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TASK FOR MASTER'S QUALIFICATION THESIS

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1. The topic: «Cost control strategies in logistics enterprises»

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6. Consultants of sections of work

Section	First name, last name, position of the consultant	Signature, date	
		issued the task	accepted the task
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2	Justification of the relevance of the topic of the work	October, 2024	<i>completed</i>
3	Work with bibliographic sources, preparation of materials for writing the first section of the work	October, 2024	<i>completed</i>
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10	Preparation of a report for the student's defense	March, 2025	<i>completed</i>

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РЕФЕРАТ

Текст стор. 67, табл. 13, рис. 9

Контроль витрат, логістичні підприємства, оптимізація витрат, методи управління витратами, логістичні витрати, компанія Keli, сучасні технології, бізнес-діяльність, стратегія контролю витрат, фінансова ефективність.

Кваліфікаційна робота присвячена дослідженню теоретичних аспектів та практичних підходів до формування стратегій контролю витрат у логістичних підприємствах, зокрема на прикладі Компанії Keli, дочірньої компанії Першого інженерно-навігаційного бюро Китаю, яке має багату історію, що відображає її розвиток у секторі навігаційної техніки. У першому розділі розглядаються основні поняття витрат у логістичній діяльності та їх класифікація, а також фактори, що впливають на логістичні витрати. Окрему увагу приділено методам управління та контролю витрат у логістичних підприємствах. У другому розділі здійснена ефективність бізнес-діяльності компанії Keli та оцінка аналізу існуючих стратегій контролю витрат. Завершення розділу містить висновки щодо поточного стану та можливостей удосконалення контролю за витратами. Третій розділ присвячений впровадженню сучасних технологій та методів оптимізації витрат, а також розробці рекомендацій для підвищення ефективності стратегій контролю витрат у логістичних підприємствах. Робота надає конкретні пропозиції щодо підвищення фінансової ефективності компанії Keli, які можуть бути корисними для інших учасників логістичного ринку.

ABSTRACT

Zhang Nan. Cost control strategies in logistics enterprises. The manuscript.

Qualifying work of the master's degree in specialty 073 "Management", educational and professional program "Management". Volodymyr Dahl East Ukrainian National University, Ministry of Education and Science of Ukraine. Kyiv, 2025.

The qualification work is devoted to the study of theoretical aspects and practical approaches to the formation of cost control strategies in logistics enterprises, in particular, on the example of Keli Company, a subsidiary of the First Engineering and Navigation Bureau of China, which has a rich history, reflecting its development in the navigation equipment sector. The first section examines the basic concepts of costs in logistics activities and their classification, as well as factors affecting logistics costs. Particular attention is paid to methods of cost management and control in logistics enterprises. The second section evaluates the efficiency of Keli's business activities and evaluates the analysis of existing cost control strategies. The conclusion of the section contains conclusions on the current state and opportunities for improving cost control. The third section is devoted to implementing modern technologies and methods of cost optimization, as well as developing recommendations for increasing the effectiveness of cost control strategies in logistics enterprises. The work provides specific proposals for increasing Keli's financial efficiency, which may be useful for other participants in the logistics market.

Key words: cost control, logistics enterprises, cost optimization, cost management methods, logistics costs, Keli company, modern technologies, business activities, cost control strategy, financial efficiency.

CONTENT

INTRODUCTION	7
SECTION 1. THEORETICAL BASIS OF COST CONTROL IN LOGISTICS ENTERPRISES	10
1.1. The concept of costs in logistics activities and their classification	10
1.2. The main factors affecting logistics costs	13
1.3. Methods of Cost Management and Control in Logistics Enterprises	19
Conclusions for section 1	25
SECTION 2. COST ANALYSIS AND CONTROL STRATEGIES USING THE EXAMPLE OF A LOGISTICS COMPANY KELI COMPANY	26
2.1. Characteristics and organizational structure of Keli Company	26
2.2. Assessment of the effectiveness of the company's business activities and existing cost control strategies	30
Conclusions for section 2	43
SECTION 3. IMPROVING COST CONTROL STRATEGIES IN LOGISTICS ENTERPRISES	46
3.1. Introduction of modern technologies and cost optimization methods	46
3.2. Recommendations for improving the effectiveness of cost control strategies	51
Conclusions for section 3	63
CONCLUSIONS	65
LIST OF USED SOURCES	68

INTRODUCTION

Cost control strategies are of utmost importance in logistics enterprises in today's rapidly evolving global economy, where logistics operations play a pivotal role in the success of businesses across various industries. Logistics costs typically make up a large percentage of total operating expenses, and managing these costs effectively is essential for maintaining profitability and competitiveness.

Implementing robust cost control strategies enables logistics enterprises to streamline operations, reduce inefficiencies, and enhance service delivery. For instance, optimizing transportation routes and consolidating shipments can substantially save fuel and labor costs. Similarly, investing in real-time tracking and data analytics technology can improve decision-making and operational efficiency, thereby reducing unexpected expenses[1].

Moreover, integrating advanced quantitative techniques, such as the Center of Gravity method, aids in determining optimal warehouse locations, further minimizing transportation costs and improving service levels. Applying these techniques demonstrates how strategic decisions can lead to significant cost reductions in logistics networks[2].

The importance of cost control in logistics is also highlighted by industry experts, who emphasize balancing efficiency with cost management. By leveraging dispatch management platforms and enhancing communication, businesses can refine their logistics operations to achieve both cost savings and improved service quality [3].

Researching cost control strategies in logistics enterprises is imperative for developing methods that enhance operational efficiency, reduce expenses, and contribute to the overall competitiveness of businesses in a rapidly evolving market landscape.

The research problem centers on understanding how logistics enterprises can develop and implement cost control strategies that reduce operational costs and enhance their competitiveness and service quality in a rapidly changing market. By addressing these issues, the research can provide valuable insights into best practices,

technological innovations, and strategies that logistics companies can use to thrive in an increasingly cost-conscious environment.

The study aims to study and analyze cost control strategies in logistics enterprises and identify effective methods and practices that allow optimizing costs, increasing the efficiency and competitiveness of enterprises in logistics.

Research objectives:

- analyze the main types of costs in logistics enterprises and classify them according to various characteristics;
- investigate factors affecting logistics costs;
- assess the role of modern technologies in reducing costs in logistics enterprises, and study cost control methods in various segments of logistics processes;
- analyze costs at a logistics enterprise;
- assess the effectiveness of existing cost control strategies;
- identify the main problems and reserves for reducing costs;
- implement modern technologies and methods for optimizing costs;
- propose the use of automation and digital solutions in cost control;
- recommend measures to improve the effectiveness of cost control strategies.

The object of the study is logistics enterprises, their activities, cost management processes, and applied cost control strategies.

The subject of the study is the theoretical, methodological, and practical principles of cost control strategy in logistics enterprises, in particular, the methods, tools, and technologies used to reduce costs in the processes of transportation, warehousing, and inventory management, as well as the analysis of their impact on the overall efficiency of the enterprise.

The novelty of the results obtained in the work lies in the development of directions of cost control strategies for the logistics enterprise of the Kelly Company.

The research's theoretical and methodological basis was general scientific knowledge methods: monographic, theoretical generalization, systematization, analysis, and synthesis.

The information base of the research was made up of scientific articles and monographs on the development of the strategy of marketing activities of enterprises, scientific and methodological publications, analytical articles in the periodical press, information from Internet resources, data from internal reporting of the studied company, information from the author's personal research.

The practical significance of the work lies in developing recommendations for the enterprise on developing a cost control strategy for the logistics enterprise.

SECTION 1.

THEORETICAL BASIS OF COST CONTROL IN LOGISTICS ENTERPRISES

1.1. The concept of costs in logistics activities and their classification

Costs in logistics activities are a set of financial resources that an enterprise directs to organize and support logistics processes, including transportation, warehousing, inventory management, information technology, and other operating costs. Effective cost management is a key factor in the success of logistics enterprises, as it reduces the cost of services, increases competitiveness, and ensures the stability of financial flows.

In logistics activities, "costs" encompass all expenses incurred in moving goods from their origin to the end consumer. These costs include transportation, warehousing, inventory carrying, order processing, and administrative expenses associated with supply chain operations [4].

Transportation costs involve expenses related to the movement of goods, such as fuel, labor, and vehicle maintenance. Warehousing costs cover storage expenses, including rent, utilities, and salaries of personnel managing inventory. Inventory carrying costs refer to the total cost of holding inventory, encompassing warehousing expenses, financial costs like opportunity cost, and costs related to perishability, shrinkage, and insurance [5].

Administrative costs pertain to overheads associated with managing logistics operations, including staff salaries and information systems.

Understanding and effectively managing these costs are crucial for enhancing the efficiency and profitability of logistics operations.

Costs in logistics can be classified according to the criteria presented in Fig. 1.

1. By the nature of variability, they are divided into fixed and variable costs [6-8].

- Fixed costs are costs that do not depend on the volume of logistics operations, such as warehouse space rental, equipment depreciation, and management personnel payment.

- Variable costs - depending on the enterprise's logistics activity level, for example, costs of fuel, packaging, and hourly wages of workers.

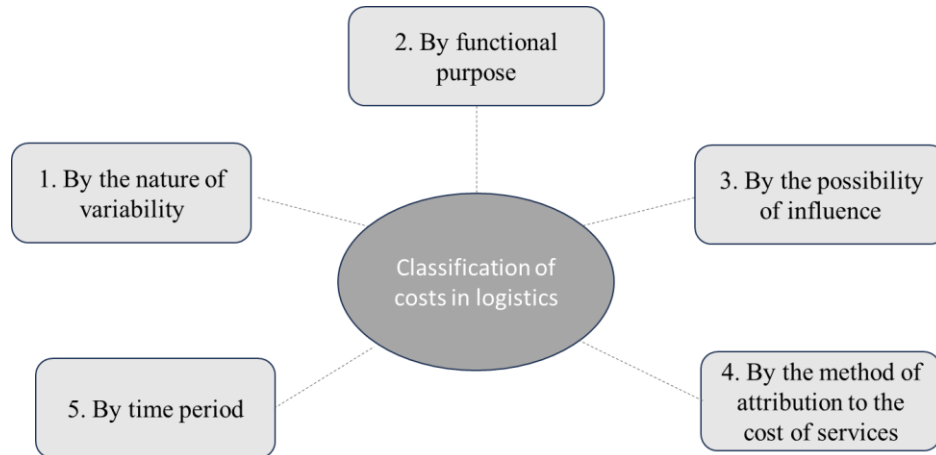


Fig. 1. Classification of costs of logistics enterprises

2. By functional purpose, they are divided into transport, warehouse, inventory management, administrative, and information and analytical costs [9-10].

- Transport costs - costs for transporting goods, including fuel, driver wages, depreciation of vehicles.

- Warehouse costs - include payment for warehouse space rental, energy, personnel costs, and maintenance of warehouse equipment.

- Inventory management costs include purchasing, storing and accounting of inventories.

- Administrative costs - costs for management personnel, information systems, document management.

- Information and analytical costs - related to implementing and supporting information technologies for logistics management (for example, ERP systems and GPS monitoring).

3. Depending on the possibility of influence, they are divided into controlled and uncontrolled costs [11-14].

- Controlled costs - costs that can be directly regulated, such as optimization of transportation routes, selection of profitable suppliers, and automation of warehouses.

