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**CUSTOMER VALUE
ASSESSMENT IN SUPPLY
CHAIN WITH THE FOCUS
ON 4PL SERVICES**

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ABSTRACT

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In today's dynamic business landscape, companies are increasingly turning to fourth-party logistics (4PL) services to enhance operational efficiency and ultimately improve customer value (Doe & Smith, 2023). This thesis explores the multifaceted impacts of 4PL services on customer value in the context of the studied company, considering various dimensions of supply chain management and operational effectiveness. Through a comprehensive analysis of empirical data gathered from interviews with industry experts and practitioners (Johnson et al., 2022), the study sheds light on the potential benefits and challenges associated with the adoption of 4PL services.

Key findings reveal that the transfer of responsibilities from companies to 4PL service providers significantly contributes to customer value by allowing organisations to focus on core competencies while leveraging the expertise of external partners to manage operational aspects more effectively. Additionally, the efficient utilisation of the expertise offered by 4PL providers enables companies to streamline supply chain processes, optimise material flow, and enhance service quality, thereby improving overall customer value (Gupta, 2021).

However, challenges such as maintaining quality assurance standards and fostering effective communication and collaboration with external parties emerge as critical considerations. Despite these challenges, strategic prioritisation of quality, transparent communication channels, quick response to market changes and alignment of goals between companies and 4PL providers are identified as essential strategies to maximise the benefits of 4PL services and drive sustainable growth in supply chain operations while ultimately enhancing customer value.

Overall, this thesis contributes to the understanding of the complex interplay between 4PL services and customer value, providing insights and recommendations for businesses seeking to capitalise on the opportunities presented by outsourcing supply chain functions. By addressing challenges proactively and fostering collaborative partnerships, companies can unlock the full potential of 4PL services to deliver superior customer value in today's competitive market environment.

Keywords: Fourth-party logistics (4PL), Customer value, Supply chain management, Operational effectiveness, Outsourcing, Empirical data

PREFACE

Undertaking this master's thesis has been a journey of both intellectual growth and personal development. It is with a sense of accomplishment that I present this work, which represents the completion of years of study, research, and dedication. The inspiration for this thesis emerged from my passion and curiosity for the Customer Value concept in the context of collaborating with an external service provider and a desire to delve deeper into its complexities. Throughout this journey, I have been fortunate to receive guidance, support, and encouragement from numerous individuals, without whom this endeavour would not have been possible.

I extend my deepest gratitude to my thesis advisor, Mr. Jari Paranko, whose expertise, mentorship, and support have been invaluable throughout the research process. Besides, I would also like to express my appreciation to the subject company's CEO, Mr. Teemu Hämäläinen who generously shared their knowledge, insights, and expertise. Their contributions have enriched my understanding of the subject matter and inspired me to push the boundaries of my research.

Furthermore, I am grateful to my family and friends for their unwavering encouragement, understanding, and belief in my abilities. Their constant support provided the motivation and resilience needed to overcome challenges and persevere in the pursuit of academic excellence. It is my sincere hope that this thesis contributes to the body of knowledge in the field of customer value in the service sector and inspires future research and inquiry.

In Espoo, Finland, May 2024

Yasaman Zandmiralavand

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1. Introduction

Understanding the intricate dynamics of fourth-party logistics (4PL) services and their impact on customer value is crucial in today's rapidly evolving business environment. As companies strive to maintain a competitive edge, the quest for operational efficiency and superior customer value has become paramount. This thesis embarks on an exploration of the multifaceted impacts of the case company's 4PL services on customer value within the context of supply chain management and operational effectiveness.

The focus of this study lies in analysing the implications of adopting 4PL services for enhancing customer value. Specifically, it aims to delve into the transfer of operational responsibilities to external partners and its effects on organisational efficiency and customer satisfaction. Excluded from this scope are detailed analyses of specific industries or exhaustive comparisons with other 4PL providers.

This research contributes to existing studies by offering empirical insights into the impacts of 4PL services on customer value, particularly in the context of the case company. While previous literature has explored the general benefits and challenges of 4PL adoption, this study provides a focused examination of the specific dynamics at play within the subject company's service offerings.

The primary research objective is to investigate the implications of 4PL services on customer value. Through interviews with industry experts and practitioners, the study seeks to identify the key factors influencing customer value perception and the challenges and opportunities associated with the adoption of 4PL services.

Structured into sections addressing the topic's context, rationale, methodology, findings, and conclusion, this thesis provides a comprehensive analysis. The context section sets the stage by outlining the importance of 4PL services in contemporary business environments. The rationale section explains the motivations behind the research, emphasising the significance of Hiava's services. The methodology details the approach taken, including data collection methods. Findings present key insights gleaned from the analysis of empirical

data. Finally, the conclusion synthesises the findings and offers recommendations for businesses looking to leverage 4PL services effectively.

2. Literature Review

The literature review offers a comprehensive examination of two intertwined pillars of modern business: logistics within supply chain management and customer value. It delves into the intricate landscape of logistics, defining it as the holistic management of goods and services from origin to consumption, surrounding vital functions like inventory management and technological integration. Notably, it traces the evolution of logistics service providers, from traditional roles to the consultancy focus of 4PL and 5PL providers, highlighting their pivotal role in enhancing operational synergy and competitiveness.

Aligning offerings with customer expectations and perceptions of quality is emphasized to foster loyalty, with customer value defined as the balance between perceived benefits and costs, including effort. Overall, the literature highlights the imperative for businesses to adopt value-based strategies to optimize both logistics and customer relationships, thereby driving sustainable growth and operational excellence within global supply chains.

2.1. Logistics

The examination of logistics within the realm of supply chain management requires an imperative to delve deeper into its multifaceted nature beyond the scope of merely the products sold by a company. Logistics, defined as the management of the flow of goods and services from the point of origin to the point of consumption, encompasses a broad spectrum of activities and operations crucial for the smooth flow of goods and services. This entails not only the physical transportation and storage of goods but also encompasses aspects such as inventory management, procurement, distribution, and even the integration of various technologies to optimize efficiency and effectiveness (Wood et al., 1995). To provide a comprehensive understanding of logistics, it's essential to outline its components and key methods utilized within the context of supply chain management. This includes elucidating the various modes of transportation utilized, such as road, rail, sea, and air freight, as well as the intricacies of warehousing, inventory control systems, and the role of information technology in

streamlining logistics processes. Moreover, discussing logistics within the broader framework of supply chain management entails exploring concepts like supply chain visibility, demand forecasting, and strategic sourcing, all of which contribute significantly to the overall efficiency and competitiveness of businesses operating within global markets (Mangan & Lalwani, 2016).

By presenting a detailed overview of logistics that encompasses its definition, components, methods, and overarching significance within the realm of supply chain management, this work will demonstrate a comprehensive understanding of logistics that goes beyond mere surface-level descriptions. This broader perspective will not only enhance the reader's comprehension but also underscore the critical role that logistics plays in facilitating seamless operations and driving competitiveness in today's interconnected global marketplace (Mangan & Lalwani, 2016).

In supply chain processes, logistics service providers are categorised differently according to the range, format, and arrangement of services they provide. First Party Logistics (1PL) refers to the companies that provide one single logistics service, for example, freight forwarding. Second Party Logistics (2PL) provides the typical logistics services which include various services from parcel handling, transporting, and storing. Third-party logistics (3PL) carries out elevated versions of the logistics services that 2PL companies offer. Inventory management and package designing are a few services to mention. 3PL providers are no strangers to international operations, accordingly, they invest in optimising their services in different fields such as route planning and resource management. Moreover, 3PL providers aim to integrate with various functions of the supply chain to be able to provide more customised customer services as well as increase efficiency among all members involved (Gruchmann et al., 2020).

2.2. 4PL Services

In addition, there are Fourth Party Logistics (4PL) providers who do not own any logistics operation (assets) themselves and focus heavily on consulting services. In practice, they are the connection between the customer and First, Second- or Third-Party logistics providers. 4PL providers focus on designing and coordinating the most suitable logistics solution possible according to the

customer's needs and requirements by using various IT tools to decrease the customer's costs. Last but not least, Fifth Party Logistics (5PL) providers offer almost the same services as 4PL with a slight difference in that they own part of the logistics assets and implement some of the operations themselves. IT tools and digitalizations play a vital role when it comes to 4PL and 5PL services (Gruchmann et al., 2020).

2.3. The Main Areas of Services Provided by Fourth Party Logistics

What makes 4PL providers different from other logistics providers is the fact that their services focus on integrating resources on hand such as human resources, infrastructure, knowledge and technical resources in an effective, comprehensive and adjustable way to respond to customers' needs. Therefore, 4PL providers focus on identifying the operational capabilities and methods to increase the collaboration between those to not only provide wholesome logistics services but also gain competitiveness (Subramanian et al., 2016).

3PL providers offer various logistics services and carry out the complete logistics operations for moving goods from point A to B. Those services include transportation, warehousing, inventory management and freight forwarding. Besides, 3PL providers offer enhanced services such as cross-docking and packaging to facilitate the logistics process (Sahay, 2006).

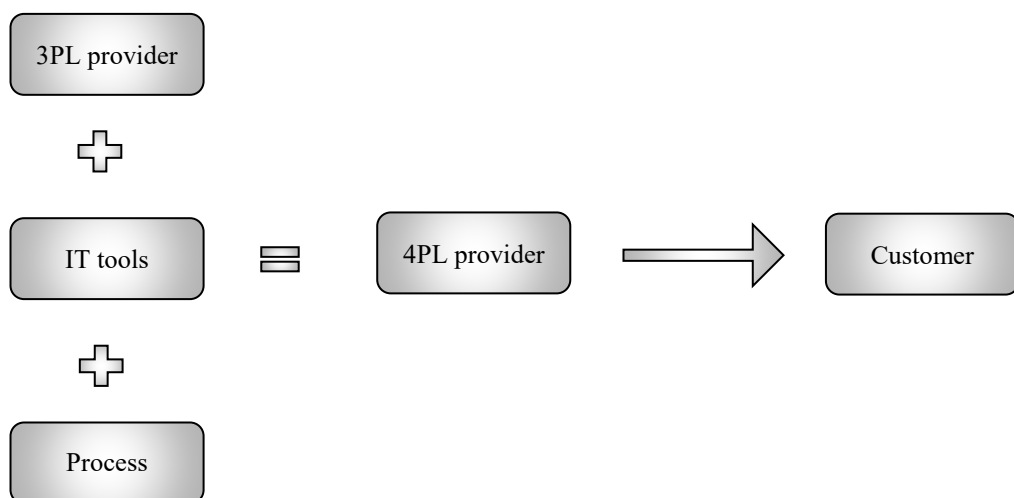


Figure 1 4PL provider (Subramanian et al., 2016)

As it stated in the picture above, the main difference between 3PL and 4PL providers is that transport management and coordination are not part of a 3PL provider's responsibilities. 4PL providers combine the processes and technology to provide extensive, less complex, and more cost-efficient logistics solutions. They have multiple partners in different fields warehousing, transportation, etc to collaborate with. Hence, 4PL providers utilise the company's assets and resources to find the most suitable logistics solutions according to the customers' will and requirements and manage the whole process (Sahay, 2006).

2.3.1. Common Tools and Applications

The logistics processes stand to benefit significantly from the availability of accurate and comprehensive information. The seamless flow of data is paramount in facilitating informed decision-making within logistics operations. Recognizing this critical role, a myriad of tools has emerged in the market designed specifically to manage this data flow effectively. These tools serve as invaluable assets in optimizing logistics operations and ensuring efficiency across the supply chain. Among the plethora of available options, some notable tools highlighted by Goodhue (2020) include:

WMS (Warehouse Management System)

It is a tool that could be essential in monitoring and planning logistics operations. It is a software application used for managing discrete resources in a warehouse to make sure product flow is done efficiently in the warehouse. WMS helps both managers and employees to plan and monitor logistics operations. For example, it provides full; visibility of the stock available including all the SKUs (Stock Keeping Unit) for the warehouse manager as well as the exact location of each unit which is a necessary piece of info for warehouse workers (Goodhue, 2020).

OMS (Order Management System)

Order Management Systems (OMS) represent a pivotal platform within the logistics landscape, offering a centralized hub where purchase orders are not only

visible but also accurately monitored. This comprehensive system empowers customers to seamlessly place orders tailored to their unique requirements and product specifications. One of the key advantages of OMSs lies in their ability to provide managers with unparalleled visibility into all registered orders, alongside their respective statuses and priorities. This transparency equips managers with the insights needed to make informed decisions swiftly, thereby enhancing operational efficiency and customer satisfaction levels. As underscored by Goodhue (2020), the utilization of OMSs signifies a strategic investment in bolstering order visibility and management within the logistics realm.

TMS (Transportation Management System)

TMSs are used for managing transportation processes from the point an order is placed until the moment it reaches the customer. Transportation Management Systems are utilised for planning, executing, and tracking the transportation processes. They could be used as individual software or as a part of ERP (Enterprise Resource Planning) systems. Hence, TMS could be used for finding the most suitable transportation route according to the customers' requirements and needs, choosing the most fitting mode of transportation, tracking parcels and calculating transport costs (Goodhue, 2020).

