiūnaitė

No, it is clearly I am not saying that it won't be.

0:20:30.440 --> 0:20:41.330

Dovilė Stasiūnaitė

Also this other part which will be the transformational, but at this phase now of how much we know it is helping us and it's optimizing us and enabling us for the efficiency.

0:20:41.600 --> 0:20:45.50

Dovilė Stasiūnaitė

But the yes, I see that in the future there are more opportunities.

0:20:46.670 --> 0:20:47.190

Domantas Mincė

That's good.

0:20:47.200 --> 0:20:47.550

Domantas Mincė

Thank you.

0:20:48.240 --> 0:20:53.650

Domantas Mincė

Uh, do you have any KPIs to measure the impact of disruptive technologies?

0:20:55.920 --> 0:20:56.270

Dovilė Stasiūnaitė

Uh.

0:20:53.760 --> 0:20:59.240

Domantas Mincė

Like, you know, EV's are you comparing EVs versus traditional, you know, internal combustion engines, cars and so on.

0:20:59.890 --> 0:21:3.380

Dovilė Stasiūnaitė

It's, but it's a more like project related.

0:21:3.490 --> 0:21:15.290

Dovilė Stasiūnaitė

If we are doing the test because we have them, our assumptions, so which efficiency levels we need to reach in order to say that we can replace the standard vehicle with the EV for example.

0:21:15.300 --> 0:21:22.350

Dovilė Stasiūnaitė

So it's project based if we have like a chat bot and we have a standard person like customer service agent.

0:21:22.360 --> 0:21:29.450

Dovilė Stasiūnaitė

Of course we are then comparing the efficiency of one or the other, or how many FTE's we can save more than to replace and have this technology installed.

0:21:29.460 --> 0:21:32.160

Dovilė Stasiūnaitė

Installed same you know with all the robotic solutions.

0:21:32.170 --> 0:21:39.320

Dovilė Stasiūnaitė

Same with the sorting clients, so that's project or specific solution based but not common global company level.

0:21:40.220 --> 0:21:40.600

Domantas Mincė

OK.

0:21:41.590 --> 0:21:46.540

Domantas Mincė

So and the last question I have, I will turn it around and because we are talking from the Lithuania perspective.

0:21:44.820 --> 0:21:46.860

Dovilė Stasiūnaitė

Umm. Mm-hmm.

0:21:46.550 --> 0:21:50.500

Domantas Mincė

So how do you see actually Lithuania in the adoption of technologies?

0:21:50.810 --> 0:21:51.460

Domantas Mincė

Do we have?

0:21:51.510 --> 0:21:56.670

Domantas Mincė

Are we ahead or are we behind some other countries you know from your perspective, as you're working in global company?

0:22:3.450 --> 0:22:3.680

Domantas Mincė

Umm.

0:21:58.590 --> 0:22:13.720

Dovilė Stasiūnaitė

If not, as you know, I can compare the context of the whole Europe plus now in the UK, which is out of Europe, I can say that we are thirsty and we are maybe work with knowledge, but maybe not yet in the practical part.

0:22:13.830 --> 0:22:19.640

Dovilė Stasiūnaitė

Whilst the UK, the Netherlands, Germany, they already there, you know, with the practical implementation.

0:22:19.650 --> 0:22:22.0

Dovilė Stasiūnaitė

So knowledge wise, we are thirsty.

0:22:22.10 --> 0:22:23.460

Dovilė Stasiūnaitė

We are constantly seeking.

0:22:23.470 --> 0:22:29.490

Dovilė Stasiūnaitė

We are considering, yes, the theory and the information is here, but practicalities are not period.

0:22:29.500 --> 0:22:37.210

Dovilė Stasiūnaitė

Or maybe we are not overtaking them as fast and even testing out them as test, but the explanation was already mentioned by me.

0:22:37.440 --> 0:22:38.700

Dovilė Stasiūnaitė

It's just for them.

0:22:38.710 --> 0:22:55.310

Dovilė Stasiūnaitė

It's more commercial that I’m there more on the stake while in our case, you know it is, it is coming, it is coming, some solutions are coming, but they're just taking a little bit more time and more business case calculation because we need to be maybe more conservative than they are.

0:22:55.380 --> 0:22:56.730

Dovilė Stasiūnaitė

It's not so immediate yet.

0:22:56.740 --> 0:23:1.70

Dovilė Stasiūnaitė

As for them, you know, like with OCR technology, you know for us it's nice to have.

0:23:1.80 --> 0:23:8.940

Dovilė Stasiūnaitė

But if you're talking about such countries like the Netherlands, if you're talking about the fraud cases that they're dealing with for them, it's immediate solution, no questions asked.

0:23:9.230 --> 0:23:10.530

Dovilė Stasiūnaitė

So it it all depends.

0:23:13.540 --> 0:23:14.530

Domantas Mincė

Yeah, that's.

0:23:14.540 --> 0:23:15.160

Domantas Mincė

That makes sense.

0:23:15.170 --> 0:23:18.610

Domantas Mincė

So thanks a lot for the for the for holding this interview with me.

0:23:22.180 --> 0:23:22.320

Dovilė Stasiūnaitė

Yeah.

0:23:18.680 --> 0:23:25.330

Domantas Mincė

So it's clearly visible that you are all on top of these things just and actually has all the interviews I already had.

0:23:30.730 --> 0:23:31.20

Dovilė Stasiūnaitė

Umm.

0:23:25.340 --> 0:23:31.540

Domantas Mincė

So we, from my perspective, we are not yet seeing the change of substantial changes for the business models.

0:23:33.290 --> 0:23:33.590

Dovilė Stasiūnaitė

Umm.

0:23:31.550 --> 0:23:35.780

Domantas Mincė

Optimization is more the target of implementation of these technologies.

0:23:36.510 --> 0:23:36.810

Dovilė Stasiūnaitė

Yeah.

0:23:36.290 --> 0:23:37.0

Domantas Mincė

So thanks a lot.

0:23:37.10 --> 0:23:39.480

Domantas Mincė

Again, thanks for dedicating the time for me.

0:23:39.550 --> 0:23:40.460

Domantas Mincė

It was really interesting.

0:23:41.540 --> 0:23:44.240

Dovilė Stasiūnaitė

Thank you very much and best of luck with your thesis.

0:23:45.430 --> 0:23:46.40

Domantas Mincė

Thank you.

Annex 5. Transcript from interview with SmartLynx

0:0:0.0 --> 0:0:4.110

Domantas Mincė

OK, so I see that transcription and recording has started.

0:0:4.400 --> 0:0:5.390

Domantas Mincė

So hello Ramūnas.

0:0:5.400 --> 0:0:9.130

Domantas Mincė

Thanks again for agreeing to hold this interview with me.

0:0:10.490 --> 0:0:35.500

Domantas Mincė

I am a student at Vilnius University Business School and I'm studying deep tech entrepreneurship program and I'm writing master's thesis on the topic to examine how disruptive technologies are impacting logistics business models and at the moment I'm doing the research comparing how technologies affects road, air and maritime logistics sectors that shortly about me.

0:0:35.550 --> 0:0:39.150

Domantas Mincė

Maybe you can do short introduction and then we will go into the questions.

0:0:40.850 --> 0:0:42.50

Ramunas Stanisauskas / SmartLynx Airlines

So my name's Ramūnas.

0:0:42.140 --> 0:0:46.690

Ramunas Stanisauskas / SmartLynx Airlines

I've been working in operational excellence field more than 10 years.

0:0:46.750 --> 0:0:53.160

Ramunas Stanisauskas / SmartLynx Airlines

Uh, majority of the time is focused on logistics or moving goods.

0:0:53.350 --> 0:0:56.720

Ramunas Stanisauskas / SmartLynx Airlines

Both track or road and then right now air.

0:0:58.630 --> 0:0:59.640

Ramunas Stanisauskas / SmartLynx Airlines

Yeah, I think that's enough.

0:1:1.420 --> 0:1:1.880

Domantas Mincė

Sure.

0:1:2.0 --> 0:1:5.750

Domantas Mincė

OK, so let's begin with the with the first question.

0:1:5.760 --> 0:1:12.410

Domantas Mincė

So in my work, I'm examining the challenges that we that logistics and whole world faced over the past few years.

0:1:12.820 --> 0:1:18.270

Domantas Mincė

So can you tell me if did the challenges of past few years like COVID-19 war in Ukraine?

0:1:19.140 --> 0:1:25.510

Domantas Mincė

Now we have lots of regulations and increasing fuel prices for this forced logistics sector to change.

0:1:25.960 --> 0:1:28.970

Domantas Mincė

And did they have any impact on technologies adoption?

0:1:30.10 --> 0:1:32.680

Ramunas Stanisauskas / SmartLynx Airlines

Umm, I think it actually have a drastic.

0:1:32.690 --> 0:1:35.190

Ramunas Stanisauskas / SmartLynx Airlines

So the first question, right, it did it have an impact.

0:1:35.200 --> 0:1:35.780

Ramunas Stanisauskas / SmartLynx Airlines

I think it did.

0:1:36.200 --> 0:1:45.380

Ramunas Stanisauskas / SmartLynx Airlines

Have a huge impact, mainly because the supply chain is forced to reduce its costs because otherwise it becomes a well.

0:1:45.530 --> 0:1:53.200

Ramunas Stanisauskas / SmartLynx Airlines

At some point, hyperinflation of cost in general, so you cannot reimburse those costs on the client as money become much more expensive.

0:1:53.370 --> 0:2:3.780

Ramunas Stanisauskas / SmartLynx Airlines

And then therefore, all of the supply chain needs to find a way how to reduce cost from their own operations, because that's the only one thing they can do.

0:2:4.560 --> 0:2:10.270

Ramunas Stanisauskas / SmartLynx Airlines

UM now in terms of well, technology adoption, right.

0:2:11.20 --> 0:2:24.870

Ramunas Stanisauskas / SmartLynx Airlines

I think that yes, this is the most common approach of the organizations how to do that and mainly technology used to actually control processes in a much more tight way just to make sure that decisions are made faster.

0:2:25.870 --> 0:2:29.550

Ramunas Stanisauskas / SmartLynx Airlines

The process are more streamlined, more data, more accuracy and so on.

0:2:29.560 --> 0:2:33.470

Ramunas Stanisauskas / SmartLynx Airlines

So yes, it does have a huge impact on that.

0:2:33.480 --> 0:2:42.970

Ramunas Stanisauskas / SmartLynx Airlines

And of course, another impact is general buzz about automation, AI and all of the potential solutions, which is becoming revolutionary so.

0:2:44.760 --> 0:2:45.10

Domantas Mincė

Yeah.

0:2:45.20 --> 0:2:47.540

Domantas Mincė

So it's kind of a driver for innovation.

0:2:48.230 --> 0:2:48.450

Ramunas Stanisauskas / SmartLynx Airlines

Umm.

0:2:48.940 --> 0:2:49.350

Domantas Mincė

OK.

0:2:49.360 --> 0:2:54.520

Domantas Mincė

So moving on in the in the in my work, I'm examining 3 technologies basically.

0:2:54.530 --> 0:2:55.590

Domantas Mincė

So let's talk about first one.

0:2:55.600 --> 0:2:57.150

Domantas Mincė

It's already mentioned by you, AI.

0:2:57.160 --> 0:3:9.370

Domantas Mincė

I'm also investigating machine learning and deep learning, so are you using this and if yes did they improve the effectiveness, reduced costs or so on in your logistics operations.

0:3:11.60 --> 0:3:13.970

Ramunas Stanisauskas / SmartLynx Airlines

Uh, you're currently talking about current company, right?

0:3:13.980 --> 0:3:14.760

Ramunas Stanisauskas / SmartLynx Airlines

Which I'm working at.

0:3:14.430 --> 0:3:14.950

Domantas Mincė

Yes, yes.

0:3:15.610 --> 0:3:18.360

Ramunas Stanisauskas / SmartLynx Airlines

Umm, OK, so let's start with the first one.

0:3:18.370 --> 0:3:35.150

Ramunas Stanisauskas / SmartLynx Airlines

So AI is being used it maybe I will say a general notice that I don't think that current company is very technologically advanced and the current one of my positions is actually to move this topic forward because I also inherit that IT department.

0:3:23.590 --> 0:3:23.820

Domantas Mincė

Umm.

0:3:35.160 --> 0:3:39.280

Ramunas Stanisauskas / SmartLynx Airlines

So I'm currently operational excellence slash CIO at some point.

0:3:40.170 --> 0:4:2.60

Ramunas Stanisauskas / SmartLynx Airlines

So yes, automation is there, and unfortunately the level automation is in a quite simple way yet, which means that we do simple automation tasks such as SP flows and then from A to B we don't have like very sophisticated robot farm or you know, 20 robots working for us, even though there's a lot of attention.

0:4:3.10 --> 0:4:18.150

Ramunas Stanisauskas / SmartLynx Airlines

One of the limitations here is because airlines are very regulated, so any automatical decisions should be approved by a lot of different authorities as it includes safety and in the end not all of the things right.

0:4:18.160 --> 0:4:30.170

Ramunas Stanisauskas / SmartLynx Airlines

But it's definitely and another problem is that the organization has not seen very good examples of automation, which means that lack of knowledge doesn't drive us to actually finding those examples.

0:4:30.180 --> 0:4:32.890

Ramunas Stanisauskas / SmartLynx Airlines

And I can give you like a very good way.

0:4:33.160 --> 0:4:41.90

Ramunas Stanisauskas / SmartLynx Airlines

Very good example is that we have employed the Director of Process Excellence, whose focus is to find automation cases in.

0:4:41.620 --> 0:4:43.430

Ramunas Stanisauskas / SmartLynx Airlines

He's working with four or five months.

0:4:43.440 --> 0:4:53.340

Ramunas Stanisauskas / SmartLynx Airlines

He has been looking at the processes which might lead to information and people are starting to be hyped up because he sees opportunities, he explains them to them and then that drives curiosity.

0:4:53.870 --> 0:4:55.740

Ramunas Stanisauskas / SmartLynx Airlines

The next challenge will be to actually adopt.

0:4:59.200 --> 0:5:9.470

Ramunas Stanisauskas / SmartLynx Airlines

IT competence actually do that and one of the I'm not sure if I can if where chat GPT on all models are standing.

0:5:0.390 --> 0:5:0.590

Domantas Mincė

Mm-hmm.

0:5:9.480 --> 0:5:13.600

Ramunas Stanisauskas / SmartLynx Airlines

Is deep learning or somewhere in terms of automation in in your scope?

0:5:14.240 --> 0:5:14.740

Ramunas Stanisauskas / SmartLynx Airlines

I'm not that.

0:5:15.760 --> 0:5:17.520

Domantas Mincė

I'm not checking.

0:5:19.330 --> 0:5:19.580

Domantas Mincė

Like.

0:5:21.630 --> 0:5:23.760

Ramunas Stanisauskas / SmartLynx Airlines

OK, there's a.

0:5:23.690 --> 0:5:29.300

Domantas Mincė

But you know, into this process like predictive maintenance or demand forecasting and so on.

0:5:29.590 --> 0:5:29.800

Ramunas Stanisauskas / SmartLynx Airlines

Umm.

0:5:29.670 --> 0:5:33.420

Domantas Mincė

But I guess we can talk at common AI, you know, as a part of this.

0:5:32.980 --> 0:5:35.200

Ramunas Stanisauskas / SmartLynx Airlines

OK, OK.

0:5:35.250 --> 0:5:44.40

Ramunas Stanisauskas / SmartLynx Airlines

So let's say that, uh, chat GPT buzz is actually increasing the awareness of about, uhm, in general AI as such, and it can be.

0:5:44.50 --> 0:5:46.40

Ramunas Stanisauskas / SmartLynx Airlines

And it's already being adopted more and more.

0:5:46.210 --> 0:5:50.240

Ramunas Stanisauskas / SmartLynx Airlines

Now you asked about machine learning, so machine learning is not very common.

0:5:50.250 --> 0:5:52.860

Ramunas Stanisauskas / SmartLynx Airlines

But we do use a couple of things.

0:5:52.870 --> 0:5:55.830

Ramunas Stanisauskas / SmartLynx Airlines

And by the way, in aviation, it's quite a new thing, to be honest.

0:5:56.570 --> 0:6:17.520

Ramunas Stanisauskas / SmartLynx Airlines

So we use as an example a system that is doing predictive maintenance, which means that we are installing certain equipment into the airplane which is connected to all of the parameters and based on certain criterias evaluating that this and this part might go off soon.

0:6:17.530 --> 0:6:21.900

Ramunas Stanisauskas / SmartLynx Airlines

So you need to replace it because it go off soon and then in aviation it's even more important.

0:6:21.910 --> 0:6:28.950

Ramunas Stanisauskas / SmartLynx Airlines

They're logistics because the standing plane costs you thousands of dollars every day and cost not in in lost revenue.

0:6:28.960 --> 0:6:52.490

Ramunas Stanisauskas / SmartLynx Airlines

Even the challenge is that it's quite a fair new technology across the industry and they never challenge is that the not big airline carriers such as Delta Airlines who buy new planes such as Girteka, right, new trucks, you have a typical airline has a plane which is 15 years old, which is a normal practice, which means that those planes might be not technologically adopted.

0:6:52.660 --> 0:7:1.590

Ramunas Stanisauskas / SmartLynx Airlines

And then you need to also update the plane and you need to also then install the equipment and most of the planes are being even more complex.

0:7:1.600 --> 0:7:9.140

Ramunas Stanisauskas / SmartLynx Airlines

Most of the planes are being leased for six years, which is that the normal business model and then you need to consider the investment for six years, right?

0:7:9.430 --> 0:7:12.70

Ramunas Stanisauskas / SmartLynx Airlines

And then deep learning, we don't do anything in terms of deep learning, so.

0:7:9.630 --> 0:7:9.890

Domantas Mincė

OK.

0:7:13.570 --> 0:7:14.80

Domantas Mincė

OK.

0:7:14.170 --> 0:7:14.540

Domantas Mincė

Thanks.

0:7:14.550 --> 0:7:18.160

Domantas Mincė

So the next question is associated to what you just mentioned.

0:7:18.680 --> 0:7:22.660

Domantas Mincė

As I mentioned, I'm analyzing OK the route planning.

0:7:22.730 --> 0:7:25.100

Domantas Mincė

I guess it's not relevant in the air logistics.

0:7:25.260 --> 0:7:28.650

Domantas Mincė

You know that as much as demand forecasting and predictive maintenance.

0:7:28.660 --> 0:7:33.140

Domantas Mincė

You mentioned that you are already having predictive maintenance as they practice in in your company, right?

0:7:34.450 --> 0:7:45.280

Ramunas Stanisauskas / SmartLynx Airlines

We are, let's say this is an ongoing project which is already some, some of the parts is already on the ground, which means that we are piloting it.

0:7:45.350 --> 0:7:47.900

Ramunas Stanisauskas / SmartLynx Airlines

But what I mean live it gives us

0:7:47.910 --> 0:7:49.910

Ramunas Stanisauskas / SmartLynx Airlines

Data it gives us predictions.

0:7:49.20 --> 0:7:49.260

Domantas Mincė

Umm.

0:7:49.920 --> 0:7:59.500

Ramunas Stanisauskas / SmartLynx Airlines

The biggest problem right now is that the processes which should be triggered there at yet not connected, which means that we might see that the plane is having some kind of broken part.

0:8:0.80 --> 0:8:2.550

Ramunas Stanisauskas / SmartLynx Airlines

But that doesn't mean that it will automatically.

0:8:2.850 --> 0:8:11.350

Ramunas Stanisauskas / SmartLynx Airlines

Kind of trigger supply chain process or notified people or so on, so it's still like, you know single algorithm or operating on somebody's supervision.

0:8:12.0 --> 0:8:15.260

Ramunas Stanisauskas / SmartLynx Airlines

And in terms of planning, by the way, it's important for aviation.

0:8:15.500 --> 0:8:26.870

Ramunas Stanisauskas / SmartLynx Airlines

Ohh a good planning, but it's not that sensitive as in logistics because it's much more regulated the planning side which is not explored is that how?

0:8:27.710 --> 0:8:40.620

Ramunas Stanisauskas / SmartLynx Airlines

Umm, how more effective you can be in terms of saving fuel speeds and so on because you can fly faster and burn more fuel and rather than slower and then can consume less.

0:8:35.540 --> 0:8:35.810

Domantas Mincė

Umm.

0:8:40.630 --> 0:8:43.800

Ramunas Stanisauskas / SmartLynx Airlines

So it's not that but predictive maintenance is the one.

0:8:44.230 --> 0:8:44.510

Ramunas Stanisauskas / SmartLynx Airlines

Let's see.

0:8:44.580 --> 0:8:45.170

Domantas Mincė

OK.

0:8:45.300 --> 0:8:45.850

Domantas Mincė

Yeah. Thanks.

0:8:46.720 --> 0:8:47.90

Domantas Mincė

OK.

0:8:47.100 --> 0:8:52.330

Domantas Mincė

So next question I have is about the warehouses and operating warehouses.

0:8:52.340 --> 0:8:55.320

Domantas Mincė

Do you have any of warehouses in your company?

0:8:56.260 --> 0:9:7.490

Ramunas Stanisauskas / SmartLynx Airlines

We did used to have a maintenance uh supply warehouse which we closed and we outsourced all of the parts to a different location.

0:9:7.500 --> 0:9:9.690

Ramunas Stanisauskas / SmartLynx Airlines

Mainly we closed due to reasons.

0:9:9.760 --> 0:9:18.670

Ramunas Stanisauskas / SmartLynx Airlines

One reason is it was in tactically bad location and 2nd is because we have mismanaged and there's no technology we couldn't understand which part is they're not there.

0:9:18.680 --> 0:9:23.170

Ramunas Stanisauskas / SmartLynx Airlines

We couldn't find it, so we just did a massive move to supplier who could do that professionally.

0:9:20.70 --> 0:9:20.390

Domantas Mincė

OK.

0:9:23.600 --> 0:9:24.930

Ramunas Stanisauskas / SmartLynx Airlines

So that's also shows maturity.

0:9:23.930 --> 0:9:24.380

Domantas Mincė

Understood.

0:9:24.390 --> 0:9:26.630

Domantas Mincė

Yeah, yeah, yeah.

0:9:26.640 --> 0:9:28.290

Domantas Mincė

So my question was about the technology.

0:9:28.300 --> 0:9:36.250

Domantas Mincė

So you, you know you're example is perfectly that sometimes if you don't have technologies it might lead to getting third party logistics and in place.

0:9:35.910 --> 0:9:36.30

Ramunas Stanisauskas / SmartLynx Airlines

Yeah.

0:9:36.260 --> 0:9:46.860

Domantas Mincė

And so OK, so the next technology moving out away from the AI and all these technological coding stuff is the.

0:9:43.970 --> 0:9:44.160

Ramunas Stanisauskas / SmartLynx Airlines

Umm.

0:9:48.390 --> 0:9:50.100

Domantas Mincė

I analyzed the electric vehicles.

0:9:50.110 --> 0:9:51.840

Domantas Mincė

I understand it's not the case, you know.

0:9:51.850 --> 0:9:53.540

Domantas Mincė

Yet in the aviation.

0:9:53.880 --> 0:9:54.70

Ramunas Stanisauskas / SmartLynx Airlines

Umm.

0:9:54.90 --> 0:9:58.180

Domantas Mincė

But we can think about electrification overall as it's becoming a trend, right?