- Uncontrolled costs - costs on which the enterprise has limited influence, such as fluctuations in fuel prices, tax payments, and currency risks.

4. By the attribution method to the cost of services - direct and indirect costs [15-17].

- Direct costs - costs that can be directly associated with a specific logistics operation (for example, transportation costs for a specific route).

- Indirect costs - costs distributed between several logistics operations (for example, general administrative costs).

5. They are divided into one-time and current costs by time period.

- One-time costs are incurred once, for example, the purchase of new logistics software or warehouse modernization.

- Current costs - costs that are incurred regularly, for example, the cost of personnel remuneration and transport maintenance.

Investing in highway improvement projects will impact the characteristics of links within the U.S. transportation network. Specifically, flow capacity could be enhanced by adding more lanes, raising speed limits due to safer, wider roads, creating limited access highways, and implementing operational or Intelligent Transportation Systems (ITS) upgrades. Additionally, there could be fewer restrictions on truck weights, better bridge clearances, and other similar improvements. Further enhancements to ports and customs could streamline and boost the overall traffic flow of the system. These upgrades are likely to result in reduced travel times and increased reliability. The potential effects of these improvements are illustrated in Fig. 2. Knowledge and correct distribution of costs in logistics allow enterprises to effectively control financial flows and find ways to optimize and reduce costs without losing the quality of logistics services. This, in turn, contributes to increasing the profitability and competitiveness of the company.

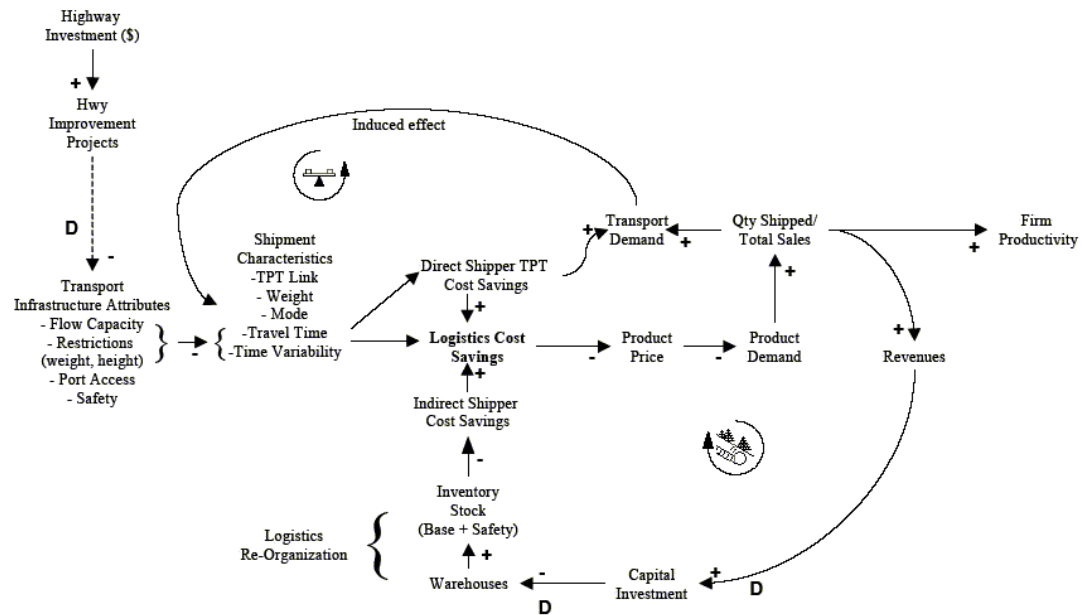


Fig. 2. Freight Economics Influence Diagram[9]

In conclusion, costs in logistics activities represent a significant portion of operational expenses for businesses in this sector, directly impacting profitability and efficiency. Understanding the concept of costs and their classification is crucial for effectively managing logistics operations. Costs can be categorized in various ways, such as by their nature (fixed or variable), by their functional purpose (transport, warehouse, inventory management, etc.), and by their attribution to services (direct or indirect). Each classification provides valuable insights into where and how costs can be controlled or optimized, helping logistics companies improve their financial performance. The effective management of logistics costs is essential for enhancing competitiveness, improving service quality, and ensuring long-term sustainability in a dynamic and competitive market environment.

1.2. The main factors affecting logistics costs

The costs of logistics activities are formed under the influence of a wide range of external and internal factors that determine the level of operating, transport, warehouse, administrative, and other costs. Managing these factors is a key task of logistics enterprises, as it allows them to increase activities' efficiency and reduce the company's financial burden.

The main factors affecting logistics costs include the factors presented in Fig. 3.

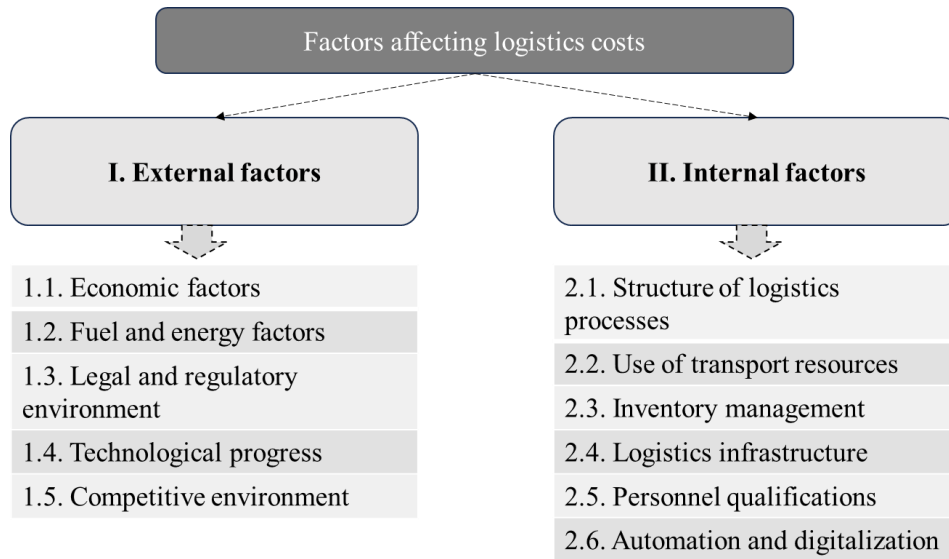


Fig. 3. The main factors affecting logistics costs

The influence of external economic factors on the activities of logistics enterprises in China. The logistics industry in China is one of the most developed in the world, and it is associated with the dynamic growth of the economy, a high level of investment in transport infrastructure, and the country's active integration into global trade chains. However, the activities of logistics enterprises in China largely depend on external economic factors that shape the conditions for doing business and affect the costs, competitiveness, and adaptability of companies to changes in the global environment.

Among the external economic factors affecting the costs of logistics systems, the factors presented in Fig. 4 can be included.



Fig. 4. Economic factors influencing the costs of logistics systems

China is one of the largest exporters in the world, and logistics companies play a key role in ensuring the international transportation of goods. Global economic trends, such as the slowdown in GDP growth in key trading partners (USA, EU), can decrease demand for Chinese products, reducing transportation volumes and profitability of logistics companies. Also, trade wars, for example, between the USA and China, create risks of increasing tariff barriers and reducing the volume of international logistics operations.

The Chinese logistics industry highly depends on international financial markets since a significant part of international trade settlements is carried out in US dollars. Changes in the yuan exchange rate affect the costs of Chinese logistics companies, especially if they use imported fuel and equipment or carry out international operations paid in foreign currency. A weaker yuan can make exports cheaper but, at the same time, increase the cost of purchasing foreign equipment and technologies for logistics infrastructure.

Oil and natural gas prices directly affect the costs of China's transportation and logistics companies. China is heavily dependent on energy imports, so global oil and gas price fluctuations can significantly change the operating costs of companies involved in road, air, and maritime transportation. High fuel prices lead to increased transportation costs and the need to increase tariffs for customers, which can reduce the competitiveness of Chinese logistics companies in international transportation.

Disruptions to global supply chains due to pandemics (as happened during COVID-19), geopolitical conflicts, or natural disasters significantly impact China's logistics sector. For example, the blockade of the Suez Canal in 2021 led to significant delays in international transportation, which affected the cost of delivery and the efficiency of logistics chains. Sanctions and restrictions on using Chinese technology in international transportation (for example, the US ban on the use of Chinese telecommunications systems in logistics) also create additional challenges for businesses.

China is actively developing its transport infrastructure through public and private investment. The "One Belt, One Road" project has become a strategic direction that stimulates the development of rail, maritime and air logistics corridors between

China and Europe, Asia and Africa. However, the financing of such projects depends on global economic conditions, the investment climate and the political situation. Slowing economic growth or a decrease in the level of investment can limit the development of logistics infrastructure and increase business costs.

The global e-commerce market is growing rapidly, creating opportunities and challenges for Chinese logistics companies. On the one hand, the increase in online trade stimulates the development of delivery and warehousing. On the other hand, logistics companies are forced to adapt to new requirements for speed and accuracy of delivery, which requires additional costs for automation, the implementation of artificial intelligence, and the development of logistics hubs. Companies that cannot quickly integrate digital solutions risk losing the market.

Many countries are tightening environmental requirements for logistics transportation, forcing Chinese companies to switch to more environmentally friendly vehicles (electric trucks, low-emission ships, etc.). On the one hand, this contributes to increased environmental responsibility, but it also requires significant financial investments in new technologies and alternative energy resources.

Fuel and energy factors significantly influence the logistics activities of Chinese enterprises, affecting operational costs, efficiency, and strategic decisions.

Diesel has traditionally been the primary fuel for China's logistics sector. However, recent economic slowdowns have reduced trucking and construction activities, correlating with a decline in diesel consumption. The U.S. Energy Information Administration noted that these sectors' reduced activity contributed to decreased diesel usage 2024 [18].

In response to environmental concerns and fuel cost volatility, Chinese logistics companies are transitioning to alternative fuels, notably liquefied natural gas (LNG). Government subsidies and stricter emission standards have accelerated this shift. Reuters reported a surge in LNG truck sales, with over 108,000 vehicles sold in the first half of 2024, leading to a decline in diesel demand [19].

The rapid growth of China's logistics industry has led to a significant increase in energy consumption. A decomposition analysis revealed that the rise in logistics activities was the major driving energy usage, accounting for 48.8% of the increase.

Notably, fuel consumption in highway transportation has become more dominant in logistics energy consumption [20].

The logistics sector is a substantial contributor to carbon emissions in China. In 2019, carbon dioxide emissions from this industry reached 180.65 million tons. To address this, the government has implemented policies promoting energy efficiency and the adoption of cleaner energy sources, influencing logistics enterprises to adjust their operations accordingly [21].

China's energy security strategies, including diversification of energy imports and investments in renewable energy, impact the logistics sector. The country's status as the largest liquefied natural gas (LNG) importer affects fuel availability and pricing, influencing logistics operations [22].

In summary, fuel and energy factors play a crucial role in shaping the logistics activities of Chinese enterprises. Fluctuations in fuel prices, shifts toward alternative energy sources, regulatory changes, and broader energy security policies collectively influence the logistics sector's operational strategies, cost structures, and environmental footprints.

Legal and regulatory environment. Government regulation, tax changes, environmental standards, and customs tariffs can significantly affect the costs of enterprises. For example, mandatory environmental transport standards or increased tax burden can significantly increase costs [23-24].