2.3.2. Examples of Successful 4PL Companies

Numerous logistics companies have extended their services and are now working as 3PL and 4PL providers. Here are examples of some successful companies:

Accenture

Accenture is a global professional services company that offers a range of services, including 4PL logistics solutions. Accenture's 4PL services are designed to help clients optimise their supply chain operations, reduce costs, and improve efficiency. The company leverages advanced analytics and technology solutions to manage and coordinate all logistics activities of its clients (Logical Steps to Logistics Optimization, 2016).

Accenture Logistics Financial Statement Analysis

The financial data from August 2019 to August 2023 presents a picture of consistent growth and stability for the company. Operating revenue steadily increased over the period, with a notable rise from 43,215,013 thousand USD in August 2019 to 64,111,745 thousand USD in August 2023. This upward trend suggests successful revenue generation efforts and potential market expansion initiatives undertaken by the company. Moreover, profitability indicators remained robust, with consistent profit margins ranging from 14.26% to 15.36%, indicating effective cost management and revenue generation strategies (Orbis, 2024).

Furthermore, the company demonstrated strong financial health and stability, as evidenced by the solvency ratio consistently above 45% over the period. This metric indicates the company's ability to meet its long-term financial obligations comfortably. Additionally, both return on equity (ROE) and return on capital employed (ROCE) remained healthy, suggesting efficient utilization of shareholders' funds and capital resources to generate profits. The current ratio, while showing slight fluctuations, generally remained above 1, indicating the company's ability to cover its short-term liabilities with its current assets (Orbis, 2024).

The increase in the number of employees from 492,000 in August 2019 to 733,000 in August 2023 reflects potential growth and expansion initiatives undertaken by the company during this period. Overall, the financial performance data suggests a well-managed and growing company, with consistent revenue growth, profitability, and financial stability (Orbis, 2024).

XPO Logistics

XPO Logistics is a leading global provider of transportation and logistics solutions. The company offers a range of logistics services, including 4PL services, to help clients manage their supply chain operations more efficiently. XPO Logistics' 4PL

services include supply chain design, optimization, and management, as well as transportation and warehouse management (About Us - XPO, 2023).

XPO Logistics Financial Statement Analysis

The financial data from 2019 to 2023 reveals a fluctuating performance trajectory for the company. Operating revenue experienced a significant decline from 10,681,000 thousand USD in 2019 to 6,168,000 thousand USD in 2020, followed by a gradual recovery in subsequent years, reaching 7,744,000 thousand USD in 2023. This trend suggests a period of instability, possibly influenced by market dynamics or internal factors affecting revenue generation. Similarly, profitability indicators such as profit margin and return on equity (ROE) fluctuated over the years, reflecting the company's challenges in maintaining consistent profitability. Notably, the company reported a loss in 2020, with a negative profit margin and ROE, indicating operational difficulties during that period. However, there was a notable improvement in profitability in 2021 and 2022, followed by a slight decline in 2023 (Orbis, 2024).

Despite the fluctuations in revenue and profitability, the company maintained stable solvency ratios, suggesting its ability to meet long-term financial obligations. The current ratio remained above 1 for the most part, indicating sufficient current assets to cover short-term liabilities, although there were slight variations over the years. Additionally, the company's efficiency in utilizing capital, as reflected in the return on capital employed (ROCE), improved gradually over the years, albeit with fluctuations. The workforce size also showed variations, with the number of employees ranging from 37,800 to 102,000 over the five years, potentially indicating changes in operational scale or efficiency measures implemented by the company. Overall, the financial performance of the company demonstrates resilience in navigating challenges and adapting to changing market conditions, albeit with fluctuations in revenue and profitability (Orbis, 2024).

DHL Supply Chain

DHL Supply Chain is a division of DHL, a global logistics company. DHL Supply Chain offers a range of logistics services, including 4PL services, to help clients manage their supply chain operations more effectively. DHL Supply Chain's 4PL services include supply chain design, optimization, and management, as well as transportation and warehouse management. The company leverages advanced analytics and technology solutions to provide clients with real-time visibility into their supply chain operations (DHL Supply Chain, 2023).

DHL Supply Chain Logistics Financial Statement Analysis

The financial performance of the company over the past five years demonstrates fluctuations in operating revenue and profitability. Operating revenue showed a general downward trend, reaching its lowest point in 2020 at 3,435,184 thousand USD, before experiencing a slight recovery in 2021 and 2022. Similarly, profitability indicators varied over the years, with the company reporting losses in 2020, reflected in negative profit margins and net income figures. However, there was a notable improvement in profitability in 2021 and 2022, with positive profit margins and net income figures, although they remained relatively modest compared to previous years (Orbis, 2024).

Despite the fluctuations in revenue and profitability, the company maintained relatively stable financial positions, as evidenced by the current ratio and solvency ratios. The current ratio remained above 1, indicating that the company's current assets were sufficient to cover its short-term liabilities. Additionally, the solvency ratio remained relatively consistent over the years, suggesting the company's ability to meet its long-term financial obligations. However, it's important to note that without data on the number of employees, it's challenging to assess the company's operational efficiency and workforce management strategies. Overall, the company's financial performance reflects a mix of revenue volatility, varying levels of profitability, and efforts to maintain financial stability amidst changing market conditions (Orbis, 2024).

2.4. Customer Value

Customer Value has become a trendy concept in today's business. It refers to a new method of measuring customers' perceptions of companies' offerings, building differentiation, understanding different organisational forms and emerging retail phenomena. In the service sector, the focus has been on quality or value dimensions. Linking quality perceptions to the customer value perspective can provide deeper insights for designing and managing service experiences that lead to desirable behavioural intentions known as customer loyalty as well (Yrjölä *et al.*, 2019).

As defined in the Harvard Business Review Article *Business Marketing: Understand what customers value* (2022), "Value in business markets is the worth in monetary terms of the technical, economic, service, and social benefits a customer company receives in exchange for the price it pays for a market offering."

Fontanella (2022) explains customer value as "a product or service's worth and compares it to its possible alternatives. This determines whether the customer feels like they received enough value for the price they paid for the product/service." It means that the customer evaluates if the benefits gained from a purchase would surpass the costs and the amount of effort the customer spends on the purchase (Fontanella, 2022).

2.5. Customer Value Measurements

This Value-based strategy has gained significant attention among businesses as there has been an emphasis that companies who are trying actively to generate more value for their customers have performed better in terms of customer retention and generally being successful. However, it's vital to understand the meaning value and how it could be measured to be able to plan upon it (Salem Khalifa, 2004).

The text explains that perceived customer value is the difference between the perceived benefits and perceived costs of a customer. The concept of benefits and costs is based on the customer's perceptions of different activities such as

acquisition, consumption, and maintenance, as well as their expectations of personal value satisfaction before buying (Salem Khalifa, 2004).

As Sweeney et al., 2015 explain customer perceived costs as customer effort which refers to the various resources such as physical, mental and financial that the customer invests to purchase a product (Sweeney et al., 2015). Lyly-Yrjänäinen et al. (2010) also mention that customer costs are not limited to only the purchasing phase but using and disposing of a product or service will cost customers as well.

Salem Khalifa (2004) mentioned that customer value could be measured by deducting costs incurred by the customer when acquiring a product or service from benefits received. The benefits refer to how the product or service improves the customer's performance or experience in various ways such as economically, financially or physiologically Lyly-Yrjänäinen et al. (2010). The costs include both monetary and non-monetary factors such as time spent on delays, errors, and effort (Salem Khalifa, 2004).

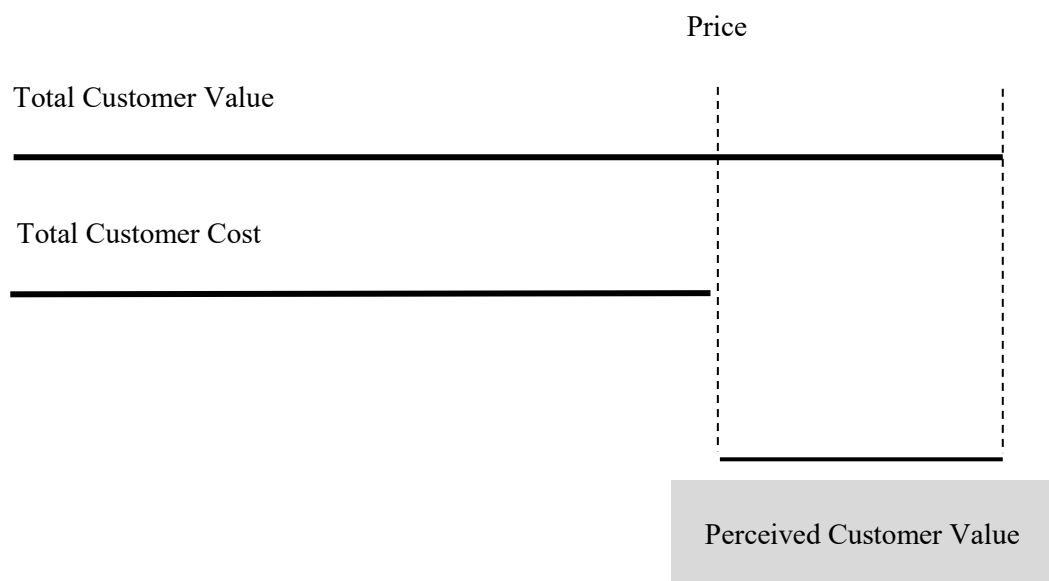


Figure 2 Total customer value and customer perceived value (Lyly-Yrjänäinen et al., 2018)

As shown in the above picture, the price of a product or service could be somewhere between total customer value and supplier costs. The price must be

placed correctly if it is significantly close to the supplier costs, then there is little incentive for the supplier to sell their product or service. On the other hand, if there would be rather close to total customer value, then there would not be enough incentives for the customer to make the purchase (Lyly-Yrjänäinen et al., 2018).

3. Methodology

This paper follows an empirical study approach where the thesis subject will be thoroughly observed and analysed through a literature review and interviews that will be conducted with various stakeholders involved to verify new facts and make conclusions accordingly (Meaning of empirical research (methods, types, and examples), 2022). Accordingly, the first step started with a preliminary interview with the company's CEO to better comprehend the subject company's business line, services they offer, their goals and their limitations.

The second step started with collecting and observing the subject company's documentation, tools, partners, and customers. Besides, their services, development process data was gathered from their databases such as marketing material, brochures, and websites. This was done to increase understanding, access organisational memory, and support detailed analysis.

The third step was conducting interviews with the current and potential customers, suppliers and the company's CEO and supply manager to better comprehend the requirements and expectations of different stakeholders.

Finally, an analysis of collected data was conducted to understand and evaluate if the company's services would affect customer value and if further studies and adjustments are needed to enhance the current service provided.

3.1 Methodological Choices

Empirical studies could be executed using two main methods categorised as qualitative and quantitative. The major difference between these two research methodologies is how research questions are approached.

3.2. Qualitative Methodology

The qualitative method focuses on gathering experimental data more than measurements and numerical data. It can be described as a research method

that includes various substances such as text, voice, methods, and topics (Mills, 2014).

In qualitative methodology, researchers learn and know more about a subject from an individual perspective. Therefore, the truth is not set and the focus of qualitative research is on giving individuals to express their opinions, feelings and knowledge about a subject. Vishnevsky & Beanlands (2004) beautifully states that

“Qualitative research follows a naturalistic paradigm based on the notion that reality is not predetermined, but constructed by research participants”

In a qualitative approach, a phenomenon is explored and evaluated by learning about different people's opinions and experiences regarding that specific matter regardless of making assumptions, and biases and setting the truth (Vishnevsky & Beanlands, 2004).

3.3. Quantitative Methodology

Quantitative research is a type of research method that focuses on collecting and analysing numerical data using statistical, mathematical, or computational techniques. The data is typically collected through polls, questionnaires, surveys, or pre-existing statistical data, and the aim is to generalise the findings across groups of people or to explain a particular phenomenon. The emphasis is on objective measurements and the use of numerical analysis to conclude (Research guides: Organising your Social Sciences Research Paper: Purpose of Guide, 2023).

This passage explains the two main types of quantitative research designs: descriptive and experimental. Descriptive studies measure subjects only once and establish associations between variables, while experimental studies measure subjects before and after treatment and establish causality. Quantitative research is characterised by its use of numbers, logic, and an objective approach, focusing on numeric and unchanging data and detailed, convergent reasoning rather than divergent reasoning (Research guides: Organising your Social Sciences Research Paper: Purpose of Guide, 2023).

3.4. Data Collection

In the pursuit of comprehensive insights into the subject company, the chosen research methodology for this thesis is a qualitative approach. Qualitative methods have been adopted to gather a wide range of information that extends beyond numerical data, allowing for a more in-depth exploration of the company's goals and road plan.

Through techniques such as interviews, focus groups, and content analysis, the qualitative methodology facilitates the collection of rich and contextually relevant data. The qualitative method provides a platform for capturing diverse perspectives, exploring underlying motivations, and clarifying the complex interplay of factors that shape the company's dynamics, goals, and approaches. This methodological choice enhances the depth of information gathered, contributing to a more comprehensive analysis, and offering valuable insights that extend beyond the surface-level quantitative indicators.