0:9:58.190 --> 0:9:59.260

Domantas Mincė

Right in the world.

0:9:59.390 --> 0:10:2.890

Domantas Mincė

Does it play any role in air logistics already?

0:9:59.570 --> 0:9:59.700

Ramunas Stanisauskas / SmartLynx Airlines

Uh.

0:10:4.910 --> 0:10:7.920

Ramunas Stanisauskas / SmartLynx Airlines

Umm, I would say that there's a couple of phases.

0:10:7.930 --> 0:10:12.880

Ramunas Stanisauskas / SmartLynx Airlines

One is Bio fuel and I can give you an example of complexity.

0:10:13.590 --> 0:10:21.800

Ramunas Stanisauskas / SmartLynx Airlines

There's one plane who made the fly fully on one flight, fully on Bio fuel, and then you know, it's kind of wild moment.

0:10:21.810 --> 0:10:35.370

Ramunas Stanisauskas / SmartLynx Airlines

You can be more sustainable and sound because aviation definitely impacts a lot of the greenhouse gas, but then the question is, have anyone calculated how much be a fuel we need to produce to maintain all of the fuel and that we actually don't have that capacity?

0:10:35.750 --> 0:10:40.420

Ramunas Stanisauskas / SmartLynx Airlines

He has a world to actually produce that amount of fuel in terms of electricity.

0:10:40.430 --> 0:10:45.720

Ramunas Stanisauskas / SmartLynx Airlines

I've not heard an examples of uh airliners which are doing charter flights and then long haul flights.

0:10:46.340 --> 0:10:51.180

Ramunas Stanisauskas / SmartLynx Airlines

Yeah, my prediction will be based on documents.

0:10:51.190 --> 0:10:53.530

Ramunas Stanisauskas / SmartLynx Airlines

I've seen it's more related to weight of the plane.

0:10:53.600 --> 0:11:4.760

Ramunas Stanisauskas / SmartLynx Airlines

It's very important to have it and then the electricity electrical battery still have a huge weight, which then automatically increases the decrease of the flight time and that's.

0:10:53.880 --> 0:10:54.120

Domantas Mincė

Umm.

0:11:6.270 --> 0:11:6.490

Domantas Mincė

Him.

0:11:6.640 --> 0:11:7.200

Ramunas Stanisauskas / SmartLynx Airlines

Vicious circle.

0:11:8.290 --> 0:11:15.840

Domantas Mincė

That's interesting because I'm also analyzing, as mentioned, you know, roads and maritime logistics or the maritime logistics already had interviews with.

0:11:15.850 --> 0:11:21.200

Domantas Mincė

There are also quite skeptic about the electricity part for their operations.

0:11:20.210 --> 0:11:20.450

Ramunas Stanisauskas / SmartLynx Airlines

Umm.

0:11:21.210 --> 0:11:23.980

Domantas Mincė

They're more interested in in hydrogen fuel and so on.

0:11:23.990 --> 0:11:29.880

Domantas Mincė

So I guess it's also more relevant for aviation rather than electrification.

0:11:25.300 --> 0:11:25.540

Ramunas Stanisauskas / SmartLynx Airlines

Umm.

0:11:29.950 --> 0:11:34.710

Ramunas Stanisauskas / SmartLynx Airlines

Umm, uh, I think that maritime even explored getting back with sales.

0:11:34.770 --> 0:11:39.680

Ramunas Stanisauskas / SmartLynx Airlines

Uh and uh, meaning that putting sales and then use wind as a electric source.

0:11:37.470 --> 0:11:37.720

Domantas Mincė

Umm.

0:11:39.690 --> 0:11:42.420

Ramunas Stanisauskas / SmartLynx Airlines

But aviation is definitely not yet in electricity.

0:11:40.270 --> 0:11:40.390

Domantas Mincė

Yeah.

0:11:43.760 --> 0:11:47.850

Domantas Mincė

Uh, so the next question is about that, do you see it in the next 5-10 years?

0:11:47.860 --> 0:11:49.250

Domantas Mincė

That's something might happen.

0:11:49.420 --> 0:11:51.420

Domantas Mincė

I guess there is no, not a lot of evidence yet.

0:11:52.390 --> 0:11:53.250

Domantas Mincė

Maybe it's your view.

0:11:53.790 --> 0:11:54.680

Ramunas Stanisauskas / SmartLynx Airlines

Bio fuel.

0:11:54.690 --> 0:11:55.260

Ramunas Stanisauskas / SmartLynx Airlines

Maybe.

0:11:55.730 --> 0:11:56.0

Domantas Mincė

Umm.

0:11:56.850 --> 0:12:8.690

Ramunas Stanisauskas / SmartLynx Airlines

Which could be, I think that then because focus right now of airlines is to actually increase fuel efficiency of the engines, which for example B7 Boeing 737 Max is showing a huge improvement.

0:12:10.170 --> 0:12:10.380

Domantas Mincė

Umm.

0:12:10.710 --> 0:12:37.90

Ramunas Stanisauskas / SmartLynx Airlines

So that's where to look I as far as I already know, the aviation and I could, you know, put my technical director here would be much more relevant to say that, but just to create an engine, it takes loads of years 10s plus years to test that takes another years and then to actually once it's live and then yeah optimize it into this normal capacity which is not broken from time to time it's never 20 to 30 years.

0:12:27.530 --> 0:12:27.830

Domantas Mincė

Umm.

0:12:37.100 --> 0:12:40.820

Ramunas Stanisauskas / SmartLynx Airlines

So the most current engines are 30 to 40 years old.

0:12:41.570 --> 0:12:41.890

Domantas Mincė

OK.

0:12:42.960 --> 0:12:52.330

Ramunas Stanisauskas / SmartLynx Airlines

So that's the problem we have because of course aviation is very, you know safety regulated and we all want to be safe, but that's what prevents a test adoption of things.

0:12:48.770 --> 0:12:48.990

Domantas Mincė

Umm.

0:12:52.410 --> 0:12:55.40

Domantas Mincė

Yeah, that makes a lot of sense here.

0:12:55.50 --> 0:12:59.580

Domantas Mincė

So it's like 5 to 10 years is not realistic, even from the development side.

0:12:59.880 --> 0:13:0.150

Domantas Mincė

Yeah.

0:13:0.600 --> 0:13:1.700

Ramunas Stanisauskas / SmartLynx Airlines

No, I don't think so.

0:13:0.870 --> 0:13:5.130

Domantas Mincė

OK, so let's move to the third and final.

0:13:5.140 --> 0:13:6.850

Domantas Mincė

Technology is the telematics.

0:13:7.620 --> 0:13:7.840

Ramunas Stanisauskas / SmartLynx Airlines

Umm.

0:13:7.720 --> 0:13:10.60

Domantas Mincė

Uh, does it play any role in your operations?

0:13:12.20 --> 0:13:38.630

Ramunas Stanisauskas / SmartLynx Airlines

Yes, I think the telematics it's one of the most advanced sections because even you can go to flightradar.com and see where all the planes are and then see all the information there depends on the you know how deep we look at it is the biggest problems planes have is the Internet connection is that you need to make sure that the there's a, there's still cases where you need to go with you, USB flash put in, get data and then put it somewhere else.

0:13:38.640 --> 0:13:45.260

Ramunas Stanisauskas / SmartLynx Airlines

So even right now, new technology is considered when the plane is landing, connects to 3G and then dumps the data about the plane.

0:13:45.270 --> 0:13:48.220

Ramunas Stanisauskas / SmartLynx Airlines

That's how the predictive maintenance works, right?

0:13:49.90 --> 0:13:52.510

Ramunas Stanisauskas / SmartLynx Airlines

But in the end it's a mix of that.

0:13:52.520 --> 0:13:55.730

Ramunas Stanisauskas / SmartLynx Airlines

So we can see it at the same time, but also not everything can be done.

0:13:53.140 --> 0:13:53.390

Domantas Mincė

Umm.

0:13:56.450 --> 0:13:56.730

Domantas Mincė

OK.

0:13:59.760 --> 0:14:1.720

Domantas Mincė

I guess it's introduced for quite some time.

0:14:1.780 --> 0:14:8.220

Domantas Mincė

I do you see any benefits of having all this data you know, have seeing, seeing it planning and so on from this technology?

0:14:9.250 --> 0:14:22.780

Ramunas Stanisauskas / SmartLynx Airlines

Yeah, I think that's I don't even know how many benefits I could, you know name, but I guess that that the full transparency gives a very good planning of aviation industry in general.

0:14:23.110 --> 0:14:31.960

Ramunas Stanisauskas / SmartLynx Airlines

For example, each airplane has their own slots in the airports when they need to land, and that means that we've all the telematics ability, we can plan it.

0:14:31.970 --> 0:14:36.340

Ramunas Stanisauskas / SmartLynx Airlines

If you miss your slot, then you need to wait for another slot until somebody misses, right?

0:14:35.450 --> 0:14:35.710

Domantas Mincė

Umm.

0:14:36.350 --> 0:14:39.960

Ramunas Stanisauskas / SmartLynx Airlines

So it plays a vital role because it gives efficiency to airports.

0:14:40.480 --> 0:14:43.720

Ramunas Stanisauskas / SmartLynx Airlines

It's very important to see air routes.

0:14:43.770 --> 0:14:44.930

Ramunas Stanisauskas / SmartLynx Airlines

Uh, who's flying where?

0:14:44.940 --> 0:14:46.200

Ramunas Stanisauskas / SmartLynx Airlines

At which altitude where?

0:14:46.210 --> 0:14:47.650

Ramunas Stanisauskas / SmartLynx Airlines

Just to make sure to prevent crashes.

0:14:47.660 --> 0:14:53.360

Ramunas Stanisauskas / SmartLynx Airlines

So I think it's actually playing a pivotal role in the aviation industry just to see all that information.

0:14:56.10 --> 0:15:10.930

Ramunas Stanisauskas / SmartLynx Airlines

And then the question is how much it drives efficiency of think it's more about more of a philosophical question, but it drives, they're very good safety and efficiency of airports, not entirely of planes efficiency, but the other parts of the aviation.

0:15:3.290 --> 0:15:3.560

Domantas Mincė

Umm.

0:15:12.230 --> 0:15:12.940

Domantas Mincė

OK.

0:15:13.30 --> 0:15:13.460

Domantas Mincė

Thanks.

0:15:13.470 --> 0:15:16.660

Domantas Mincė

So as I see, we are running out of time.

0:15:16.790 --> 0:15:18.440

Domantas Mincė

Let's move to the next question.

0:15:18.450 --> 0:15:22.880

Domantas Mincė

So the next one was about the challenges integrating telematics into your operations.

0:15:22.890 --> 0:15:24.660

Domantas Mincė

So you are already answered this.

0:15:24.670 --> 0:15:25.670

Domantas Mincė

You know Internet connection.

0:15:27.70 --> 0:15:27.530

Ramunas Stanisauskas / SmartLynx Airlines

Umm.

0:15:27.570 --> 0:15:29.840

Ramunas Stanisauskas / SmartLynx Airlines

Which is funny, right at some point?

0:15:27.590 --> 0:15:28.360

Domantas Mincė

During flights?

0:15:29.960 --> 0:15:31.960

Domantas Mincė

Yeah, that.

0:15:32.330 --> 0:15:36.40

Domantas Mincė

Yeah, but then, you know, there is this startling another satellite coming up.

0:15:36.50 --> 0:15:38.930

Domantas Mincė

So it might be solved in some, you know, near future.

0:15:40.80 --> 0:15:41.410

Ramunas Stanisauskas / SmartLynx Airlines

It's most likely yes.

0:15:41.420 --> 0:15:43.550

Ramunas Stanisauskas / SmartLynx Airlines

Uh, and I think that the biggest part is the costs.

0:15:43.560 --> 0:15:50.230

Ramunas Stanisauskas / SmartLynx Airlines

Uh, because all of the but even the startling has an option for aircraft, which is yet not for commercial, I think, but it's cost.

0:15:44.140 --> 0:15:44.480

Domantas Mincė

Umm.

0:15:50.240 --> 0:15:50.790

Ramunas Stanisauskas / SmartLynx Airlines

Loads of money.

0:15:50.800 --> 0:15:54.630

Ramunas Stanisauskas / SmartLynx Airlines

Then it means that the client will be reimbursed of that money, and the question will you fly?

0:15:53.790 --> 0:15:54.30

Domantas Mincė

Yep.

0:15:55.570 --> 0:16:0.960

Ramunas Stanisauskas / SmartLynx Airlines

I best I biggest our biggest challenge, I think, is the ages of the aircraft.

0:16:0.970 --> 0:16:6.150

Ramunas Stanisauskas / SmartLynx Airlines

As I said, typical ages 15 years, so you need to understand that 15 years ago it was 2008.

0:16:6.880 --> 0:16:7.460

Domantas Mincė

Yeah, yeah.

0:16:7.850 --> 0:16:9.950

Ramunas Stanisauskas / SmartLynx Airlines

Remember what kind of iPhone we had there so.

0:16:10.580 --> 0:16:11.170

Domantas Mincė

Yeah.

0:16:11.760 --> 0:16:12.150

Domantas Mincė

Yeah.

0:16:12.250 --> 0:16:16.120

Domantas Mincė

OK, so let's move on now to the kind of more common questions.

0:16:16.830 --> 0:16:23.280

Domantas Mincė

Uh, so you are using data, you're getting data from the planes, you're trying to get, you know, technologies in place.

0:16:23.710 --> 0:16:24.460

Domantas Mincė

Do you say that?

0:16:24.550 --> 0:16:25.820

Domantas Mincė

Do you have you?

0:16:25.830 --> 0:16:29.130

Domantas Mincė

Do you make your decisions based on on data like this?

0:16:29.140 --> 0:16:41.480

Domantas Mincė

You know trend data driven decision making and does it help you know to for the supply chain resilience like during covert times or during the war starts right which changed the whole world?

0:16:42.440 --> 0:16:44.570

Ramunas Stanisauskas / SmartLynx Airlines

Right now I can only judge the current company.

0:16:44.580 --> 0:16:53.850

Ramunas Stanisauskas / SmartLynx Airlines

I have not cannot speak for whole in this trip because they usually data, data and all of these related matters are very protected in the companies.

0:16:54.320 --> 0:16:59.990

Ramunas Stanisauskas / SmartLynx Airlines

So in the current company, data is something which is fairly new to be used.

0:17:0.0 --> 0:17:8.190

Ramunas Stanisauskas / SmartLynx Airlines

As I said, that predictive maintenance is just beginning and then it connected with loads of things we have internally which is not qualitative in data.

0:17:8.960 --> 0:17:11.780

Ramunas Stanisauskas / SmartLynx Airlines

The good thing about deviation is regulated.

0:17:11.790 --> 0:17:13.110

Ramunas Stanisauskas / SmartLynx Airlines

That's the part where it's good.

0:17:13.290 --> 0:17:17.800

Ramunas Stanisauskas / SmartLynx Airlines

So there's certain types of data you need to always have and then store and then have.

0:17:17.870 --> 0:17:22.240

Ramunas Stanisauskas / SmartLynx Airlines

Otherwise you will have a non regulatory things and then be out of business.

0:17:18.30 --> 0:17:18.310

Domantas Mincė

Umm.

0:17:22.410 --> 0:17:30.420

Ramunas Stanisauskas / SmartLynx Airlines

So there's part of the data which is there, which is you want to have part of the data which is not yet even yet captured due to previous discussion, right?

0:17:30.670 --> 0:17:32.240

Ramunas Stanisauskas / SmartLynx Airlines

And then the question, do we use it?

0:17:32.810 --> 0:17:44.730

Ramunas Stanisauskas / SmartLynx Airlines

I don't think that that amount of data which we have is even used properly, meaning that you should I can simply say if you use data lot you're most likely have a 10 plus people team.

0:17:44.740 --> 0:17:49.470

Ramunas Stanisauskas / SmartLynx Airlines

Uh, there's just working on data and then data is a common name, so this is not something there.

0:17:49.940 --> 0:17:50.210

Domantas Mincė

OK.

0:17:50.300 --> 0:17:50.900

Ramunas Stanisauskas / SmartLynx Airlines

It's not even.

0:17:53.460 --> 0:17:53.950

Domantas Mincė

Yeah.

0:17:54.20 --> 0:17:56.550

Domantas Mincė

I mean, it's like the future anyway.

0:17:56.560 --> 0:17:58.850

Domantas Mincė

So you have to work towards that.

0:17:58.860 --> 0:18:3.650

Domantas Mincė

So the organization should go on and then, you know, understand it.

0:18:0.170 --> 0:18:2.120

Ramunas Stanisauskas / SmartLynx Airlines

Future, sure.

0:18:3.690 --> 0:18:13.620

Domantas Mincė

OK, so do you collaborate with any technology providers, startups and so on to seek or develop together some technological advances?

0:18:14.790 --> 0:18:15.800

Ramunas Stanisauskas / SmartLynx Airlines

Meaning create product.

0:18:17.220 --> 0:18:22.640

Domantas Mincė

Create products or you know some kind of just gets it from, you know, from the universities, laboratories and so on.

0:18:22.650 --> 0:18:23.620

Domantas Mincė

You know if there is some.

0:18:23.850 --> 0:18:27.800

Ramunas Stanisauskas / SmartLynx Airlines

We do have internal R&D team which is creating some kind of product.

0:18:27.810 --> 0:18:28.450

Ramunas Stanisauskas / SmartLynx Airlines

Uh.

0:18:28.710 --> 0:18:35.170

Ramunas Stanisauskas / SmartLynx Airlines

Such as, for example, having confidential right or it's you will show how much I can.

0:18:36.480 --> 0:18:40.10

Domantas Mincė

It I can remove this this this stuff from the transcript, it's OK.

0:18:39.460 --> 0:18:39.930

Ramunas Stanisauskas / SmartLynx Airlines

Yeah.

0:18:39.940 --> 0:18:40.190

Ramunas Stanisauskas / SmartLynx Airlines

OK.

0:18:40.200 --> 0:18:42.130

Ramunas Stanisauskas / SmartLynx Airlines

But, but let's say it doesn't matter.

0:18:42.140 --> 0:18:46.830

Ramunas Stanisauskas / SmartLynx Airlines

So we do invent internally because not everything is in aviation.

0:18:46.840 --> 0:18:51.170

Ramunas Stanisauskas / SmartLynx Airlines

A lot of softwares are like a monopoly, not don't have many choices.

0:18:50.80 --> 0:18:50.320

Domantas Mincė

Umm.

0:18:51.480 --> 0:18:52.420

Ramunas Stanisauskas / SmartLynx Airlines

So that's one part.

0:18:52.430 --> 0:19:1.860

Ramunas Stanisauskas / SmartLynx Airlines

There is some and the collaboration with random startups who just started working and then doing things and also we use already existing software provider.

0:19:1.870 --> 0:19:3.880

Ramunas Stanisauskas / SmartLynx Airlines

So we do all fronts where it's possible.

0:19:3.580 --> 0:19:4.950

Domantas Mincė

OK, OK.

0:19:5.360 --> 0:19:7.580

Domantas Mincė

I guess there was nothing confidential in this part, right?

0:19:7.700 --> 0:19:7.990

Ramunas Stanisauskas / SmartLynx Airlines

Yeah.

0:19:8.0 --> 0:19:9.660

Ramunas Stanisauskas / SmartLynx Airlines

I just removed the confidential part right now.

0:19:9.550 --> 0:19:10.350

Domantas Mincė

Yeah, that's good.

0:19:10.370 --> 0:19:10.680

Domantas Mincė

That's good.

0:19:10.690 --> 0:19:11.360

Domantas Mincė

Yeah.

0:19:11.630 --> 0:19:19.800

Domantas Mincė

OK, so commonly to the coming back to the topic of my of my thesis, right, the business models and the effects on that.

0:19:19.810 --> 0:19:31.450

Domantas Mincė

So do you think that introduction or using of these disruptive technologies which we discussed are creating or substantially changing the business models of air logistics?

0:19:37.170 --> 0:19:41.20

Ramunas Stanisauskas / SmartLynx Airlines

I think business models is a strong word.

0:19:41.210 --> 0:19:42.930

Ramunas Stanisauskas / SmartLynx Airlines

I think it's definitely.

0:19:43.590 --> 0:19:49.40

Ramunas Stanisauskas / SmartLynx Airlines

Shaping the way we'll look at the operational costs and being much more effective.

0:19:49.50 --> 0:19:51.320

Ramunas Stanisauskas / SmartLynx Airlines

And then being able to provide a better service.

0:19:52.330 --> 0:19:56.620

Ramunas Stanisauskas / SmartLynx Airlines

But does it change the operating model of the company or business model?

0:19:56.720 --> 0:20:0.230

Ramunas Stanisauskas / SmartLynx Airlines

I don't think yet, meaning, you know, I could take an example.

0:20:0.240 --> 0:20:5.100

Ramunas Stanisauskas / SmartLynx Airlines

You start using Chat GPT for all of the you know whatever or a I just to plan routes and everything.

0:20:6.240 --> 0:20:7.210

Ramunas Stanisauskas / SmartLynx Airlines

No, you.

0:20:7.220 --> 0:20:9.470

Ramunas Stanisauskas / SmartLynx Airlines

No, you can't because it's regulatory.

0:20:9.530 --> 0:20:16.70

Ramunas Stanisauskas / SmartLynx Airlines

Imagine I would just put all of the aviation regulations and manuals into chat GPT and create a, you know, knowledge base.

0:20:16.560 --> 0:20:22.390

Ramunas Stanisauskas / SmartLynx Airlines

They wouldn't allow you to use it because it's second opinion, so there.

0:20:21.520 --> 0:20:21.880

Domantas Mincė

Yeah.

0:20:22.400 --> 0:20:32.160

Ramunas Stanisauskas / SmartLynx Airlines

So there's and of course you know, you wouldn't be willing to crash in a plane which somehow changed to be advised you to turn left and then eventually it was a, you know, 0.1% mistake.

0:20:32.670 --> 0:20:35.30

Ramunas Stanisauskas / SmartLynx Airlines

So I think that's the stopper here.

0:20:33.300 --> 0:20:33.840

Domantas Mincė

Definitely.

0:20:37.70 --> 0:20:37.230

Ramunas Stanisauskas / SmartLynx Airlines

Yeah.

0:20:38.300 --> 0:20:38.650

Domantas Mincė

OK.

0:20:38.660 --> 0:20:40.110

Domantas Mincė

That's interesting.

0:20:40.120 --> 0:20:52.720

Domantas Mincė

So is the first interview I'm having with the air logistics actually, you know and with you, so it's you, you not think about that, you know from the like and you end user right of the of the companies that are flying us somewhere.

0:20:43.810 --> 0:20:43.980

Ramunas Stanisauskas / SmartLynx Airlines

Umm.

0:20:52.730 --> 0:20:55.960

Domantas Mincė

So you don't even think of such things, so it's good that it's regulated.

0:20:55.970 --> 0:20:57.670

Domantas Mincė

Yeah. Uh.

0:20:56.960 --> 0:21:5.180

Ramunas Stanisauskas / SmartLynx Airlines

That we think how to employ it, but regulations are making sure that there is risks the controlled right so.

0:20:59.470 --> 0:21:1.930

Domantas Mincė

Umm yeah, yeah.

0:21:5.190 --> 0:21:5.530

Domantas Mincė

Yeah.