Technological progress. The development of digital technologies, automated logistics process management systems (WMS, TMS, ERP systems), artificial intelligence, and Big Data to optimize transportation routes and forecast demand allows you to reduce costs. However, introducing the latest technologies requires significant investments, affecting overall costs [25].

Competitive environment. The level of competition in the logistics market forces enterprises to implement cost-reduction strategies without losing service quality. Companies that cannot optimize costs risk losing customers due to high tariffs or inefficiency [26-27].

Let's consider internal factors influencing logistics systems.

Structure of logistics processes. The optimal organization of internal logistics processes directly affects the level of costs. For example, proper management of warehouse stocks allows you to reduce storage costs, and effective planning of delivery routes reduces transport and fuel costs.

Use of transport resources. The type and technical condition of vehicles affect the company's costs. The costs of depreciation, maintenance, repair and insurance of transport are a significant expense item. The use of outdated vehicles can lead to increased costs for fuel and repairs [28].

Inventory management. Suboptimal inventory management can cause unnecessary costs associated with storage, spoilage or loss of goods. The use of Just-in-Time methods or automated demand forecasting systems allows you to minimize storage costs and reduce frozen assets.

Logistics infrastructure. The efficiency of the location of warehouses, terminals, and distribution centers affects the company's costs. The optimal location of logistics facilities in relation to sales markets and suppliers allows you to reduce transportation costs.

Personnel qualifications. The level of training of employees, the efficiency of their work, and the ability to use modern logistics technologies and tools directly affect the company's costs. Unqualified personnel can cause losses due to accounting errors, improper planning of transportation, or warehouse operations [29].

Automation and digitalization. Using information technologies in logistics (GPS monitoring, robotic warehouses, blockchain for tracking supplies) allows you to reduce costs significantly, reduce the time for logistics operations, and minimize the risks of losses and errors [30].

Logistics costs are formed under the influence of external and internal factors that determine the efficiency of the company's operation. To reduce costs, enterprises must consider changes in the external environment, apply modern technologies, and improve internal logistics processes. The use of innovative inventory management methods, route optimization, implementation of digital solutions, and effective personnel management are the main tools for controlling and reducing logistics activities' costs.

1.3. Methods of Cost Management and Control in Logistics Enterprises

Effective cost management in logistics enterprises is crucial for maintaining profitability and competitiveness. Various methods can be employed to control costs while ensuring efficient logistics operations. These methods include activity-based costing (ABC), total cost analysis (TCA), Just-in-Time (JIT), lean logistics, automation and digitalization, and strategic outsourcing (fig.5).

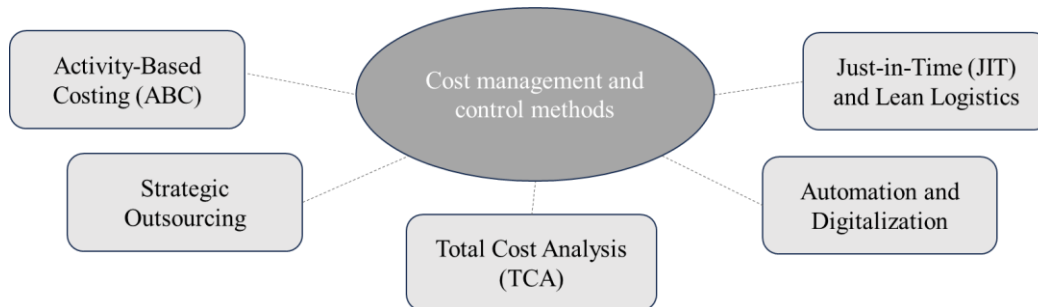


Fig. 5. Basic cost management and control methods for use in logistics enterprises

Activity-Based Costing (ABC) is a cost management method that assigns expenses to logistics activities based on their actual resource consumption rather than broadly distributed cost categories. This approach enhances cost transparency by identifying specific cost drivers, such as transportation, warehousing, inventory management, and order processing, allowing companies to allocate costs more accurately. Unlike traditional costing methods, which distribute overhead costs using general volume measures, ABC links expenses directly to operational activities, providing a more detailed view of financial resource usage [31].

The implementation of ABC in logistics involves several key steps. First, companies identify and categorize logistics activities, including inbound and outbound transportation, storage, order fulfillment, and administrative functions. Next, cost drivers are determined—these are the factors influencing the cost of each activity. For example, the number of shipments may drive transportation costs, storage costs may depend on warehouse space utilization, and order fulfillment costs may be influenced by the number of processed orders. Once these cost drivers are established, costs are grouped into activity-based pools, and cost rates are calculated based on actual usage. These activity rates are then used to allocate costs more precisely across products, customers, or services.

By implementing ABC, logistics enterprises can pinpoint inefficiencies and high-cost activities, such as excessive handling in warehouses, underutilized transportation capacity, or inefficient routing. The method enables businesses to optimize cost allocation within the supply chain, leading to better financial decision-making, improved pricing strategies, and enhanced profitability analysis. Furthermore, ABC helps companies evaluate the cost-to-serve different customers and product lines, allowing for more strategic resource allocation and process optimization. As a result, logistics firms can enhance their competitive edge by reducing unnecessary costs and improving operational efficiency.

Total Cost Analysis (TCA) is a comprehensive cost management approach that evaluates all cost components across logistics functions, including transportation, warehousing, inventory management, and administration. Unlike traditional cost accounting methods that may focus on individual cost elements in isolation, TCA considers the interdependencies between different logistics activities, ensuring a more accurate assessment of total system efficiency. This holistic perspective helps businesses identify hidden costs that might otherwise go unnoticed, such as inefficiencies in transportation routes, suboptimal warehouse utilization, excessive inventory holding costs, or administrative overhead.

The implementation of TCA involves several critical steps. First, all cost components related to logistics operations are identified and categorized. These typically include direct costs, such as fuel, labor, and storage fees, as well as indirect costs, such as order processing, customer service, and capital investments in infrastructure. Next, businesses analyze how these costs interact within the logistics network. For example, reducing inventory levels may lower storage costs but could lead to higher transportation expenses due to more frequent shipments. Similarly, opting for low-cost carriers might reduce transport expenses but increase the risk of delays and service disruptions, leading to higher customer service costs.

By using TCA, logistics enterprises can make more informed decisions that optimize overall cost efficiency rather than focusing on isolated cost factors. For instance, instead of simply minimizing transportation costs, a company may evaluate the trade-offs between transport, warehousing, and inventory costs to achieve the

lowest total logistics expenditure. Additionally, TCA enables businesses to assess the cost-to-serve different customer segments and product lines, leading to better pricing strategies and resource allocation. Research highlights that companies applying TCA are better equipped to avoid suboptimal decision-making and improve supply chain performance by balancing cost reduction with service quality [32]. Ultimately, TCA supports long-term cost efficiency by aligning logistics strategies with broader financial and operational objectives.

Just-in-Time (JIT) and Lean Logistics are strategic approaches that aim to enhance efficiency and reduce costs in logistics operations by minimizing waste and synchronizing supply chain processes with actual demand. JIT focuses on reducing inventory holding costs by ensuring that materials, components, and products arrive exactly when needed, thereby eliminating excessive stockpiling and reducing storage expenses. This approach requires precise coordination with suppliers, reliable transportation networks, and real-time demand forecasting to prevent disruptions in the supply chain. By implementing JIT, companies can significantly lower working capital requirements, reduce warehouse space usage, and minimize the risk of inventory obsolescence [33].

Lean Logistics, an extension of JIT, applies lean manufacturing principles to the entire logistics process, emphasizing the elimination of inefficiencies such as excess transportation, delays, unnecessary handling, and redundant processes. The core objective is to streamline operations, enhance resource utilization, and improve service levels while maintaining cost efficiency. Key lean logistics practices include optimizing transportation routes, consolidating shipments, implementing cross-docking strategies to reduce storage needs, and using automated systems for real-time tracking and demand forecasting.

Research highlights that companies adopting lean logistics principles can achieve substantial cost savings and operational improvements. For instance, reducing unnecessary transportation and optimizing delivery schedules lowers fuel consumption and vehicle maintenance costs. Similarly, eliminating redundant warehouse processes enhances labor productivity and reduces handling time. Womack and Jones (1996) emphasize that lean logistics not only improves financial performance by cutting costs

but also enhances customer satisfaction by ensuring faster and more reliable deliveries. Additionally, integrating lean logistics with digital technologies, such as IoT-based tracking and AI-driven predictive analytics, further enhances supply chain agility and responsiveness. Ultimately, JIT and lean logistics provide businesses with a competitive advantage by reducing waste, improving process efficiency, and ensuring a seamless flow of goods throughout the supply chain.

Automation and digitalization in logistics involve the integration of advanced technologies such as warehouse management systems (WMS), transport management systems (TMS), artificial intelligence (AI), and Big Data analytics to streamline operations, enhance decision-making, and reduce costs. WMS optimizes warehouse operations by improving inventory tracking, automating order picking, and reducing storage inefficiencies, leading to lower labor costs and minimizing inventory discrepancies. TMS enhances transportation efficiency by optimizing delivery routes, reducing fuel consumption, and improving fleet utilization through real-time tracking and predictive analytics. AI-driven logistics solutions analyze vast amounts of data to forecast demand, prevent stockouts, and optimize supply chain processes, ensuring cost-effective resource allocation and minimizing waste.

Big Data analytics plays a crucial role in improving logistics performance by identifying inefficiencies, predicting demand fluctuations, and optimizing supply chain networks. By analyzing historical and real-time data, companies can enhance delivery scheduling, reduce lead times, and mitigate risks associated with supply chain disruptions. Additionally, integrating IoT (Internet of Things) devices enables real-time monitoring of goods in transit, ensuring timely deliveries and reducing the risk of damage or loss. Automated robotic systems improve warehouse efficiency by handling repetitive tasks, reducing human error, and lowering labor costs.

Research confirms that digitalization significantly enhances logistics efficiency and reduces operational expenses. Hofmann and Rüsç [34] highlight that companies leveraging digital tools experience improved transportation and inventory control cost management due to more accurate forecasting and enhanced supply chain visibility. Moreover, blockchain technology is increasingly used to enhance transparency and security in logistics transactions, reducing fraud risks and improving trust between

supply chain partners. Ultimately, automation and digitalization lower operational costs and improve service reliability, responsiveness, and overall supply chain resilience, providing businesses with a competitive advantage in a rapidly evolving market.

Strategic outsourcing in logistics involves delegating specific supply chain functions - such as transportation, warehousing, inventory management, and distribution - to third-party logistics (3PL) providers. This approach allows companies to convert fixed logistics costs into variable costs, reducing capital expenditures on infrastructure, fleet maintenance, and personnel while improving overall efficiency. By leveraging the expertise, advanced technologies, and established networks of 3PL providers, businesses can optimize delivery routes, streamline inventory handling, and improve order fulfillment processes.

One of the primary advantages of outsourcing logistics is cost reduction, as 3PL providers benefit from economies of scale, better supplier relationships, and advanced logistics infrastructure that would be costly for individual firms to develop independently. For example, 3PL providers can consolidate shipments from multiple clients, reducing per-unit transportation costs and improving delivery speed. Additionally, outsourcing warehousing operations allows companies to scale storage capacity up or down based on seasonal demand, preventing unnecessary expenditures on underutilized facilities.