Interviews are one of the common ways of gathering information and drawing more detailed conclusions accordingly. Interviews could be conducted differently according to the type of questions used. Interviews could be categorised into three different types structured, semi-structured and unstructured interviews (Types of interviews in research ~ A simple guide & examples, 2023).

Structured interviews consist of close-ended questions where the answers are simply either "yes" or "no" or there are multiple choice questions. In structured interviews, interviewees are asked a specific set of questions in the same order (Stuckey, 2013).

In the semi-structured interviews, the interviewer or researcher sets the general outline but the direction of the interview could be chosen according to the interviewee's answers to a set of open-ended questions (Stuckey, 2013).

Narrative or unstructured interviews are conducted through a set of wide open-ended questions in a way that the interview is not directed but the interviewee could express their opinion and experience without the least amount of disruption. Usually, it is complicated to analyse the data gathered from unstructured interviews compared to the other two methods (Stuckey, 2013).

The chosen methodology for the present thesis project involves the utilisation of semi-structured interviews. Before the interviews, the interviewer formulated a set

of questions to establish a comprehensive agenda for the discussions. Nevertheless, during the interviews, a deliberate effort is made to maintain an open stance, enabling participants to freely express their opinions. This approach tries to balance the benefits of a predefined structure with the necessity of allowing interviewees to articulate their viewpoints without needless constraints.

3.5. Validity and Reliability of Methodology

In assessing the trustworthiness of this study and its methodologies, the researcher turned to the evaluation criteria proposed by Lincoln and Guba (1985), which highlight credibility, transferability, dependability, and conformability as key considerations. Credibility was addressed through the researcher's deep immersion in the research topics and subjects, ensuring that all collected data, rather than selective portions, were accounted for in the reported categories (Elo & Kyngäs, 2008). This thorough involvement lent robustness to the credibility of the study. Although full transferability was not claimed due to the contextual and business-specific nature of individual subjects, efforts were made to augment transferability by furnishing detailed descriptions of each aspect and stage of the study (Elo & Kyngäs, 2008).

To ensure dependability and conformability, measures were taken to uphold rigor and impartiality. Lincoln and Guba (1985) underscored the importance of external peer review, which was incorporated into the study through systematic engagement with the author's peers. This external review process, conducted methodically to safeguard participant anonymity and confidentiality, bolstered the stability and consistency of the data over time (Elo & Kyngäs, 2008). Dependability, integral to the evaluation, refers to the data's consistency and stability over time, a criterion upheld through meticulous review and validation processes.

Proactive steps were taken to enhance the validity of data collection. Interviewees were furnished with interview themes beforehand, enabling them to prepare and gather pertinent information in advance. Sampling errors were mitigated by constructing a manageable target population that effectively represented the broader population. Diversification of interviewee sampling across various

industries and roles further attenuated potential biases, thereby enhancing the study's external validity to the best extent possible (Elo & Kyngäs, 2008).

Thematic analysis, while valuable, presents challenges due to its inherent subjectivity, impacting both validity and reliability. To mitigate these challenges, the research process, from literature review to the final analysis stages, was meticulously documented to promote transparency and facilitate potential replication in diverse contexts, thereby reinforcing the study's transferability (Elo & Kyngäs, 2008).

3.6. Participants

For this thesis project, four interviews were conducted, encompassing individuals with backgrounds in business development, logistics, supply chain, and management.

To ensure a comprehensive understanding of the thesis subject, interviewees were selected from two distinct categories: young companies with a start-up culture, characterised by ongoing research to optimise procedures swiftly across various sectors, and older, well-established companies that have structured processes in place.

The three companies that were part of this thesis project data collection, which shall be named as companies A, B and C, have different supply chains structured in place.

3.6.1. Company A

Two Company A, established in 2016, has emerged as Europe's premier online platform for buying and selling refurbished smartphones, boasting approximately 800 employees, and generating €208 million in annual revenue. A key aspect of Company A's operations involves handling production processes and daily operations in-house. The organisational infrastructure extends across two distinct production sites situated in Eastern and Central Europe.

Company A has become a significant player in the industry, holding a leading position and expanding beyond geographical boundaries. The company's sphere of influence extends beyond the borders of Finland, serving diverse customer segments throughout the European region. Company A has delegated the

logistical segment of its supply chain, establishing collaborations with reputable courier services for the expeditious delivery of customer orders.

Financial Statement Analysis

In 2022, the company experienced a slight increase in operating revenue compared to the previous year, reaching \$221,847,170. However, the profitability indicators showed a decline with a negative profit margin of -18.98%, indicating that for every dollar of revenue, the company incurred approximately 19 cents in losses. The P/L before tax worsened significantly from -30,269,432 USD in 2021 to -42,116,238 USD in 2022. This decline led to a substantial decrease in the return on equity (ROE) and return on capital employed (ROCE) ratios, indicating inefficiency in generating profits relative to shareholders' equity and total capital employed, respectively. Furthermore, the solvency ratio based on assets dropped from 65.44% in 2021 to 40.88% in 2022, suggesting a weakened ability to meet long-term financial obligations (Orbis, 2024).

Additionally, the company experienced a reduction in total assets from 120,149,558 USD to 77,552,378 USD and a considerable decrease in shareholders' funds from 78,619,408 USD to 31,702,560 USD. Despite the decrease in assets, the current ratio improved from 3.24 to 1.59, indicating a more conservative approach to managing short-term liquidity compared to the previous year. The increase in the number of employees from 726 to 1,266 suggests potential expansion efforts or changes in operational strategies, which might have contributed to the financial performance shifts observed during the year. Overall, the company faces challenges in improving profitability and maintaining financial stability amidst changing market conditions and internal dynamics (Orbis, 2024).

3.6.2. Company B

Company B founded in 2018 and headquartered in Berlin, is a leading provider of shared micro-mobility solutions globally. Offering a range of light electric vehicles, including e-scooters and e-bikes. Company B operates in over 260 cities across 22 countries in Europe and the Middle East. Besides, it became climate neutral in 2020, emphasizing its commitment to providing environmentally friendly mobility options for urban communities.

The company's supply chain integrates both in-house and outsourced activities. Collaborating with overseas production partners for both end products and required spare parts, Company B has witnessed strategic shifts in recent years, progressively outsourcing certain day-to-day operations. Consequently, in various locations, these activities are either fully or partially managed by third-party entities.

Financial Statement Analysis

In 2020, the company exhibited substantial growth in operating revenue, which increased to 72,803 thousand USD compared to 40,271 thousand USD in 2019. This significant revenue expansion was accompanied by a corresponding rise in total assets, which surged from 75,813 thousand USD in 2019 to 302,430 thousand USD in 2020, indicating substantial investment or acquisition activities. Shareholders' funds also experienced a notable increase from 50,968 thousand USD to 211,752 thousand USD, indicating enhanced equity position and potentially improved financial stability. The current ratio improved from 4.58 to 8.03, suggesting stronger short-term liquidity and improved ability to meet immediate obligations (Orbis, 2024).

Despite the positive revenue and balance sheet indicators, the company reported losses in both years, with P/L before tax amounting to -97,729 thousand USD in 2020 and -64,643 thousand USD in 2019. This resulted in negative ROE and ROCE figures, reflecting the company's challenges in generating profits relative to shareholders' equity and total capital employed, respectively. The solvency ratio remained relatively stable, indicating a high level of asset coverage for the company's financial obligations. The increase in the number of employees from 285 to 452 suggests potential expansion efforts, which might have contributed to the company's revenue growth but also highlights the need for improved profitability to sustain such expansion. Overall, while the company demonstrated strong revenue growth and balance sheet expansion, it faces the challenge of translating this growth into profitability to ensure long-term sustainability (Orbis, 2024).

3.6.3. Company C

In contrast to Companies A and B, Company C, founded in 1968, has built a reputation in vehicle manufacturing for renowned OEMs, producing over 1.8 million vehicles for brands like Mercedes-Benz, Saab, and Porsche. Since 2010, Company C has also been focused on electric mobility, operating a battery factory in Finland, and producing 48-volt batteries and high-voltage battery systems for electric vehicles. Additionally, the company leads in electric mobility through its ACTUATING business line, specializing in complex electric drives for convertible roof systems, active spoilers, and loading flaps.

Financial Statement Analysis

Over the past five years, the company's operating revenue fluctuated, reaching its peak in 2018 at 770,851,028 USD and then experiencing a decline in subsequent years, with a significant drop to 627,630,614 USD in 2020. However, there was a slight recovery in 2021 and 2022, with revenues of 705,310,985 USD and 721,816,937 USD, respectively. Despite these revenue fluctuations, the company exhibited varying levels of profitability. While it reported losses in 2020, with a net income of -19,564,871 USD, it managed to achieve positive net income in the other years, with the highest recorded in 2021 at 22,988,388 USD. The profitability margins also showed fluctuations, with the highest profit margin of 4.41% in 2021 and the lowest of 1.54% in 2018 (Orbis, 2024).

The company's financial stability, as reflected in its solvency ratio, showed improvement over the years, albeit with fluctuations. The solvency ratio, which measures the ability to meet long-term obligations, was at its lowest in 2020 at 0.35%, indicating significant financial strain, but improved to 5.37% in 2022. However, the current ratio, which assesses short-term liquidity, exhibited a declining trend over the years, indicating potential challenges in meeting immediate financial obligations. Despite fluctuations in financial performance, the company has maintained a relatively stable workforce size, with the number of employees ranging from 3,617 to 4,792 over the five years. Overall, the company's financial performance reflects a mix of revenue volatility, varying levels of profitability, and efforts to maintain financial stability amidst changing market conditions (Orbis, 2024).

4. Supplier of 4PL Services

Hiava is the subject company with which this thesis has been performed. Hiava helps companies build and structure their production/supply chain process by providing tools and advice during the creation phase. They offer customised multidisciplinary approaches to each case and aim to provide companies with the best assets for their project's success. The company provides customised solutions according to their customers' limitations, needs, and goals, across various sectors and industries like Retail, Manufacturing, Logistics, and Aviation. Therefore, solutions are unique and tailor-made according to each customer's purpose.

Hiava offers services in various fields such as import, transit and export. Their services are not limited to the mentioned ones. They also provide customised services according to the international customers' needs in Finland such as customer representation, operation management, custom clearance, and market analysis.

4.1. Characteristics

Certainly, categorizing Hiava's services into four main fields could provide clarity and structure for their offerings. Here's a breakdown:

4.1.1. Process Optimization

Consultancy services represent a cornerstone of Hiava's comprehensive offerings. Tailored to meet the diverse needs of their clientele, Hiava's consultancy arm plays a pivotal role in driving operational excellence. Upon understanding the unique requirements of each customer, Hiava undertakes a meticulous review of their existing processes. This thorough examination allows Hiava to identify areas for enhancement and innovation. Drawing upon their wealth of expertise and industry insights, Hiava then provides targeted suggestions aimed at optimizing current processes while also presenting viable alternatives for consideration. Whether it's streamlining workflows, enhancing efficiency, or exploring novel approaches, Hiava's consultancy services are

designed to empower their clients with the knowledge and strategies needed to thrive in dynamic market landscapes. By fostering a culture of continuous improvement and strategic foresight, Hiava equips its customers with the tools necessary to stay ahead of the curve and achieve sustained success.

4.1.2. Building Operation Structure

Comparisons Hiava takes pride in leveraging its expertise to collaborate closely with customers in actualizing its operational visions. With a keen focus on understanding both short-term objectives and long-term aspirations, Hiava's dedicated team conducts thorough analyses to craft tailored supply chain solutions. This meticulous approach considers not only the immediate requirements but also the broader strategic goals of the customer. By considering the available resources and limitations unique to each customer, Hiava ensures that the proposed processes are not only aligned with the client's vision but also optimized for minimal risk and maximum cost-effectiveness. Through this collaborative effort, Hiava empowers its clients to navigate the complexities of operations management with confidence, driving efficiency, and fostering sustainable growth in their endeavours.

4.1.3. Methods Analysis

In addition to its extensive support framework, Hiava extends another crucial line of services by meticulously analysing and evaluating its customers' current processes. This comprehensive approach allows Hiava to pinpoint existing defects and bottlenecks within their clients' operations, providing invaluable insights to illuminate areas for improvement. Through thorough examination and analysis, Hiava offers not just a diagnosis of these issues but also practical solutions and clarifications, empowering their clients to overcome obstacles and optimize their processes effectively. By addressing underlying challenges head-on, Hiava ensures that its customers are equipped with the knowledge and tools necessary to drive sustainable growth and success in their respective fields.

4.2. Productivity Enhancement

Hiava goes above and beyond merely supporting their customers; they actively engage in comprehensive assistance, delving into the complexity of their client's operations to facilitate not just operational stability but also enhanced productivity and process advancement. By thoroughly understanding their customers' needs and objectives, Hiava collaborates closely with them to implement tailored strategies aimed at maximizing efficiency and achieving desired outcomes. Whether it's streamlining workflows, optimizing resource allocation, or introducing innovative solutions, Hiava is committed to empowering its clients to excel in their endeavours. Through ongoing guidance and support, they enable organizations to navigate challenges effectively and unlock new levels of success.