0:21:5.540 --> 0:21:6.10

Domantas Mincė

Yeah. OK.

0:21:7.40 --> 0:21:14.780

Domantas Mincė

Uh, do you have any KPI's measuring the impact or you know measuring these technologies usage and so on in your company?

0:21:15.870 --> 0:21:24.860

Ramunas Stanisauskas / SmartLynx Airlines

Umm, I would say that we start to do that because whole project management and process efficiency topic is like one year old year in this company.

0:21:22.560 --> 0:21:22.900

Domantas Mincė

Umm.

0:21:24.870 --> 0:21:31.320

Ramunas Stanisauskas / SmartLynx Airlines

So it's becoming much more widely understanding that we need to have adoption of technology.

0:21:31.360 --> 0:21:37.600

Ramunas Stanisauskas / SmartLynx Airlines

Let's say we measure how many people use LLM models and try to encourage to do that.

0:21:37.610 --> 0:21:47.550

Ramunas Stanisauskas / SmartLynx Airlines

We try to use and measure adoption of technology through those CRM usage through automated supply chain stocks replenishment.

0:21:47.560 --> 0:21:56.660

Ramunas Stanisauskas / SmartLynx Airlines

So there is metrics which are measuring completely technology adoption, not end result even because we understand that by using that most likely end result will be better.

0:21:57.60 --> 0:22:1.260

Ramunas Stanisauskas / SmartLynx Airlines

So there is metrics there yet very fragile, but they're coming our way.

0:22:2.130 --> 0:22:2.690

Domantas Mincė

OK.

0:22:2.870 --> 0:22:3.500

Domantas Mincė

Thank you.

0:22:3.730 --> 0:22:7.130

Domantas Mincė

And the last question, it's more for the companies that are.

0:22:8.230 --> 0:22:13.200

Domantas Mincė

Uh, not based in Lithuania or, you know, more worldwide about the.

0:22:13.330 --> 0:22:14.780

Domantas Mincė

So I will just turn it around a bit.

0:22:14.790 --> 0:22:27.500

Domantas Mincė

So do you think that companies operating in Lithuania are on the same level of technological literacy than others, or do you see that this we are behind or ahead of some others?

0:22:27.510 --> 0:22:27.940

Domantas Mincė

And they were.

0:22:28.420 --> 0:22:29.930

Ramunas Stanisauskas / SmartLynx Airlines

Aviation wise or in general?

0:22:30.90 --> 0:22:31.570

Domantas Mincė

Yes, yes, aviation wise.

0:22:36.330 --> 0:22:36.580

Ramunas Stanisauskas / SmartLynx Airlines

Hmm.

0:22:40.70 --> 0:22:46.720

Ramunas Stanisauskas / SmartLynx Airlines

Well, I need to stress that the my company Latvian based, but part of Lithuanian group.

0:22:45.440 --> 0:22:45.640

Domantas Mincė

Umm.

0:22:46.730 --> 0:22:47.10

Ramunas Stanisauskas / SmartLynx Airlines

Right.

0:22:47.720 --> 0:22:51.130

Ramunas Stanisauskas / SmartLynx Airlines

Umm, I would say it's somewhere in the middle.

0:22:51.180 --> 0:22:59.810

Ramunas Stanisauskas / SmartLynx Airlines

I couldn't say that it's very far advanced in the world that we're leaders in that, but at the same time, it's definitely we're not behind the track.

0:23:0.60 --> 0:23:11.70

Ramunas Stanisauskas / SmartLynx Airlines

So I would say that we're not disruptors, but also not the laggers somewhere in the catching up with this, there's some areas where a bit further ahead, some areas where we're behind.

0:23:11.80 --> 0:23:12.740

Ramunas Stanisauskas / SmartLynx Airlines

So it's somewhere in the middle.

0:23:14.90 --> 0:23:15.830

Ramunas Stanisauskas / SmartLynx Airlines

Not sure what the answer helps, but uh.

0:23:15.840 --> 0:23:16.70

Domantas Mincė

Yeah.

0:23:16.700 --> 0:23:17.10

Domantas Mincė

Yeah.

0:23:17.20 --> 0:23:18.290

Domantas Mincė

So it's, you know, it's OK.

0:23:18.300 --> 0:23:22.870

Domantas Mincė

So it's we can be either ahead like we can also be behind, we can be on the same level.

0:23:22.880 --> 0:23:30.910

Domantas Mincė

So I see you know that we overall we are definitely I guess in the front of you know technologies and everything as a as a country.

0:23:30.920 --> 0:23:33.270

Domantas Mincė

But in certain sectors it might be different.

0:23:33.740 --> 0:23:34.40

Ramunas Stanisauskas / SmartLynx Airlines

For sure.

0:23:34.20 --> 0:23:34.670

Domantas Mincė

OK.

0:23:35.160 --> 0:23:39.730

Domantas Mincė

So that's actually it I had for from the questionnaire here.

0:23:39.740 --> 0:23:40.770

Domantas Mincė

Thanks a lot for your time.

0:23:41.20 --> 0:23:46.380

Domantas Mincė

So the last question is do you think I can use this transcript in my thesis if it's required to be added?

0:23:46.860 --> 0:23:47.570

Ramunas Stanisauskas / SmartLynx Airlines

Yeah, for sure.

0:23:48.60 --> 0:23:48.550

Ramunas Stanisauskas / SmartLynx Airlines

Yeah, we can.

0:23:48.460 --> 0:23:51.700

Domantas Mincė

There is nothing enclosed that I should remove, right?

0:23:53.300 --> 0:24:2.90

Ramunas Stanisauskas / SmartLynx Airlines

Not as far as I can remember right now, but I don't think you use all of this transcripts or small portion of people, but it will read it so.

0:24:7.340 --> 0:24:9.350

Domantas Mincė

If I will find something possibly risky than I will definitely remove.

0:24:9.70 --> 0:24:9.710

Ramunas Stanisauskas / SmartLynx Airlines

Yeah, yeah.

0:24:9.420 --> 0:24:10.290

Domantas Mincė

Thanks a lot Ramūnas!

Annex 6. Transcript from interview with Avion

0:0:4.160 --> 0:0:4.930

Domantas Mincė

Hello, Stasys.

0:0:4.940 --> 0:0:5.530

Domantas Mincė

Thank you.

0:0:5.600 --> 0:0:12.290

Domantas Mincė

Thanks a lot for dedicating time for me to discuss the topic which I explained to you in in the email.

0:0:12.700 --> 0:0:24.450

Domantas Mincė

I'm a student of virus in Vilnius University Business School and I'm studying deep tech entrepreneurship masters program and the thesis is on disruptive technologies and the effect it has on the logistics.

0:0:24.860 --> 0:0:27.450

Domantas Mincė

In your case, we will discussing the aviation sector.

0:0:28.380 --> 0:0:29.510

Stasys Viltrakis

OK, no problem.

0:0:28.770 --> 0:0:32.470

Domantas Mincė

Also, I wanted to inform that this meeting is being recorded and transcribed.

0:0:32.490 --> 0:0:32.830

Domantas Mincė

Do you agree?

0:0:33.530 --> 0:0:34.240

Stasys Viltrakis

Yes, yes, of course.

0:0:35.500 --> 0:0:35.830

Domantas Mincė

OK.

0:0:35.840 --> 0:0:36.110

Domantas Mincė

Thanks.

0:0:36.120 --> 0:0:38.0

Domantas Mincė

Maybe you can do introduction from your side then.

0:0:39.260 --> 0:0:42.310

Stasys Viltrakis

OK, so my name is Stasys Viltrakis.

0:0:42.320 --> 0:0:47.520

Stasys Viltrakis

I'm working Avion express like Chief Operating Officer, same time accountable manager.

0:0:49.470 --> 0:0:50.480

Stasys Viltrakis

I don't know what do you need more.

0:0:51.770 --> 0:0:53.60

Domantas Mincė

It's OK. It's OK.

0:0:53.570 --> 0:0:53.760

Stasys Viltrakis

With.

0:0:53.70 --> 0:0:53.880

Domantas Mincė

Yeah.

0:0:54.890 --> 0:0:59.860

Domantas Mincė

OK, so let's not waste the time and maybe let's go to the questionnaire.

0:0:59.950 --> 0:1:18.360

Domantas Mincė

The questionnaire is standard and it's being used within all the interviews I'm holding with all the companies and I'm also, uh, checking the impact on aviation, on road transportation and on maritime logistics to compare the sectors are more advanced or maybe it's all the in the same level of technologies.

0:1:19.520 --> 0:1:38.100

Domantas Mincė

So firstly, talking about past few years, we had quite a lot of challenges COVID-19 war in Ukraine started, fuel prices increased and there is lots and lots of regulations happening on the CO2 emissions and coming from European Union and other institutions.

0:1:38.620 --> 0:1:39.280

Domantas Mincė

How do you see?

0:1:39.290 --> 0:1:41.60

Domantas Mincė

Did it forced logistics sector to change?

0:1:43.970 --> 0:1:47.680

Stasys Viltrakis

Ohh OK, I think it is.

0:1:49.600 --> 0:1:50.690

Stasys Viltrakis

A bit, but not much.

0:1:50.700 --> 0:1:57.330

Stasys Viltrakis

You know, because there are no really advanced technologies that would be, let's say, changing logistics sectors, at least I'm talking about aviation now.

0:1:58.140 --> 0:2:1.140

Stasys Viltrakis

Uh, two other side because we're not really.

0:2:3.40 --> 0:2:19.970

Stasys Viltrakis

Effective electric engines or capacity of batteries with light weight of batteries which is the makes kind of uh problematic to be to implement something really new in the aviation market so.

0:2:22.420 --> 0:2:27.260

Stasys Viltrakis

In terms of uh, uh, CO2 emission reduction.

0:2:28.60 --> 0:2:31.480

Stasys Viltrakis

Uh, which part is a bit more advanced?

0:2:31.490 --> 0:2:37.220

Stasys Viltrakis

Let's call it and there are some technologies already were already flying with CO2 emission?

0:2:37.830 --> 0:2:46.950

Stasys Viltrakis

Let's call it lower CO2 emission with a oh, it's called this fuel CO2 friendly, let's say fuel and so on.

0:2:48.610 --> 0:2:54.680

Stasys Viltrakis

But the, as I said, I don't know how it's going to work because we are living in our not only in Europe.

0:2:54.690 --> 0:3:0.110

Stasys Viltrakis

We are flying as aviation is really, let's call it transcontinental business.

0:3:0.120 --> 0:3:5.20

Stasys Viltrakis

You know, just you are going everywhere and it should be decision from all around.

0:3:5.30 --> 0:3:16.700

Stasys Viltrakis

All the parts on around the world, you know, now if Europe will take a decision and I don't know where it's going to lead us because we are competition, competition wise we will be really in worse conditions when ours.

0:3:17.70 --> 0:3:28.600

Stasys Viltrakis

So means as you know, for Middle East, this is a we never go for at least next decade, I would call it let's say for something like that because we are living from regular fuel regular oil.

0:3:29.110 --> 0:3:33.420

Stasys Viltrakis

So United States is not clear as well because it's highly political stuff.

0:3:33.690 --> 0:3:37.980

Stasys Viltrakis

So means if we go in the Europe only solely, I would call it.

0:3:37.990 --> 0:3:40.720

Stasys Viltrakis

Let's say we are in a competition market.

0:3:40.730 --> 0:3:49.520

Stasys Viltrakis

We will be not in the best conditions here, so means for me it's difficult to predict what we will be really fast moving towards something really efficient or electric.

0:3:49.530 --> 0:3:56.180

Stasys Viltrakis

Batteries and electric motors, electric aircrafts or CO2, low emission fuel and so on.

0:3:56.170 --> 0:3:56.410

Domantas Mincė

Umm.

0:3:56.510 --> 0:4:1.650

Stasys Viltrakis

It will take some, I would call it, yes or maybe decades, but because new technology should be developed in.

0:4:4.400 --> 0:4:5.470

Domantas Mincė

Yeah, definitely.

0:4:5.480 --> 0:4:8.810

Domantas Mincė

So actually the next question is about the technologies.

0:4:8.820 --> 0:4:15.130

Domantas Mincė

One of the technologies I'm analyzing is the artificial intelligence with machine learning and deep learning.

0:4:16.340 --> 0:4:23.890

Domantas Mincė

So can you elaborate if you are using or starting to at least evaluate the usage of this?

0:4:23.900 --> 0:4:28.260

Domantas Mincė

Or maybe you know something you know from the broader aviation sector that someone is using it.

0:4:30.390 --> 0:4:30.740

Stasys Viltrakis

Yeah.

0:4:30.750 --> 0:4:33.620

Stasys Viltrakis

So what's on operational side?

0:4:33.990 --> 0:4:35.180

Stasys Viltrakis

I don't think so.

0:4:35.590 --> 0:4:44.290

Stasys Viltrakis

What somebody is using it, let's say like I'm from a biologic or something else maybe could be used from a, maybe crew planning or something?

0:4:44.360 --> 0:4:47.70

Stasys Viltrakis

I don't know planning of resources, but I don't think so.

0:4:47.80 --> 0:4:48.710

Stasys Viltrakis

We still have some, I I never heard.

0:4:48.720 --> 0:4:54.70

Stasys Viltrakis

What somebody would have a really efficient tool for that, but it will not make any anyway.

0:4:58.80 --> 0:4:58.300

Domantas Mincė

Umm.

0:4:54.80 --> 0:5:0.320

Stasys Viltrakis

Let's say a really big difference and regular programs because we've been developed this way.

0:5:0.330 --> 0:5:7.800

Stasys Viltrakis

What you entering as many, let's say parts as you want into this planning and afterwards it gives you some results.

0:5:7.890 --> 0:5:12.130

Stasys Viltrakis

So maybe a artificial intelligence would help it, but not that much I would call.

0:5:12.890 --> 0:5:28.560

Stasys Viltrakis

Uh, in terms of maintenance part and calling in general maintenance, it's many, many things that are under maintenance, but I know what the big companies like Lufthansa or even some our competitors or our colleagues, we already trying to implement some AI.

0:5:32.70 --> 0:5:39.380

Stasys Viltrakis

Some of it I tools to be more efficient on delivering spare parts on the changes of spare parts and so on.

0:5:39.390 --> 0:5:41.560

Stasys Viltrakis

But it's still again it's I would call it.

0:5:43.870 --> 0:5:44.720

Domantas Mincė

Umm OK.

0:5:41.570 --> 0:5:47.170

Stasys Viltrakis

It's really beginning of the processes and it's, I would call it for now.

0:5:47.180 --> 0:6:11.530

Stasys Viltrakis

It's time consuming and resources consuming and I don't know when we did not discuss this, at least now for we were maintenance guys about it and what I know in a broader perspective already where I discussions on a using single pilot checkups or no pilot aircrafts and it's definitely will be underwear influence of artificial intelligence.

0:6:11.540 --> 0:6:25.980

Stasys Viltrakis

But it's again, it's an embryonic stage, I would call it like that because there are many things, even legal things and some others, you know, just it's, I don't know, maybe next decade we will see some cargo aircrafts flying on with maybe without pilots with pilots.

0:6:25.990 --> 0:6:26.400

Stasys Viltrakis

I don't know.

0:6:28.290 --> 0:6:28.510

Domantas Mincė

Umm.

0:6:26.410 --> 0:6:33.270

Stasys Viltrakis

We want pilot like operator but it's still in a I cannot give you really deep insights on that part.

0:6:33.280 --> 0:6:34.130

Stasys Viltrakis

You know, just it's.

0:6:34.140 --> 0:6:35.940

Stasys Viltrakis

As I said, Embryo stage or no.

0:6:37.460 --> 0:6:52.250

Domantas Mincė

Umm, that's the actually it trend that I can see from other interviews and the analysis of the financial reports of companies that uh people companies are starting to implement stuff.

0:6:52.320 --> 0:6:59.230

Domantas Mincė

But they I guess they're still investing and looking for answers rather than doing it for the specific purpose.

0:7:0.110 --> 0:7:0.320

Stasys Viltrakis

Yeah.

0:7:0.750 --> 0:7:1.100

Domantas Mincė

Uh.

0:7:0.330 --> 0:7:3.790

Stasys Viltrakis

Yeah, I can imagine, you know, and do Lufthansa has a sources for that, but we are not that big ones.

0:7:3.800 --> 0:7:9.180

Stasys Viltrakis

So means you know, for us it would be really, I would say, but painful and challenging you know to do it.

0:7:11.310 --> 0:7:12.30

Domantas Mincė

Yeah, definitely.

0:7:12.40 --> 0:7:16.470

Domantas Mincė

So you mentioned spare parts ordering and so on.

0:7:16.480 --> 0:7:22.140

Domantas Mincė

So moving to the first question is OK, uh, it's basically answered about it.

0:7:22.150 --> 0:7:26.720

Domantas Mincė

I'm analyzing demand for recasting predictive maintenance, which you mentioned and route planning.

0:7:27.330 --> 0:7:31.470

Domantas Mincė

So in your company, understand you are just thinking of it.

0:7:32.380 --> 0:7:32.540

Stasys Viltrakis

Yeah.

0:7:31.970 --> 0:7:40.890

Domantas Mincė

But overall in the in the in the sector of aviation, you mentioned that there is some kind of stuff happening in bigger companies that have resources, right?

0:7:41.660 --> 0:7:41.960

Stasys Viltrakis

Yeah.

0:7:41.970 --> 0:7:44.330

Stasys Viltrakis

On the big, big, big, big players here, we do it.

0:7:45.420 --> 0:7:45.680

Domantas Mincė

Umm.

0:7:49.140 --> 0:7:49.300

Domantas Mincė

Yeah.

0:7:44.740 --> 0:7:54.70

Stasys Viltrakis

I don't want to give a comments any because it's as I said I'm I've just heard some rumors, but I never will deep into that because it's when you started to analyze how much it would cost to us.

0:7:54.200 --> 0:7:58.420

Stasys Viltrakis

We understood what is really, let's say, expensive and we don't know where result.

0:7:59.520 --> 0:8:0.540

Domantas Mincė

Umm, sure.

0:7:59.650 --> 0:8:4.280

Stasys Viltrakis

It's a, you know, in our companies we are not really keeping aircrafts for a long, long term.

0:8:4.290 --> 0:8:17.110

Stasys Viltrakis

We are keeping for maybe 3-5 years across, so if you if you across will be owned by us, that's and we would be working with them for 20 years and this case, yes, I would say we can, we can look for some, but for us it's far from now.

0:8:17.120 --> 0:8:18.560

Stasys Viltrakis

I would say it's not worth to start.

0:8:20.220 --> 0:8:25.910

Domantas Mincė

So your business model is basically different from that does not require implementation of such processes.

0:8:27.660 --> 0:8:28.170

Domantas Mincė

Kind of, yeah.

0:8:30.690 --> 0:8:31.710

Domantas Mincė

Umm yeah.

0:8:36.560 --> 0:8:38.560

Domantas Mincė

Umm yeah.

0:8:26.750 --> 0:8:41.850

Stasys Viltrakis

You know, as I said, we can't we could, but it would be really, I would say expensive and I even don't know who can be a really expert now in that level you know whom to really hire to be like a owner of a processing this would be let's say like a guessing game.

0:8:42.870 --> 0:8:43.10

Domantas Mincė

Yeah.

0:8:44.170 --> 0:8:44.780

Domantas Mincė

OK.

0:8:44.870 --> 0:8:51.160

Domantas Mincė

The next question is, do you have any warehouses and operating any warehouses in your company?

0:8:51.170 --> 0:8:55.220

Domantas Mincė

If yes, are using any technologies to automate or optimize operations.

0:8:57.0 --> 0:8:57.490

Stasys Viltrakis

Ohh.

0:9:0.470 --> 0:9:3.710

Stasys Viltrakis

Yes, but the technology is not that much developed in that part.

0:9:3.720 --> 0:9:6.600

Stasys Viltrakis

You know, just it's and I'm not really expert of that.

0:9:7.690 --> 0:9:12.440

Stasys Viltrakis

I would need to ask the our maintenance guys, colleagues, how exactly it works.

0:9:12.450 --> 0:9:14.800

Stasys Viltrakis

You know, I did not check this question.

0:9:14.810 --> 0:9:20.870

Stasys Viltrakis

For about what you've been asking and I need to if you need something I can ask after, but I cannot give you no answers, correct answers.

0:9:20.880 --> 0:9:21.740

Stasys Viltrakis

How do we work with?

0:9:34.670 --> 0:9:34.990

Stasys Viltrakis

No, no.

0:9:23.980 --> 0:9:35.750

Domantas Mincė

I guess it's OK, but as long as it's small warehouse, like if you know when I'm talking to the guys like DPD, they have these sophisticated parcel separation services where they have different belts.

0:9:35.760 --> 0:9:38.90

Domantas Mincė

So yeah, so I was expecting that because.

0:9:37.410 --> 0:9:39.50

Stasys Viltrakis

It's it can.

0:9:39.60 --> 0:9:45.900

Stasys Viltrakis

It can be, let's say, what we have quite many items, but it's not something like you said, the DPD or DHL or something, you know, just it's completely different stuff.

0:9:44.930 --> 0:9:47.650

Domantas Mincė

Umm yeah, that's clear.

0:9:49.330 --> 0:9:57.280

Domantas Mincė

OK, so the next technology I'm looking into is the actually the electric vehicles, which is, you know oriented in the road transportation.

0:9:57.330 --> 0:10:1.70

Domantas Mincė

However, there is this term electrification overall.

0:10:1.490 --> 0:10:7.50

Domantas Mincė

Do you see any of that in in air logistics or is it not yet there?

0:10:7.520 --> 0:10:15.270

Domantas Mincė

From what I heard, alternative fuels is the one that is driving the sector of, you know, air transportation.

0:10:15.370 --> 0:10:16.180

Domantas Mincė

What is your view on this?

0:10:17.330 --> 0:10:18.700

Stasys Viltrakis

Uh, I was in a conference.

0:10:18.710 --> 0:10:19.680

Stasys Viltrakis

I told you before, Lithuanian.

0:10:20.90 --> 0:10:20.320

Domantas Mincė

Umm.

0:10:19.690 --> 0:10:31.770

Stasys Viltrakis

And so when I had a conference now and we had one company from the north, uh, from Sweden, I think what we've been proud, but there is one aircraft already created what it's works on a batteries.

0:10:33.380 --> 0:10:36.190

Stasys Viltrakis

But as per my understanding it's more let's say like a.

0:10:38.500 --> 0:10:47.630

Stasys Viltrakis

Data project and maybe just uh, we're trying to show something that is possible because it's as if I'm understanding it's compensated.

0:10:47.880 --> 0:10:50.980

Stasys Viltrakis

All the researchers are never compensated for by the government and.

0:10:53.100 --> 0:10:56.950

Stasys Viltrakis

We need to again to get some boost of Technologies here.

0:10:56.960 --> 0:10:58.770

Stasys Viltrakis

Just a battery should be light.

0:10:58.920 --> 0:11:5.350

Stasys Viltrakis

Let's say we capacity should be different, you know, and temperature should be not affecting this batteries and so on.

0:11:5.360 --> 0:11:21.380

Stasys Viltrakis

It's a lot of things to change in order to be effective because now if you will put a lithium batteries on the aircraft, I don't know what is the payload of aircrafts will be saved instead of if it's let's say 10 tons, let's take it like an average 10 tons payload before now it will batteries maybe will be 3 or 4 tons you know.