Beyond cost savings, strategic outsourcing enhances supply chain flexibility, allowing businesses to quickly adapt to changing market conditions, fluctuating demand, and geographic expansion without the need for large capital investments. Companies can also gain access to cutting-edge logistics technologies, such as real-time shipment tracking, automated warehouse systems, and predictive analytics, which improve decision-making and operational efficiency. Furthermore, outsourcing can mitigate risks associated with regulatory compliance, labor management, and customs procedures, as 3PL providers are often well-versed in international trade laws and industry standards.

Research suggests that outsourcing logistics functions leads to significant operational improvements. Bolumole et al. [35] highlight that companies utilizing 3PL

services experience enhanced service reliability reduced overhead costs, and improved customer satisfaction due to more efficient logistics execution. However, businesses must carefully select and manage their logistics partners to ensure alignment with strategic objectives, maintain service quality, and prevent dependency on external providers. Strategic outsourcing allows firms to focus on their core competencies while benefiting from specialized logistics providers' expertise, efficiency, and cost advantages.

Effective cost management in logistics enterprises ensures long-term profitability, operational efficiency, and competitive advantage. The integration of various cost control methods - such as Activity-Based Costing (ABC), Total Cost Analysis (TCA), Just-in-Time (JIT), lean logistics, automation, digitalization, and strategic outsourcing - enables businesses to optimize resource allocation, enhance supply chain efficiency, and minimize unnecessary expenses. Each approach provides unique benefits: ABC improves cost transparency and precision, TCA ensures holistic financial decision-making, JIT and lean logistics reduce waste and inventory costs, automation and digitalization streamline operations, and outsourcing leverages external expertise to improve flexibility and reduce overhead.

In the modern logistics landscape, digital transformation plays a crucial role in enhancing cost management strategies. Advanced technologies such as artificial intelligence, Big Data analytics, the Internet of Things (IoT), and blockchain improve real-time tracking, predictive analysis, and supply chain visibility, allowing businesses to respond swiftly to demand fluctuations and logistical challenges. Additionally, the integration of automation in warehousing and transportation reduces labor costs and enhances accuracy in inventory management.

By combining these cost control methods, logistics enterprises can achieve a balance between cost efficiency and service quality, ensuring sustainable growth in a highly competitive market. The successful implementation of these strategies not only lowers operational expenses but also improves customer satisfaction and overall supply chain resilience. Therefore, adopting a comprehensive and technology-driven approach to cost management is essential for logistics enterprises seeking to optimize performance and maintain long-term financial sustainability.

Conclusions for section 1

In conclusion, logistics costs represent a significant portion of operational expenses for businesses in the sector, directly affecting profitability and efficiency. A thorough understanding of cost concepts and classifications is essential for effective management of logistics operations. Costs can be categorized in various ways, including by their nature (fixed or variable), by their functional role (transportation, warehousing, inventory management, etc.), and by their attribution to services (direct or indirect). Each classification offers valuable insights into areas where costs can be controlled or optimized, enabling logistics companies to improve their financial performance. Efficient management of logistics costs is crucial for enhancing competitiveness, improving service quality, and ensuring long-term sustainability in a dynamic and competitive market.

Logistics costs are influenced by both external and internal factors that determine the overall efficiency of a company's operations. To reduce these costs, businesses must adapt to changes in the external environment, leverage modern technologies, and refine internal logistics processes. Key strategies for controlling and reducing logistics costs include the implementation of innovative inventory management techniques, route optimization, digital solutions, and effective personnel management. These tools are essential for improving cost efficiency in logistics activities.

Effective cost management in logistics enterprises requires a combination of strategic approaches and technological advancements. Methods such as ABC, TCA, JIT, lean logistics, automation, and outsourcing allow firms to identify inefficiencies, optimize resource utilization, and enhance supply chain performance. Digital transformation is crucial in modern cost control strategies, enabling real-time decision-making and operational efficiency. Logistics enterprises can maintain competitive advantages and improve financial sustainability by integrating these cost management techniques.

SECTION 2.

COST ANALYSIS AND CONTROL STRATEGIES USING THE EXAMPLE OF A LOGISTICS COMPANY KELI COMPANY

2.1. Characteristics and organizational structure of Keli Company

Keli Company, a subsidiary of the First Navigation Engineering Bureau of China, has a rich history that reflects its evolution in the navigation engineering sector. Founded in the early 2000s, Keli emerged in response to the growing demand for specialized engineering services in navigational construction, focusing on integrating modern technology with traditional methods. Over the years, the company has established itself as a leader in providing innovative solutions that address the complex challenges of navigation infrastructure development. The mission of Keli is to deliver high-quality engineering services that enhance maritime operations' safety, efficiency, and reliability. By prioritizing technological advancements and sustainable practices, Keli aims to support the strategic goals of the First Navigation Engineering Bureau while contributing positively to the global navigation engineering landscape.

The vision of Keli Company extends beyond immediate operational goals; it seeks to be a recognized leader in navigation engineering by cultivating a culture of excellence and continuous improvement. The company envisions a future where its innovative contributions transform maritime infrastructure and logistics operations, setting industry standards for performance and safety. This forward-thinking outlook is underpinned by a commitment to leveraging cutting-edge technology and digital integration to streamline engineering processes, improve project delivery timelines, and enhance overall operational efficiency.

Its core values are central to Keli's identity, which guide its strategic decisions and shape its organizational culture. These values include integrity, innovation, collaboration, and customer-centricity. Integrity reflects Keli's commitment to ethical practices and transparency in all dealings, fostering trust among clients, partners, and employees. Innovation is at the heart of Keli's operations, driving the development of new methodologies and technological solutions that keep pace with industry

advancements. Collaboration emphasizes the importance of teamwork, both within the organization and with external stakeholders, ensuring that diverse perspectives contribute to problem-solving and project success. Finally, a customer-centric approach ensures that the needs and expectations of clients are prioritized, leading to long-lasting relationships and successful project outcomes.

As an organization deeply embedded in the field of navigation engineering, Keli places significant emphasis on aligning its operational practices with industry standards and regulatory requirements. This alignment ensures compliance and reinforces Keli's reputation as a reliable provider of navigational infrastructure solutions. By fostering an environment of continuous learning and adaptation, Keli demonstrates its commitment to remaining responsive to the ever-evolving demands of the maritime industry.

Keli Company's strategic vision and adherence to core values have positioned it to tackle the complexities of modern navigation engineering. The company's historical foundation, mission, and vision are not merely statements but integral components of its operational framework, influencing every project and decision made. This alignment is crucial as Keli navigates through the competitive landscape of engineering and logistics, reinforcing its status as a key player in the sector. Through its commitment to quality, safety, and innovation, Keli is well-equipped to meet future challenges while contributing to the advancement of navigation engineering practices domestically and internationally.

The organizational structure of Keli Company is intricately designed to facilitate effective navigation engineering operations while promoting both innovation and efficiency. The company operates under a hierarchical framework that ensures clear lines of authority and communication among its various departments. At the helm is the Chief Executive Officer (CEO), responsible for the overarching strategic direction and management of the organization. Directly underneath the CEO are several key executives, each overseeing critical areas essential for operational success.

The organizational chart of Keli Company visually represents these interdepartmental relationships and the flow of information within the organization.

The organizational structure of a logistics company includes the following key departments (Fig. 6).

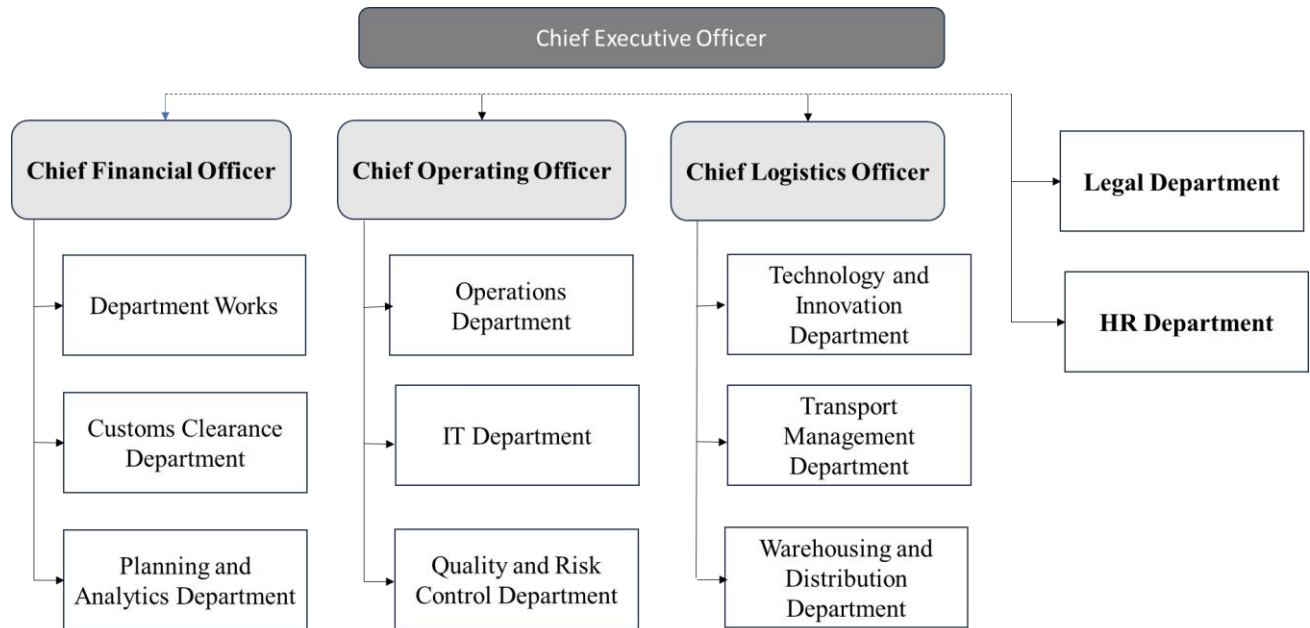


Fig. 6. The organizational structure of Keli Company

The senior management team is represented by:

Chief Executive Officer – responsible for strategic management, company development, and key decision-making.

Chief Financial Officer – oversees finances, budgeting, reporting, and risks.

Chief Operating Officer – manages the company's daily operations and optimizes processes.

Chief Logistics Officer – responsible for all logistics activities, supplies, and transport.

The **Operations Department** is pivotal in Keli and is tasked with planning and executing navigation projects. This department is responsible for resource allocation, project management, and ensuring all engineering processes meet client specifications and industry standards. The team comprises project managers, engineers specializing in various fields, and logistical coordinators who work together to ensure seamless project implementation.

Planning and Analytics Department - analyzes the efficiency of logistics processes and develops optimal routes and cost reduction strategies. Keli's **Planning and Analytics Department** also plays a significant role in overseeing the company's financial health. This department is responsible for budgeting, financial analysis, and

cost control measures. By maintaining strict financial oversight, the this Department ensures that projects are executed within budgetary constraints, thus maximizing overall profitability.

The Technology and Innovation Department is integral to Keli's commitment to technological advancement. This department is focused on research and development, exploring new engineering methodologies, and integrating digital technologies into existing processes. By fostering an environment of creativity and experimentation, the department ensures that Keli remains at the forefront of navigation engineering by adopting innovative solutions that enhance operational efficiency and project outcomes.

Transport Management Department – organizes transportation, cooperates with carriers, and monitors routes.

Warehousing and Distribution Department – is responsible for storing goods and managing warehouse stocks.