4.3. The denotation of Tools in Use

AinaK Leap

The text describes the development of AinaK's patent-pending technology, which includes an Augmented Reality (AR) layout planner that can be used for any product and any quantity. The technology is designed to be intuitive and easy to use, while also providing users with intelligent features. AinaK's technology is compatible with both Android and iOS devices, as well as various CAD formats. AinaK leaPP application could be used in sales pitches and specifically as a method of value proposition to the customers. Their application provides the opportunity to visualise various products in different settings in a 3D environment instead of using pictures or maps.

In Hiava's case, the AinaK leaPP application could be adapted to provide customers with a clear vision of possible warehouse and distribution centre settings as part of a supply chain solution. As all Hiava's solutions are customised according to the customer's needs and goals, they will be involved in the planning phase the AinaK leaPP application allows them to imagine and visualise the proposed suggestions and match them to their expectations.

Nadii

Nadii is an AI-based system that could be used to observe, evaluate and optimise financial and customer processes in all stages of a supply chain through a data-driven and automated procedure (<https://nadii.io/>, 2022).

Nadii functions the best in assisting to make detailed and micro decisions in various matters such as ordering and replenishment, logistics costs optimization, demand forecasting, product management, lead time forecasting and analysing data. Staff engagement is only needed for setting targets and goals and Nadii will provide relevant adjustments required to be done accordingly (<https://nadii.io/>, 2022).

YOURedi

YOURedi is another tool that Hiava has adopted in managing supply chain processes. It is a cloud-based integration platform that integrates data between various data sources regardless of their interfaces, the data type they use, and their locations whether they are cloud-based or on-premises (Inc., Youredi technology: Reliable and Versatile Integration ipaas 2023).

YOURedi connects various organisations all across the globe and makes it possible for companies specialising in supply chain solutions to be connected constantly with other logistics and shipping companies for more adequate data and product flow. YOURedi requires the least amount of human intervention as it is run as a managed service. Therefore, as long as companies make sure they have the most updated data in the data system, data runs automatically among organisations (Inc., Youredi technology: Reliable and Versatile Integration ipaas 2023).

Advanced Tracking System

Innovating beyond conventional tracking systems, Hiava is pioneering the development of an advanced real-time tracking system that revolutionizes the logistics industry. In an interview with Hiava's CEO, it was revealed that the company is actively engaged in creating a tracking solution that goes beyond

mere location updates. Unlike existing tracking systems provided by logistics providers, Hiava's focus is on delivering unparalleled transparency and control to customers throughout the shipment journey.

This cutting-edge tracking system promises to keep customers informed at every step of the process, providing real-time updates on the status and whereabouts of their shipments. What sets Hiava's solution apart is its ability to offer dynamic insights and proactive alerts. For instance, in the event of an accident or crisis along the shipment route, customers will not only be promptly notified but also empowered with options. They will have the flexibility to make informed decisions, such as opting for an alternative means of transport if they require expedited delivery.

By providing customers with visibility into the entire shipment process, Hiava aims to enhance trust, reliability, and satisfaction. With access to comprehensive information and the ability to take proactive measures, customers can better manage their logistics operations and respond swiftly to unforeseen circumstances. Hiava's real-time tracking system represents a significant leap forward in the quest for greater efficiency, agility, and customer-centricity in the logistics industry.

4.4. The Objective of the Case Company

Vision As mentioned in the previous sections, Hiava specialises in offering customised supply chains solutions such as process design and enhancement, project management and resource coordination according to their customers' requirements, needs and goals. Hiavas' focus is on providing solutions that are cost-effective, and sustainable that could result in high-quality results.

The company's CEO has been working in the logistics sector for more than 10 years so he successfully has been able to establish a network of various partners including logistics operators, custom clearance agencies and business owners who work both in B2B and B2C sales.

One of Hiava's ongoing projects is to advance their 4PL services that would operate both locally and on an international level. Hiava has been working on designing a well-established 4PL service as their next service line that could

assist businesses with their supply chain and logistics processes both in Finland and internationally.

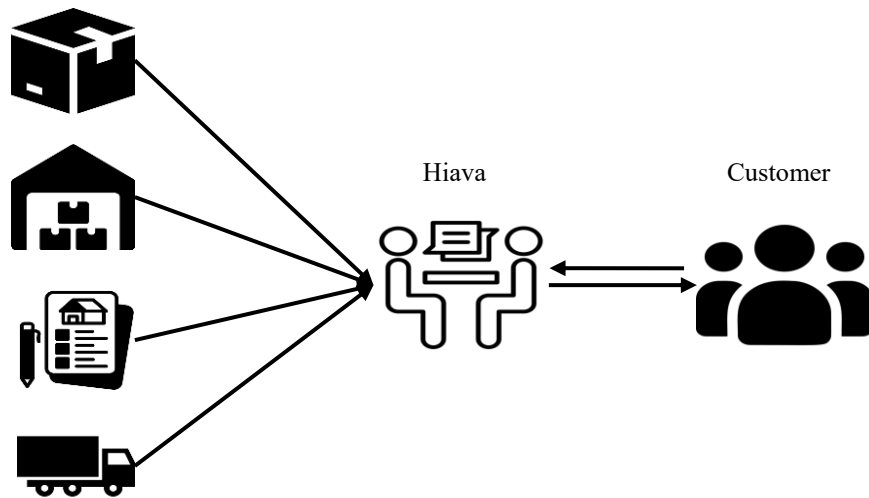


Figure 3 Hiava as a 4PL provider (<https://www.flaticon.com/>, 2023)

As it is shown in the figure above, Hiava, as a 4PL service provider, does not possess any logistics assets, however, they will provide their customers consultancy services to create the most compatible supply chain procedure according to their goals and limitations. Hiava's service areas include transportation, transportation, warehousing, custom clearance, inventory management and freight forwarding. In addition, according to Hiava's customised solution strategy, customer involvement during whole processes is a crucial matter for the company. They consider customer's feedback and requests into account to provide the most desirable solution.

4.5. Obstacles and Challenges

Tables Hiava is the connection between the customer and logistics operators. Therefore, Hiava has all the resources needed to design a supply chain network according to customer's requirements and goals.

Businesses have multiple choices when it comes to selecting their supply chain processes. Some have all the facilities and assets such as freight forwarding, warehousing, packaging, and documentation to carry out the whole operation

themselves. On the other hand, some companies outsource either part of the process or complete operations according to their needs and constraints. So, in other words, entities from different countries engage in various forms of international cooperation, integration, subcontracting, and outsourcing to achieve a competitive advantage, reduce costs, and increase economic efficiency (Bilan *et al.*, 2017).

Hiava's main challenges could be summarised in two categories:

Data Collection and Management

Technological enhancement and countries becoming more liberalised in economic aspects have had an extensive impact on changing production to be more globalised. In addition, the internet and its advancement have accelerated the speed of global commerce and at the same time decreased the supply chain cost (Milberg & Winkler, 2013). Accordingly, data and its real-time transactions play a vital role in analysing the supply chain processes and accomplishing the tasks as there are operators all around the globe and their main source of contact is their databases (Mehmood *et al.*, 2019).

Hiava as the 4PL provider and the channel between customers and suppliers would make sure that the data flows smoothly between stakeholders. Accordingly, Hiava has adopted various tools that assist them in fulfilling this goal. Nadii is an AI-based application that could be employed to mainly optimise and manage financial processes. It requires input and then according to the goals set, it would propose multiple solutions in various matters such as lead time forecasting, resource management and logistics cost optimization. Thus, it requires both suppliers and customers to provide the most updated version of the info required.

Customer's Education

As per the CEO of the respective company, a significant challenge lies in raising awareness among customers regarding the brand image and educating them on the potential benefits of the company's services, tools, and expertise. Moreover,

the CEO notes the difficulty in identifying the appropriate initial contact person to initiate the first conversation which hopefully leads to further steps.

Furthermore, the CEO addresses the company's reluctance and resistance to collaborate with an external team for a specific period to enhance existing procedures. This reluctance may be derived from either a shortage of resources or a disinclination to modify established habits and processes.

4.6. A Review of the Potential Customers' Profiles

The stakeholders involved in Hiava's operations include subcontractors, partners in software development, other consultants, and service providers, all of which can be combined based on customers' needs. Hiava acts as a subcontractor for its stakeholders and customers, leveraging its own team and service providers as integrator partners. They provide senior advisory and consultancy services in software development and collaborate with transportation companies for logistics solutions. Customers are considered the main stakeholders in Hiava's operations. According to Hiava's CEO, the company serves a wide range of industries, including manufacturing, warehousing, and logistics, and they emphasise that the size of the company is not a determining factor for collaboration. They are committed to developing processes, investing in operations, and allowing external partners to support them. However, industries such as industrial companies and logistics companies may pose challenges due to cultural barriers and resistance to change.

Small companies typically have basic production and ERP systems but lack resources and expertise for daily operations and future developments. Hiava aims to support them by improving their software and providing the necessary resources. Mid-sized companies often engage in short-term projects focused on specific areas where Hiava's tools and licences can offer high value at a low cost. Large companies seek validation for strategic decisions and may engage in larger projects involving multiple partners, where Hiava's services can contribute as one part of the project.

5. Results

There are various ways of analysing qualitative data according to the paper's subject and goals. In the project, the Thematic Analysis approach has been adapted as this method aims to uncover interpretations, offering a systematic approach to data analysis. This method enables researchers to link the frequency of identified themes to the entirety of the content, ensuring accuracy and complexity, thereby enriching the overall significance of the research. (Alhojailan & Ibrahim, 2012)

Given that qualitative research and especially semi-structured interview demands diverse aspects and data, Thematic Analysis serves as a valuable tool by providing an opportunity to gain a broader understanding of potential issues. (Alhojailan & Ibrahim, 2012)

5.1. Impacts of Proposed 4PL Services on the Customer Value

In this section, the author examines a comprehensive analysis of the data acquired through interviews, specifically focusing on understanding the impact of 4PL (Fourth Party Logistics) services on customer value. Additionally, the exploration aims to enlighten the diverse ways in which these services could potentially bring about advantages for the companies in question.

According to Erlingsson and Brysiewicz (2017), qualitative content analysis involves systematically transforming transcribed interview texts into a concise summary of key results. This process begins with reading and re-reading interviews to understand participants' discussions, followed by dividing the text into meaning units and condensing them while retaining their core meanings. Next, codes are formulated to label condensed meaning units, which are then grouped into categories. Depending on the study's aim and data quality, categories may serve as the highest level of abstraction for reporting results, or further abstraction into themes may be pursued. The objective is to progress from analysing manifest and literal content to uncovering latent meanings, facilitating a deeper understanding of the data (Erlingsson and Brysiewicz, 2017).

Each sub-section includes a table illustrating the correlation between the data obtained from the interviews and the corresponding themes derived from it which will be further elaborated. Despite the variations among the industries represented by the potential customers of the case company and the consequential differences in their respective supply chain structures, the examination reveals both commonalities and distinctions in their perspectives regarding the adoption of 4PL services. These noteworthy observations are systematically expressed in the subsequent discussion, providing an understanding of the landscape surrounding the integration of 4PL services across diverse industry domains.

5.1.1. Adapting Workforce Strategies to Seasonal Variations

The table below captures insightful quotes from industry professionals discussing workforce management in seasonal businesses highlighting the importance of adaptability in labour strategies.

Table 1 Adapting Workforce Strategies to Seasonal Variations

Example direct quotes from the interview	Key Words	Categories	Theme
"you don't have to control the workforce, they if it's a low season, it's their problem, not our problem. If it's a high season, they will prepare for it." (Company A)	Control, Workforce, Low Season	Labor Management, Seasonality	Adapting Workforce Strategies to Seasonal Variations
"Very clear benefit is at least this is a very seasonal business. The labor needs are changing a lot throughout the year in during different seasons. If we were not really responsible on getting the labor force ourselves, then that obviously we can get rid of that whole cost item." (Company B)	Benefit, Seasonal, Labor	Labor Demand, Cost Efficiency, Seasonality	

All three companies subjected to interviews incorporate a blend of in-house and outsourced activities within their respective supply chains. During discussions with Company A and Company B, a notable aspect highlighted was the recurrent challenge of "Seasonality" in their operations, leading to difficulties in accurate forecasting and effective resource management.

Both Company A and B expressed the view that externalising certain aspects of their operations – production for Company A and daily operations for Company B – could soothe the complexities associated with resource planning, particularly in terms of workforce management. Besides, other responsibilities such as recruitment which is part of Human Resource duties and inventory management which could be categorised under logistics activities could be outsourced alongside other activities.

5.1.2. Enhancing Supply Chain Visibility and Control

Below is a table featuring quotes from industry professionals expressing their desire for increased control and visibility in supply chain management and highlighting the importance of enhancing visibility and control in supply chain operations.