0:11:26.120 --> 0:11:26.430

Domantas Mincė

Umm.

0:11:21.390 --> 0:11:31.260

Stasys Viltrakis

So you losing your, you know capacity on a carrying cargo and passengers you know because it's a batteries are really heavy afterwards.

0:11:31.270 --> 0:11:35.520

Stasys Viltrakis

I was telling you what the actually temperatures are really affecting lithium batteries.

0:11:35.530 --> 0:11:44.240

Stasys Viltrakis

You know, if it's you're going to the somewhere on the north or you flying that minus 50 outside, it's it should decrease enough capacity quite significantly.

0:11:54.170 --> 0:11:54.430

Domantas Mincė

Umm.

0:11:44.330 --> 0:11:54.660

Stasys Viltrakis

So for me it's it's OK, but the people doing this, but it's not a really commercial project, it's a bit more, I would say governments may become support this party just to just to see how it works.

0:11:54.670 --> 0:11:59.0

Stasys Viltrakis

And then here, as I said, I heard what the cars already.

0:11:59.880 --> 0:12:6.250

Stasys Viltrakis

Uh, maybe we'll be trying to use a some different type of the batteries and so on.

0:12:6.260 --> 0:12:15.190

Stasys Viltrakis

We faster charging and capacity high, you know just this is maybe we'll change a bit as well in aviation part, but now it's again it's an embryo on stage.

0:12:16.120 --> 0:12:16.330

Domantas Mincė

Mm-hmm.

0:12:15.240 --> 0:12:19.150

Stasys Viltrakis

So it's nothing really what would be going to the commercial part in.

0:12:20.320 --> 0:12:20.870

Domantas Mincė

Mm-hmm.

0:12:21.120 --> 0:12:21.790

Domantas Mincė

Sure.

0:12:21.860 --> 0:12:30.370

Domantas Mincė

Do you see any possible impact for the air logistics in the next 5-10 years from this electrification or it's still too short period of time?

0:12:30.180 --> 0:12:30.660

Stasys Viltrakis

Stop.

0:12:30.770 --> 0:12:32.630

Stasys Viltrakis

I would call to shorten first of all engines.

0:12:32.640 --> 0:12:34.660

Stasys Viltrakis

I don't know where we need to look for the engines.

0:12:35.290 --> 0:12:39.260

Stasys Viltrakis

Engines should be different ones and it's, I don't know.

0:12:39.270 --> 0:12:45.20

Stasys Viltrakis

I never heard what the Rolls Royce or Brighton Whitney or CFM or somebody would be working on.

0:12:45.30 --> 0:12:45.500

Stasys Viltrakis

Afternoon.

0:12:45.990 --> 0:12:46.940

Stasys Viltrakis

Maybe we have it.

0:12:46.770 --> 0:12:47.30

Domantas Mincė

Umm.

0:12:46.950 --> 0:12:49.240

Stasys Viltrakis

Is that's really not, I don't know.

0:12:49.250 --> 0:12:54.540

Stasys Viltrakis

Let's say this is maybe for a small aircrafts or something could be done, but it's not for not for commercial aviation.

0:12:55.660 --> 0:12:56.460

Domantas Mincė

Yeah. OK.

0:12:58.940 --> 0:12:59.870

Domantas Mincė

That makes sense.

0:12:59.880 --> 0:13:0.330

Domantas Mincė

Definitely.

0:13:0.340 --> 0:13:4.910

Domantas Mincė

As you know, you'd you need to consider lots of stuff also from my insides.

0:13:4.920 --> 0:13:13.190

Domantas Mincė

You know that firstly the aviation is very heavily regulated as you're carrying people, you are responsible for lives basically.

0:13:13.200 --> 0:13:15.310

Domantas Mincė

So it's hard to introduce anything new.

0:13:15.320 --> 0:13:23.250

Domantas Mincė

Also, the uh life cycle of creation of let's say new engine, it's in terms of years with all the testing and everything.

0:13:26.970 --> 0:13:27.440

Stasys Viltrakis

It is.

0:13:27.450 --> 0:13:27.960

Stasys Viltrakis

It is.

0:13:23.260 --> 0:13:29.290

Domantas Mincė

So it's yeah, 10 years is nothing basically in this environment. Umm.

0:13:28.590 --> 0:13:31.930

Stasys Viltrakis

It is no if you want to change and afterwards you know just with this batteries.

0:13:31.940 --> 0:13:34.380

Stasys Viltrakis

But I was saying, you know, it's impossible.

0:13:34.390 --> 0:13:37.560

Stasys Viltrakis

Because if you want to charge, it's not a card to charge, you need to charge.

0:13:37.620 --> 0:13:37.800

Domantas Mincė

Yeah.

0:13:37.570 --> 0:13:40.320

Stasys Viltrakis

I don't know how many batteries, it's how much?

0:13:40.620 --> 0:13:40.800

Domantas Mincė

Yeah.

0:13:40.410 --> 0:13:40.820

Stasys Viltrakis

How?

0:13:40.830 --> 0:13:45.930

Stasys Viltrakis

How you need a kind of nuclear power plant next to the airport and just charge the aircraft.

0:13:48.0 --> 0:13:48.680

Domantas Mincė

Yeah.

0:13:49.170 --> 0:13:57.200

Domantas Mincė

OK, so let's move to the third technology, which is definitely used in the in the air logistics, it's telematics, right?

0:13:57.750 --> 0:14:2.120

Domantas Mincė

So does telematics play any role in your operations?

0:14:2.380 --> 0:14:9.790

Domantas Mincė

And since it's production, did it improve any fleet management or safety or overall companies efficient efficiency?

0:14:10.590 --> 0:14:13.560

Stasys Viltrakis

And then you give me a bit more insight on telematics.

0:14:13.640 --> 0:14:16.880

Stasys Viltrakis

What is exactly meaning, let's say because I'm more or less understand it.

0:14:16.890 --> 0:14:17.700

Stasys Viltrakis

But let's say I don't.

0:14:17.710 --> 0:14:17.960

Stasys Viltrakis

Don't.

0:14:17.970 --> 0:14:19.110

Stasys Viltrakis

Really not really deep into this.

0:14:19.270 --> 0:14:19.880

Domantas Mincė

Mm-hmm.

0:14:20.150 --> 0:14:20.440

Domantas Mincė

Sure.

0:14:20.450 --> 0:14:33.620

Domantas Mincė

So basically the Internet of Things technology, you have something, you know, some things in the in the plane that is tracking the location, the altitude etcetera, you know and giving all this data in lifetime for the let's say operators.

0:14:33.630 --> 0:14:40.100

Domantas Mincė

If I'm not sure about the aviation, but in Rd logistics you see always where the truck is, where how much fuel does it have?

0:14:40.110 --> 0:14:41.470

Domantas Mincė

What speed is he traveling on?

0:14:42.240 --> 0:14:43.290

Domantas Mincė

Consumption and so on.

0:14:45.700 --> 0:14:47.670

Stasys Viltrakis

Yeah, but it's a, you know, aviation.

0:14:49.990 --> 0:14:50.240

Domantas Mincė

Umm.

0:14:47.680 --> 0:14:57.350

Stasys Viltrakis

It's for a long time already that these things, these things are working, you know, for we know constantly where we aircrafts is and the rest of the things I as well recorded.

0:14:57.360 --> 0:15:0.80

Stasys Viltrakis

You know you're doing recording of the fueling and so on and so on.

0:15:0.750 --> 0:15:7.440

Stasys Viltrakis

And we are making route planning and according to the winds where we are, it goes on the live status.

0:15:7.450 --> 0:15:8.510

Stasys Viltrakis

You know, we are not planning route.

0:15:10.840 --> 0:15:11.70

Domantas Mincė

Umm.

0:15:9.900 --> 0:15:12.10

Stasys Viltrakis

OK, let's go to Tenerife from Guinness.

0:15:12.620 --> 0:15:13.780

Stasys Viltrakis

Constantly the same routing.

0:15:13.790 --> 0:15:14.640

Stasys Viltrakis

You know you're looking for.

0:15:14.650 --> 0:15:18.490

Stasys Viltrakis

However, winds around the routing and so on and afterwards it's.

0:15:19.100 --> 0:15:19.630

Stasys Viltrakis

Let's call it.

0:15:26.430 --> 0:15:26.650

Domantas Mincė

Umm.

0:15:19.640 --> 0:15:29.450

Stasys Viltrakis

Machine gives you a way where it's better to to fly South or north, or maybe in that Center just just in order to be faster, more efficient on the Web Part. Umm.

0:15:32.720 --> 0:15:32.880

Stasys Viltrakis

But.

0:15:29.400 --> 0:15:35.570

Domantas Mincė

So it so it's improving basically you know because if you are saving on fuel, the operational costs are lower, right?

0:15:38.390 --> 0:15:38.580

Domantas Mincė

Mm-hmm.

0:15:51.680 --> 0:15:51.980

Domantas Mincė

Umm.

0:15:35.560 --> 0:15:55.310

Stasys Viltrakis

Yeah, but this part is already for you, for years implemented in aviation because it's, you know, if you will be flying in the wrong part that put, let's say, in transatlantic flights, it can give you one hour more flight time if you when you be flying out sometimes it's the best option, the best and interesting option you can see.

0:15:55.780 --> 0:15:57.570

Stasys Viltrakis

Sometimes it is interesting for you.

0:16:3.820 --> 0:16:4.40

Domantas Mincė

Umm.

0:15:57.580 --> 0:16:14.710

Stasys Viltrakis

You can look for a Finnair now because we close the Russian their space, so we can we can say we one day we can fly the same flight over North Pole and then never fly another day the same routing we can fly over let's say South Turkey part and so on and so on.

0:16:14.960 --> 0:16:19.230

Stasys Viltrakis

When they were going to Asian, so means which is taken in consideration.

0:16:20.330 --> 0:16:25.690

Domantas Mincė

Umm, but it means that it needs human interaction there as well, right?

0:16:25.780 --> 0:16:34.370

Domantas Mincė

If you say you know you might burn a bit more fuel but save an hour or a few hours of flying time, it's also, you know, is it considered like that?

0:16:33.620 --> 0:16:35.480

Stasys Viltrakis

It's, it's goal.

0:16:35.490 --> 0:16:36.370

Stasys Viltrakis

So let's call it.

0:16:40.300 --> 0:16:40.480

Domantas Mincė

OK.

0:16:43.900 --> 0:16:44.110

Domantas Mincė

Umm.

0:16:36.380 --> 0:16:46.630

Stasys Viltrakis

OK, you need to give an first inputs, let's say like where are you going from where to where and afterwards you can get the routines you know just to which one is more effective and afterwards you're choosing let's say which one is better to fly.

0:16:46.640 --> 0:16:47.100

Domantas Mincė

Yeah.

0:16:47.200 --> 0:16:47.590

Domantas Mincė

OK.

0:16:48.0 --> 0:16:56.780

Domantas Mincė

And there's a did you have or do you have any challenges with the telematics, let's say, talking about Internet connections and flying in the high altitudes and so on?

0:16:58.70 --> 0:16:59.860

Stasys Viltrakis

Uh, we are not.

0:16:59.870 --> 0:17:6.710

Stasys Viltrakis

We have other ways how to communicate, but to the New Orleans here we have we have some Internet connections on that.

0:17:7.520 --> 0:17:15.930

Stasys Viltrakis

On the new aircraft you can have it, uh, we have some other things, but we are going for paperless cockpit.

0:17:15.940 --> 0:17:16.410

Stasys Viltrakis

I don't know.

0:17:16.420 --> 0:17:18.670

Stasys Viltrakis

Can you call it Telematics or not?

0:17:18.680 --> 0:17:20.530

Stasys Viltrakis

But we don't have any more papers.

0:17:20.540 --> 0:17:23.770

Stasys Viltrakis

All the new flight plans and everything is goes through enter, but it's mostly on the ground.

0:17:25.40 --> 0:17:25.230

Domantas Mincė

Umm.

0:17:23.780 --> 0:17:34.300

Stasys Viltrakis

You know you going you on the ground, you connecting to the Internet and you're making loading your files in order to get lost information with the company you're offering you to fly.

0:17:34.310 --> 0:17:39.490

Stasys Viltrakis

And just so something like that, if it's if it's false under this doesn't matter, they'll have.

0:17:40.70 --> 0:17:40.350

Domantas Mincė

Umm.

0:17:40.310 --> 0:17:41.240

Stasys Viltrakis

What's it with?

0:17:41.250 --> 0:17:42.490

Stasys Viltrakis

With work that's going to call it.

0:17:42.500 --> 0:17:42.750

Stasys Viltrakis

I don't know.

0:17:42.840 --> 0:17:45.130

Domantas Mincė

Yeah. OK.

0:17:55.840 --> 0:17:56.110

Domantas Mincė

Umm.

0:17:44.270 --> 0:17:57.740

Stasys Viltrakis

So me and uh, we are constantly on some on connect connection to the technologies on the Internet, on the aircraft as well not that full scope let's call it but yes, but we anyway more and more you know trying to avoid let's say all the papers and so on and so on.

0:17:57.750 --> 0:18:3.590

Stasys Viltrakis

So we need to trying to be more as much effective as we can in order just to be competitive for the marketing.

0:18:5.900 --> 0:18:6.430

Domantas Mincė

The good?

0:18:6.440 --> 0:18:6.860

Domantas Mincė

Yeah.

0:18:7.30 --> 0:18:9.680

Domantas Mincė

So you mentioned moving on to the next question.

0:18:9.690 --> 0:18:15.700

Domantas Mincė

Then you mentioned that you are gathering lots of data from the this how is it called?

0:18:16.960 --> 0:18:18.860

Domantas Mincė

Uh forecast of the weather?

0:18:18.880 --> 0:18:19.300

Domantas Mincė

Right.

0:18:19.310 --> 0:18:22.450

Domantas Mincė

The event, the directions and so on.

0:18:22.460 --> 0:18:26.930

Domantas Mincė

So it means that you have a lot of data and you're making decisions based on this data.

0:18:27.80 --> 0:18:28.270

Domantas Mincė

So how do you see this?

0:18:28.340 --> 0:18:38.350

Domantas Mincė

Does this having data and making decisions based on data is helping with resilience, supply chains, resilience and during the disruptions like COVID and so on.

0:18:38.420 --> 0:18:43.630

Domantas Mincė

And I guess in this case, war is more of the disruption when you cannot fly over certain countries, right?

0:18:46.450 --> 0:18:47.480

Stasys Viltrakis

Ooh yeah.

0:18:47.810 --> 0:18:52.760

Stasys Viltrakis

Ohh, I'm just thinking what to say and what to answer.

0:18:52.770 --> 0:18:53.910

Stasys Viltrakis

We connecting what data?

0:18:53.920 --> 0:19:6.590

Stasys Viltrakis

Of course, you know, even before we are planning some routings, if you if it goes already on a quite long distances you are taking, you know, uh, some kind of the statistical data in order to plan it.

0:19:15.500 --> 0:19:15.710

Domantas Mincė

Umm.

0:19:6.600 --> 0:19:16.450

Stasys Viltrakis

You know, can we do it or we cannot, you know, just in to see your consumption and some other things, you know, statistically temperatures on Air Force winds on a on a routing sensor.

0:19:17.540 --> 0:19:18.710

Stasys Viltrakis

You do so, of course.

0:19:18.720 --> 0:19:19.130

Stasys Viltrakis

Yeah.

0:19:19.200 --> 0:19:23.880

Stasys Viltrakis

And I don't know what to say more.

0:19:23.970 --> 0:19:27.140

Stasys Viltrakis

Let's say like if you have his date, of course you can.

0:19:27.150 --> 0:19:30.200

Stasys Viltrakis

You can plan if you need to avoid the Russian territorial or Russian territory.

0:19:30.210 --> 0:19:31.20

Stasys Viltrakis

You can do it or not.

0:19:31.30 --> 0:19:37.320

Stasys Viltrakis

Let's say that now it's not affecting, but our company specially but much because we are not long haul routings.

0:19:37.830 --> 0:19:38.500

Stasys Viltrakis

But OK, why?

0:19:38.510 --> 0:19:38.840

Stasys Viltrakis

Why not?

0:19:38.850 --> 0:19:39.750

Stasys Viltrakis

It's affecting actually.

0:19:39.760 --> 0:19:40.900

Stasys Viltrakis

Let's call it Dubai.

0:19:41.370 --> 0:19:43.640

Stasys Viltrakis

Previously, we could go Dubai directly now.

0:19:43.650 --> 0:19:44.260

Stasys Viltrakis

No, you're not.

0:19:44.270 --> 0:19:44.680

Stasys Viltrakis

Let's go.

0:19:44.690 --> 0:19:54.120

Stasys Viltrakis

We need to maybe most of the transatlantic, you know, because it's it was quite long flight and now we've avoiding all the space of Russia, Ukraine.

0:19:55.600 --> 0:19:56.110

Stasys Viltrakis

I don't know.

0:19:56.120 --> 0:20:7.300

Stasys Viltrakis

We would spend that would say maybe something like 1/2 an hour, 40 minutes more and it's it's makes some kind of effect on hour one hour work and using the data we can say in advance can we do it or not?

0:20:8.560 --> 0:20:8.770

Domantas Mincė

OK.

0:20:7.370 --> 0:20:9.10

Stasys Viltrakis

No, you are not planning the same day.

0:20:10.970 --> 0:20:11.460

Domantas Mincė

OK.

0:20:11.530 --> 0:20:11.800

Domantas Mincė

Yeah.

0:20:13.630 --> 0:20:14.820

Stasys Viltrakis

Yeah, I'll.

0:20:11.810 --> 0:20:15.610

Domantas Mincė

So it helps seeing, you know, planning and seeing.

0:20:14.830 --> 0:20:15.720

Stasys Viltrakis

At least we have you.

0:20:15.730 --> 0:20:17.100

Stasys Viltrakis

Yeah, at least we have understanding.

0:20:17.110 --> 0:20:18.470

Stasys Viltrakis

You can do it or not change smallest.

0:20:18.910 --> 0:20:19.930

Domantas Mincė

OK, OK.

0:20:21.210 --> 0:20:24.470

Domantas Mincė

And do you collaborate with any startups?

0:20:24.480 --> 0:20:34.780

Domantas Mincė

Maybe scientific institutions or any, you know, technology providers to look into different technologies you know to see if it fits, you know your sector and so on.

0:20:37.340 --> 0:20:37.570

Stasys Viltrakis

Who?

0:20:37.580 --> 0:20:38.770

Stasys Viltrakis

Technologies. Technologies.

0:20:38.780 --> 0:20:39.370

Stasys Viltrakis

I'm not calling.

0:20:39.380 --> 0:20:44.30

Stasys Viltrakis

I wouldn't call it, let's say, like a Technologies but with but with software providers.

0:20:48.410 --> 0:20:48.630

Domantas Mincė

Umm.

0:20:44.40 --> 0:20:55.30

Stasys Viltrakis

Definitely yes, because we are trying to optimize our software, we have and Even so I'm trying to create some, some others even sometimes we help of IT specialist we are creating.

0:20:56.770 --> 0:21:4.870

Stasys Viltrakis

Some uh, kind of software did help, would help would do what we need like a company because our company is a bit specific.

0:21:5.820 --> 0:21:6.50

Domantas Mincė

Umm.

0:21:5.260 --> 0:21:7.830

Stasys Viltrakis

We're not regular, let's say, carrier.

0:21:7.840 --> 0:21:15.250

Stasys Viltrakis

We are charter provider and there are some cost optimizations, some other things, but we need to count it before and you know, just even signing projects.

0:21:15.260 --> 0:21:16.630

Stasys Viltrakis

So what are you enduring?

0:21:16.640 --> 0:21:22.910

Stasys Viltrakis

Let's say projects we want to optimize our say resources and even cost control to help.

0:21:22.920 --> 0:21:29.100

Stasys Viltrakis

So we are working with some idea companies and so on just to make some products.

0:21:29.110 --> 0:21:30.640

Stasys Viltrakis

What this fits as well?

0:21:31.770 --> 0:21:37.720

Domantas Mincė

OK, so we came to the main question, what's your view?

0:21:37.730 --> 0:21:49.760

Domantas Mincė

Do this disruptive technologies, we discussed artificial intelligence, electrification and telematics are changing the air logistics business models creating some new opportunities or not yet.

0:21:52.170 --> 0:21:54.800

Stasys Viltrakis

OK, I myself, I really like this.

0:21:54.910 --> 0:22:1.140

Stasys Viltrakis

All these things and they life I'm making, you know, we've charged PT quite a lot of stuff.

0:22:3.730 --> 0:22:3.930

Domantas Mincė

Yeah.

0:22:1.250 --> 0:22:8.560

Stasys Viltrakis

It helps you just to be more efficient, you know, but of course you need to check it's still not on the level that you can trust 100%.

0:22:8.570 --> 0:22:9.580

Stasys Viltrakis

Of course, you know just but.

0:22:10.290 --> 0:22:11.460

Stasys Viltrakis

But myself, I like it.

0:22:11.470 --> 0:22:16.340

Stasys Viltrakis

And in terms of aviation, I would call it it's, it's started, it's good, but it's started.

0:22:16.350 --> 0:22:24.690

Stasys Viltrakis

And because afterwards I don't want aviation sector would be behind, but it's still as they set again, it kind of embryo level because it just beginning.

0:22:32.960 --> 0:22:33.150

Domantas Mincė

Right.

0:22:25.920 --> 0:22:39.800

Stasys Viltrakis

Uh should change some things you know, because as you said before, aviation is really how to say regulated environment, you know, and to do something, you know you need to do a lot of stuff, that stuff, you know, risk assessments and so on.

0:22:39.810 --> 0:22:44.110

Stasys Viltrakis

You know, just to prove it, because afterwards if something would happen, crashes would be the disaster.

0:22:44.410 --> 0:22:47.460

Stasys Viltrakis

So means, you know it's a I would call it it.

0:22:47.470 --> 0:22:48.650

Stasys Viltrakis

It need to take time.

0:22:48.660 --> 0:22:51.640

Stasys Viltrakis

People should be ready mentally to use it afterwards.

0:22:51.650 --> 0:22:52.930

Stasys Viltrakis

Maybe it will come to to aviation.

0:22:54.80 --> 0:22:54.250

Domantas Mincė

Umm.

0:22:55.180 --> 0:22:55.850

Domantas Mincė

OK.

0:22:56.220 --> 0:23:11.930

Domantas Mincė

Yeah, that's the trend that I can see from all the analysis I have done so far and actually in all of these sectors that I have in analyzing, uh, do you have any KPI to measure the impact of technologies on your business?

0:23:14.510 --> 0:23:15.810

Stasys Viltrakis

Umm, I'm good question.

0:23:15.820 --> 0:23:18.170

Stasys Viltrakis

I'm just thinking, let's say what would be on the company level?

0:23:18.180 --> 0:23:28.0

Stasys Viltrakis

I wouldn't say on the maybe some small like let's say in departmental level, maybe yes, I could find it, but like it would be let's say keep Pi for all organization.

0:23:29.330 --> 0:23:29.840

Stasys Viltrakis

Just think.

0:23:29.850 --> 0:23:30.640

Stasys Viltrakis

I don't think so.

0:23:30.690 --> 0:23:32.40

Stasys Viltrakis

But we have something, let's say.

0:23:32.110 --> 0:23:36.970

Stasys Viltrakis

Look for with technology would be, let's say what we would measure in technology, how effective technology for us.