Support functions are equally crucial to Keli's success, as the Department Works manages workforce-related activities. This department focuses on recruitment, training, and employee development, ensuring all staff members possess the necessary skills and competencies to contribute to the company's goals. Regular training programs are implemented to keep employees abreast of the latest engineering practices and safety protocols.

Customs Clearance Department – handles documentary support for international transportation and cooperates with customs authorities.

The Sales and Marketing Department operates to foster and maintain relationships with clients and stakeholders. This team is responsible for understanding market trends and client needs, which informs project development and execution. Their efforts are critical in positioning Keli within the competitive landscape of navigation engineering as they strive to enhance customer satisfaction while expanding the company's market share.

IT Department - responsible for developing and implementing logistics information systems and GPS monitoring.

Lastly, the Quality and Risk Control Department ensures that all company operations adhere to legal standards and safety regulations. This department conducts regular audits and assessments to identify potential risks, ensuring navigation operations are conducted safely and legally. Keli mitigates potential liabilities by fostering a culture of compliance and safety while enhancing its reputation as a responsible engineering firm.

Legal and HR Departments - responsible for contractual relations, legal issues, recruitment, and personnel management.

This structure ensures effective management of the logistics company, process optimization, and high-quality customer service.

This structured approach allows Keli to operate effectively, respond promptly to client needs, and implement strategic initiatives that propel the company's mission and vision forward. Each department's roles and responsibilities are aligned with the overarching goals of Keli, ensuring that all activities contribute to the organization's growth and success in the domain of navigation engineering.

2.2. Assessment of the effectiveness of the company's business activities and existing cost control strategies

As a subsidiary of the First Navigation Engineering Bureau of China, Keli Company plays a pivotal role in the navigation engineering sector through its comprehensive logistical operations. Keli's logistics activities primarily focus on coordinating and managing materials, equipment, and personnel essential for navigation engineering projects. This involves an intricate web of supply chain processes, including the procurement of construction materials, transportation logistics, warehousing, project scheduling, and the distribution of resources to various project sites. Such operations are vital to maintaining efficiency and ensuring that projects are completed on time and within budget.

The company serves a diverse clientele comprising governmental agencies, private sector clients, and international partners involved in maritime infrastructure development. Keli has established a significant market positioning within this niche

through its commitment to quality and innovation in engineering solutions. The company's reputation for reliability in its logistical support has enabled it to secure contracts for large-scale projects, including port construction, dredging, and other critical infrastructure activities. This strategic positioning is further complemented by Keli's ability to adapt to the evolving demands of the navigation engineering sector, allowing it to maintain a competitive edge.

A critical aspect of Keli's logistical operations is its engagement with subcontractors. The company relies on a network of specialized subcontractors who contribute specific skills and resources, enhancing the overall efficiency of the logistical framework. Effective collaboration with these external partners is essential for bolstering operational capacity and ensuring that project timelines are adhered to. Keli employs rigorous evaluation processes to select subcontractors, focusing on their track record, capabilities, and alignment with Keli's operational standards. This strategic integration of subcontractors not only augments Keli's logistical effectiveness but also fosters innovation and flexibility within the company's operational model.

Furthermore, Keli employs advanced digital integration techniques to streamline logistical operations. The incorporation of logistics management software has allowed for real-time tracking of materials and equipment, improving visibility throughout the supply chain. By leveraging technology, Keli enhances its ability to manage inventory, forecast demand, and optimize transportation routes. This digital approach significantly minimizes delays and reduces operational costs, aligning with the company's strategic goals of efficiency and responsive service delivery.

Market analysis reveals that Keli's logistical operations are benchmarked against industry best practices. Key performance indicators (KPIs) such as delivery timelines, cost per project, and resource utilization rates are meticulously monitored to ensure Keli remains at the forefront of the industry. Recent performance reports indicate an upward trend in delivery efficiency, contributing to Keli's ability to maintain strong market share amidst growing competition. The company's proactive stance in adopting innovative logistics practices places it in an advantageous position to capitalize on emerging opportunities within the maritime construction sector.

In summary, Keli Company’s logistics operations are critical to its success in navigation engineering. Through strategic collaborations, advanced digital integrations, and a clear focus on performance metrics, the company effectively meets the demands of its clients while positioning itself favorably within a competitive market landscape. By continuously refining these logistical activities, Keli enhances its operational capabilities and strengthens its overall market presence in the navigation engineering industry.

The study of the company's financial condition allowed us to draw generalized conclusions about it.

Kelly's Company, demonstrated steady revenue growth from 2020 to 2023, with revenues increasing from 250 million yuan in 2020 to 345 million yuan in 2023 (Table 2.1. and Figure 6).

Table 2.1.

Kelly Company's total revenue growth rate for the period 2020-2023		
Years	Total Revenue (million CNY)	Year-over-Year-Growth, %
2020	250	-
2021	270	8
2022	308	14
2023	345	12

Kelly is showing steady growth in total revenue over 2020–2023, increasing from CNY 250 million to CNY 345 million, an increase of 38%. The highest growth rates were observed in 2022 (14%), after which they were observed in 2023 to 12%, which may indicate saturation or a change in external economic conditions.

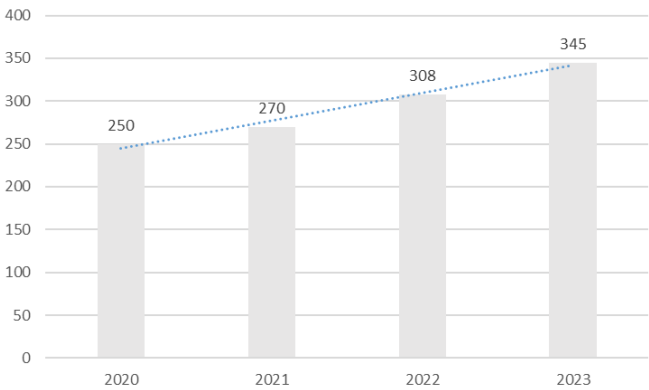


Fig. 6. Total Revenue (million CNY) Kelly's Company

Despite this, the overall trend remains positive, indicating an effective business strategy and stable demand for the company's products or services. It is worth assessing risk opportunities, opening up new market opportunities, and investing in innovation or business process optimization to maintain Kelly's growth momentum.

For 2022, the company had the following results (table 2.2.).

Table 2.2.

The Kelly Company's financial results for 2022

Metric	Amount (million CNY)	Margin, %
Gross profit	120	40,0
Operating profit	80	26,7
Net profit	65	21,7

Kelly Company's financial results for 2022 demonstrate efficient operations and high business profitability. The gross margin is 40%, which indicates the company's ability to maintain a high-profit level after considering the cost of production. Operating profit amounted to CNY 80 million, and its margin of 26.7% demonstrates effective management of operating expenses. Net profit of CNY 65 million with a margin of 21.7% confirms the company's financial stability and ability to generate significant income after paying taxes and other financial expenses. The financial indicators indicate high business profitability, creating favorable conditions for further growth and development.

In 2023, the company reported total revenue of 1,072.18 million yuan, compared to 1,060.5 million yuan in 2022, and net profit was 312.43 million yuan, an increase from 260.12 million yuan in the previous year.

The main risks faced by Kelly are as follows.

The company operates in a highly competitive environment, marked by internal and external risks that could affect its financial condition. Understanding these risk factors is crucial for investors.

Industry competition. Competitive risks in the logistics industry are associated with a high level of market rivalry, which can lead to a decrease in the company's rates and margins. The large number of players in the market, including international corporations and regional carriers, creates pricing pressure and forces the company to constantly improve its services. Technological innovation is an important factor,

without which competitors who are faster in implementing automated logistics management systems can gain significant advantages. In addition, consumers are increasingly focused on speed, flexibility, and quality of service, so companies that cannot offer competitive service risk losing customers. Strategic alliances between large players also have an impact, which can change the balance of power in the industry, limiting the opportunities of smaller companies. Another risk is the entry of new participants into the market who can offer innovative solutions or more attractive terms of cooperation. To minimize these risks, logistics companies should invest in modernization, improve the quality of services, expand the delivery geography, and form long-term partnerships with the client.

Operational risks. The company's operational risks include delays in delivery due to weather conditions, transport accidents, or malfunctions, which can lead to disruptions in delivery times. A significant risk is problems with warehouse inventory management, which can cause shortages or surpluses of products, affecting the company's financial stability. IT system failures also have an impact, which can cause errors in cargo accounting, route tracking, or customer communication. In addition, it is worth considering risks associated with the human factor, such as personnel errors, violations of labor discipline, or insufficient qualifications of employees, which can reduce the efficiency of operations. Also important are legal and regulatory risks associated with changes in legislation, customs procedures or environmental standards, which can complicate international transportation. Thus, in 2023, due to unforeseen delays, the company had additional costs of 5 million US dollars. In general, operational risk management requires a comprehensive approach, including the implementation of modern technologies, optimization of logistics processes, and careful control of all stages of supply.

Financial risks in the company include currency fluctuations, which can negatively affect costs and revenues when carrying out international transportation or purchases. Another risk is changes in fuel prices, which are a significant cost item in logistics. A sharp increase in fuel prices can significantly increase transportation costs and reduce the profitability of companies. In addition, high levels of customer debt can cause financial problems if the company is unable to pay for services provided, which can affect liquidity. Credit risks are also important, especially for companies that depend on external finance or investment for development. Changes in legislation and

tax policy can increase additional financial burdens or change the conditions for doing business, posing risks to financial stability. The debt-to-equity ratio in 2023 was 1 to 2, which indicates a moderate level of financial leverage. An important component of financial risks is the instability of the country's economic situation or international markets, which can affect the demand for logistics services and reduce overall profits. Managing these risks requires an effective financial strategy, insurance against currency and fuel fluctuations, diversification of the customer base, and constant monitoring of the economy.

To illustrate these risks, Table 2.3 presents key financial statements of Kelly Company.

Table 2.3.

Key indicators of Kelly Company's financial statements for 2022-2023.

Financial metric	2023 (Q2)	2022 (Q2)	% Change
Revenue	\$45 million	\$40 million	12,5%
Net Income	\$7 million	\$6 million	16,7%
Operating Margin	15%	13%	2%
Debt-to-Equity Ratio	1,2	1,0	20%
R&D Investment	\$3 million	\$2,5 million	20%

Analyzing Kelly's financial performance for 2022-2023, several risks can be identified that could negatively impact its financial stability.

First, the increase in the debt-to-equity ratio from 1.0 to 1.2 by 20% is a significant signal for increased financial risks. This indicates that the company has become more dependent on external borrowings, which in conditions of economic instability, changes in interest rates or fluctuations in exchange rates can lead to increased debt service costs and reduced financial flexibility. In the event of adverse economic conditions, a high level of debt can become an obstacle to the company's further development.

Second, although the operating margin increased by 2% (from 13% to 15%), this small increase indicates that the company has not had time to significantly improve its operating efficiency, which may limit opportunities for further profitability growth. If costs do not decrease or income does not grow faster, this may lead to a decrease in future rental capacity.

Third, investment in research and development (R&D) increased by 20% and amounted to \$ 3 million, a positive aspect of the company's long-term development. However, investment in R&D may not bring negative results, which creates risks associated with possible support in the commercialization of new technologies or products. If new developments do not bring expected income, this may put the company in a serious financial position.

Overall, the company shows positive growth rates in revenue and profit, but the increase in debt load and R&D investment costs require important financial stability monitoring. The lack of a significant increase in operating margin may also indicate limited opportunities for further growth, which creates certain financial risks.