Table 2 Enhancing Supply Chain Visibility and Control

Example direct quotes from the interview	Key Words	Categories	Theme
"For I don't know... maybe for my personal, like, calmness, and... you know, to be able to say that, like, yes, for sure these things will arrive on Tuesday, I would love to have a little bit more control over how stock moves on the way to us." (Company C)	Control, Stock, Visibility	Supply Chain Management, Control, Visibility	Enhancing Supply Chain Visibility and Control
"I would honestly prefer more visibility and more control over how goods are moving to us, not just from Asian suppliers, but also European ones." (Company C)	Visibility, Control	Supply Chain Transparency, Global Sourcing, Control	
"Maybe I'll have more visibility over the stock in the warehouses... right now we're dependent on external warehouses that are not necessarily involved in our success, impacting our production and material planning." (Company C)	Visibility, Stock, Dependency	Inventory Management, Dependency, Outsourcing	

As mentioned in the table above, another advantageous aspect of integrating a 4PL service entity lies in streamlining and optimising supply chain processes, thereby facilitating a seamless flow of both data and materials. This is achieved by entrusting tasks to experts in the field.

A 4PL entity, possessing extensive contacts with logistics partners, is well-positioned to provide a diverse array of solutions and tools for freight forwarding, inventory management, parcel tracking, and other administrative tasks. This multifaceted capability not only ensures efficiency but also enhances the adaptability of operations.

Furthermore, the flexibility afforded by a 4PL service is underscored by the ability to selectively choose partners that align most favourably with the customers' needs. Some interviews revealed a recurring challenge wherein companies, constrained by limited options, often settled for familiar choices rather than necessarily the most suitable ones. The lack of a comprehensive array of options constrains decision-making, impacting priorities that may differ based on company size, business field, and overarching goals.

Additionally, interviews underscored the potential for enhanced visibility across the entire supply chain with the adoption of 4PL services. As expressed in one interview:

“it would be great to have some kind of helicopter view and a bit of ownership of all of those processes so that we don’t just take whatever is given to us, but take a more proactive role in finding better and more suitable options for us.”

This proactive stance enables companies to move beyond merely accepting available options and actively seek more beneficial alternatives.

Another highlighted benefit in the interviews was the concept of a "single contact point." This contrasts with the challenges posed by collaborating with diverse stakeholders. A centralised point of contact streamlines communication, fostering efficiency and coherence in supply chain management.

5.1.3. Quality Management in Outsourcing and Partnerships

The table below presents excerpts from interviews that underscore the critical importance of quality across various aspects of business operations, including outsourcing, service provision, production decisions, logistics partnerships, and inventory management.

Table 3 Quality Management in Outsourcing and Partnerships

Example direct quotes from the interview	Key Words	Categories	Theme
"So all of these add-on services it can make it difficult to outsource to another company to fully take care of especially since we want to keep control on the quality as well as quality aspect of it." (Company A)	Outsource, add-on services, quality	Quality control in outsourcing	Quality Management in Outsourcing and Partnerships
"I personally I feel that if you want to have a maximum or as good level of service as possible, or quality of service as possible. You have to be very close to the to the people who actually take care of the vehicles or keep the service running." (Company B)	Service, quality, close	Importance of proximity in service quality	
"So if we outsource production, then there is a great danger that the brand image will be damaged because of the decline in quality, for instance." (Company C)	Outsource, production, brand image	Impact of outsourcing on brand image	
"We were afraid that if we cooperate with a 3PL, maybe they don't really care about the quality that we can actually compromise our position in Germany for the future as well." (Company A)	3PL, quality, compromise	Importance of quality in third-party partnerships	
"What else did I have? Maybe? Maybe, maybe I'll have more visibility over the stock in the warehouses... because right now we're, we're dependent on external warehouses that are not necessarily like, you know, involved in our success or, you know, mentally they know devoted to us feeding and having the most accurate data. And then, of course, impacts our production planning, and material planning also, like how much of what we have in our, in our stocks." (Company C)	Visibility, stock, warehouses	Importance of visibility in inventory mana	

As shown in the table above, each of the companies interviewed highlighted the inherent risk associated with outsourcing supply chain processes, whether partially or entirely, due to the potential discrepancy in meeting their established quality standards.

For instance, in the case of Company A, which manufactures a primary category of products alongside offering supplementary add-on products and services, ensuring the accurate implementation of these additional services is crucial. This is particularly applicable as customers are levied additional charges for each of these services. Consequently, the delivery of a superior customer experience articulates upon the exact execution of these services.

In the case of Company C, a primary concern regarding quality assurance revolves around safeguarding the brand image. Consequently, any potential decline in the quality of services and products delivered poses a significant risk to the company's reputation.

5.1.4.Challenges in the Third Party's Integration Process

The table below shows insights into the complexities and nuances of organizational dynamics, particularly within the realm integration process of different parties in the supply chain.

Table 4 Challenges in the third party's integration process

Example direct quotes from the interview	Key Words	Categories	Theme
<p>“we're working with three different customers and a whole tonne of different suppliers, and we produce at least three different products to them. So, in a sense for, you know, an external consultant to come and make sense out of it for the first, however long it would take them is going to be quite a challenge. Not that I undermine people's ability to learn, but it will take a while to understand the various specifications and why things are done a certain way at the company.” (Company C)</p>	<p>customers, suppliers, products, consultant, challenge, specifications</p>	<p>Complexity in supply chain management</p>	<p>Challenges in the third party's integration process</p>

Another salient point raised in one of the interviews pertains to the obstacles and complexities surrounding the education and training of third-party entities. For Company C, in particular, to be able to comprehend its product offerings, one must have a thorough understanding of the intricate processes involved. This complexity is further compounded by the intricate web of relationships with various stakeholders, each with its unique set of requirements and expectations. Consequently, the task of familiarising external parties with the intricacies of the company's operations presents a formidable challenge.

5.1.5. Confidentiality Management

The following table provides excerpts from interviews highlighting the significance of confidentiality within various operational processes, shedding light on how businesses address data security concerns in outbound processes and maintain sensitivity towards confidential information, such as names, in quality management procedures.

Table 5 Confidentiality Management

Example direct quotes from the interview	Key Words	Categories	Theme
"When it comes to confidentiality, if I'm thinking about the outbound process itself, there is nothing really special about it." (Company A)	confidentiality, outbound process, special	Data Security	Confidentiality Management
"Quality? Yes. Confidentiality? Most likely, because they are pretty sensitive to like, you know, names and whatever." (Company C)	quality, confidentiality, sensitive, names	Confidentiality Awareness	

As shown in the table above, another aspect highlighted in the interviews, which falls into a grey area between positive and negative considerations, refers to the matter of confidentiality. The significance of confidentiality varies depending on the nature of the company's operations.

For instance, in the case of Company A, confidentiality may not be a critical concern as their logistics processes are relatively general and can be readily explained to a third party without compromising sensitive information. However, for Company C, whose products may involve innovative technology or sensitive information, confidentiality emerges as a paramount consideration.

As articulated by a representative from Company C, the sensitivity of their products necessitates a cautious approach to sharing information, even internally. This underscores the need for demanding protocols to safeguard confidential data and trade secrets. Consequently, while collaboration with third-party entities may offer benefits in terms of efficiency and expertise, it also necessitates careful consideration of confidentiality concerns to mitigate potential risks to the company's intellectual property and competitive advantage.

5.1.6. Process Adjustment Application/Challenges of Maintaining Supply Chain Visibility and Agility

The table below navigates changes and complexities in operational processes. It encompasses the challenges of introducing new products, managing partnerships, adapting to rapid changes, and maintaining control in dynamic environments.

Table 6 Process Adjustment Application/Challenges of Maintaining Supply Chain Visibility and Agility

Example direct quotes from the interview	Key Words	Categories	Theme
"we want to sell some new accessories or we want to install tempered glass in a different way. And we want to do it from fairly fast next week or next month. It might be so that the they will not be able to cooperate with the local partners in time to actually train them and make them understand what change is coming and how it's going to affect them." (Company A)	sell, accessories, tempered, cooperate, local partners	Innovation, Market Introduction, Collaboration, Partnership	Process adjustment application/Challenges of Maintaining Supply Chain Visibility and Agility
"So how fast we are able to change! Maybe also something that could be potentially a bottleneck is that we're not having full control over what's happening. So we might be cooperating with so many different partners, because the four PL, potentially is connecting us with different 3PL or 2PL. So then we might not fully know who we are working with, and it might be difficult to actually control." (Company A)	fast, change, control, cooperating, partners	Adaptation, Agility, Control, Networking, Partner Management	

During the interviews with Company A, a recurring topic of discussion revolved around the importance of implementing timely process adjustments. As articulated by the Company A representative:

“Because you do cooperate with another organisation and they in turn cooperate with others. And if you want to change something fairly fast, that you might not really be able to, you have to make sure that this change does not have an impact on others.”

In the context of Company, A, their products undergo frequent updates and enhancements, leading to corresponding adjustments in after-sales services and upselling strategies. Consequently, the dynamic nature of their offerings often necessitates continuous adaptations in daily operations to ensure optimal efficiency and cost-effectiveness.

Given the intricate interplay between product development and service provision, maintaining clear visibility over supply chain processes is vital for Company A. However, in instances where certain aspects of the supply chain are outsourced, whether partially or entirely, this visibility may become compromised. Consequently, in the event of a need for swift adjustments or modifications, Company A may find itself lacking the capability to promptly initiate changes, potentially leading to delays and inefficiencies.

5.1.7.Operational Efficiency

The following table presents a collection of quotes focusing on strategies to enhance operational efficiency in the context of order processing, warehouse management, and inventory control. These quotes highlight the importance of optimizing processing time, improving data accuracy, and addressing challenges associated with outsourcing.

Table 7 Operational Efficiency

Example direct quotes from the interview	Key Words	Categories	Theme
"If you want to optimize to be faster like a package on order from the moment it arrives in our system to the moment that it's completed meaning packed. It shall be a couple of minutes, then you need to really look at how to save even seconds from each task that add up to reducing the time." (Company A)	Optimization, speed, efficiency	Operational Efficiency	Operational Efficiency
"Maybe owning a warehouse, or having our people work at the rented warehouse would positively impact that at least we'll have a little bit more accurate data because you know, when you own it, you take it a little bit more seriously rather than outsourcing it to somebody else. And better visibility systems." (Company C)	warehouse ownership, data accuracy, visibility systems	Supply Chain Efficiency	
" I don't think that it would be impossible to also outsource the inventory management in the local warehouses, but that's probably something that's more difficult to do. Because then that would also require the service provider to have someone on site at least semi regularly to check the actual inventory level." (Company B)	Service provider, inventory level	Accuracy	

In the case of Company B, due to their local warehouses and operations spread across multiple cities, the proximity of the operational management team to the local offices and warehouses is deemed crucial. As articulated by the Company B representative:

"I don't think that it would be impossible to also outsource the inventory management in the local warehouses, but that's probably more difficult to do. Because then that would also require the service provider to have someone on-site at least semi-regularly to check the actual inventory level."

Consequently, the geographical distribution of Company B's local warehouses and operations poses a notable challenge in ensuring effective supervision by a third-party entity. Given the diverse locations involved, it becomes imperative for the overseeing team to be closely situated to the local offices and warehouses. This proximity facilitates prompt response to operational needs, enhances communication, and fosters a deeper understanding of local dynamics.

However, finding a third-party provider willing to invest adequate resources in overseeing these dispersed operations can be challenging. Without sufficient attention and resources dedicated to local supervision, Company B may encounter difficulties in achieving the desired outcomes. Delays, miscommunication, and inefficiencies may arise, impacting the overall effectiveness of the supply chain management process.

Besides, Company A and C representatives emphasize the need for meticulous attention to detail and continuous improvement to optimize processing time, especially in the production section, even when working with external partners. They underscore the benefits of ownership and direct control in enhancing operational efficiency, suggesting that while outsourcing certain tasks is feasible, maintaining oversight and alignment with service providers is crucial for achieving desired outcomes. This synthesis underscores the importance of strategic collaboration with 4PL service providers within the broader context of operational efficiency.

5.1.8. Balancing Cost Efficiency and Operational Control

In the realm of business logistics management, strategic decision-making plays a crucial role in balancing cost efficiency and operational control. The following table delves into key quotes from industry professionals, highlighting their perspectives on cost-saving strategies and outsourcing considerations.