0:23:38.120 --> 0:23:43.690

Stasys Viltrakis

Umm, not sure, maybe from off side or from somewhere I can find it and can show you.

0:23:44.930 --> 0:23:45.150

Domantas Mincė

Umm.

0:23:44.100 --> 0:23:50.650

Stasys Viltrakis

Of course, as I said, this planning over routings and so on and so on, you know, uh, for sure this works.

0:23:50.660 --> 0:23:58.790

Stasys Viltrakis

You know, I can tell you what for us is maybe not that much important because we I see MI provider, we don't pay for the fuel, it's our customers mostly pay for the fuel you know.

0:23:58.800 --> 0:24:8.810

Stasys Viltrakis

So if we would be, let's say carrier, this one is would be really important and would definitely would be, it would be main reason for us to, to see and maybe ticketing and so on.

0:24:8.820 --> 0:24:10.650

Stasys Viltrakis

But we can gain more money.

0:24:10.660 --> 0:24:13.80

Stasys Viltrakis

But for four hours we are seeing my provider.

0:24:13.90 --> 0:24:15.440

Stasys Viltrakis

We are really on a kind of specific business.

0:24:15.450 --> 0:24:18.880

Stasys Viltrakis

We are B2B and some other things that have worked for other companies will not really.

0:24:20.370 --> 0:24:20.980

Domantas Mincė

OK.

0:24:21.70 --> 0:24:22.40

Domantas Mincė

Yeah, that makes sense.

0:24:22.150 --> 0:24:30.260

Domantas Mincė

It's if, if, if the costs are, you know, reimbursed on the client, then it's it does not make sense to track it a lot.

0:24:30.770 --> 0:24:36.80

Stasys Viltrakis

Like you know, we are tracking, but it's not, as I said, it's not with directly in impacted financial.

0:24:35.960 --> 0:24:36.280

Domantas Mincė

Umm.

0:24:36.90 --> 0:24:36.520

Stasys Viltrakis

Definitely.

0:24:36.530 --> 0:24:39.300

Stasys Viltrakis

We're trying to get the give a best product for our customer.

0:24:40.840 --> 0:24:41.50

Domantas Mincė

Yeah.

0:24:39.310 --> 0:24:46.70

Stasys Viltrakis

I cannot say what we are not tracking and we're not looking because customers as well, but it's not a main KPI, let's called what we need to track him.

0:24:47.160 --> 0:24:48.270

Domantas Mincė

OK, OK.

0:24:49.270 --> 0:24:56.400

Domantas Mincė

And moving to the last question is from the uh technology advancements in countries.

0:24:56.710 --> 0:25:6.900

Domantas Mincė

So I have it, you know, question if operating in Lithuania, do you see any difference in adoption of technologies or anything specific to the market of our country?

0:25:6.990 --> 0:25:17.700

Domantas Mincė

I can elaborate with you think it's Lithuania is somewhere behind in the technology adoption or they're leading, you know and moving forward in the aviation sector.

0:25:18.860 --> 0:25:19.700

Stasys Viltrakis

I talking about deviation.

0:25:20.710 --> 0:25:20.880

Domantas Mincė

Yes.

0:25:25.90 --> 0:25:25.810

Stasys Viltrakis

I don't know.

0:25:25.910 --> 0:25:29.720

Stasys Viltrakis

As I said, it's in a really early stages and I don't know who does this.

0:25:29.730 --> 0:25:32.520

Stasys Viltrakis

I think our military is are doing the most of this, but it's not.

0:25:32.530 --> 0:25:33.360

Stasys Viltrakis

We don't know about it.

0:25:34.200 --> 0:25:34.420

Domantas Mincė

Umm.

0:25:33.410 --> 0:25:39.710

Stasys Viltrakis

So means we are still really on a kind of really beginning of everything.

0:25:39.820 --> 0:25:40.400

Stasys Viltrakis

I don't think so.

0:25:40.410 --> 0:25:52.0

Stasys Viltrakis

You can be somewhere really ahead or behind here because you know aviation quite expensive the business and if somebody will create something, it's definitely will be on the market next day.

0:25:52.10 --> 0:25:52.240

Stasys Viltrakis

No.

0:25:52.550 --> 0:25:55.810

Stasys Viltrakis

So means you will be buying it and then paying.

0:26:3.180 --> 0:26:3.410

Domantas Mincė

Umm.

0:25:55.820 --> 0:26:16.320

Stasys Viltrakis

But I don't know now anything because they said only maybe some big airlines who trying to do it with some on the maintenance provider side, let's say if you know just some tracking of yeah spare parts and so on and maybe just predicting how when to change something but it's not it's still too early to say something maybe 5-10 years will be some changes soon.

0:26:18.320 --> 0:26:19.530

Domantas Mincė

Yeah, that's clear.

0:26:19.590 --> 0:26:20.790

Domantas Mincė

OK, so actually that's it.

0:26:20.800 --> 0:26:22.810

Domantas Mincė

I had for today's interview.

0:26:22.820 --> 0:26:25.750

Domantas Mincė

Thanks a lot again for the for the time given for me.

0:26:26.800 --> 0:26:30.550

Domantas Mincė

So to summarize, it's same as everywhere, right?

0:26:30.620 --> 0:26:33.350

Domantas Mincė

It's not yet changing or creating new business models.

0:26:34.90 --> 0:26:38.930

Domantas Mincė

It's too premature, especially in this very regulated environment of the aviation, right?

0:26:40.440 --> 0:26:40.890

Stasys Viltrakis

I will call.

0:26:41.790 --> 0:26:41.910

Domantas Mincė

Yeah.

0:26:40.900 --> 0:26:42.150

Stasys Viltrakis

Yes, let's say it's.

0:26:42.520 --> 0:26:43.150

Stasys Viltrakis

Yeah.

0:26:43.280 --> 0:26:44.710

Stasys Viltrakis

At least as I told you, I don't know about.

0:26:46.870 --> 0:26:47.440

Domantas Mincė

OK.

0:26:48.30 --> 0:26:49.0

Domantas Mincė

Thanks a lot then.

0:26:49.70 --> 0:26:50.0

Domantas Mincė

Thanks for the time.

0:26:52.460 --> 0:26:54.400

Domantas Mincė

I will be stopping the recording then.

0:26:54.170 --> 0:26:55.230

Stasys Viltrakis

You're welcome.

Annex 7. Transcript from interview with Girteka

00:00:01 Domantas Mincė

OK, so the recording has started.

00:00:03 Domantas Mincė

Hello Jeroen.

00:00:04 Domantas Mincė

Thanks a lot for having time for me.

00:00:06 Domantas Mincė

I'm Domantas.

00:00:07 Domantas Mincė

I'm student of Vilnius University Business School.

00:00:09 Domantas Mincė

I'm studying deep tech entrepreneurship master's program and I'm doing the research on how the disruptive technologies are affecting the logistics business models.

00:00:18 Domantas Mincė

So firstly, I would like to.

00:00:20 Domantas Mincė

Tell that the meeting.

00:00:21 Domantas Mincė

Is being recorded transcripted, do you agree?

00:00:24 Jeroen Eijsink

I agree with.

00:00:24 Jeroen Eijsink

That no problem.

00:00:26 Domantas Mincė

Thanks a lot.

00:00:26 Domantas Mincė

So thanks again for having giving time for me.

00:00:29 Domantas Mincė

Can you do a short introduction from yourself?

00:00:32 Jeroen Eijsink

My name is Jeroen.

00:00:34 Jeroen Eijsink

I'm the chief executive.

00:00:35 Jeroen Eijsink

Officer for the Girteka Group.

00:00:37 Jeroen Eijsink

UAB, one of the leading transport services.

00:00:40 Jeroen Eijsink

Providers in Europe.

00:00:43 Domantas Mincė

Thanks a lot.

00:00:43 Domantas Mincė

So let's not waste any time and let's go.

00:00:45 Domantas Mincė

To the questions.

00:00:46 Domantas Mincė

The question here is standard.

00:00:48 Domantas Mincė

The same questions are being asked.

00:00:49 Domantas Mincė

Every single person that I'm interviewing so that we could do so that I could do the comparison.

00:00:55 Domantas Mincė

On how different?

00:00:57 Domantas Mincė

Fields are reacting to the same technologies, so the first one.

00:01:02 Domantas Mincė

As you know, we had very challenging past few years.

00:01:05 Domantas Mincė

We had the COVID-19 all over the world.

00:01:06 Domantas Mincė

We had the war started in Ukraine.

00:01:09 Domantas Mincė

Do this due to these two.

00:01:12 Domantas Mincė

Things the fuel price has got increased right and we have lots and lots of regulations coming from the institutions like European Union on the CO2 emissions and so on.

00:01:21 Domantas Mincė

So how do you think did it first the logistics?

00:01:24 Domantas Mincė

Sector to change and did it have any impact on technologies adoption?

00:01:35 Jeroen Eijsink

I think we need to abstract from short term changes.

00:01:37 Jeroen Eijsink

There were a lot of short-term changes and you forgot the Brexit.

00:01:40 Jeroen Eijsink

Which is also an.

00:01:41 Jeroen Eijsink

Another event that happened so that caused a lot of short-term changes which the transportation and logistics industry is quite.

00:01:47 Jeroen Eijsink

Familiar with.

00:01:48 Jeroen Eijsink

We're quite flexible in adapting.

00:01:51 Jeroen Eijsink

But what are the underlying long term?

00:01:53 Jeroen Eijsink

Changes that we see.

00:01:55 Jeroen Eijsink

I think that it is very clear that we are have a structural shortage of drivers with reducing productivity.

00:02:05 Jeroen Eijsink

So a shortage of drivers, simply.

00:02:07 Jeroen Eijsink

Because there are not enough people.

00:02:09 Jeroen Eijsink

In the European Union.

00:02:11 Jeroen Eijsink

Uh, that are willing and able to drive long distance trucking.

00:02:16 Jeroen Eijsink

But secondly, their productivity is reducing.

00:02:19 Jeroen Eijsink

Because of all.

00:02:20 Jeroen Eijsink

The regulations that are being put in place for.

00:02:23 Jeroen Eijsink

The well-being of the drivers.

00:02:24 Jeroen Eijsink

I would say.

00:02:25 Jeroen Eijsink

But those two effects strengthen itself, and that obviously requires a new way of thinking about how do we make sure that we find sufficient workers that to help us provide services.

00:02:37 Jeroen Eijsink

Because at the same times our economies over the.

00:02:39 Jeroen Eijsink

Longer period of time will be.

00:02:41 Jeroen Eijsink

Although slowly growing.

00:02:43 Jeroen Eijsink

The second underlying challenge that we see is.

00:02:46 Jeroen Eijsink

That it is the regulations.

00:02:50 Jeroen Eijsink

But also the social and moral pressures to.

00:02:57 Jeroen Eijsink

Invest in technology that helps us to do climate to help us to deal with the climate change.

00:03:03 Jeroen Eijsink

Particularly as a trucking company are obviously accelerating.

00:03:07 Jeroen Eijsink

So this means that we need, I think that the technology developed in that field accelerates and we are working closely together.

00:03:14 Jeroen Eijsink

With the manufacturers to see what does that mean for the?

00:03:18 Jeroen Eijsink

Trucks that we put on the road.

00:03:20 Jeroen Eijsink

So I think that field is accelerating and we need to deal with.

00:03:25 Jeroen Eijsink

With that and then and if you combine.

00:03:29 Jeroen Eijsink

The two what?

00:03:30 Jeroen Eijsink

Technologies do we see adopting, I think on the?

00:03:35 Jeroen Eijsink

On the trucking side, alternative fuels are.

00:03:41 Jeroen Eijsink

Field which we will discuss.

00:03:44 Jeroen Eijsink

Like electricity, hydrogen feel in the short term.

00:03:48 Jeroen Eijsink

If you look at a shortage of Labor.

00:03:51 Jeroen Eijsink

On the driver side.

00:03:52 Jeroen Eijsink

There's obviously autonomous vehicles, which.

00:03:54 Jeroen Eijsink

Will be a disruptive technology.

00:03:56 Jeroen Eijsink

Albeit probably still some time away.

00:04:00 Jeroen Eijsink

And then on the white collar workers, the shortage there.

00:04:03 Jeroen Eijsink

I think artificial intelligence will be disruptive technology which can replace a lot of routine.

00:04:10 Jeroen Eijsink

Repetitive tasks that we see in our daily life.

00:04:13 Domantas Mincė

OK.

00:04:15 Domantas Mincė

Yeah, that makes sense.

00:04:16 Domantas Mincė

As we already.

00:04:17 Domantas Mincė

See it some of those trends coming in.

00:04:19 Domantas Mincė

So moving on.

00:04:21 Domantas Mincė

In your company are you implementing any.

00:04:23 Domantas Mincė

Artificial intelligence, machine learning or maybe deep learning technologies.

00:04:27 Domantas Mincė

And do they improve the effectiveness or reduce the costs?

00:04:31 Domantas Mincė

You know, make cost saving efficient.

00:04:32 Jeroen Eijsink

I think I'm not qualified to judge whether something is artificial intelligence.

00:04:36 Jeroen Eijsink

Machine learning or deep learning, I think you.

00:04:38 Jeroen Eijsink

Are more qualified to just that.

00:04:40 Jeroen Eijsink

But what I can say is that yes, we are.

00:04:44 Jeroen Eijsink

Experimenting with.

00:04:46 Jeroen Eijsink

Probably artificial intelligence tools.

00:04:48 Jeroen Eijsink

I would, I would guess.

00:04:51 Jeroen Eijsink

In the beginning very much about automating routine tasks, I think that increasingly we will be looking at giving the more complex tasks.

00:05:00 Jeroen Eijsink

For example, I would like to see more progress on our planning our truck planning.

00:05:04 Jeroen Eijsink

So every day we need to plan.

00:05:07 Jeroen Eijsink

6 1/2 thousand trucks across Europe.

00:05:09 Jeroen Eijsink

They need to start somewhere and end somewhere.

00:05:12 Jeroen Eijsink

And we have all the regulations navigate.

00:05:13 Jeroen Eijsink

Through we have.

00:05:16 Jeroen Eijsink

Planning tools for that, but I think that those planning tools are still very slow to adapt to day-to-day changes.

00:05:23 Jeroen Eijsink

That's why we need so many planners and people. Who.

00:05:26 Jeroen Eijsink

Actually, have experience to do that.

00:05:28 Jeroen Eijsink

But I still believe that artificial intelligence can play a massive.

00:05:30 Jeroen Eijsink

Role there.

00:05:32 Jeroen Eijsink

If we find the right access to it, so we will be experimenting in that field at the moment the focus is on very much on applying it to reduce routine tasks and reduce cost.

00:05:45 Jeroen Eijsink

OK.

00:05:46 Domantas Mincė

Uh in my.

00:05:47 Domantas Mincė

In the literature analysis I found most interesting cases where the actual intelligence is being used is processes like demand forecasting.

00:05:56 Domantas Mincė

Predictive maintenance, especially for the companies that like if Girteka has.

00:05:59 Domantas Mincė

A lot of fleet.

00:06:00 Domantas Mincė

Right.

00:06:01 Domantas Mincė

And the route planning so.

00:06:04 Domantas Mincė

Are you using the technologies to for these processes and is it is a I used.

00:06:11 Domantas Mincė

In there basically.

00:06:12 Jeroen Eijsink

So I think if you think about the topic of demand forecasting.

00:06:20 Jeroen Eijsink

To a degree.

00:06:20 Jeroen Eijsink

I think we have pricing tools that we're building that try to predict the pricing.

00:06:27 Jeroen Eijsink

Over a period of a week.

00:06:29 Jeroen Eijsink

A month, three months or up to a year where we try to predict where the cost.

00:06:33 Jeroen Eijsink

Levels will be.

00:06:34 Jeroen Eijsink

That obviously carries a bit of demand forecasting in it because demand is obviously a big driver of our price development.

00:06:42 Jeroen Eijsink

So in that sense, I would say yes, we're using.

00:06:44 Jeroen Eijsink

We're using it in that field in terms of predictive maintenance.

00:06:48 Jeroen Eijsink

I obviously AM.

00:06:50 Jeroen Eijsink

Not long enough in the company to judge how.

00:06:52 Jeroen Eijsink

Good. We are with that.

00:06:56 Jeroen Eijsink

We do get data from our trucks and our.

00:07:03 Jeroen Eijsink

Technology boards that sit on the trucks that give us information up about.

00:07:08 Jeroen Eijsink

About damages or things like that. How?

00:07:11 Jeroen Eijsink

Predictive and how modern that is, I cannot.

00:07:15 Jeroen Eijsink

I cannot.

00:07:16 Jeroen Eijsink

I cannot tell route.

00:07:17 Jeroen Eijsink

Planning for sure.

00:07:18 Jeroen Eijsink

I mentioned our.

00:07:19 Jeroen Eijsink

Planning tool. So we do have tools.

00:07:21 Jeroen Eijsink

That basically help us.

00:07:22 Jeroen Eijsink

To plan our fleet every day.

00:07:24 Jeroen Eijsink

We achieved 65 to 80% of our trucks can be planned fully automated.

00:07:30 Jeroen Eijsink

But it is the 20 to 35% that obviously still need human intervention.

00:07:35 Jeroen Eijsink

Which we want to improve upon.

00:07:36 Jeroen Eijsink

As I mentioned earlier.

00:07:38 Domantas Mincė

OK.

00:07:39 Domantas Mincė

Thank you.

00:07:40 Domantas Mincė

Uh, moving on to the discussion is more for the.

00:07:44 Domantas Mincė

Providers like DHL.

00:07:46 Domantas Mincė

UPS and others doing last month delivery who has the sorting centers?

00:07:49 Domantas Mincė

But do you, are you using any technologies to optimize or automate warehouse operations?

00:07:55 Domantas Mincė

I mean, I'm most probably don't have this big warehouses.

00:07:58 Domantas Mincė

Yeah, but then still, you know.

00:08:00 Jeroen Eijsink

Thanks for asking the question.

00:08:02 Jeroen Eijsink

So we.

00:08:04 Jeroen Eijsink

Don't we do have some cross docks, particularly in the fish logistics business?

00:08:10 Jeroen Eijsink

But these are very traditional warehouses.

00:08:13 Jeroen Eijsink

It's.

00:08:14 Jeroen Eijsink

It's basically pellets in repack and pallets out and that is apart from the forklift.

00:08:20 Jeroen Eijsink

A very manual process.

00:08:22 Jeroen Eijsink

It's very difficult to automate with robots, so at the end it's not at big scale.

00:08:27 Jeroen Eijsink

So an investment would probably be too much.

00:08:28 Jeroen Eijsink

So no, we don't have.

00:08:30 Jeroen Eijsink

Any experience with that in getting?

00:08:31 Domantas Mincė

It's not the field we are specializing in.

00:08:34 Domantas Mincė

Exactly, exactly we’re.

00:08:35 Jeroen Eijsink

Road transportation.

00:08:37 Domantas Mincė

OK, so now let's move to the very much closer topic to the transportations of the 5th question is about.

00:08:43 Domantas Mincė

The electric vehicles.

00:08:44 Domantas Mincė

So does electric vehicles.

00:08:46 Domantas Mincė

Pure hybrid or plug-in play.

00:08:48 Domantas Mincė

Any role in your logistics fleet and are they already affecting the sustainability and cost saving initiatives?

00:08:55 Jeroen Eijsink

So at the moment.

00:09:01 Jeroen Eijsink

The reach of electric fully loaded trucks is such that they cannot be used in our core fleet.

00:09:08 Jeroen Eijsink

We basically run between 1500 and 2000 kilometers per trip per load.

00:09:15 Jeroen Eijsink

And these vehicles will not.

00:09:17 Jeroen Eijsink

Hit those numbers. They will be South.

00:09:19 Jeroen Eijsink

Of 250 kilometers.

00:09:21 Jeroen Eijsink

Per trip.

00:09:22 Jeroen Eijsink

So that means we.

00:09:23 Jeroen Eijsink

Would have far too many stops.

00:09:24 Jeroen Eijsink

To load so those vehicles, the moment are pretty much for short distance traffic can be very well used in city logistics.

00:09:32 Jeroen Eijsink

So delivering from a distribution center in a city.

00:09:36 Jeroen Eijsink

To shops in.

00:09:37 Jeroen Eijsink

A city or businesses in the city.

00:09:40 Jeroen Eijsink

They can be used, for example, and that's where we also use them to pick up trailers or containers from the train.

00:09:48 Jeroen Eijsink

And then basically drive them to the final destinations.

00:09:50 Jeroen Eijsink

So that's where we also testing them.

00:09:53 Jeroen Eijsink

But at the moment we can only use them for these short distances.

00:09:57 Jeroen Eijsink

Which is not in our core business.

00:10:01 Jeroen Eijsink

So at this moment in.

00:10:02 Jeroen Eijsink

Time it's at a limited scale.

00:10:04 Jeroen Eijsink

But we're testing them.

00:10:06 Jeroen Eijsink

Also ensure that.

00:10:07 Jeroen Eijsink

The distances.

00:10:08 Jeroen Eijsink

To learn about.

00:10:11 Jeroen Eijsink

The real reach, the real behavior.

00:10:13 Jeroen Eijsink

The maintenance schedules that they have because they have different maintenance schedules longer.

00:10:18 Jeroen Eijsink

They have longer maintenance cycles.

00:10:22 Jeroen Eijsink

We're learning how the battery life we're learning around the cost of replacing.

00:10:26 Jeroen Eijsink

So we are we are utilizing electric fleet, but it's really to learn and to start to learn envisaging that in a longer period of time we will have vehicles that also.

00:10:37 Jeroen Eijsink

Have a longer range.

00:10:40 Domantas Mincė

That's very well connected to the next question.

00:10:42 Domantas Mincė

So how do you see this electrification trended like impacting logistics of five or ten years?

00:10:48 Jeroen Eijsink

So I would like to.

00:10:49 Jeroen Eijsink

Start by saying that we are technology open.

00:10:51 Jeroen Eijsink

So whilst we acknowledge that, it seems that the world is moving towards electrification.

00:10:57 Jeroen Eijsink

We are also working together in Norway with a consortium to look at hydrogen technology for vehicles.

00:11:05 Jeroen Eijsink

Hydrogen is probably.

00:11:07 Jeroen Eijsink

Technically, a better solution for trucks because it requires less.

00:11:11 Jeroen Eijsink

Weight and it will probably deliver.

00:11:14 Jeroen Eijsink

A longer reach.

00:11:15 Jeroen Eijsink

But the production of hydrogen is obviously.

00:11:18 Jeroen Eijsink

Very costly and.

00:11:21 Jeroen Eijsink

It's not available.

00:11:22 Jeroen Eijsink

Decentralized and.

00:11:25 Jeroen Eijsink

Hydrogen is probably utilized heavily in the industry.

00:11:28 Jeroen Eijsink

So that means that.

00:11:29 Jeroen Eijsink

The question is whether trucking would get?

00:11:33 Jeroen Eijsink

Sufficient share of the hydrogen market after the industry has taken its share.

00:11:39 Jeroen Eijsink

So electrification for those reasons decentral availability.

00:11:45 Jeroen Eijsink

Seems more likely, but we're still testing both.

00:11:49 Jeroen Eijsink

If we go and focus in on electric, we think that in the not-too-distant future.

00:11:56 Jeroen Eijsink

By the end of this decade.