A SWOT analysis was conducted to identify strengths, weaknesses, opportunities, and threats that are crucial for understanding Keli's operating situation (Table 2.4.).

Table 2.4

Results of the SWOT analysis of Kelly's company

Category	Factors
Strengths	<ul style="list-style-type: none"> - Strong reputation in the navigation technology industry - Support from China's First Navigation Engineering Bureau - Top technical foundation and innovative development - Active digital integration and use of advanced technologies - High efficiency in project implementation and customer satisfaction
Weaknesses	<ul style="list-style-type: none"> - Lack of a comprehensive management system - Problems with coordination between departments - Lack of systematic evaluation of subcontractors - Inefficient financial management and risk of budget overrun - Gaps in compliance with regulatory requirements
Opportunities	<ul style="list-style-type: none"> - Implementation of an improved management system - Development of quality control mechanisms of business entities - Optimization of financial processes and increased cost control - Investment in training and advanced training of personnel - Market expansion and international expansion
Threats	<ul style="list-style-type: none"> - Competition from other high-tech companies - Regulatory risks and potential fines for non-compliance - Fluctuations in production and resource costs - Instability in the work of subcontractors - Changes in the global technological environment requiring rapid adaptation

Kelly's SWOT analysis highlights a combination of significant strengths and critical weaknesses that shape its current position and future prospects in the navigation technology industry. The company has a strong reputation, a solid technical base, and continuous innovation that ensure high project performance and customer satisfaction. In addition, Kelly's active integration of advanced digital technologies further

strengthens its competitive position. However, the company faces several challenges, including the lack of a comprehensive management system, coordination issues between departments, and the lack of systematic evaluation of subcontractors. Inefficient financial management and regulatory compliance deficiencies also pose risks to operational sustainability. To address these weaknesses and seize growth opportunities, Kelly should focus on improving its management system, strengthening quality control mechanisms, streamlining financial processes, and investing in workforce development. Entering international markets and strengthening cost management will also contribute to long-term sustainability. However, external threats such as intense competition, regulatory risks, cost fluctuations, and technological changes require a proactive approach to adaptation and risk mitigation. By addressing these challenges strategically, Kelly can gain a competitive advantage and ensure sustainable growth in an evolving global landscape.

The challenges identified during the study were resource allocation and workflow management.

Resource allocation was a critical issue, often characterized by an uneven distribution of personnel and equipment across projects. In several cases, resources were overly focused on projects that did not align with the company's strategic priorities, while other high-potential projects suffered from a lack of support. This misallocation resulted from a reliance on historical project data that did not consider current market dynamics or new technological needs. As a result, this led to project delays and the need for overtime, affecting productivity and employee morale.

Workflow management also showed significant weaknesses. Existing systems relied heavily on traditional methodologies that were poorly integrated with modern technologies. Despite the company's laudable position in navigation technology, its engineering processes were often plagued by red tape and bureaucratic bottlenecks. For example, project approval stages were lengthy due to manual documentation processes that required multiple signatures across departments. Such red tape led to delays in decision-making, frustrated employees, and wasted time and resources that could have been allocated elsewhere.

Cost control is a critical issue that significantly impacts the financial health and operational efficiency of Keli Company. During the internship, several inefficiencies in financial management practices were identified, leading to unnecessary expenditures

and diminished profitability. One notable inefficiency lies in the budgeting process, where there appears to be a lack of alignment between project forecasts and actual spending. Projects often exceed their allocated budgets due to inadequate preliminary cost assessments and the absence of stringent budgetary controls. This mismatch creates a ripple effect, straining resources and limiting the company's ability to invest in strategic initiatives or technological upgrades.

Another area contributing to financial inefficiency is the procurement process. Keli's existing vendor selection criteria prioritize cost over quality, frequently resulting in partnerships with suppliers that offer subpar materials or services. These decisions compromise the integrity of projects and lead to increased costs associated with rework, shipment delays, and warranty claims. The absence of a robust supplier evaluation framework prevents the company from leveraging competitive pricing effectively, which is pivotal in an industry where materials constitute a significant portion of project costs.

Labor costs represent another substantial area of financial waste. During the internship, it became evident that labor hours are often logged without proper oversight, leading to inflated payroll expenses. In several instances, employees were found to be engaged in activities unrelated to their core responsibilities, which not only reduces productivity but also increases labor costs. The lack of a systematic approach to monitoring employee performance and adjusting roles based on usage and demand contributes to this inefficiency. Implementing performance metrics that align employee output with project requirements could alleviate this burden and foster a more disciplined approach toward labor allocation.

Additionally, wasteful practices permeate Keli's operational routines, such as excess inventory management. The firm maintains high safety stock levels to mitigate risks of supply chain disruptions, yet this practice ties up substantial capital that could be otherwise allocated to more productive uses. An inconsistent inventory turnover ratio indicates overstocking issues and highlights the need for improved demand forecasting methods. By adopting a just-in-time inventory system and enhancing collaboration with suppliers, Keli can optimize its stock levels, reduce holding costs, and free up cash flow for strategic investments.

Adhering to regulatory standards also surfaces as a pivotal aspect of financial management. Several compliance-related expenditures were uncovered during the

internship, revealing inefficiencies in meeting legal requirements. Ensuring compliance tends to be reactive rather than proactive, leading to rushed implementations of costly changes or fixes. A shift towards a more systematic approach that integrates compliance into the company's operational framework would minimize the associated costs and enhance the company's reputation and reliability in the market.

Overall, Keli Company faces various financial inefficiencies, from inadequate cost control measures, ineffective supplier management, inflated labor costs, excessive inventory, and compliance-related expenditures. Addressing these areas through strategic financial practices, comprehensive supplier evaluations, labor performance assessments, inventory optimization, and a proactive compliance framework could significantly enhance the company's financial health and operational efficiency. Identifying and remedying these inefficiencies will ensure that Keli is better positioned to compete in the navigation engineering sector while maximizing profitability and investment potential.

In addition, subcontractor coordination posed significant challenges, particularly regarding communication and performance tracking. Keli's reliance on numerous subcontractors to meet project requirements often resulted in inconsistent quality of work and safety compliance. The lack of a formal performance appraisal system for subcontractors meant that partners who performed poorly could continue working without scrutiny. Communication gaps became apparent during joint projects, as subcontractors' differing work standards and expectations hindered smooth execution. These inconsistencies affected the project's quality and increased the risks associated with delays and non-compliance with contractual obligations. Assessing the effectiveness of a logistics company's cost control strategies involves analyzing key financial and operational indicators and using appropriate assessment methods (Table 2.5).

Effective cost control is a critical aspect for any logistics enterprise, even if small failures in management costs can significantly affect the company's overall financial stability and profitability. Regular analysis of costs and the introduction of modern technologies for their optimization allow not only the reduction of overall costs but also the increase in the efficiency of operations.

Table 2.5

Basic criteria, methods of performance evaluation, and assessment of the effectiveness of current strategies

Criteria	Name of criterion or method	Contents
Main assessment criteria	Operating costs	comparing actual costs with planned indicators and industry standards
	Transportation cost level	the share of transportation costs in total logistics costs
	Warehouse costs	costs for storage, cargo handling, space and equipment use
	Transport load factors	the efficiency of vehicle use
	Technological efficiency	the implementation of automation and digital solutions in logistics processes
	Delivery time and timeliness of order fulfillment	assessing compliance with lines and planned schedules
Methods of assessing effectiveness	Financial analysis	Analysis of the cost of services and cost dynamics
		Profitability of logistics operations
	Benchmarking	Comparison of costs with competitors' indicators and industry norms
	ABC and XYZ analysis	Identification of the largest costs of processes and priority categories of costs
	SWOT analysis	Assessment of the strengths and weaknesses of the cost control strategy
	Productivity ratios	Analysis of costs per 1 km of transportation or per 1 unit of cargo
Assessment of the effectiveness of current strategies	Route optimization	reduction of transportation costs
	Automation of warehouse operations	reduction of personnel costs
	Implementation of outsourcing	reduction of capital investments in vehicles

One of the key strategies is route optimization, which allows to reduce transportation costs. Using a GPS system and analytical tools for route planning allows to significantly reduce the time and cost of transporting goods, choosing the most optimal and economically advantageous routes. This also reduces fuel costs and increases transport operations' overall efficiency.

Another important strategy is the automation of warehouse operations, which significantly reduces personnel costs and minimizes errors associated with the manual management of warehouse processes. The use of automated systems for storing, moving, and handling goods, as well as the integration of automated inventory management systems, also ensures the efficiency of warehouse operations and reduces labor costs.

Outsourcing is another step towards reducing capital investment in own vehicles and equipment. Before all outsourcing operations, the company can reduce the costs of maintaining its own fleet and other infrastructure costs by focusing on core business processes.

However, the company also faces risks such as inflexible planning and outdated technologies. Inflexible planning can lead to unforeseen costs if changes in the market or transportation conditions are not considered in real-time. Outdated technologies increase operating costs due to low efficiency and the need for more human resources for data processing and operation management.

The company should implement modern technologies such as TMS (Transport Management System) for transportation management to increase efficiency. This system allows you to automate the processes of planning, monitoring, and evaluating transportation efficiency, which reduces administration costs and, ultimately, the accuracy of operations.

Also, IoT solutions for monitoring transport and warehouses must receive real-time data on the status of vehicles, cargo, and warehouse stocks, which allows you to respond quickly to changes in the situation and optimize maintenance costs.

The introduction of dynamic pricing for cost management will help optimize transportation tariffs depending on market conditions, which allows you to achieve greater profitability and provide flexibility in response to changes in the company's demand or resource costs.

As a result of the comprehensive implementation of these strategies and technologies, the company can significantly increase the efficiency of its activities, reduce costs, and ensure stable development in a competitive environment.

Performance metrics play a crucial role in assessing the efficiency and effectiveness of Keli Company, particularly in its logistical operations. The company has established several key performance indicators (KPIs) that reflect its operational success and market positioning. One of the primary metrics used is delivery efficiency, which gauges the average time taken to complete deliveries against the expected timeframes. Data indicates that Keli has achieved a delivery efficiency rate of 92%, a figure that significantly outperforms the industry average of approximately 85%. This high level of efficiency can be attributed to the company's robust logistics network and effective resource management strategies.

Market share is another critical performance indicator for Keli. Recent analyses reveal that the company holds a 15% share of the navigation engineering market within the region, positioning it as one of the leading players. This market share growth can be traced back to a series of strategic partnerships and expansion initiatives that Keli has undertaken over the past few years, enabling it to tap into new client bases and diversify its service offerings. Furthermore, Keli has demonstrated strong revenue growth, with a reported annual increase of 10% in the previous fiscal year, reflecting both increased demand for navigation engineering solutions and enhanced operational capabilities.

The company employs advanced data analytics tools to dissect these performance metrics further, allowing for real-time operations tracking. Such tools provide insights into performance trends and facilitate immediate corrective actions when inefficiencies are detected. For instance, during the internship, it was observed that the company utilizes a comprehensive system of dashboards that visually represent KPIs related to order fulfillment and customer satisfaction. These dashboards enhance transparency and enable management to make informed decisions quickly.

Customer satisfaction is another pivotal metric evaluated through regular surveys and feedback mechanisms. Keli enjoys a customer satisfaction rating of 4.5 out of 5, which attests to its commitment to providing high-quality service and maintaining strong client relationships. The feedback loops established by the company ensure that any grievances are promptly addressed and that improvements can continually be made to service delivery. Such direct engagements with clients serve as a measure of performance and a vital input for future strategic planning.