Table 8 Balancing Cost Efficiency and Operational Control

Example direct quotes from the interview	Key Words	Categories	Theme
<p>"It obviously makes it a lot easier for them to just book everything to this one service provider. But I know that in 90% of the cases if they had their own conduct or knew that which transportation company to call to direct that they would get the same shipment with less money with without obviously the added value services but still cheaper." (Company B)</p>	<p>service provider, transportation, cost-saving</p>	<p>Cost Efficiency and Strategy</p>	
<p>"And it's going to take some resistance, especially from like, upper management.... But you know, they got to build a whole business case! and you got to defend it and explain how much it would cost initially, and how much money it's going to save us." (Company C)</p>	<p>resistance, business case, cost analysis</p>	<p>Change Management and Analysis</p>	
<p>"So, opening the site, hiring employees having inventory there, or will it make more financial sense to actually cooperate with a 3PL and have them handle everything from end to end? It sounded very promising, of course, not having to take maybe responsibility or having to hire people and keeping everything in check. However, when we investigated closer, we realized that perhaps our systems are not built at such a good level that we could just give those systems to the 3PL to us because they require that." (Company A)</p>	<p>site opening, 3PL cooperation, operational efficiency</p>	<p>Outsourcing and Operational Readiness</p>	<p>Balancing Cost Efficiency and Operational Control</p>
<p>"There was not a significant (financial) difference between opening our own site and keeping control of everything or they're cooperating with a 3PL so it didn't really justify giving that control away." (Company A)</p>	<p>control, outsourcing, financial analysis</p>	<p>Financial Analysis and Decision-making</p>	

According to the table above, an essential point highlighted in all three interviews concerns the interplay between cost considerations and the value derived from utilising 4PL services. In the case of Company C, a significant portion of the supply chain costs is covered by their customers, particularly regarding sourcing processes. This strategic allocation of costs enables Company C to exercise control over logistics expenditures by distributing them among various stakeholders involved in the process. Consequently, the adoption of 4PL services has the potential to significantly increase logistics costs for Company C.

Conversely, in the case of Company A, expansion into Central Europe prompted considerations of adopting 3PL services, given the unfamiliarity with the market. However, after careful evaluation, the decision was made to retain control over most supply chain processes internally, primarily driven by considerations of quality and cost.

As noted by the Company A representative, the perceived difference in utilising 3PL services versus managing processes internally was not significant enough to warrant outsourcing. Furthermore, the complexity of quality assurance emerged as a decisive factor, leading Company A to opt for internal handling of tasks using their resources, rather than relying on 3PL services.

5.1.9. Communication Challenges in Supply Chain Management

The table below delves into the intricate dynamics of communication within supply chain management, highlighting the challenges posed by unclear standards and cultural differences. It explores how these factors impact directness in responses, particularly evident in cross-cultural interactions, underscoring the significance of effective communication strategies in fostering collaboration and understanding across diverse contexts.

Table 9 Communication Challenges in Supply Chain Management

Example direct quotes from the interview	Key Words	Categories	Theme
"If we don't have very clear standards and ways of working, that can be challenging as well communicating how we work to the 4PL company as well." (Company A)	clear standards, communication	Communication Challenges	Communication Challenges in Supply Chain Management
"And I think it also stems from the cultural differences that we have. So, for instance, if I work with, or we talking with Chinese suppliers they are, I hope I don't come off as racist, but what I noticed is that they really avoid giving direct answers. And they like, for whatever reason, I don't quite understand why, but not just to me, to my colleagues and to our warehouse as well, it's they really give as vague answers as possible until they have a paper to back them off on their like direct answer." (Company C)	cultural differences, direct answers, communication	Cross-cultural Communication	

Another salient point that emerged in several interviews, both directly and indirectly, referred to the significance of effective communication with external parties. An insightful observation arose during the interview with Company A, where it was revealed that the company's rapid growth had outpaced its ability to establish the foundational infrastructure necessary to sustain this expansion. As articulated by the Company A representative:

"If I'm thinking that's let's say, we are ready to make a contract with the 4PL tomorrow, if we don't have very clear standards and ways of working, that can be challenging as well communicating how we work to the four PL company as well. So, then they can take it with their network further. So, there might be a mismatch there as well, if we don't have very clear processes on our side."

Thus, collaboration with a 4PL service provider has the potential to intensify operational complexities if clear criteria, standardised protocols, and established processes are not in place.

5.1.10. Potential Beneficiaries of the Proposed Tools

As mentioned previously in this paper, Hiava offers a variety of tools to help its customers in decision-making and optimising different processes. The three main tools that were introduced are, AinaK leaPP which is an Augmented Reality (AR) based layout planner, Nadii is an AI-based system for observing and optimising financial processes through a data-driven and automated procedure, YOURedi is a cloud-based integration platform that integrates data between various data sources and advanced tracking system that follows the parcel journey in details all along the way.

As a part of the interviews, the interviewees were asked about their opinions on the tools that Hiava offers and how they could benefit them in their day-to-day processes as well as short- and long-term projects.

Regarding AinaK leaPP, a point that was mutually mentioned in two of the interviews was the fact that using these tools would save a significant amount of time as it provides the customer with the opportunity to explore new ideas without actually testing them in reality. Therefore, they would be able to categorise tangible and unpractical solutions more easily without making the actual change. For example, as mentioned in the interview with Company C, according to the interviews the mentioned tool would have helped the company in its recent warehouse redesign. Hence, she mentions that:

“We have redesigned the warehouse recently. And that all like, based on the dimensions that we have gotten from our supplier, so I think the visualisation, like this, would have sped up the process and made it a lot more painless”

The financial management tool that Hiava offers, Nadii, is also discussed with the interviewees and various opinions are expressed. One of the points mentioned was how helpful this tool would be in managing resources especially the workforce during low season. The tool could provide the company with a clear picture of its financial performance, its goals and actions to reach the goals by adjusting various factors.

Hence, as it was mentioned in one of the interviews, using the mentioned tool might decrease the need to do various simulations and calculations and therefore save the company's time. In addition, the Company C representative mentions:

“So the fact that there is a system that can predict and calculate how certain changes will impact the cash flow, and I don't know expenses and things like this. I think it would help the decision-making process so much”

All three interviewees were also asked about Hiava's advance tracking system. In the company's A interview, due to the high number of single shipments they have, the company's representative mentions that the advanced tracking system would assist them in improving their customer services and saving resources. For instance, utilising the mentioned tool could help the customer service team in having a more proactive approach towards their customers by informing their customers about for example possible delays in the delivery rather than answering incoming calls about delays.

On the other hand, a company C representative mentions that:

“I'm thinking within one production line that I'm working with right now and they're like the supplier takes care of everything, we're talking DAP Incoterms. So, until the vessel comes to us, or the product comes to us, we do not sort of need to bother with anything that happens to the vessel, all we care about is that it comes on time.”

Therefore, as the company does not own the main part of the logistics processes, it might not be able to fully benefit from the advanced tracking system as its liability only starts when the products reach the company's doorstep.

5.2. Recommendations for Improvement of the Service

This chapter explores the receptiveness of companies to external collaborations, emphasizing openness to innovation but also the need to address management resistance and evaluate resource implications according to the data collected from interviews. It highlights the importance of compelling business cases and transparent communication to foster productive collaborations between companies and 4PL service providers. Additionally, insights from Hiava's CEO underscore the significance of upfront discussions on distinct matters such as quality standards to elevate the 4PL service providers and customer cooperation.

5.2.1.Strategic Considerations in Collaborating with External Partners: Insights from Interviews with Three Companies

A common question posed in all interviews revolved around the company's receptiveness to collaborating with external parties and embracing approaching changes. Each of the three companies expressed a general openness to new ideas and methodologies that could enhance efficiency and yield cost savings. Nonetheless, several essential considerations must be carefully evaluated before embarking on collaborative ventures.

As articulated by Company C, potential resistance from management towards adopting new approaches looms as a significant challenge. Thus, it becomes imperative to precisely formulate a compelling business case elaborating how the proposed approach would yield tangible monetary benefits for the company.

Moreover, a recurring theme across all interviews applied to the assessment of resource implications associated with the proposed plan. It is imperative for the 4PL service provider to transparently communicate the resource and training requirements inherent in their offer. According to the information provided, customers can make informed decisions and proactively plan for the future.

Consequently, the 4PL provider should furnish a comprehensive, accessible roadmap enlightening how their services address the customer's challenges and delineating the requisite investments, whether monetary or in terms of workforce. This clarity and transparency facilitate informed decision-making and foster productive collaborations between the customer and the service provider.

5.2.2."Prioritising Quality and Responsibilities in Collaboration: Viewpoints from the Case Company"

Moreover, Hiava's CEO emphasises the importance of initiating a thorough discussion regarding the quality standards expected by the customer at the outset of the collaboration. It is imperative to meticulously outline and analyse the quality criteria and standards, considering how the anticipated level of quality can be achieved. Additionally, it is crucial to define the respective responsibilities of both the customers and the service provider, clearly defining where each party's obligations begin and end.

As highlighted by Hiava's CEO, these responsibilities should be delineated at the service level, ensuring a comprehensive understanding of the tasks to be undertaken. Furthermore, Hiava is prepared to assume additional tasks if requested by the customers, demonstrating a willingness to accommodate their needs and preferences.

6. Discussion

In this chapter, the implications of incorporation of Fourth Party Logistics (4PL) services that provide numerous benefits while also posing various challenges for companies seeking to elevate customer value and operational efficiency in their supply chains are discussed. Contextualization of these advantages encompassing a broad spectrum, including streamlining supply chain operations, reducing operational burdens—particularly in seasonal sectors—and expanding the array of choices for selecting business collaborators in light of previous studies is presented below.

6.1. Impacts of Proposed 4PL Services on Customer Value and Supply Chain Operations

The integration of Fourth Party Logistics (4PL) services represents a transformative opportunity for companies seeking to optimize their operations and elevate their competitiveness in the marketplace. Beyond the immediate benefits of streamlined workforce management and enhanced supply chain visibility, 4PL integration opens avenues for strategic adaptation and long-term resilience. Particularly in seasonal businesses, where fluctuations in labour demand pose significant challenges, outsourcing functions such as recruitment and inventory management to a specialized 4PL provider offers a strategic advantage. By leveraging the expertise and resources of a 4PL entity, companies can navigate the complexities of seasonal variations with agility and precision, reallocating resources as needed to meet demand fluctuations while maintaining operational efficiency.

Furthermore, the strategic partnership with a 4PL provider extends far beyond operational efficiency, offering companies a holistic approach to supply chain management. Centralized oversight and access to advanced analytics tools empower companies to make data-driven decisions, optimize processes, and minimize disruptions throughout the supply chain network (Yao, 2010). This comprehensive visibility not only enhances operational efficiency but also enables proactive decision-making, ensuring timely delivery of goods and services to customers. Moreover, the flexibility to selectively choose partners and

access a diverse range of solutions enables companies to adapt swiftly to changing market dynamics and customer preferences. By embracing 4PL integration as a strategic imperative, companies position themselves for sustained growth, competitive advantage, and enhanced customer satisfaction in an increasingly dynamic business landscape.

6.1.1. Quality Management and Challenges in Third-Party Integration

While outsourcing certain supply chain functions undoubtedly offers advantages such as cost savings and operational flexibility, it simultaneously brings forth a myriad of challenges and risks that demand careful attention. One of the foremost concerns pertains to maintaining stringent quality control measures and safeguarding brand reputation amidst the involvement of third-party entities (Foster, 2008.). The integration of Fourth Party Logistics (4PL) services, therefore, calls for a meticulous approach to quality management practices to uphold customer value and brand integrity. Establishing robust quality assurance protocols becomes imperative, necessitating vigilant monitoring of third-party performance to ensure alignment with established standards and expectations. Moreover, the seamless integration of third-party entities into the supply chain requires significant investment of both time and resources from companies. Strategic alignment of objectives and seamless coordination are essential to maximize the potential benefits of outsourcing partnerships while mitigating integration challenges. Effective communication channels and collaborative efforts are pivotal in overcoming obstacles and nurturing productive relationships with third-party providers, ultimately fostering a cohesive and efficient supply chain ecosystem.

6.1.2. Confidentiality Management and Process Adjustment Application

In the realm of contemporary supply chain management, confidentiality emerges as an indispensable consideration, particularly in collaborative ventures with external partners. As companies integrate Fourth Party Logistics (4PL) services into their operations, the imperative for robust data security measures and contractual agreements intensifies, serving as bulwarks against potential

intellectual property theft (Abdel-Rahman, 2023). Fostering a culture of confidentiality awareness becomes imperative, with companies prioritizing the implementation of stringent protocols to safeguard proprietary data and uphold their competitive advantage in the market.

Moreover, the pursuit of supply chain visibility and agility mandates a perpetual process of adjustment and adaptation to the ever-changing market landscape. Although the integration of 4PL services holds promise for operational streamlining and process optimization, it also introduces formidable challenges. Companies must adeptly navigate the complexities of rapid changes, the intricacies of partnership management, and the imperative of maintaining control in dynamic environments. Proactive communication channels and strategic alignment with 4PL providers emerge as indispensable pillars for surmounting these obstacles and fortifying supply chain agility.

6.1.3. Operational Efficiency and Balancing Cost Efficiency with Control

Integration with a fourth-party logistics (4PL) entity holds immense potential for revolutionizing operational efficiency across various facets of supply chain management. By optimizing processing time, enhancing data accuracy, and implementing effective inventory management practices, companies can unlock new levels of efficiency and productivity. To capitalize on these opportunities, organizations must prioritize operational excellence, committing to continuous improvement through the adoption of cutting-edge technologies and strategic process optimization initiatives.