00:11:58 Jeroen Eijsink

Trucks will be able to run loaded 500 to 600 kilometers.

00:12:03 Jeroen Eijsink

That would mean that we can.

00:12:04 Jeroen Eijsink

Do most of our trips, which.

00:12:07 Jeroen Eijsink

One or two times charging, noting that our drivers also need to rest.

00:12:11 Jeroen Eijsink

So if we can come on charging a resting time.

00:12:14 Jeroen Eijsink

Then we would be able to utilize these electric vehicles.

00:12:19 Jeroen Eijsink

We think that by then the technology.

00:12:21 Jeroen Eijsink

Is right?

00:12:22 Jeroen Eijsink

Particularly the battery technology, because the current battery technology would still require too heavy batteries in the vehicles.

00:12:29 Jeroen Eijsink

Which would reduce our load factor.

00:12:31 Jeroen Eijsink

So we think that.

00:12:32 Jeroen Eijsink

There will there will need.

00:12:33 Jeroen Eijsink

To be lighter.

00:12:34 Jeroen Eijsink

Batteries with a longer reach.

00:12:36 Jeroen Eijsink

And the second so that technology development will take a bit of time.

00:12:40 Jeroen Eijsink

The second thing we need to think about is the charging infrastructure so.

00:12:47 Jeroen Eijsink

At the moment, if we would load up too many trucks of our vehicles in the same place at the same time.

00:12:54 Jeroen Eijsink

It wouldn't work.

00:12:55 Jeroen Eijsink

The grant would simply not provide sufficient electricity capacity, so we need those grid connections and that need to acquire so that infrastructure rollout will take a bit of time as well.

00:13:09 Jeroen Eijsink

And thirdly, I think that once the European Commission and the European Union would provide.

00:13:18 Jeroen Eijsink

Would uh take Road transportation into their emission transfer system?

00:13:23 Jeroen Eijsink

Which basically means that CO2 pricing for diesel trucks versus electric trucks that also the economics of at the moment the more expensive electric trucks would prevail.

00:13:36 Jeroen Eijsink

So it's those three things.

00:13:38 Jeroen Eijsink

So emission transfer pricing implementation combined with battery technology.

00:13:43 Jeroen Eijsink

Development combined with infrastructure development that I'm thinking that by the end of this decade.

00:13:49 Jeroen Eijsink

Which is 5 to 10 years as you posing your question we there's a high likelihood that we will have electric trucks for longest tracking as well.

00:13:59 Domantas Mincė

OK. Thank.

00:14:02 Domantas Mincė

Moving on to the third technology already mentioned that we are getting data from the vehicles.

00:14:06 Domantas Mincė

That means that we are using the telematics.

00:14:08 Domantas Mincė

So just simple question, does it play any role in the in the logistics operations and?

00:14:15 Domantas Mincė

Since introduction didn't improve the fleet management driver safety as it's really important topic in the long distance travelling right and overall companies efficiency.

00:14:26 Jeroen Eijsink

So I think all of the above, right, the question is what can?

00:14:29 Jeroen Eijsink

We really measure.

00:14:30 Jeroen Eijsink

So from a company's efficiency for.

00:14:32 Jeroen Eijsink

Sure. I mean we definitely measure.

00:14:35 Jeroen Eijsink

Kilometers per truck per day loaded and unloaded empty kilometer reduction.

00:14:41 Jeroen Eijsink

I think the combination of.

00:14:42 Jeroen Eijsink

Planning tools and proper telematics where we.

00:14:44 Jeroen Eijsink

Can really predict?

00:14:46 Jeroen Eijsink

Where the trucks end up and where they come back, combined with GPS technology where we can actually see the truck and we can pre plan because we can make estimated times of arrival.

00:14:55 Jeroen Eijsink

So we roughly know when the truck.

00:14:56 Jeroen Eijsink

To arrive from the onboard unit.

00:14:58 Jeroen Eijsink

We know how many.

00:14:59 Jeroen Eijsink

The driver still has left combined.

00:15:01 Jeroen Eijsink

With our planning tools.

00:15:01 Jeroen Eijsink

We can really optimize.

00:15:02 Jeroen Eijsink

That and therefore it will definitely improve company sufficiency.

00:15:06 Jeroen Eijsink

It will improve quality and to improve, improve our fleet management operations and how far it improves.

00:15:14 Jeroen Eijsink

Driver safety, I think that's.

00:15:16 Jeroen Eijsink

A little bit more.

00:15:19 Jeroen Eijsink

So basically we serve our drivers with all the information that he or she needs at any given time.

00:15:25 Jeroen Eijsink

When it comes to routing, when it comes to alternative routing.

00:15:28 Jeroen Eijsink

When it comes to information about the loading place, information about the unloading place.

00:15:32 Jeroen Eijsink

Information about the cargo and how the cargo needs to be loaded.

00:15:36 Jeroen Eijsink

So we can provide a lot of information.

00:15:38 Jeroen Eijsink

To the drivers.

00:15:38 Jeroen Eijsink

But that's still the.

00:15:39 Jeroen Eijsink

Drivers need to act upon that information.

00:15:41 Jeroen Eijsink

We obviously check fuel consumption on the truck driving behavior.

00:15:45 Jeroen Eijsink

We can see.

00:15:46 Jeroen Eijsink

So a driver that accelerates heavily or breaks heavily, it's normally more inefficient.

00:15:51 Jeroen Eijsink

We have a point system for driver efficiency, so that helps both climate change as well as our cost base.

00:15:57 Jeroen Eijsink

So all those.

00:16:00 Jeroen Eijsink

Telemetric tools, I think play an important role.

00:16:05 Jeroen Eijsink

Driver safety, probably more indirect than direct, OK.

00:16:09 Domantas Mincė

Do you see any challenges in integrating telematics into logistics operations?

00:16:16 Jeroen Eijsink

I think the opportunities are endless.

00:16:19 Jeroen Eijsink

The problem is that a lot of the tools.

00:16:20 Jeroen Eijsink

Do not always ideally communicate with each other, and I'm now in the field.

00:16:25 Jeroen Eijsink

Where you probably know more off than I do.

00:16:27 Jeroen Eijsink

But we have we have a planning tool from a different company.

00:16:31 Jeroen Eijsink

We have.

00:16:33 Jeroen Eijsink

We have different trucks with different onboard units.

00:16:37 Jeroen Eijsink

We have the driver on board unit.

00:16:39 Jeroen Eijsink

We have the GPS system, which yet another provider and integrating them all and then creating a data layer out of it where we can basically combine the.

00:16:50 Jeroen Eijsink

Data to the ideal.

00:16:51 Jeroen Eijsink

And then have artificial intelligence help us to optimize that?

00:16:56 Jeroen Eijsink

I think we're still need to make a.

00:16:57 Jeroen Eijsink

Stop a couple of months.

00:16:58 Jeroen Eijsink

It's.

00:16:59 Jeroen Eijsink

It's working with all.

00:17:00 Jeroen Eijsink

Those variety of systems that do not are not always compatible.

00:17:03 Jeroen Eijsink

I think that is the major.

00:17:04 Jeroen Eijsink

Challenge for for all those tools.

00:17:07 Jeroen Eijsink

But that is a matter of time.

00:17:09 Domantas Mincė

OK.

00:17:09 Domantas Mincė

Thank you.

00:17:10 Domantas Mincė

So we discussed all these two technologies, right.

00:17:13 Domantas Mincė

We are getting data basically from everything we are gathering as much data as possible.

00:17:17 Domantas Mincė

So do the data-driven decision making or does it have any impact on you know?

00:17:25 Domantas Mincė

Resilience and.

00:17:26 Domantas Mincė

Out of the building in the face of the changes basically having data.

00:17:29 Domantas Mincė

Having data help you know to predict and prepare for the challenges in the future, yeah.

00:17:34 Jeroen Eijsink

Tremendously, tremendously.

00:17:35 Jeroen Eijsink

And COVID is, maybe one example where we obviously the company had to go remote and work completely remote.

00:17:45 Jeroen Eijsink

That wouldn't be possible 5 or 10 years ago.

00:17:48 Jeroen Eijsink

I think that would be everybody would have to go to the office.

00:17:51 Jeroen Eijsink

So that's a simple example.

00:17:53 Jeroen Eijsink

But I think that the fact that you know where your trucks is, you know.

00:17:55 Jeroen Eijsink

No matter how many hours you know what the.

00:17:57 Jeroen Eijsink

Truck is damaged or not damaged.

00:18:00 Jeroen Eijsink

You know the temperature of the cargo.

00:18:02 Jeroen Eijsink

You know whether the temperatures alright.

00:18:04 Jeroen Eijsink

You can see that remotely because we do a lot of temperature control cargos.

00:18:07 Jeroen Eijsink

You know all of those data points we've got.

00:18:10 Jeroen Eijsink

So we know exactly what's happening on route, which means that if there is a road closure a.

00:18:19 Jeroen Eijsink

Whether uh, bad weather conditions we can reroute, we can inform the customer immediately.

00:18:25 Jeroen Eijsink

We can.

00:18:26 Jeroen Eijsink

So I think that.

00:18:30 Jeroen Eijsink

We wouldn't be able.

00:18:32 Jeroen Eijsink

To operate the supply chains that we do.

00:18:34 Jeroen Eijsink

Without the technology that we've got, there is only one challenge that I think we need to realize is that because we have all the technology and because we're optimizing.

00:18:44 Jeroen Eijsink

That means that there's not a lot of room for disruption anymore because we make everything so perfectly connected that if they're in a bad event happens that.

00:18:53 Jeroen Eijsink

We basically need to.

00:18:54 Jeroen Eijsink

Redo all of that, planning to get another perfect setup in.

00:18:59 Jeroen Eijsink

In different conditions and you notice that for example.

00:19:02 Jeroen Eijsink

If you privately take an airplane on holidays.

00:19:06 Jeroen Eijsink

Particularly now in the winter time, if you miss your connection because of bad weather in some place and then it goes wrong and then.

00:19:14 Jeroen Eijsink

You miss your.

00:19:14 Jeroen Eijsink

Flight then the crew is in the wrong location.

00:19:17 Jeroen Eijsink

The plane is in the.

00:19:18 Jeroen Eijsink

Wrong location. So the following flights.

00:19:20 Jeroen Eijsink

Get disrupted and delayed and then?

00:19:22 Jeroen Eijsink

The whole chain and you can see that the air traffic.

00:19:23 Jeroen Eijsink

Has been so optimized.

00:19:25 Jeroen Eijsink

That there is very little room for disruption and immediately the whole system needs to be reprogrammed.

00:19:31 Jeroen Eijsink

And that is, I think, a little bit the risk of these technologies.

00:19:34 Jeroen Eijsink

That it pushes us to.

00:19:36 Jeroen Eijsink

A perfect situation on the perfect conditions and that we need a lot of computing power to deal with it when the disruption happens to basically reprogram.

00:19:45 Jeroen Eijsink

The whole system.

00:19:46 Jeroen Eijsink

And that don't mean that from.

00:19:48 Jeroen Eijsink

A technology perspective, but from a network perspective.

00:19:50 Jeroen Eijsink

So that is, I think the biggest.

00:19:52 Jeroen Eijsink

Risk that I've.

00:19:54 Domantas Mincė

OK.

00:19:55 Domantas Mincė

Uh, are you collaborating with any technology provider?

00:19:58 Domantas Mincė

Startups, industry partners, maybe scientific organizations like.

00:20:01 Domantas Mincė

University Labs to stay in front of.

00:20:05 Domantas Mincė

Technological advancements in logistics.

00:20:08 Jeroen Eijsink

So I think all of the above, right?

00:20:10 Jeroen Eijsink

So I think we are one of the largest fleet operators in Europe.

00:20:14 Jeroen Eijsink

So all the.

00:20:15 Jeroen Eijsink

Big truck manufacturers we are closely working with testing alternative drive trains.

00:20:21 Jeroen Eijsink

Testing alternative fuels.

00:20:23 Jeroen Eijsink

Being invited to discuss with them how the truck of the future would look like.

00:20:28 Jeroen Eijsink

And what it needs.

00:20:29 Jeroen Eijsink

So I think we have a very close collaboration there.

00:20:32 Jeroen Eijsink

And that sense?

00:20:33 Jeroen Eijsink

Then on the software side, as you know.

00:20:35 Jeroen Eijsink

We have a big collaboration with SAP which we,

00:20:38 Jeroen Eijsink

Are working with.

00:20:39 Jeroen Eijsink

At the moment still doing the basics but in the longer run I think they have a lot of interesting tools that we can utilize as well.

00:20:45 Jeroen Eijsink

Then there's some specialist software partners.

00:20:47 Jeroen Eijsink

That we are working closely with.

00:20:50 Jeroen Eijsink

To look at their developments, I mentioned our planning software as an example.

00:20:57 Jeroen Eijsink

And then obviously we go to all these forums and where young technology companies present themselves and we just pick up ideas and see.

00:21:08 Jeroen Eijsink

What they're doing and whether working with.

00:21:12 Jeroen Eijsink

We do have.

00:21:16 Jeroen Eijsink

Some investment in.

00:21:18 Jeroen Eijsink

Startup companies.

00:21:19 Jeroen Eijsink

But that's very limited by our parent company.

00:21:23 Jeroen Eijsink

So for the moment, we're more really partnering as.

00:21:25 Jeroen Eijsink

In the supply of customer relationship.

00:21:28 Jeroen Eijsink

And then we were closely with some universities and there we focus a lot on management and the way we lead and using new technologies obviously to lead the company less so long transportation.

00:21:40 Domantas Mincė

Thank you.

00:21:41 Domantas Mincė

So the key.

00:21:43 Domantas Mincė

The main question from my side is, you know from all.

00:21:46 Domantas Mincė

Of this that we discussed.

00:21:47 Domantas Mincė

So what do you think?

00:21:48 Domantas Mincė

Or does the disruptive technologies like AI, electric vehicles and telematics already creating also substantially changing logistics business models?

00:22:00 Jeroen Eijsink

It is already changing and.

00:22:02 Jeroen Eijsink

It will be. It will be more.

00:22:04 Jeroen Eijsink

I think that.

00:22:06 Jeroen Eijsink

Our industry has evolved because there are a lot of shippers and there are a lot of trucking providers and to and to get them together it needed a middleman to basically connect.

00:22:18 Jeroen Eijsink

The tool.

00:22:20 Jeroen Eijsink

I think that middleman is.

00:22:21 Jeroen Eijsink

Going to be replaced by technology.

00:22:23 Jeroen Eijsink

Either technology used by the customer, the shippers or technology used by the trucking.

00:22:27 Jeroen Eijsink

Companies like ourselves in.

00:22:29 Jeroen Eijsink

Order to manage that.

00:22:32 Jeroen Eijsink

Technologies allow for companies for small companies to have.

00:22:37 Jeroen Eijsink

To act as if they have big scale, so can imagine you have a platform in the middle that connects a lot of small trucking companies and then certainly you can have a fleet of thousand trucks and you connect them with the customer.

00:22:49 Jeroen Eijsink

So technology can play a big role in that.

00:22:52 Jeroen Eijsink

I think technology is absolutely necessary to improve the productivity of companies because our white collar productivity needs to massively improve because of the shortage of qualified workers.

00:23:04 Jeroen Eijsink

So I think.

00:23:04 Jeroen Eijsink

Artificial intelligence is absolutely necessary in our society.

00:23:08 Jeroen Eijsink

Not just in logistics, but in our society to improve the productivity of our society.

00:23:14 Jeroen Eijsink

And we have two because otherwise we will simply have a lack of workers.

00:23:18 Jeroen Eijsink

To do the work that we need.

00:23:21 Jeroen Eijsink

Think about hospitals.

00:23:22 Jeroen Eijsink

Where I believe that.

00:23:25 Jeroen Eijsink

The people who are helping us in the hospitals are far too busy to demonstrative work and instead of patient care.

00:23:32 Jeroen Eijsink

And I think there needs to be a lot of artificial intelligence to help them to focus.

00:23:35 Jeroen Eijsink

Really on.

00:23:35 Jeroen Eijsink

The patients, because we can't find a lot of.

00:23:36 Jeroen Eijsink

Care caretakers in in.

00:23:40 Jeroen Eijsink

In hospitals anymore as an example.

00:23:43 Jeroen Eijsink

So I see that across all of the industries.

00:23:45 Jeroen Eijsink

And I think that.

00:23:50 Jeroen Eijsink

The relationship with our customers is maturing because of technology because the fact that we can now share.

00:23:56 Jeroen Eijsink

With the customers, a lot of information about where their cargo is and so forth.

00:24:00 Jeroen Eijsink

They basically use.

00:24:01 Jeroen Eijsink

This as inventory on wheels and that means that.

00:24:03 Jeroen Eijsink

They need to know where the cargo is.

00:24:05 Jeroen Eijsink

So our relationship gets much closer.

00:24:07 Jeroen Eijsink

And with that, we create different business models from which money you can earn.

00:24:11 Jeroen Eijsink

Uh, we do.

00:24:12 Jeroen Eijsink

Not only earn on trucking anymore, we can.

00:24:14 Jeroen Eijsink

Earn on giving additional services.

00:24:16 Jeroen Eijsink

As well.

00:24:17 Jeroen Eijsink

So I think that will be a massive a massive change.

00:24:20 Jeroen Eijsink

Electric vehicles will mean that we will have longer maintenance cycles.

00:24:26 Jeroen Eijsink

Longer truck lifetimes.

00:24:27 Jeroen Eijsink

So that means our buying and.

00:24:30 Jeroen Eijsink

Selling of trucks will change.

00:24:32 Jeroen Eijsink

Our maintenance.

00:24:34 Jeroen Eijsink

Schedules will change, so there's a there's a lot of.

00:24:41 Jeroen Eijsink

Of changes in every.

00:24:42 Jeroen Eijsink

Facet of our business model that is going to.

00:24:43 Jeroen Eijsink

Happen and they provide as much opportunity.

00:24:46 Jeroen Eijsink

As they provide risk.

00:24:47 Jeroen Eijsink

I think it's up to us to turn it into opportunities as much as we can.

00:24:52 Domantas Mincė

That's very good inside.

00:24:53 Domantas Mincė

So that's, that's what I also see from about the productivity.

00:24:55 Domantas Mincė

That's also what I see from the financial analysis that all the companies that keeps investing the capital expenditures or at least proportional to the revenue.

00:25:03 Domantas Mincė

The revenue per employee is increasing even though the number of.

00:25:06 Domantas Mincė

Employees is increasing.

00:25:07 Domantas Mincė

So yeah, the productivity is increasing technologies.

00:25:11 Domantas Mincė

Or like newer fleet and so on.

00:25:14 Domantas Mincė

Moving to the one of the last questions, do you have any KPI's to measure the impact of disruptive technologies on your business models?

00:25:23 Jeroen Eijsink

No, I don't think we have.

00:25:25 Jeroen Eijsink

I don't think we have an adoption.

00:25:28 Jeroen Eijsink

I'm not even sure whether we have a common definition of what the disruptive technologies mean.

00:25:32 Jeroen Eijsink

What does disruptive for some is non disruptive for others I think we have obviously an investment budget on technology which is quite sizable.

00:25:44 Jeroen Eijsink

Uh, we have.

00:25:48 Jeroen Eijsink

We look at productivity metrics as output, but we don't look at such KPI and I would be grateful for any suggestions and ideas that we would be out.

00:25:58 Jeroen Eijsink

There at the moment, it's difficult for us.

00:26:02 Domantas Mincė

OK.

00:26:03 Domantas Mincė

And the last question is, is?

00:26:05 Domantas Mincė

Is the business operating?

00:26:06 Domantas Mincė

And you know, not only in.

00:26:07 Domantas Mincė

In Lithuania at all, over.

00:26:10 Domantas Mincė

Europe or the world?

00:26:11 Domantas Mincė

So maybe for you it's only for your experience from the logistics sector.

00:26:15 Domantas Mincė

Do you see any differences in adoption of?

00:26:17 Domantas Mincė

Technologies overall, Lithuania versus other countries.

00:26:25 Jeroen Eijsink

I have to say that across Europe, I think.

00:26:28 Jeroen Eijsink

We're all kind of.

00:26:29 Jeroen Eijsink

Like minded.

00:26:30 Jeroen Eijsink

And I would say that if I compare transport companies from here with transport companies in the Netherlands.

00:26:36 Jeroen Eijsink

Where I worked or transport companies in Germany, I think we're all trying to go in the same direction.

00:26:40 Jeroen Eijsink

We're all trying to make similar investments and I wouldn't say that there is a necessary architectural difference in that.

00:26:47 Jeroen Eijsink

I would say that the people I've met here in in Lithuania are tech open.

00:26:55 Jeroen Eijsink

If you look at daily life.

00:26:57 Jeroen Eijsink

Not so much in logistics.

00:26:58 Jeroen Eijsink

But at daily life, I mean the.

00:27:01 Jeroen Eijsink

I had to register as a citizen there that.

00:27:03 Jeroen Eijsink

That was all digital and that was pretty efficient.

00:27:08 Jeroen Eijsink

If you think about the supermarkets with, with the automated cashing machines.

00:27:13 Jeroen Eijsink

I even have a.

00:27:14 Jeroen Eijsink

supermarket without staff next.

00:27:17 Jeroen Eijsink

Door where I can just put cameras.

00:27:19 Jeroen Eijsink

They basically scan what I'm taking and then.

00:27:20 Jeroen Eijsink

They debit my.

00:27:23 Jeroen Eijsink

My card.

00:27:25 Jeroen Eijsink

So I think that the country itself seems to be quite advanced and quite thinking advanced in all this in and quite eager to adopt new technologies.

00:27:35 Jeroen Eijsink

But from a logistics perspective, I wouldn't say there is a massive difference between Lithuania and the rest of Europe.

00:27:42 Jeroen Eijsink

I think in Europe we're there.

00:27:44 Jeroen Eijsink

If you compare.

00:27:44 Jeroen Eijsink

Europe to the United States then I.

00:27:46 Jeroen Eijsink

Would say there's a massive difference.

00:27:48 Jeroen Eijsink

I think the United States is much more ahead.

00:27:50 Jeroen Eijsink

Much more advanced.

00:27:52 Jeroen Eijsink

I think they see more the opportunity of new technology.

00:27:54 Jeroen Eijsink

And less the risks.

00:27:56 Jeroen Eijsink

So it's no surprise that all these artificial intelligence.

00:28:00 Jeroen Eijsink

Technologies like Chat GPT, et cetera, come from the United States because they think about the opportunity and then about data privacy and all the risks of artificial intelligence later.

00:28:10 Jeroen Eijsink

We start to think about the risks and 1st and then once we.

00:28:14 Jeroen Eijsink

Our lawmakers have figured out how to deal with the risk.

00:28:17 Jeroen Eijsink

Then we start developing the opportunity.

00:28:19 Jeroen Eijsink

So I think.

00:28:20 Jeroen Eijsink

That that's where there is a massive difference.

00:28:21 Jeroen Eijsink

I worked for an American.

00:28:22 Jeroen Eijsink

Company, I can tell you that the way they utilize data.

00:28:26 Jeroen Eijsink

They're far more open.

00:28:27 Jeroen Eijsink

To shared data across the industry.

00:28:31 Jeroen Eijsink

I think they.

00:28:32 Jeroen Eijsink

Create more tools.

00:28:33 Jeroen Eijsink

They're not smarter than us.