Regarding resource allocation, Keli has implemented performance metrics that optimize the use of both human and material resources. By evaluating worker productivity and equipment utilization rates, the company maintains an agile workforce capable of responding to varying project demands without compromising on quality. Recent data demonstrated that worker productivity increased by 15% following introducing a new employee training initiative, which directly contributed to meeting project timelines more effectively.

Additionally, cost control is an essential aspect of Keli's performance metrics. The company has established benchmarks for operational costs that are continuously monitored against industry standards. During the internship, it was assessed that Keli's

logistics costs represented approximately 12% of its total revenue, which is below the industry average of 15%. This efficient management of logistics costs indicates a proficient operational strategy that effectively balances expense and service quality, ultimately driving profitability.

Keli's emphasis on performance metrics enhances operational accountability and aligns with its long-term strategic objectives in the competitive navigation engineering sector. By continuously monitoring these metrics, the company is well-positioned to adapt to changing market conditions and to implement innovations that further solidify its role as a market leader.

Conclusions for section 2

The current management system at Keli Company demonstrates a structural alignment with the organization's overarching goals, although several areas require further optimization. Keli Company's primary objective is to enhance its competitive stance in the navigation engineering sector while fostering innovation and efficiency. The existing management framework emphasizes a top-down approach where senior management formulates strategic decisions and disseminates them downward through the organizational hierarchy. While this facilitates a clear direction and unified purpose, it may inadvertently stifle creativity and responsiveness among lower-level employees who often interact directly with operational challenges.

Overall, while Keli Company's management system possesses fundamental elements that align with its strategic goals, significant improvements are necessary to exploit growth opportunities fully. Enhancing feedback mechanisms, integrating advanced management technologies, promoting a collaborative culture, and standardizing project management practices are critical steps that would foster a more agile and innovative organization. Without addressing these areas, Keli risks falling short of its ambitions in the dynamic landscape of navigation engineering, where speed and adaptability are paramount for success. The commitment to reevaluating and evolving its management systems is essential for Keli to not only align effectively with its goals but also to remain competitive in the market.

Kelly's Company, demonstrated steady revenue growth from 2020 to 2023, with revenues increasing from 250 million yuan in 2020 to 345 million yuan in 2023. Kelly is showing steady growth in total revenue over 2020–2023, increasing from CNY 250 million to CNY 345 million, an increase of 38%. The highest growth rates were observed in 2022 (14%), after which they were observed in 2023 to 12%, which may indicate saturation or a change in external economic conditions.

Kelly Company's financial results for 2022 demonstrate efficient operations and high business profitability. The gross margin is 40%, which indicates the company's ability to maintain a high-profit level after considering the cost of production. Operating profit amounted to CNY 80 million, and its margin of 26.7% demonstrates effective management of operating expenses. Net profit of CNY 65 million with a margin of 21.7% confirms the company's financial stability and ability to generate significant income after paying taxes and other financial expenses. The financial indicators indicate high business profitability, creating favorable conditions for further growth and development.

In 2023, the company reported total revenue of 1,072.18 million yuan, compared to 1,060.5 million yuan in 2022, and net profit was 312.43 million yuan, an increase from 260.12 million yuan in the previous year.

Kelly Company is showing positive revenue and profit growth; however, several financial risks warrant close attention. An increase in the debt-to-equity ratio of 20% indicates a greater financial reliance on borrowing, which could reduce flexibility in adverse economic conditions. While operating margins improved somewhat, a modest 2% increase indicates limited efficiency gains, potentially limiting future profitability. In addition, higher investments in research and development support long-term innovation but carry risks if new developments do not deliver the expected returns. Overall, despite the positive financial trends, rising debt, modest efficiency gains, and uncertain returns on R&D create potential risks to financial stability that require ongoing monitoring.

Kelly's SWOT analysis highlights its strong industry reputation, technical expertise, and digital innovation as key strengths. However, issues such as weak governance systems, poor coordination, gaps in subcontractor evaluation, and financial

inefficiency pose risks. To ensure sustainable growth, Kelly needs to improve management practices, improve quality control, streamline finances, and invest in workforce development. International expansion and strengthened cost management will contribute to stability, while proactively adapting to competition, regulation, and technological change will ensure long-term success.

The challenges identified in the study are resource allocation and workflow management, and subcontractor coordination, which contribute to increased risk and reduced productivity, requiring immediate attention and strategic intervention. Improving these key areas will not only contribute to a more productive work environment but will also improve the company's reputation and financial performance in the long term.

SECTION 3

IMPROVING COST CONTROL STRATEGIES IN LOGISTICS ENTERPRISES

3.1. Introduction of modern technologies and cost optimization methods

The introduction of modern technologies and cost optimization methods in logistics companies in China is extremely relevant given the rapid development of e-commerce, globalization of markets and growing demands for speed and efficiency of transportation. China is a world leader in logistics due to the development of infrastructure, large-scale investments in transport networks and innovative approaches to supply chain management. Increasing costs for fuel, personnel, warehouse rental and environmental restrictions force companies to introduce modern cost optimization methods.

The need to introduce new technologies is explained by high competition among logistics operators, reduction of operating costs and increased accuracy of demand forecasting. Automation of logistics processes, application of artificial intelligence and analysis of big data contribute to improving warehouse inventory management, optimization of transportation routes and reduction of costs of administrative processes. The use of autonomous vehicles, drones for delivery, robotic warehouse systems and blockchain for cargo tracking allows to significantly increase the efficiency of logistics operations.

The main directions of modern technology implementation in logistics companies in China include the digitalization of logistics processes, the use of the Internet of Things (IoT) for real-time monitoring of transportation, the use of artificial intelligence to optimize routes and requests, and the forecast expansion of the network of automated warehouses. Green technologies such as electric trucks, energy-efficient warehouses and the use of renewable energy sources also play an important role, allowing not only to reduce costs, but also to meet modern environmental standards.

Therefore, the integration of modern technologies into the logistics system of China is a strategic step to maintain competitiveness in the global market. The use of

innovative methods allows companies to reduce costs, improve service quality and ensure sustainable development in the long term.

In the context of applying lean management theories to Keli Company's operational challenges, it is crucial to understand the fundamental principles of lean thinking, which prioritize the elimination of waste and the enhancement of processes to add value to the customer. By focusing on reducing non-value-adding activities, Keli can achieve significant cost control and improved efficiency across its operations.

A comprehensive analysis of the company's current operational processes reveals several areas where waste can be identified and addressed. For instance, the practice of just-in-case inventory management leads to excessive stock levels and associated holding costs, which do not align with the lean principle of just-in-time inventory. Transitioning to a just-in-time model would not only minimize inventory costs but also enhance flow efficiency, allowing Keli to meet customer demands more responsively.

Process mapping, a core component of lean management, can provide insight into the workflow inefficiencies within Keli's logistics operations. By visually outlining each step involved in the logistical activities, the company can identify bottlenecks where delays occur, leading to unnecessary resource allocation. For instance, if certain subcontractors are consistently lagging in their delivery timelines, analyzing these patterns may reveal the need for improved communication protocols or reevaluation of the subcontractor selection criteria to ensure alignment with Keli's operational standards.

Another lean principle, the focus on continuous improvement, can be instrumental in driving employee engagement and operational excellence. Implementing regular training workshops that introduce employees to lean methodologies can foster a culture of proactive problem-solving. When employees at all levels are empowered to suggest improvements in their daily operations, Keli can expect to see enhanced productivity and a reduction in redundant practices that lead to wasted time and resources.

Furthermore, the application of value stream mapping can help Keli analyze their supply chains more effectively by visualizing the flow of materials and information.

This technique allows the company to assess the value added at each stage of the process, helping to pinpoint which activities contribute to waste and which enhance value. By streamlining these processes, Keli can achieve not only cost reductions but also improve service quality and customer satisfaction, thereby solidifying its competitive market position.

Implementing a feedback loop, as suggested by lean management, will enable Keli to continuously monitor the effectiveness of the changes enacted. By establishing key performance indicators (KPIs) focused on efficiency, quality, and cost savings, the company can maintain a pulse on its operational performance. Regular assessments and adaptations based on these metrics are crucial for sustaining a lean environment, ensuring that Keli remains agile and responsive to market fluctuations.

Finally, fostering a collaborative atmosphere between Keli and its subcontractors can further reinforce lean practices. Establishing clear communication channels and regular evaluation of subcontractor performance can eliminate the inefficiencies that arise from misalignment of goals or expectations. By aligning the interests of all stakeholders within the supply chain, Keli can cultivate a more streamlined, cohesive operational strategy that delivers value efficiently.

Keli's cost reduction proposals (ranked by priority) are presented in Figure 7.

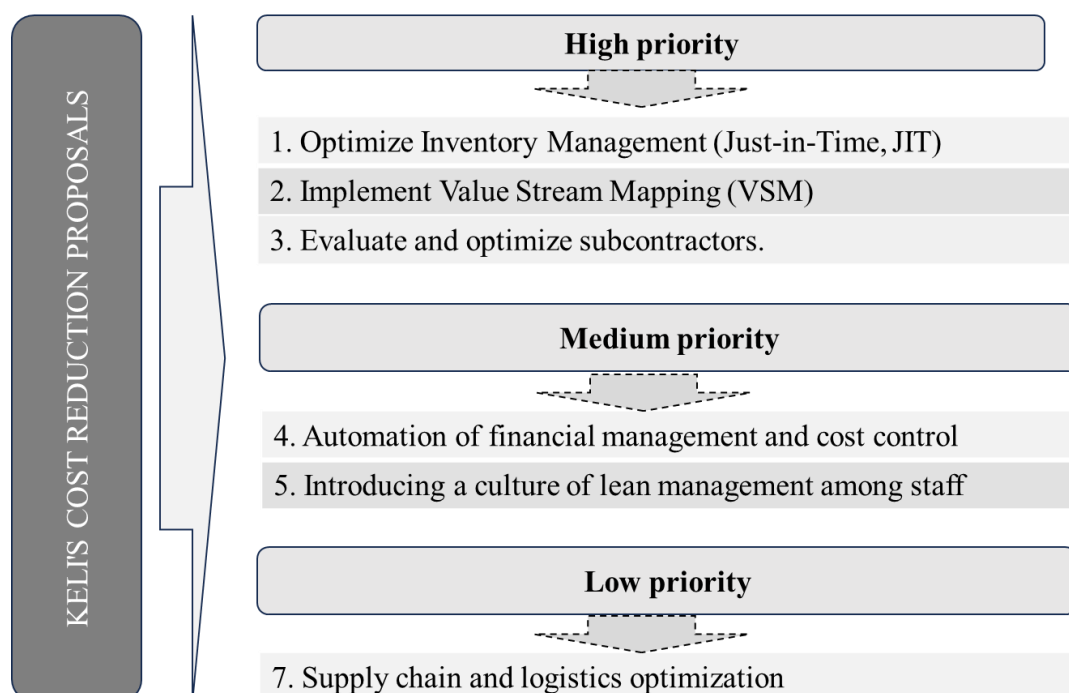


Fig. 7. Keli's cost reduction proposals (ranked by priority)

1. Optimize Inventory Management (Just-in-Time, JIT). High priority – minimize inventory storage and maintenance costs and reduce excess resources.