Achieving a delicate balance between cost efficiency and operational control emerges as a cornerstone of sustainable growth and competitive advantage in today's marketplace (Kaplan et al., 2008). Strategic decision-making in logistics management entails weighing the potential cost-saving benefits of 4PL adoption against critical factors such as quality assurance, brand reputation, and operational preparedness. Companies must conduct thorough cost analyses and engage in transparent communication channels to ensure that decisions align closely with organizational goals and priorities. By navigating this balance with foresight and precision, companies can leverage 4PL integration to drive

efficiency, profitability, and long-term success in a dynamic business environment.

6.2. Summary

In conclusion, the integration of Fourth Party Logistics (4PL) services offers a myriad of advantages and presents several challenges for companies aiming to enhance customer value and operational efficiency within their supply chains. The advantages are multifaceted, ranging from optimizing supply chain processes to decreasing operational workload, especially in seasonal industries, and providing more varieties and options for choosing business partners.

Firstly, one significant impact identified is the transfer of responsibilities from the company to the 4PL service provider, particularly in areas such as production, daily operations, recruitment, and inventory management (Jones & Smith, 2019). By integrating with a 4PL entity, companies gain access to specialized expertise and resources that can streamline supply chain operations. Through centralized oversight and advanced analytics tools, companies can optimize processes, minimize disruptions, and ensure the timely delivery of goods and services to customers. This not only enhances operational efficiency but also improves customer satisfaction by meeting or exceeding expectations. By outsourcing these functions, companies can alleviate the pressures of resource planning and workforce management while potentially reducing labour costs (Gupta, 2018).

Secondly, in seasonal industries where labour demand fluctuates significantly, outsourcing certain aspects of operations, such as recruitment and inventory management, can alleviate the complexities associated with workforce management. By leveraging 4PL services, companies can adapt their workforce strategies to seasonal variations more effectively, thereby reducing overhead costs and improving overall efficiency.

Another crucial impact lies in the efficient use of expertise offered by 4PL service providers, who possess extensive networks and capabilities in logistics management (Johnson et al., 2021). By leveraging their expertise, companies can streamline supply chain processes, optimize material and data flow, and benefit from a range of solutions and tools for freight forwarding, inventory management, and parcel tracking (Gupta, 2018). This expertise-driven

optimization enhances customer value by ensuring smoother operations, faster delivery times, and overall higher service quality. Additionally, the integration of 4PL services provides companies with a wider range of options and opportunities to choose business partners. This enables them to select partners that align most favourably with their needs and objectives, thereby enhancing flexibility and adaptability in supply chain management.

However, alongside these advantages, there are also notable challenges associated with the integration of 4PL services. The integration process can be time-consuming and complex, requiring careful coordination and communication between multiple stakeholders. Companies must invest significant resources in facilitating seamless integration and aligning objectives to maximize the benefits of outsourcing partnerships.

Cost justification is another challenge that companies must address when considering the adoption of 4PL services. While outsourcing certain functions may offer cost-saving opportunities in the long run, the initial investment required for integration and ongoing management must be carefully evaluated and justified against potential benefits.

Quality assurance emerges as a paramount concern, as companies seek to uphold their established quality standards amidst the outsourcing of supply chain processes (Lee & Kim, 2020). Ensuring the accurate implementation of services and maintaining brand reputation are essential considerations in this regard. Through effective collaboration with the 4PL provider, companies can mitigate risks and ensure that customer value is maintained or improved through consistent service quality and reliability.

Furthermore, challenges related to communication with external parties and the need for clear criteria and standardized processes underscore the importance of effective collaboration in realizing the full potential of 4PL services (Choi & Lee, 2019). By establishing transparent communication channels and aligning goals and expectations, companies and their 4PL partners can work together to address challenges and optimize supply chain performance, ultimately enhancing customer value through seamless and efficient service delivery.

In conclusion, while the adoption of Hiava's 4PL services offers opportunities for enhancing operational efficiency and customer value, it also presents challenges that must be carefully navigated. By carefully weighing the advantages and

disadvantages of integrating 4PL services, companies can make informed decisions that align with their organizational goals and priorities, ultimately driving sustainable growth and maintaining competitiveness in the marketplace, fostering effective communication, and embracing collaborative partnerships while ultimately enhancing customer value.

Further Studies

The author, acknowledging the intricacies of the thesis's subject matter, presents an extensive range of potential research directions. These proposed studies constitute a logical extension, offering avenues to explore different facets of the topic in greater depth and to build upon the knowledge gained from the current research effort.

Global Supply Chain Dynamics

In a rapidly evolving global landscape, it's imperative to comprehensively investigate the multifaceted challenges and opportunities that arise from the integration of Fourth Party Logistics (4PL) services within global supply chains. Delve into the intricate nuances of cross-border logistics, analysing the complexities of international trade routes, customs regulations, and transportation networks. Explore the dynamic interplay between 4PL integration and trade compliance, examining how adherence to regulatory frameworks influences supply chain efficiency and risk mitigation strategies (Nagurney et al, 2005).

Moreover, delves into the intricate dynamics of geopolitical risks, assessing the impact of geopolitical tensions, trade disputes, and regulatory changes on global supply chain operations. Investigate how 4PL integration enhances supply chain resilience and agility, enabling organizations to effectively navigate disruptions stemming from geopolitical instability, pandemics, natural disasters, and other unforeseen events. By examining case studies and empirical data, gain insights into the strategic approaches adopted by organizations to bolster their supply chain resilience and minimize the adverse effects of global disruptions.

Performance Measurement and Benchmarking

In the quest for operational excellence, it's essential to develop robust frameworks that comprehensively evaluate the performance of Fourth Party Logistics (4PL) partnerships and benchmark them against industry standards. Embark on an in-depth exploration of the intricacies involved in performance measurement, considering diverse facets such as service quality, cost-effectiveness, and responsiveness (Anderson et al, 2004).

Develop comprehensive sets of key performance indicators (KPIs) tailored specifically to 4PL integration, encompassing metrics such as on-time delivery rates, inventory turnover, transportation efficiency, and supply chain cost optimization. Utilize advanced analytical techniques to extract actionable insights from vast datasets, enabling organizations to identify areas of improvement and optimize their 4PL partnerships for maximum efficiency.

Customer Value Enhancement

In today's fiercely competitive business landscape, understanding the precise impacts of Fourth Party Logistics (4PL) integration on customer value is paramount. Dive deep into the intricate dynamics of customer satisfaction, loyalty, and retention, dissecting the underlying mechanisms through which enhanced supply chain visibility and control translate into tangible benefits for customers.

Employ a multidimensional approach to assess the holistic impact of 4PL integration on customer experiences, considering factors such as service reliability, order accuracy, and responsiveness to customer needs. Identify key performance indicators (KPIs) that accurately capture the nuances of customer value in the context of 4PL integration, enabling organizations to measure and optimize their efforts to enhance customer satisfaction and foster long-term loyalty. Through empirical research and qualitative analysis, uncover actionable insights that empower organizations to elevate the customer experience and gain a competitive edge in the market.

Limitations

There have been multiple limitations to this study that should be accounted for in the review of this research. Firstly, in addition to the thematic analysis mentioned, it would be advantageous to delve deeper into the dynamics of 4PL services within specific industry contexts. Rather than solely examining broad strokes of effectiveness, a detailed examination could uncover industry-specific challenges, opportunities, and success factors. For instance, within the manufacturing sector, the research could explore how 4PL services interact with just-in-time manufacturing principles or lean production methods, shedding light on how these strategies synergize or potentially conflict.

Similarly, within the retail industry, understanding the interplay between 4PL services and e-commerce fulfilment could offer valuable insights into optimizing omnichannel logistics strategies. By dissecting the impact of 4PL on order fulfilment accuracy, delivery speed, and customer satisfaction metrics, researchers can provide actionable recommendations tailored to the unique demands of modern retail operations.

Moreover, extending the research to include international perspectives would enrich our understanding of 4PL's global applicability and adaptation. Investigating how different regions or countries integrate 4PL into their supply chain ecosystems could uncover cultural, regulatory, and infrastructural factors that influence its effectiveness. For example, exploring how 4PL services navigate customs regulations, trade agreements, and geopolitical tensions can elucidate the complexities of managing supply chains across borders.

Furthermore, a longitudinal study tracking the evolution of 4PL implementation over time could offer valuable insights into its scalability, resilience, and long-term impact on organizational performance. By observing how companies adapt their 4PL strategies in response to market fluctuations, technological advancements, or geopolitical shifts, researchers can identify patterns of success and failure, informing future strategic decision-making.

Another notable limitation stems from the relatively small sample size employed in this research. Due to resource constraints, time limitations, and the specificity of the study population, the sample size may not fully encapsulate the complexity present within the broader population. As a result, the findings derived from this

limited sample may lack generalizability to larger populations or alternative contexts. While efforts were made to ensure the sample was representative and diverse within its constraints, the intrinsic limitations of a small sample size persist and should be acknowledged when interpreting the results.

Additionally, the qualitative nature of the research methodology introduces its own set of limitations. Qualitative methods bring about a degree of subjectivity, relying on interpretations and perspectives that may vary among researchers and participants. Furthermore, qualitative research typically involves smaller sample sizes compared to quantitative studies, limiting the scope and generalizability of the results. While qualitative methods offer valuable insights into complex phenomena and allow for in-depth exploration of individual experiences and perspectives, they also entail limitations in terms of replicability (Marshall and Cox, 2008).

Overall, by expanding the research scope to encompass industry-specific nuances, international perspectives, and longitudinal analyses, expanding the sample size, and incorporating quantitative research methods, a deeper understanding of the multifaceted relationship between 4PL services and customer value, empowering companies to optimize their logistics operations in an ever-changing business landscape could be achieved (Marshall and Cox, 2008).

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APPENDIX

Questionnaire

The following table provides an illustrative framework outlining the key themes addressed in interview questions, along with the relevant articles that have informed the development of these inquiries. Through a thorough examination of these themes and insights drawn from the literature cited the author has strived to construct a comprehensive set of questions that encapsulate the core aspects of the subject matter under examination.

Table 10 Interview Questions

Questions	Related Article
1. Familiarity and Consideration: Are you familiar with 4PL services, and do you see potential benefits for your business in adopting them?	Pavlič Skender, H., Mirković, P.A. and Prudky, I., 2017. The role of the 4PL model in a contemporary supply chain. <i>Pomorstvo</i> , 31(2), pp.96-101.
2. Feasibility and Cost: What would be a reasonable fee for a 4PL provider, considering potential benefits and existing logistics costs?	Kiggell, L.S., Kilbourn, P.J. and Heyns, G.J., 2021. Sustainable cost reductions obtained by using a fourth party logistics provider. <i>Journal of Transport and Supply Chain Management</i> , 15, p.13.
3. Evaluation and Implementation: Under what circumstances would you consider partnering with a 4PL provider, and what changes would be necessary for implementation?	Hingley, M., Lindgreen, A., Grant, D.B. and Kane, C., 2011. Using fourth-party logistics management to improve horizontal collaboration among grocery retailers. <i>Supply Chain Management: An International Journal</i> , 16(5), pp.316-327.
Cost: How does the cost factor influence the decision not to partner with a 4PL provider?	Kiggell, L.S., Kilbourn, P.J. and Heyns, G.J., 2021. Sustainable cost reductions obtained by using a fourth party logistics provider. <i>Journal of Transport and Supply Chain Management</i> , 15, p.13.