00:28:34 Jeroen Eijsink

They're just more looking at the chances and the opportunities rather than the risks.

00:28:40 Jeroen Eijsink

And that is a big cultural difference.

00:28:42 Jeroen Eijsink

That I could highlight.

00:28:42 Jeroen Eijsink

But within Europe, I wouldn't.

00:28:44 Jeroen Eijsink

Necessarily say that.

00:28:46 Domantas Mincė

OK.

00:28:47 Domantas Mincė

Thanks a lot.

00:28:47 Domantas Mincė

So actually that's it that they had for the for today.

00:28:50 Domantas Mincė

So in summary, so there is already visible changes right on the business models that are being brought by the technology that's actually different from everything.

00:28:59 Domantas Mincė

And I was expecting this to hear today because like in the maritime and logistics.

00:29:03 Domantas Mincė

It does not have any impact yet.

00:29:05 Domantas Mincė

However, these like logistics are even more regulated than you know than any other.

00:29:10 Domantas Mincė

Because it's.

00:29:11 Domantas Mincė

Talking about people's lives so.

00:29:13 Domantas Mincė

So thanks a lot.

00:29:14 Domantas Mincė

Thank you for giving your time.

00:29:16 Jeroen Eijsink

Thank you.

00:29:17 Jeroen Eijsink

Thanks for the opportunity and I'm looking forward to hearing feedback from your final thesis.

00:29:21 Jeroen Eijsink

Sure, all the best.

00:29:22 Domantas Mincė

Thanks a lot.

Annex 8. Transcript from interview with Maersk

00:00:03 Domantas Mince

So hello Jens.

00:00:04 Domantas Mince

Thanks a lot for having giving time for me.

00:00:07 Domantas Mince

I'm Domantas.

00:00:08 Domantas Mince

I'm student at Vilnius University Business School and studying deep tech entrepreneurship master's program.

00:00:14 Domantas Mince

My thesis is on the topics to examine how deep technologies and analyzing artificial.

00:00:21 Domantas Mince

Electric vehicles, or electrification as a whole for maritime sector and telematics.

00:00:26 Domantas Mince

Are affecting or not yet affecting the business models of the companies?

00:00:31 Domantas Mince

So I want to inform you that this.

00:00:32 Domantas Mince

Meeting is being recorded and transcribed for the.

00:00:35 Domantas Mince

We used in the master thesis.

00:00:36 Domantas Mince

Do you agree?

00:00:37 Jens Jensen

Yes, I agree.

00:00:38 Jens Jensen

That's perfectly fine.

00:00:39 Domantas Mince

OK, so thanks a lot and can.

00:00:42 Domantas Mince

Give short introduction from yourself, yeah.

00:00:45 Jens Jensen

I'm currently the Chief People officer for Girteka have been that for two.

00:00:49 Jens Jensen

Years prior to that, I had.

00:00:52 Jens Jensen

Almost 13 years, I think it was with Maersk of most of.

00:00:55 Jens Jensen

That was with Merce Klein the shipping part.

00:00:59 Jens Jensen

So yeah, good.

00:01:01 Domantas Mince

Thanks a lot.

00:01:01 Domantas Mince

So today the topic is from the from the maritime and Maersk perspective.

00:01:05 Domantas Mince

OK, I have a standard questionnaire of 13 questions.

00:01:09 Domantas Mince

Yeah, we should take around half an hour.

00:01:10 Domantas Mince

According to the previous.

00:01:12 Domantas Mince

Interviews and that's being asked for all the.

00:01:14 Domantas Mince

Sectors in the same way.

00:01:15 Domantas Mince

So that they could so that I can make the conclusions based on the on this on the same data received.

00:01:22 Domantas Mince

So as you know, the past few years, we are.

00:01:23 Domantas Mince

Really challenging for the whole world.

00:01:25 Domantas Mince

We had COVID-19 3 years back started, then we had more in Ukraine.

00:01:30 Domantas Mince

Fuel prices increased due to these events, right?

00:01:32 Domantas Mince

And we have lots and lots of regulations coming down from EU.

00:01:35 Domantas Mince

European Council and other institutions.

00:01:38 Domantas Mince

So how do you think that the challenges of past few years force logistics sector to change?

00:01:44 Domantas Mince

And did it have impact on technologies adoption?

00:01:47 Jens Jensen

Yeah, I think it.

00:01:48 Jens Jensen

It forced the customers of logistics sector to change because.

00:01:54 Jens Jensen

If you look at logistics.

00:01:55 Jens Jensen

Over all, back up until 2019 and also in in the beginning of COVID.

00:02:02 Jens Jensen

Everyone saw it as an afterthought.

00:02:05 Jens Jensen

It was not very important in the.

00:02:07 Jens Jensen

In the businesses side.

00:02:09 Jens Jensen

It was really.

00:02:10 Jens Jensen

Everyone was focused on just in time, logistics, keeping their warehouse work at the right level.

00:02:15 Jens Jensen

So all the time and they were really.

00:02:17 Jens Jensen

Not thinking of contingencies, the last use crisis has significantly changed that starting excuse me.

00:02:24 Jens Jensen

Starting with the.

00:02:26 Jens Jensen

Evergreen parking the ship in the Suez.

00:02:29 Jens Jensen

That blocked the traffic for a long time.

00:02:31 Jens Jensen

And then the pandemic and the out of touch of looking more towards technology.

00:02:36 Jens Jensen

But at the same time, it's difficult to say only one thing.

00:02:39 Jens Jensen

Because we look at large language models and.

00:02:41 Jens Jensen

Chat GPT and AI has entered the picture.

00:02:44 Jens Jensen

So the technology of today is also capable of doing something we couldn't 2-6 years ago.

00:02:50 Jens Jensen

So logistics is changing with the big change, which I'm curious which will last now or not was the customers perception of logistics changed and it certainly got from the last priority which was all just about price.

00:03:06 Jens Jensen

It got moved up to say, well, it's not all about price.

00:03:09 Jens Jensen

It's also really about logistics supply chains.

00:03:12 Domantas Mince

OK. Yeah.

00:03:15 Domantas Mince

Back from your experience, Maersk, are you where they implementing or are they implementing artificial intelligence?

00:03:21 Domantas Mince

Maybe machine learning or deep learning in their business?

00:03:25 Jens Jensen

Yeah, they are.

00:03:26 Jens Jensen

And they are using it.

00:03:27 Jens Jensen

I would say in all aspects of the business right now.

00:03:30 Jens Jensen

So customer service sales are supported by AI and large learning models and large language models or and they.

00:03:39 Jens Jensen

They are having it rolled out in more and more sets of the organization.

00:03:44 Jens Jensen

I don't think that there done yet, but whether it's customer facing or internally or utilizing AI for optimizing operations and operational analytics.

00:03:55 Jens Jensen

They are really focusing on that, particularly of the main.

00:03:59 Jens Jensen

Marine companies.

00:04:01 Jens Jensen

So typically that's Maersk line.

00:04:04 Jens Jensen

I think Maersk deliberately chose a technology first strategy where MSC.

00:04:10 Jens Jensen

For example, when the traditional way with assets first and buying more ships and taking over the assets mark.

00:04:16 Jens Jensen

But yes, it's been used a lot of places.

00:04:19 Domantas Mince

Actually, I'm also in addition to the interviews.

00:04:22 Domantas Mince

I'm also doing the analysis of financial yeah, fiscal years and for the.

00:04:26 Domantas Mince

Five years and I've also analyzing Maersk.

00:04:27 Domantas Mince

So it seems that they are capital expenditures are constantly growing and the.

00:04:34 Domantas Mince

Revenue per employee is increasing staff to staff.

00:04:36 Domantas Mince

Cost to revenue is decreasing, so it means that.

00:04:38 Domantas Mince

The their operations are.

00:04:40 Domantas Mince

Definitely more effective after adopting this technology.

00:04:43 Jens Jensen

And it's interesting because I think the data analysis is often based on revenue per employee.

00:04:50 Jens Jensen

And right now.

00:04:51 Jens Jensen

It will be interesting to see what your analysis will say at the end of this year.

00:04:55 Jens Jensen

We don't know because we don't.

00:04:56 Jens Jensen

Have the fiscal year yet.

00:04:58 Jens Jensen

But the doubled their revenue just because of price increases.

00:05:02 Jens Jensen

So that of course, if we use that as efficiency metrics.

00:05:05 Jens Jensen

It will give you a false.

00:05:06 Jens Jensen

Reading, yeah. Now they're.

00:05:08 Jens Jensen

Moving into an I think 2023 is a more of a normal year.

00:05:12 Jens Jensen

But I still think you're right that they will see the efficiency gains.

00:05:16 Jens Jensen

So yeah.

00:05:18 Domantas Mince

OK.

00:05:19 Domantas Mince

Thank you.

00:05:20 Domantas Mince

In the thesis in theoretical part of the thesis on the all the you know.

00:05:25 Domantas Mince

Literature analysis I was analyzing demand forecasting.

00:05:28 Domantas Mince

Predictive maintenance and route planning says the key processes affected by the artificial intelligence.

00:05:34 Domantas Mince

You know, are you aware if there are any signs of this?

00:05:38 Domantas Mince

Process being introduced in the in the company.

00:05:42 Jens Jensen

Uh maintenance was definitely introduced when I was there and it's not just by the company itself.

00:05:50 Jens Jensen

Because every supplier wants to also have the maximum out of their product.

00:05:55 Jens Jensen

So if you have a man engines in the vessels.

00:06:00 Jens Jensen

They themselves would do predictive analytics supplement to their to their products to also lock the customers in.

00:06:09 Jens Jensen

So yes, there's a lot of that being introduced.

00:06:13 Jens Jensen

I think demand forecasts, I don't know how much it's AI driven yet.

00:06:20 Jens Jensen

But we.

00:06:21 Jens Jensen

We always in the shipping head a lot of coalition analysis and statisticians doing that analysis where GDP growth in the quarters where the big is predictive of what would happen for volume growth.

00:06:33 Jens Jensen

In the container industry.

00:06:35 Jens Jensen

So I would imagine that they now like better math tools including AI.

00:06:40 Jens Jensen

But they probably just shifted it all into a robot doing what people?

00:06:43 Jens Jensen

Were doing before.

00:06:45 Domantas Mince

OK. Yeah.

00:06:48 Domantas Mince

Moving on then.

00:06:51 Domantas Mince

I have also.

00:06:51 Domantas Mince

I've also been analyzing some various part.

00:06:54 Domantas Mince

I'm not sure how advanced and if Maersk is having some kind of warehouses.

00:07:00 Domantas Mince

Maybe ports might be taken as the as an example?

00:07:03 Domantas Mince

Are there any technologies that are used to automate or optimize the operations of warehouses or ports in the case of maritime?

00:07:10 Jens Jensen

So the one that I know most of was.

00:07:15 Jens Jensen

So the last place in Maersk I worked, we had vessels as well and.

00:07:19 Jens Jensen

When I think warehouse there, it was the.

00:07:22 Jens Jensen

Maintenance and spare parts warehouses.

00:07:25 Jens Jensen

For the vessels.

00:07:27 Jens Jensen

And when I was there, we started doing warehouse analytics and spare parts analytics.

00:07:32 Jens Jensen

Because if you look.

00:07:33 Jens Jensen

At the traditional way, if you are master on the vessel.

00:07:36 Jens Jensen

You want to have excess spare parts of pretty much everything.

00:07:39 Jens Jensen

Because if you breakdown at sea, you need to be able to fix it and then if you didn't have it on the boat.

00:07:44 Jens Jensen

You needed to have it in the warehouse, but.

00:07:47 Jens Jensen

Humans are not the best predictors of what parts will be used and where.

00:07:52 Jens Jensen

So we started having very large warehouse.

00:07:54 Jens Jensen

Stocks of all kinds of spare parts, we've.

00:07:57 Jens Jensen

Joking saying you can basically build a new boat from all the spare parts we have.

00:08:01 Jens Jensen

But we started using both the predictive analytics or actual spare parts and then consolidating the warehouse analytics global to see where the spare parts were and where would they most likely be used.

00:08:13 Jens Jensen

So it didn't help us that if.

00:08:14 Jens Jensen

We had a lot of spare parts in.

00:08:16 Jens Jensen

In Manaus, in the Oppland, Brazil.

00:08:19 Jens Jensen

But there were very few vessels that actually take birth in this.

00:08:23 Jens Jensen

So yes, it's being used.

00:08:25 Jens Jensen

I don't know how they do it now or continuous stocks in it.

00:08:29 Jens Jensen

But we started using it for maintenance and repair.

00:08:32 Domantas Mince

OK.

00:08:35 Domantas Mince

Thank you.

00:08:35 Domantas Mince

Moving on to the next technology, the question is formulated for the electric vehicles perspective.

00:08:40 Domantas Mince

However, you know maritime, it's a bit different.

00:08:42 Domantas Mince

So, are there any signs of electrification in the maritime industry like?

00:08:47 Domantas Mince

Electric ships and so on.

00:08:50 Jens Jensen

So yes, but we'll start in the in the container business the there's a lot of say moving parts on.

00:08:58 Jens Jensen

The land side, when you have to load and unload the container.

00:09:01 Jens Jensen

Ship and if you look at the Maersk, was one of the.

00:09:04 Jens Jensen

First one doing.

00:09:05 Jens Jensen

I think fully automated.

00:09:07 Jens Jensen

I'm not sure if they would fully electric to begin with.

00:09:09 Jens Jensen

But there is a port in Rotterdam that has no people out on the on the land side.

00:09:14 Jens Jensen

It's all done remotely.

00:09:15 Jens Jensen

So the crane operators actually sit with robots and manage this.

00:09:20 Jens Jensen

And the next step is electrification that's coming in that one.

00:09:23 Jens Jensen

Then another part of electrification came when.

00:09:28 Jens Jensen

Some normal.

00:09:29 Jens Jensen

When this ships, they go, they dock and they are key side.

00:09:33 Jens Jensen

They need power still on the vessel and traditionally up until I think 2015-16.

00:09:39 Jens Jensen

it was the.

00:09:42 Jens Jensen

Auxiliary engine of the vessel that was running and burning bunker fuel.

00:09:46 Jens Jensen

But after that now you have.

00:09:48 Jens Jensen

Basically, you plug the vessel in and you turn off the engine while you are at.

00:09:53 Jens Jensen

At port so you don't pollute, so most international ports today they don't allow you to run and motor while you are unless you're actually.

00:10:03 Jens Jensen

Creating propulsion and movement.

00:10:06 Jens Jensen

So there is a lot happening.

00:10:07 Jens Jensen

Well, the vessels themselves won't be electric because it's not.

00:10:11 Jens Jensen

Suitable for long distance, similar to we have challenges, but the long distance trucking haulage.

00:10:18 Jens Jensen

But they will look at ammonia and they will look at other elements on other alternative views.

00:10:24 Domantas Mince

Yeah, that's the.

00:10:25 Domantas Mince

That's the same thing I found in the.

00:10:27 Domantas Mince

In the annual reports and the strategy.

00:10:29 Domantas Mince

The maritime industry companies that.

00:10:31 Domantas Mince

Ammonia, LPG gas, CNG gas after the future or hydrogen.

00:10:36 Jens Jensen

Yeah, and hydrogen.

00:10:37 Jens Jensen

Is interesting because if we work away a bit with.

00:10:40 Jens Jensen

Norwegian hydrogen here in Girteka as well. And.

00:10:43 Jens Jensen

Hydrogen for trucks because electric has the challenge that the batteries weigh a lot.

00:10:50 Jens Jensen

And that means that we have Max carrying.

00:10:53 Jens Jensen

Or Max total truck weight.

00:10:56 Jens Jensen

So if we add 2 tons of battery, we need 2 tons less cargo and the clients are not really ready to pay for that.

00:11:03 Jens Jensen

Hydrogen has a different mix.

00:11:05 Jens Jensen

Plus you can drive much longer, so I think electrification will be in short distances like.

00:11:10 Jens Jensen

Ports where you have the containers to be moved around by small vehicles that today are diesel.

00:11:17 Jens Jensen

They could easily be.

00:11:18 Jens Jensen

It's some sort of electrical vehicles.

00:11:21 Jens Jensen

Where you put for example, replace the batteries.

00:11:23 Jens Jensen

Then you're going to have hydrogen for medium distance, and then you can have things like ammonia for long distance.

00:11:29 Jens Jensen

But there is not one source that I think covers everything.

00:11:32 Domantas Mince

So the alternative fuels is the future, not.

00:11:35 Domantas Mince

Electric is one part of the.

00:11:36 Jens Jensen

I think it is that it's a mix that it no one can cover at all because then we get too dependent on another thing and then in 10 years we'll find out that ammonia has a bad side effect or.

00:11:49 Jens Jensen

The problem with electricity today is it has to be created somewhere so as long as there are people that produce electricity.

00:11:56 Jens Jensen

By large coal plants, I don't see the.

00:11:58 Jens Jensen

Purpose exactly.

00:11:59 Domantas Mince

The same or even more pollution?

00:12:02 Jens Jensen

It's just don't elsewhere where we feel better about it because it's.

00:12:05 Jens Jensen

Not where we live.

00:12:06 Jens Jensen

But it doesn't pollute the planet.

00:12:07 Jens Jensen

Any less.

00:12:09 Domantas Mince

That makes sense.

00:12:11 Domantas Mince

So how do you say electric?

00:12:12 Domantas Mince

Vehicles impacting or electrification impacting?

00:12:15 Domantas Mince

Maritime logistics in the next 5 to 10 years I.

00:12:17 Jens Jensen

Guess I think so.

00:12:19 Jens Jensen

It does impact and I think what I think we can take maybe another 10 to 20%.

00:12:23 Jens Jensen

Out of the pollution element, in the same way, if you look at my and most of our cars today.

00:12:29 Jens Jensen

My car, still a diesel car, but it has a small electrical help engine right?

00:12:33 Jens Jensen

And it actually means that now I can.

00:12:35 Jens Jensen

Run much further per liter the same way you see these auxiliary engines that there's a lot of waste heat created on vessels that waste heat can be reused to create electricity or save one of you.

00:12:47 Jens Jensen

And I think electrical is a is a supplemental ourselves to reduce and then in the maritime sector at large everything that happens on land side.

00:12:55 Jens Jensen

Particularly in the shipping yards that can be taken out a lot.

00:13:00 Jens Jensen

So maybe 10-20% reduction of overall pollution.

00:13:05 Domantas Mince

That's good.

00:13:05 Domantas Mince

Sounds promising.

00:13:06 Jens Jensen

Hopefully, and we have to.

00:13:08 Jens Jensen

I think we've you noticed in the maritime sector the latest COP 28 meeting there.

00:13:13 Jens Jensen

The six largest container shipping lines went out and said.

00:13:16 Jens Jensen

Could you please globally regulate our industry, making it much more difficult for us to pollute?

00:13:23 Jens Jensen

Because unless you.

00:13:24 Jens Jensen

In our industry, we're going to have new competitors entering in the old polluting ways and we can't compete with people that do that.

00:13:32 Jens Jensen

So they are.

00:13:32 Jens Jensen

The first time an industry has actually.

00:13:34 Jens Jensen

Requested global statesman to be.

00:13:37 Domantas Mince

Yesterday had an interview also with the airlines, the airlines provider.

00:13:44 Domantas Mince

They have very recently there was also a conference on.

00:13:52 Domantas Mince

So for the airlines and there is the President of the basically rooting for the.

00:13:59 Domantas Mince

Sustainability increase and so on is the owner of the oil company back in the Middle East.

00:14:05 Domantas Mince

So you know, so the main.

00:14:07 Domantas Mince

The key idea that he told that.

00:14:08 Domantas Mince

If you don't have this global.

00:14:10 Domantas Mince

Then it's not worth to do.

00:14:11 Domantas Mince

It for Europe because we lose business.

00:14:13 Domantas Mince

Yes, that's the same answer.

00:14:14 Jens Jensen

Yeah, exactly.

00:14:15 Jens Jensen

Others will will disrupt the entire idea.

00:14:19 Domantas Mince

OK.

00:14:20 Domantas Mince

Thank you.

00:14:20 Domantas Mince

Moving down to the third technology, which I'm looking for is the telematics and the Internet of Things, right.

00:14:26 Domantas Mince

In the in the trucking business, it's clear we see that you know the.

00:14:30 Domantas Mince

Miles per gallon or?

00:14:32 Domantas Mince

Or the latest per kilometer.

00:14:34 Domantas Mince

The range locations on.

00:14:37 Domantas Mince

How is it in maritime logistics?

00:14:38 Domantas Mince

Does it any at all?

00:14:40 Domantas Mince

And does it improve fleet operations or cost management?

00:14:44 Jens Jensen

It's a little bit more So what discovered by telematics.

00:14:46 Jens Jensen

Which things?

00:14:48 Jens Jensen

Would that include?

00:14:49 Domantas Mince

Basically getting the data from the vessels right and then if something is being done with this or you know it's like.

00:14:51

OK.

00:14:57 Jens Jensen

Yeah. So.

00:14:58 Jens Jensen

So I think there's an.

00:15:01 Jens Jensen

The we already started that around 10 years ago, but I didn't think we have the processing.

00:15:07 Jens Jensen

Power and.

00:15:07 Jens Jensen

There is two things in particular.

00:15:09 Jens Jensen

One is that when I was in Maersk, if you design a global network where you can go from anywhere on the world to.

00:15:16 Jens Jensen

Anywhere on the world.

00:15:18 Jens Jensen

The possibilities of connecting this network is unlimited and no computer can crunch it.

00:15:24 Jens Jensen

So you give it.

00:15:25 Jens Jensen

A lot of limitations you maybe you start designing.

00:15:27 Jens Jensen

A network from main ports.

00:15:29 Jens Jensen

Say Rotterdam.

00:15:30 Jens Jensen

Tangent elenbaas and.

00:15:33 Jens Jensen

I don't know.

00:15:33 Jens Jensen

You take somewhere in China and then you start limiting the your network design.

00:15:39 Jens Jensen

Because the computers can process it today, I think the computers can process much more with the with the neural networks.

00:15:46 Jens Jensen

So you can stop the limitation and then I wouldn't be surprised that today we can design networks that are more optimal for cargo flow and if there are more optimal for cargo flow.

00:15:55 Jens Jensen

They're also more optimal for consumption, and all of these.

00:15:58 Jens Jensen

Things the other thing in the maritime industry is that sea currents.

00:16:02 Jens Jensen

It's a little bit like air.

00:16:06 Jens Jensen

Jet streams that if the plane goes in the right altitude.

00:16:09 Jens Jensen

You save a lot of fuel, but the actually the sea currents have tendency to be in the same as well.

00:16:14 Jens Jensen

So what we started doing about a decade ago is there's so many measurements from the container vessels when they continue to go the same way that you can start redesigning your route.

00:16:24 Jens Jensen

So even if it's longer in miles or nautical miles or longer.

00:16:28 Jens Jensen

The fuel consumption may be less where when we have linear thinking we just say I need to get from A to B.

00:16:35 Jens Jensen

The shortest point.

00:16:36 Jens Jensen

Then it turns out that you use more fuel.

00:16:38 Jens Jensen

So those are two examples where I think that that we will see that one is that you have to design your.

00:16:43 Jens Jensen

Network optimally to ensure that you.

00:16:45 Jens Jensen

Don't sail empty the same thing.

00:16:47 Jens Jensen

With the trucks.