Administration: What administrative challenges might deter consideration of a partnership with a 4PL provider?	Fulconis, F. and Paché, G., 2018. Supply chain monitoring: LLPs and 4PL providers as orchestrators. <i>Procedia-Social and Behavioral Sciences</i> , 238, pp.9-18.
Confidentiality: What concerns about confidentiality could lead to a decision against partnering with a 4PL provider?	Kutlu, S., 2007. Fourth Party Logistics: Is It the Future of Supply Chain Outsourcing?. <i>best global publishing</i> .
Existing Partners: How might existing partnerships affect the decision-making process regarding collaboration with a 4PL provider?	Fulconis, F. and Paché, G., 2018. Supply chain monitoring: LLPs and 4PL providers as orchestrators. <i>Procedia-Social and Behavioral Sciences</i> , 238, pp.9-18.
Regarding the utilization of technologies like AI for financial process optimization, augmented reality for logistics process visualization, and cloud-based integration systems for facilitating data sharing among various stakeholders, do you perceive any advantages?	Aithal, P.S., 2023. How to Create Business Value Through Technological Innovations Using ICCT Underlying Technologies. <i>International Journal of Applied Engineering and Management Letters (IJAEML)</i> , 7(2), pp.232-292.
In your opinion, could implementing specific programs, applications, or assistance enhance the process currently? Alternatively, do you think a combination of in-house and outsourced processes could improve overall efficiency and productivity? How do you suggest we could enhance it further?	Steinborn, D., 1994. In-house or outsource?. <i>American Bankers Association. ABA Banking Journal</i> , 86(12), p.58.
Have you ever considered outsourcing the entire or a portion of your logistics process? If yes, what specific activities would you prefer to be handled by a third party? If no, could you please explain the reasons behind your decision?	Pavlič Skender, H., Mirković, P.A. and Prudky, I., 2017. The role of the 4PL model in a contemporary supply chain. <i>Pomorstvo</i> , 31(2), pp.96-101.
Are you familiar with 4PL services, and do you see potential benefits or challenges for your business in adopting them?	Pavlič Skender, H., Mirković, P.A. and Prudky, I., 2017. The role of the 4PL model in a contemporary supply chain. <i>Pomorstvo</i> , 31(2), pp.96-101.
In your opinion, could implementing specific programs, applications, or assistance enhance the process currently? Alternatively, do you think a combination of in-house and outsourced processes could improve overall efficiency and	Coskun-Setirek, A. and Tanrikulu, Z., <i>The Applications of Intelligent System Technologies in Service Processes</i> .

productivity? How do you suggest we could enhance it further?	
Do you believe there are specific programs, applications, or assistance available that could aid in improving the process? Alternatively, do you think that a combination of in-house and outsourced processes would enhance overall efficiency and productivity?	Coskun-Setirek, A. and Tanrikulu, Z., The Applications of Intelligent System Technologies in Service Processes.
From your point of view, what measures could be taken to optimize the supply chain process further?	(Adams, 2022) "Best Practices for Supply Chain Optimization: Insights from Industry Leaders"
Have you experienced challenges in data sharing and processes? If so, what bottlenecks have you encountered in data sharing and communication?	Lotfi, Z., Mukhtar, M., Sahran, S. and Zadeh, A.T., 2013. Information sharing in supply chain management. <i>Procedia Technology</i> , 11, pp.298-304.
Do you believe there are opportunities to enhance communication channels? For instance, do you currently have clear communication channels established with your suppliers?	C. Gambetti, R. and Giovanardi, M., 2013. Re-visiting the supply chain: a communication perspective. <i>Corporate Communications: An International Journal</i> , 18(4), pp.390-416.
"Do you perceive any challenges or bottlenecks associated with 4PL services? While you previously mentioned considerations regarding costs and quality with regards to 3PL services, are there any specific challenges you encounter or foresee with 4PL services?"	Vasiliauskas, A.V. and Jakubauskas, G., 2007. Principle and benefits of third-party logistics approach when managing logistics supply chain. <i>Transport</i> , 22(2), pp.68-72.
Have you explored the possibility of outsourcing the entire logistics process? If so, what specific activities would you prefer to delegate to a third-party provider? Additionally, if there have been any drawbacks or negative aspects associated with this approach, could you please provide further elaboration?	Vasiliauskas, A.V. and Jakubauskas, G., 2007. Principle and benefits of third-party logistics approach when managing logistics supply chain. <i>Transport</i> , 22(2), pp.68-72.

Interview Questions

- General background
 - What is the customer company's business line?
 - How has the company's general performance been in the last five years?
 - Has it been as expected?
 - Are there some areas that need improvements?
 - Do you have the resources to apply those improvement ideas?
- Outsourcing
 - What are your current logistics processes?
 - What is the scope of your operation? Do you operate locally, internationally or both?
 - What modes of transport are used in your process?
 - What are your main delivery types?
 - Are all your logistics activities done in-house?
 - If yes:
 - What do the activities consist of?
 - Do you categorise logistics operation activities (warehousing, inventory, transportation etc) as part of management costs or logistics costs?
 - If not,
 - Which part is carried out by a third party?
 - What percentage of your costs are allocated to the logistics processes?
 - Are there specific challenges or bottlenecks in the process?
 - Have you ever considered outsourcing the whole or part of your logistics process?
 - If yes:
 - What activities would you prefer to be taken care of by the third party?
 - If not,
 - Could you please elaborate on the reasons behind your decision?
- 4PL services
 - Are you familiar with 4PL services?
 - Do you see any benefits in adopting 4PL services?

- yes
- What would be the possible benefits for your business?
- What would be the logical fee to be charged for taking care of the supply chain procedure as a 4PL provider?
- For example, what percentage of the current logistics costs would be considered a reasonable number?
- No
- What would be the reasons for not considering a partnership with a 4PL provider?
- cost?
- administrations?
- confidentiality?
- existing partners?
- In what case you would consider 4PL provider service?
- What changes should be applied?
- Adopting new technologies
 - Do you see any benefits in using technologies such as AI for financial process optimization, Augmented reality for logistics process visualisation and a cloud-based integration system for data sharing between different stakeholders?
 - How has your experience with data transactions between partners involved in the logistics process?
 - What do you think about using an AI-based program to manage logistics processes with the least number of human interactions?
 - Would you have the capacity to enter the most updated data required into the system?
 - If yes, how often could it be done?
 - If not, could you please elaborate on the reasons behind it?
 - How important is the shipment live tracking for your company?
 - Would you prefer to get notifications about possible accidents/delays along the way?
 - yes:
 - How would this knowledge help you?
 - Would you be interested in receiving possible alternative solutions?

- How would shipment delays affect your operations?
- Do you think having a subscription to this program would be helpful?
- no:
- What are the possible reasons behind your decision?
- Do you have flexible procurement time?
- How would shipment delays affect your operations?
- Do you find it beneficial to adopt a tool that helps the company with micro-financial decisions and optimising processes?
- If yes, how would you think it could help improve your performance?
- If not, what's the reason(s) behind it?
- How important is visualisation in choosing logistics processes?
- Do you see any positive aspects to it? Specially visualising warehousing and inventory processes?
- If yes, in what ways the visualisation would help your company?
- If not, what are the reason(s) behind it?

Financial analysis

A. Company A

Table 1 Company A financial report

	31/12/2022	31/12/2021
	USD	USD
	12 months	12 months
	Local GAAP	Local GAAP
Exchange rate: EUR/USD	1.0666	1.1326
Operating revenue (Turnover)	221,847,170	221,496,520
P/L before tax	-42,116,238	-30,269,432
P/L for period [=Net income]	-42,446,373	-30,269,432
Cash flow [Net Income before D&A]	n.a.	n.a.
Total assets	77,552,378	120,149,558
Shareholders funds	31,702,560	78,619,408
Current ratio (x)	1.59	3.24
Profit margin (%)	-18.98	-13.67
ROE using P/L before tax (%)	-132.85	-38.5
ROCE using P/L before tax (%)	-108.82	-33.96
Solvency ratio (Asset based) (%)	40.88	65.44
Number of employees	1,266	726

B. Company B

Table 2 Company B financial report

	31/12/2020	31/12/2019
	th USD	th USD
	12 months	12 months
	Audit n.a.	Audit n.a.
	IFRS	IFRS
Exchange rate: EUR/USD	1.2271	1.1234
Operating revenue (Turnover)	72,803	40,271
P/L before tax	-97,729	-64,643
P/L for period [=Net income]	-97,845	-64,672
Cash flow [Net Income before D&A]	-81,738	-63,038
Total assets	302,430	75,813
Shareholders funds	211,752	50,968
Current ratio (x)	8.03	4.58
Profit margin (%)	n.s.	n.s.
ROE using P/L before tax (%)	-46.15	-126.83
ROCE using P/L before tax (%)	-34.64	-98.87
Solvency ratio (Asset based) (%)	70.02	67.23
Number of employees	452	285

C. Company C

Table 3 Company C financial report

	31/12/202 2	31/12/202 1	31/12/202 0	31/12/201 9	31/12/201 8
	USD	USD	USD	USD	USD
	12 months	12 months	12 months	12 months	12 months
	Local GAAP	Local GAAP	Local GAAP	Local GAAP	Local GAAP
Exchange rate: EUR/USD	1.0666	1.1326	1.2271	1	1.145
Operating revenue (Turnover)	721,816,9 37	705,310,9 85	627,630,6 14	749,699,7 69	770,851,0 28
P/L before tax	21,238,12 9	31,067,22 6	13,943,52 9	12,618,02 7	11,894,26 6
P/L for period [=Net income]	17,912,47 2	22,988,38 8	- 19,564,87 1	1,877,201	4,850,222
Cash flow [Net Income before D&A]	n.a.	n.a.	n.a.	n.a.	n.a.
Total assets	770,645,8 62	776,833,5 62	770,774,2 02	616,642,0 43	599,162,7 72
Shareholders funds	41,358,46 2	25,226,40 7	2,665,260	26,196,56 1	22,999,62 7
Current ratio (x)	0.82	0.78	0.75	0.7	0.73
Profit margin (%)	2.94	4.41	2.22	1.68	1.54
ROE using P/L before tax (%)	51.35	123.15	523.16	48.17	51.72
ROCE using P/L before tax (%)	15.49	24.82	16.48	8.34	11.65
Solvency ratio (Asset based) (%)	5.37	3.25	0.35	4.25	3.84
Number of employees	4,023	4,197	3,868	3,617	4,792

D. DHL SUPPLY CHAIN LIMITED

Table 4 DHL financial report

	31/12/2022	31/12/2021	31/12/2020	31/12/2019	31/12/2018
	th USD	th USD	th USD	th USD	th USD
	12 months	12 months	12 months	12 months	12 months
	Unqualified	Unqualified	Unqualified	Unqualified	Unqualified
	Local GAAP	Local GAAP	Local GAAP	Local GAAP	Local GAAP
Exchange rate: GBP/USD	1.2068	1.3434	1.342	1.31215	1.26955
Operating revenue (Turnover)	3,773,094	3,703,723	3,435,184	3,981,369	4,153,744
P/L before tax	76,371	45,575	-9,846	177,788	4,907
P/L for period [=Net income]	76,384	45,467	-9,972	177,766	4,794
Cash flow [Net Income before D&A]	110,279	86,017	7,339	214,766	45,073
Total assets	1,482,021	1,521,458	1,402,814	1,325,645	1,399,172
Shareholders funds	551,974	574,891	528,872	526,858	464,714
Current ratio (x)	1.55	1.61	1.81	1.86	1.62
Profit margin (%)	2.02	1.23	-0.29	4.47	0.12
ROE using P/L before tax (%)	13.84	7.93	-1.86	33.75	1.06
ROCE using P/L before tax (%)	11.16	6.32	-1.01	27.15	1.54
Solvency ratio (Asset based) (%)	37.25	37.79	37.7	39.74	33.21
Number of employees	n.a.	n.a.	n.a.	n.a.	n.a.

E. XPO INC.

Table 5 XPO financial report

	31/12/2023	31/12/2022	31/12/2021	31/12/2020	31/12/2019
	th USD	th USD	th USD	th USD	th USD
	12 months	12 months	12 months	12 months	12 months
	Unqualified	Unqualified	Unqualified	Unqualified	Unqualified
	US GAAP	US GAAP	US GAAP	US GAAP	US GAAP
	10-K	10-K	10-K	10-K	10-K
Operating revenue (Turnover)	7,744,000	7,718,000	7,202,000	6,168,000	10,681,000
P/L before tax	260,000	258,000	107,000	-164,000	301,000
P/L for period [=Net income]	189,000	666,000	336,000	107,000	416,000
Cash flow [Net Income before D&A]	624,000	1,122,000	721,000	485,000	925,000
Total assets	7,492,000	6,269,000	8,717,000	16,177,000	14,128,000
Shareholders funds	1,266,000	1,012,000	1,138,000	2,709,000	2,743,000
Current ratio (x)	1	1.08	1.06	1.04	1.03
Profit margin (%)	3.36	3.34	1.49	-2.66	2.82
ROE using P/L before tax (%)	20.54	25.49	9.4	-6.05	10.97
ROCE using P/L before tax (%)	7.25	8.25	5.16	1.31	5.24
Solvency ratio (Asset based) (%)	16.9	16.14	13.06	16.75	19.42
Number of employees	38,000	37,800	42,000	102,000	100,000

F. ACCENTURE PUBLIC LIMITED COMPANY

Table 6 Accenture financial report

	31/08/2023	31/08/2022	31/08/2021	31/08/2020	31/08/2019
	th USD	th USD	th USD	th USD	th USD
	12 months	12 months	12 months	12 months	12 months
	Unqualified	Unqualified	Unqualified	Unqualified	Unqualified
	US GAAP	US GAAP	US GAAP	US GAAP	US GAAP
	10-K	10-K	10-K	10-K	10-K
Operating revenue (Turnover)	64,111,745	61,594,305	50,533,389	44,327,039	43,215,013
P/L before tax	9,139,332	9,196,167	7,761,116	6,774,331	6,251,797
P/L for period [=Net income]	6,871,557	6,877,169	5,906,809	5,107,839	4,779,112
Cash flow [Net Income before D&A]	7,933,173	7,907,814	6,731,566	5,829,557	5,397,058
Total assets	51,245,305	47,263,390	43,175,843	37,078,593	29,789,880
Shareholders funds	26,458,593	22,747,088	20,097,114	17,499,173	14,827,691
Current ratio (x)	1.3	1.23	1.25	1.4	1.4
Profit margin (%)	14.26	14.93	15.36	15.28	14.47
ROE using P/L before tax (%)	34.54	40.43	38.62	38.71	42.16
ROCE using P/L before tax (%)	27.64	31.08	28.47	27.88	33.51
Solvency ratio (Asset based) (%)	51.63	48.13	46.55	47.2	49.77
Number of employees	733,000	721,000	624,000	506,000	492,000