00:16:49 Jens Jensen

Right.

00:16:49 Jens Jensen

You don't want to drive air around.

00:16:51 Jens Jensen

But the other thing is really that that in.

00:16:54 Jens Jensen

In see the sea currents into it.

00:16:56 Jens Jensen

The consumption and how many miles.

00:16:59 Jens Jensen

Per ton.

00:17:01 Domantas Mince

It's the same again, reflecting the also to the whole logistics and the air logistics people the same so.

00:17:08 Domantas Mince

Yesterday they told that they are looking into the.

00:17:10 Domantas Mince

Air streams and they're.

00:17:11 Domantas Mince

You know, they choose to fly, maybe whole.

00:17:14 Domantas Mince

Whole way around, especially when you know in the in the air logistics now we have Russia Belarus and Ukraine that you.

00:17:19 Domantas Mince

Have to go around.

00:17:20 Domantas Mince

So he mentioned Dubai flight that sometimes you know, depending on the event sometimes makes sense to go all above the.

00:17:28 Domantas Mince

You know Russian.

00:17:30 Domantas Mince

Yeah, there and other times those you know around in the in the.

00:17:33 Domantas Mince

Road logistics.

00:17:35 Domantas Mince

There was a very good literature.

00:17:38 Domantas Mince

I did a review on that in the United States.

00:17:40 Domantas Mince

The companies are even predicting traffic lights.

00:17:43 Domantas Mince

The altitudes and everything, you know that choosing the longer route.

00:17:47 Domantas Mince

The drive the cargo.

00:17:48 Domantas Mince

Means saving actually.

00:17:49 Jens Jensen

Yeah, and that's that is where I think technology could.

00:17:52 Jens Jensen

To explore and as we always have to, to be very fearful.

00:17:57 Jens Jensen

Of this saying.

00:17:58 Jens Jensen

We've always done this or no.

00:18:01 Jens Jensen

No, we.

00:18:01 Jens Jensen

That's not going to work because he.

00:18:04 Jens Jensen

If we analyzed a year.

00:18:05 Jens Jensen

Ago, if we do the same analysis today.

00:18:07 Jens Jensen

Maybe it is going to work in the maritime industry.

00:18:09 Jens Jensen

They're also talking about these northern routes.

00:18:12 Jens Jensen

That used to be covered.

00:18:13 Jens Jensen

By too much ice.

00:18:14 Jens Jensen

Where now we say, well, unfortunately the.

00:18:17 Jens Jensen

Global warming is eliminating a lot of this ice.

00:18:20 Jens Jensen

But it means that we can certainly do new network.

00:18:22 Jens Jensen

Particularly in the summertime in the northern hemisphere.

00:18:25 Jens Jensen

So I think there's.

00:18:26 Jens Jensen

That that we have to constantly as business leaders review our assumptions and even if it one year ago didn't make sense.

00:18:34 Jens Jensen

Maybe this year does because we have.

00:18:37 Jens Jensen

Technology that can crunch so much more data.

00:18:41 Domantas Mince

That makes sense.

00:18:44 Domantas Mince

Any challenges coming from the integrating telematics technology and logistics operation and maritime?

00:18:53 Jens Jensen

I think they know overall, so the I think the shared challenge we all have with now with the I and the computer.

00:19:01 Jens Jensen

The processing power is actually.

00:19:03 Jens Jensen

Imagination because people are so set in their roles and you know I'm.

00:19:09 Jens Jensen

I'm mid 40s, right?

00:19:10 Jens Jensen

And they and I've been doing.

00:19:12 Jens Jensen

Transport and logistics for 15-17 years now.

00:19:15 Jens Jensen

So I have my presumption on how.

00:19:17 Jens Jensen

It's supposed to be.

00:19:18 Jens Jensen

So if a new and a younger colleague comes and challenges me of something.

00:19:21 Jens Jensen

I would just fall back to.

00:19:23 Jens Jensen

No, no, that's not how it's done.

00:19:25

So I think.

00:19:26 Jens Jensen

The first challenge is to constantly remind ourselves of this.

00:19:28 Jens Jensen

That that we have to be.

00:19:30 Jens Jensen

Imaginative and I think also in my own organization now, we have to.

00:19:34 Jens Jensen

Use imagination to rethink how do we do things.

00:19:36 Jens Jensen

In our offices.

00:19:37 Jens Jensen

Imagination is going to be one of the skills that we're going to start hiring for.

00:19:43 Jens Jensen

We just don't have it as human beings, we are creatures of habit.

00:19:47 Jens Jensen

You drove to.

00:19:48 Jens Jensen

Work the same way this morning as you did yesterday and last week.

00:19:51 Jens Jensen

And how often do you sit in the car?

00:19:53 Jens Jensen

Or in the morning you see.

00:19:54 Jens Jensen

Let me try a different group to see if it worked better.

00:19:57 Jens Jensen

We just don't do that and.

00:19:58 Jens Jensen

I think this is simplest.

00:19:59 Jens Jensen

Examples of the biggest challenge.

00:20:00 Jens Jensen

That we have.

00:20:01 Jens Jensen

The same thing in the maritime industry.

00:20:03 Jens Jensen

There's so many people with a lot of years of experience.

00:20:06 Jens Jensen

But you have to.

00:20:07 Jens Jensen

Be open to new ways of working.

00:20:09 Domantas Mince

OK, so the that generation will bring some corruption here might bring hopefully.

00:20:15 Jens Jensen

But it also means that we need.

00:20:16 Jens Jensen

To empower them.

00:20:17 Jens Jensen

And at the same time.

00:20:19 Jens Jensen

It's equally dangerous to have experience without innovation, as it has to have innovation without experience, right? Because.

00:20:28 Jens Jensen

You can.

00:20:28 Jens Jensen

You can definitely come with the set generation analytics element.

00:20:32 Jens Jensen

But you need some of.

00:20:34 Jens Jensen

Sorry, say the old timers to tell what are the biggest problems.

00:20:36 Domantas Mince

OK.

00:20:37 Jens Jensen

You need to know where to look to find a new way.

00:20:39 Jens Jensen

Of finding.

00:20:40 Jens Jensen

A better way of innovating or doing a process.

00:20:46 Domantas Mince

OK.

00:20:46 Domantas Mince

Thank you.

00:20:48 Domantas Mince

So now everything that we just discussed gives the company data.

00:20:52 Domantas Mince

Right.

00:20:53 Domantas Mince

We get the data and.

00:20:54 Domantas Mince

Now this popular.

00:20:55 Domantas Mince

Popular trend data-driven decision making. Everyone is buzzing about that.

00:20:59 Domantas Mince

So what do you think?

00:21:01 Domantas Mince

Does having data or does data-driven decision making helps logistics sector to be more resilient and adaptive in face of challenges like COVID or the war and so on?

00:21:12 Domantas Mince

Overall, companies men.

00:21:14 Jens Jensen

And yeah.

00:21:14 Jens Jensen

So I think that's the difficult, most difficult question to answer right now because.

00:21:22 Jens Jensen

So my good nature human.

00:21:24 Jens Jensen

Being would say, yeah, yeah.

00:21:25 Jens Jensen

Everything is much better.

00:21:26 Jens Jensen

It's more resilient than we learn from our past mistakes.

00:21:28 Jens Jensen

And we're not going to do the same stupid mistakes again that we've done in the past.

00:21:32 Jens Jensen

But unfortunately, we sit now in fourth quarter of 2023 and we look towards clients that have gone back.

00:21:38 Jens Jensen

Forgotten that there was an Evergreen ship.

00:21:40 Jens Jensen

Parked in in the Suez forgotten.

00:21:43 Jens Jensen

How difficult it was to order anything, and now they're just going on.

00:21:48 Jens Jensen

Price, price, price, price.

00:21:49 Jens Jensen

Price and I think those companies right now they are optimizing the short term and they.

00:21:54 Jens Jensen

Will die in the.

00:21:55 Jens Jensen

Long term and they seem to that they have haven't learned a thing the way that we see it the most blind as well right now it's completely going back to how it was five years ago, letting 10,000 people go, reducing it, their warehouse logistic doesn't pay off.

00:22:12 Jens Jensen

The maritime is like the customer doesn't care as long as it's cheap.

00:22:15 Jens Jensen

Then they have it another 10 days.

00:22:17 Jens Jensen

On the boat.

00:22:17 Jens Jensen

They hardly care whether it pollutes or not anymore, because now everyone is poor.

00:22:22 Jens Jensen

I get.

00:22:23 Jens Jensen

And if we run into a bad economic situation.

00:22:26 Jens Jensen

For 2024 and 2025.

00:22:28 Jens Jensen

I I'm concerned.

00:22:29 Jens Jensen

And what the signs we already see now, because it really seems like we haven't learned a thing like really not learned a thing.

00:22:34

OK.

00:22:37 Jens Jensen

We're doing exactly the same thing we did in 2007 and 2009 and 2013 and in 2017.

00:22:42 Jens Jensen

The same thing all over.

00:22:43 Jens Jensen

So I would I wished I could say yes.

00:22:45 Jens Jensen

But what I see.

00:22:46 Jens Jensen

From that ad container shipping line it is.

00:22:49 Jens Jensen

It seems like they haven't learned nothing.

00:22:52 Domantas Mince

That's interesting.

00:22:53 Domantas Mince

Yeah, but it's also in the in the economic and the.

00:22:57 Domantas Mince

Whole history, like wars and everything goes around and.

00:23:01 Jens Jensen

It does and it's I heard some scary statistic from now on.

00:23:04 Jens Jensen

Daily Show and listening to the Danish.

00:23:06 Jens Jensen

News sometimes, like but young people now in Denmark, they are no longer buying the.

00:23:12 Jens Jensen

You know the organic well treated, whatever food or anything like they buy what they can afford.

00:23:18 Jens Jensen

So as much as they are all supporters of the motion that that it would say would sit in line for greater tuber, well.

00:23:24 Jens Jensen

I'm sorry, organic product sales in Denmark is down 18% overall.

00:23:29 Jens Jensen

Everyone is now bringing in the fast grown turbo chicken.

00:23:32 Jens Jensen

It's called that can reach 2 kilos in 32 days because they want cheap protein without any focus on the welfare of the animal and it's the big topic right now is that it's great to be good and do good.

00:23:44 Jens Jensen

And do you know learning all of that, but in times of crisis?

00:23:48 Jens Jensen

It's everyone.

00:23:49 Jens Jensen

Just goes back to their old habit, and I think that's that in in many ways.

00:23:53 Jens Jensen

So we will see how the next 12 to 18 months pans out because I think not only about.

00:24:00 Jens Jensen

But the but the climate that the planet can either sit.

00:24:02 Jens Jensen

There, yeah.

00:24:04 Domantas Mince

Makes sense

00:24:05 Domantas Mince

Thank you.

00:24:06 Domantas Mince

So are there any collaborations with technology providers, maybe startups, industry.

00:24:12 Domantas Mince

Partners, which is now, you know, showing tendency.

00:24:15 Domantas Mince

A bit more.

00:24:16 Domantas Mince

Or the scientific organizations to stay in front of technological advancements logistics.

00:24:20 Jens Jensen

Yeah, but I think that goes back to the same way that you think the predictive analytics.

00:24:25 Jens Jensen

While the intent producers are now competing on who has the best, uh.

00:24:30 Jens Jensen

You can see.

00:24:31 Jens Jensen

Life cycle cost.

00:24:34 Domantas Mince

Right.

00:24:34 Jens Jensen

Because before you're selling a product, you.

00:24:36 Jens Jensen

Need an engine.

00:24:37 Jens Jensen

There's a few producers globally that can deliver it.

00:24:40 Jens Jensen

And then they're competing on price and they're on the installment now.

00:24:44 Jens Jensen

You can, you can say what's the.

00:24:45 Jens Jensen

Price of the life long investment.

00:24:48 Jens Jensen

So you looking at those elements in the in the shipping sector?

00:24:52 Jens Jensen

If you look at the, it's all from third party that owns.

00:24:56 Jens Jensen

A terminal where you have to load and unload.

00:24:58 Jens Jensen

Well, if they can give it the more green or cheaper or more efficient.

00:25:02 Jens Jensen

Then certainly you don't need to go.

00:25:03 Jens Jensen

To New York.

00:25:05 Jens Jensen

You can take it further down the coast to Washington or to.

00:25:08 Jens Jensen

I don't know Alabama or whatever it is.

00:25:11 Jens Jensen

So everyone is doing something and.

00:25:13 Jens Jensen

You have to collaborate with your partners.

00:25:15 Jens Jensen

When we look at logistics planning then then it takes someone like Maersk and let me see they have own proprietary tools.

00:25:22 Jens Jensen

But I'm sure that there's someone that that is selling planning tools now.

00:25:25

A big.

00:25:26 Jens Jensen

A big.

00:25:27 Jens Jensen

Well known global company these days is Salesforce.

00:25:30 Jens Jensen

Everyone uses that for.

00:25:32 Jens Jensen

Customer relationship management tool and Salesforce is now really fighting to adapt a lot of.

00:25:38 Jens Jensen

AI large language models all of that into so because if they don't.

00:25:42 Jens Jensen

They also know that despite the strong brand name, they can be killed in a year if someone comes up with this model solution.

00:25:49 Jens Jensen

So all clients and partners globally are now collaborating with these choices.

00:25:54 Jens Jensen

If you're not, then you're probably not a partner.

00:25:56 Jens Jensen

For very long.

00:25:57 Jens Jensen

Take care.

00:25:57 Jens Jensen

In Lithuania, we have a payroll partner that's not into innovation.

00:26:02 Jens Jensen

Then, for us, that means we have.

00:26:04 Jens Jensen

A temporary payroll partner.

00:26:05 Jens Jensen

We don't have time to kill them.

00:26:07 Jens Jensen

Oh, and get rid of it now, but we will go out and change our partner because we only need partners that themselves are innovating.

00:26:14 Jens Jensen

If not, they're not a partner for us.

00:26:17 Domantas Mince

OK, that makes.

00:26:18 Domantas Mince

Sense then worldwide trend

00:26:22 Domantas Mince

So we came to the 11th question.

00:26:24 Domantas Mince

That just the key one, right?

00:26:26 Domantas Mince

So that's the disruptive technologies like artificial intelligent electric vehicles.

00:26:31 Domantas Mince

Electrification overall and telematics are creating for substantially changing business models of maritime logistics companies already.

00:26:40 Jens Jensen

I think it's it.

00:26:41 Jens Jensen

The verdict is still out there.

00:26:43 Jens Jensen

Well it's some.

00:26:44 Jens Jensen

Things are changing, but it's changing in the.

00:26:46 Jens Jensen

I would say the same pace as any other industry these days.

00:26:48 Jens Jensen

I think what a lot of companies may be afraid of now is who conducts the sale.

00:26:54 Jens Jensen

And what I mean by that is that if everything is online and everything is data-driven and what's been.

00:26:59 Jens Jensen

Difficult before to get this price transparency and transport logistics transparency.

00:27:05 Jens Jensen

If someone else can introduce a model that certainly.

00:27:08 Jens Jensen

Can with the current computing power.

00:27:10 Jens Jensen

The future computing power can.

00:27:12 Jens Jensen

Certainly give you full transparency globally, not only on price.

00:27:15 Jens Jensen

But also on persistency, reliability, environmental footprint, so.

00:27:20 Jens Jensen

Then the client should have a different their hands to choose.

00:27:25 Jens Jensen

So I think we haven't seen the last disruption yet.

00:27:28 Jens Jensen

But clearly there are.

00:27:29 Jens Jensen

There are changes now and it's continuing to accelerate, which is what the tricky part of this.

00:27:35 Jens Jensen

Which again, for leadership and executive position, makes this tough because your own.

00:27:41 Jens Jensen

Your own knowledge that got you to your position today is worth less and less.

00:27:47 Jens Jensen

What really matters is leadership, the ability to.

00:27:49 Jens Jensen

Inspire and then getting out of the way to ensure that your team can change it.

00:27:54 Jens Jensen

So I think that it is disrupting.

00:27:58 Domantas Mince

Are there any KPIs to measure the impact?

00:28:01 Domantas Mince

Of this disruption of.

00:28:02 Domantas Mince

Especially technologies impact, you know?

00:28:04 Jens Jensen

Yes, but that.

00:28:05 Jens Jensen

Yeah, I'm sure there are, but I so now because I'm not in the maritime anymore.

00:28:10 Jens Jensen

I wouldn't know how they recently measured in in my own teams today and what we're discussing for.

00:28:17 Jens Jensen

2024 one of our top three priorities.

00:28:20 Jens Jensen

Is introducing AI to our old offices and this could go with HR where I said.

00:28:24 Jens Jensen

But also beyond.

00:28:27 Jens Jensen

But the KPI's to measure will.

00:28:31 Jens Jensen

You see one is.

00:28:31 Jens Jensen

The traditional customer experience.

00:28:34 Jens Jensen

So we're, should you have it?

00:28:36 Jens Jensen

But efficiency, right?

00:28:39 Jens Jensen

And this is time to produce a result.

00:28:41 Jens Jensen

I think that's.

00:28:43 Jens Jensen

That's where we have what I'm lacking and there was having.

00:28:46 Jens Jensen

This discussion with other senior people that used to be maritime recently said that we are not very good at setting realistic KPIs that the purpose of humankind is not to work 50-60 hours per week.

00:29:01 Jens Jensen

If we can start saying that, maybe we can undo actually the 40 hours we hired or maybe even 30.

00:29:06 Jens Jensen

35 or 30 without.

00:29:07 Jens Jensen

Starting to also eliminate people salaries.

00:29:09 Jens Jensen

Then I think that would be a worthwhile KPI.

00:29:12 Jens Jensen

But organizations unfortunately tend to that as soon as.

00:29:15 Jens Jensen

You do create.

00:29:16 Jens Jensen

A time saving.

00:29:17 Jens Jensen

Then you make a stop saving.

00:29:19 Jens Jensen

Yeah, and that's tricky and that's where AI has tremendous benefits.

00:29:24 Jens Jensen

But a lot of people.

00:29:25 Jens Jensen

Are seeing it as a threat.

00:29:27 Jens Jensen

And personally, I think that prevents us from making large leaps in technology right now.

00:29:32 Jens Jensen

Because individuals are just scared that their jobs will disappear. Cool.

00:29:39 Domantas Mince

OK.

00:29:39 Domantas Mince

And there is the last question.

00:29:41 Domantas Mince

I will form it a bit differently from what's written there.

00:29:45 Domantas Mince

Do you see any difference in in?

00:29:47 Domantas Mince

The adoption of technology in.

00:29:48 Domantas Mince

Lithuania versus the other countries that you know you.

00:29:52 Jens Jensen

And I do.

00:29:53 Jens Jensen

But it's not just the arena, because I was looking at a little bit more at.

00:29:57 Jens Jensen

A broader scale.

00:29:58 Jens Jensen

Lithuanian history is if you don't even like its own salaries in Lithuania has doubled in the last 6-7 years in average because there's typically higher inflation and that means higher salary increases.

00:30:08 Jens Jensen

And in the 5-6 year period, that means that the salary stopping this is similar to a lot of other.

00:30:13 Jens Jensen

Countries that are moving up quickly in the rank of the hierarchy of high performing.

00:30:18 Jens Jensen

High developed, highly educated, well educated workforce.

00:30:23 Jens Jensen

What happens here and one of the things that we're struggling with here now is that.

00:30:29 Jens Jensen

Uh, it is still in our DNA that if we see a problem.

00:30:33 Jens Jensen

We hire an extra person and.

00:30:37 Jens Jensen

Recently we saw that in Girteka.

00:30:38 Jens Jensen

We've had.

00:30:39 Jens Jensen

15% more people in the last couple of years to do this.

00:30:42 Jens Jensen

They say work because every time we've identified the problem.

00:30:45 Jens Jensen

We think that's hire someone they can fix it.

00:30:48 Jens Jensen

So I think Lithuania is now struggling with what the West struggled with.

00:30:52 Jens Jensen

Western Europe struggled with.

00:30:53 Jens Jensen

Our 10-15 years ago is.

00:30:55 Jens Jensen

You're not going to get an extra.

00:30:56 Jens Jensen

Person you have to use your imagination, your innovation and the.

00:31:00 Jens Jensen

Technology to.

00:31:01 Jens Jensen

Do more productive outcome without stressing people more?

00:31:06 Jens Jensen

It's not about adding hours, it's about.

00:31:09 Jens Jensen

It's simply saying.

00:31:09 Jens Jensen

It's not about working harder, it's about working smarter.

00:31:13 Jens Jensen

Western Europe, if you take Netherlands, Denmark, Belgium, Germany, they probably most of the time being forced to do that 10 years ago because wages started being so high and now Lithuania has a catch up.

00:31:26 Jens Jensen

Game to do.

00:31:26 Jens Jensen

We can't keep.

00:31:27 Jens Jensen

Just hiring extra employees whenever there's a problem.

00:31:30 Jens Jensen

We need technology to continue to increase our.

00:31:33 Jens Jensen

Output and that's a cultural issue that we're struggling with.

00:31:37 Jens Jensen

The same thing happened.

00:31:38 Jens Jensen

Countries, other countries that are entering this thing.

00:31:41 Jens Jensen

From India has had the same.

00:31:43 Jens Jensen

Sort of issues.

00:31:43 Jens Jensen

They're starting to have a lot.

00:31:44 Jens Jensen

Of highly educated people.

00:31:47 Jens Jensen

That they are no longer a country for the same value proposition to outsource to.

00:31:52 Jens Jensen

And this Lithuania late 90s, early 2000.

00:31:56 Jens Jensen

You would move production here.

00:31:57 Jens Jensen

You would do service centers here.

00:31:58 Jens Jensen

You would use all of these and move it here.

00:32:00 Jens Jensen

Well, it lost that value proposition because it's too expensive.

00:32:05 Jens Jensen

But you got to move your knowledge positions here and in Lithuania.

00:32:09 Jens Jensen

We got to think more innovative.

00:32:11 Jens Jensen

How do we keep up?

00:32:12 Jens Jensen

Not just hiring another person, but use technology.

00:32:15 Jens Jensen

To be more efficient.

00:32:17 Domantas Mince

To provide tools with the same work and short period of time.

00:32:21 Jens Jensen

So that's that is tricky and I've seen that for a lot of countries globally.

00:32:25 Jens Jensen

That that as you.

00:32:27 Jens Jensen

You as a country develops substantially and fast, and your salary is also pick up.

00:32:32 Jens Jensen

Quickly you need to change your game.

00:32:35 Jens Jensen

What it is that you're providing to the world and Lithuanian needs to be.

00:32:38 Jens Jensen

A country that.

00:32:39 Jens Jensen

Eliminates task for people to not take them over.

00:32:43 Jens Jensen

And I think that's a tricky point that.

00:32:44 Jens Jensen

We are facing in the next five years.

00:32:46 Domantas Mince

That's very interesting consideration, I never.

00:32:48 Domantas Mince

Thought from this from.

00:32:49 Domantas Mince

This perspective, but then you know.

00:32:51 Jens Jensen

You see the GDP?

00:32:51 Domantas Mince

Growth of Lithuania and everything there.

00:32:55 Domantas Mince

OK, so actually that's it.

00:32:56 Domantas Mince

What they have today.

00:32:57 Jens Jensen

Thank you so much.

00:32:57 Domantas Mince

Thanks a lot.

00:32:58 Jens Jensen

Thank you.