This involves the following actions - transition to a just-in-time (JIT) system to reduce storage volumes, use predictive analytics for accurate material requirements planning, and integrate digital solutions for real-time inventory control.

2. Implement Value Stream Mapping (VSM). High priority – identify bottlenecks in logistics and production processes and eliminate redundant operations.

This involves the following actions - visually model all key company processes, identify and eliminate non-value-added operations, and optimize internal and external logistics routes.

3. Evaluate and optimize subcontractors. High priority – eliminate costs due to delays and poor quality of subcontractors' work.

What is implemented through the following actions - developing clear criteria for selecting subcontractors, regularly auditing their activities and compliance with standards, and using outsourcing only for critical services.

4. Automation of financial management and cost control has a medium priority - improving cash flow management, minimizing waste.

The following actions are planned - introducing automated budgeting and financial control systems, regular analysis of the effectiveness of operating costs and reviewing contracts and procurement terms to obtain more favorable prices.

5. Introducing a culture of lean management among personnel also has a medium priority - increasing productivity, involving employees in cost optimization.

The direction of action includes: organizing training seminars on lean management methodology, introducing a system of suggestions for improving efficiency from employees, implementing KPIs for monitoring costs at the unit levels.

6. Using digital technologies and analytics also has a medium priority - reducing costs through process automation.

What needs to be done - ERP system integration to control resources and costs, use predictive analytics for effective planning and automation of routine operations to reduce labor costs.

7. Supply chain and logistics optimization has a low priority - long-term cost reduction through improved logistics processes.

It involves the implementation of the following actions - using strategic partnerships with suppliers to reduce costs, consolidating purchases to obtain discounts, optimizing delivery routes and warehouse operations.

The implementation of these measures allows Keli to significantly reduce costs, increase operational efficiency and strengthen its competitive position.

Another key industry focus is cost-effective management and cost optimization. Companies like Van Oord are implementing just-in-time (JIT) inventory systems and predictive maintenance strategies to minimize downtime and reduce costs. In contrast, Keli's approach to inventory management, which still maintains higher-than-optimal inventory levels, results in higher holding costs and reduced financial flexibility. Moving to a JIT model, combined with digital tracking tools, can significantly improve cost efficiency and cash flow.

In terms of process mapping and workflow efficiency, leading competitors are using Value Stream Mapping (VSM) to identify bottlenecks and optimize operations. Keli has begun to implement process visualization techniques, but their implementation remains inconsistent across departments. A more structured approach, such as integrating real-time data analytics to optimize workflow, could help Keli reduce process inefficiencies and reduce response times to disruptions.

In terms of supplier and subcontractor management, industry leaders such as Boskalis have rigorous supplier evaluation systems and data-driven performance metrics to ensure reliability. Keli's current methods for evaluating subcontractors appear less structured, leading to inconsistent service levels and potential project delays. Strengthening supplier selection criteria and monitoring through key performance indicators and performance-based contractual incentives could mitigate these issues.

Finally, in the area of workforce development and continuous improvement, top-tier companies are investing heavily in employee training programs on lean manufacturing methodologies and automation systems. While Keli provides periodic training, it lacks a comprehensive training program focused on emerging industry trends, such as AI-based project management or IoT-based equipment monitoring.

Expanding training initiatives could increase workforce adaptability and drive innovation.

A summary of key data from the company benchmarking is presented in Table 3.1.

Table 3.1.

Key Benchmarking Highlights Summar			
Aspect	Industry Benchmark (Van Oord, Dredging, International)	Current Keli Practice	Opportunity for improvement
Technology Integration	AI-based Automation, Autonomous Equipment	Traditional Equipment	Invest in AI, IoT, automation
Inventory Management	Just-in-time, Predictive Inventory Control	High Inventory Level	Implement JIT, digital tracking
Process Efficiency	Value Stream Mapping, Real-time Analytics	Partial Process Mapping	Extend VSM, integrate real-time monitoring
Supplier Management	Data-driven KPI, Rigorous Evaluation	Limited Performance Tracking	Standardized KPIs, performance-based contracts
Employee Training	In-depth Lean Learning, Digital Upskilling	Basic Periodic Training	Develop continuous learning programs

Through the rigorous application of lean management theories, Keli Company can substantially improve cost control and operational efficiency. By embedding these practices into the organizational culture and continuously striving for operational excellence, Keli can enhance its bottom line and elevate its service offerings, ensuring future competitiveness in the navigation engineering sector.

By aligning its practices with industry standards, Keli can strengthen its market position, reduce costs, and improve overall operational efficiency.

3.2. Recommendations for improving the effectiveness of cost control strategies

The modern logistics market is characterized by high competition, rising fuel prices, inflationary processes and changes in global supply chains. In such conditions, effective cost management is critical to ensuring the financial stability and competitiveness of the company.

For Keli Company, the development and implementation of key cost control strategies is a necessity, which will not only reduce operating costs, but also increase the efficiency of resource management. Optimization of routes and transportation will minimize fuel costs and increase transport utilization, which will directly affect the

profitability of transportation. Automation of logistics processes will help reduce administrative costs and increase the accuracy of goods accounting.

In an unstable market, it is critical to rationalize personnel costs by introducing flexible work schedules and using outsourcing to cover peak loads. Controlling costs for warehouse logistics, particularly through WMS systems and warehouse space optimization, will minimize losses from errors and theft.

Cost control strategies were developed for Kelly Company, which are presented in Table 3.2.

Table 3.2.

Key cost control strategies for logistics company Keli Company

No	Strategy	Tasks
I	Route optimization and transport utilization	<ul style="list-style-type: none"> - Implementation of GPS monitoring system for optimal route planning . - Cargo consolidation to reduce the number of trips and increase transport capacity. - Reverse logistics optimization – avoiding empty runs by planning returns and attracting passing cargo.
II	Logistics process automation	<ul style="list-style-type: none"> - Using TMS (Transport Management System) to reduce administrative costs and increase transportation transparency. - Automation of warehouse accounting and inventory management using WMS (Warehouse Management System). - Investing in demand forecasting systems to avoid overstocking or shortage of goods.
III	Personnel cost optimization	<ul style="list-style-type: none"> - Implement flexible work schedules for drivers and warehouse staff to avoid downtime. - Outsource temporary peak loads to reduce permanent staff costs. - Train employees in effective working methods to reduce errors and productivity.
IV	Reduce fuel and maintenance costs	<ul style="list-style-type: none"> - Implement an economical driving style through driver training (eco-driving). - Use fuel under contracts with suppliers to receive discounts. - Regularly plan vehicle maintenance to prevent expensive emergency repairs.
V	Control warehouse logistics costs	<ul style="list-style-type: none"> - Automate warehouse systems to reduce losses due to errors and theft. - Optimize the location of warehouses closer to key markets to reduce transportation costs. - Review lease terms and optimize the use of warehouse space to avoid unnecessary costs.
VI	Manage procurement and partnerships	<ul style="list-style-type: none"> - Use long-term contracts with proven suppliers to obtain favorable prices. - Compare supplier prices and implement competitive tenders. - Collaborate with logistics partners to share resources and reduce costs.
VII	Cost analysis and strategic control	<ul style="list-style-type: none"> - Implement real-time cost analytics through BI (Business Intelligence) systems. - Use the Activity-Based Costing (ABC) method to allocate costs and identify inefficient areas accurately. - Regular cost audits to identify economic opportunities.

Procurement and partnership management will allow you to obtain favorable supply conditions and reduce costs through long-term cooperation with reliable

contractors. At the same time, modern cost analysis methods, such as Business Intelligence (BI) and Activity-Based Costing (ABC), will provide detailed control over the company's financial flows and allow you to respond to inefficiencies in the cost structure quickly.

Let's take a closer look at these strategies.

I. Route optimization and efficient use of transportation are key aspects for logistics companies in China, given the size of the country and the intensity of freight flows. Research in this area covers various aspects, such as route planning, supply chain management, and the use of technology to improve logistics processes.[36-38]

Effective transport logistics management allows you to reduce costs, reduce harmful emissions, and increase transportation productivity. The main optimization methods are presented in Table 3.3.

Table 3.3

Basic methods for optimizing transport logistics management

Optimization methods	Advantages	Examples of implementation	Expected effect
1. Implementation of a GPS monitoring system	<ul style="list-style-type: none"> - Determination of the shortest and most visible routes for delivery - Monitoring fuel consumption and optimizing driving style for economical resources. - Detection of congestion and route adjustment in real-time. 	<ul style="list-style-type: none"> - Use of TMS (Transport Management System) with GPS integration. - Automated rerouting of transport in case of congestion or accidents. - Analytics of route efficiency and adjustments to reduce fuel costs. 	<ul style="list-style-type: none"> - Reduction of fuel costs by 10-20% . - Reduction of delivery time by 15-30%. - Reducing vehicle wear and tear through optimal routes.
2. Cargo consolidation	<ul style="list-style-type: none"> - Rational use of vehicles and their carrying capacity. - Reduction of some trips, which reduces fuel costs and equipment depreciation. - Optimization of warehouse operations for effective shipment planning. 	<ul style="list-style-type: none"> - Using a supply chain management system (SCM) to plan transport loading. - Introduction of the HUB concept - centralized transshipment warehouses for cargo consolidation. 	<ul style="list-style-type: none"> - Reduction in transportation costs by 15-25%. - Reduction in the number of trips by 20-30%. - Optimization of warehousing costs.
3. Reverse logistics optimization	<ul style="list-style-type: none"> - Maximum use of transport without additional costs for empty runs. - Reduction of costs for recycling returned goods or their reuse. - Minimization of environmental impact by reducing the total transport mileage. 	<ul style="list-style-type: none"> - Planning routes so that transport always returns with a load. - Using digital platforms to search for passing cargo. - Integration with suppliers to return containers, packaging or products for reuse. 	<ul style="list-style-type: none"> - Reduction of empty runs by 30-50%. - Reduction of transport logistics costs by 10-20%. - Improvement of environmental friendliness of operations due to lower fuel consumption.

GPS monitoring allows logistics companies to analyze traffic, plan optimal routes, and reduce fuel costs. Combining several consignments of goods into one trip allows you to reduce the number of trips, increase transport capacity and reduce costs.

Reverse logistics allows you to avoid empty runs by planning returns and using transport to pass cargo.

General results from the implementation of these strategies:

- Reduction of overall transport logistics costs by 20-30%.
- Reduction of fuel costs and depreciation of equipment.
- Increasing the efficiency of vehicle use.

Route optimization, cargo consolidation, and effective reverse logistics planning are key strategies for increasing productivity and reducing costs in transport logistics.

II. Logistics Process Automation.

Logistics process automation is a key step in increasing efficiency and reducing costs in logistics companies. Here are some of the main approaches to implementing this strategy:

1. Using a TMS (Transportation Management System).

Benefits: TMS allows you to automate route planning, cargo tracking and transportation management. This reduces document processing costs, improves supply chain visibility, and allows you to obtain analytics to optimize transportation processes.

Economic effect: Reduction of administrative costs, increased transparency of the transportation process, reduced transportation costs, and facilitated interaction with partners.

2. Automating warehouse accounting and inventory management using WMS (Warehouse Management System).

Benefits: WMS provides automated verification of the availability of goods, optimizes product distribution in the warehouse and ensures accurate accounting. This allows you to reduce warehouse operation costs, reduce errors and optimize warehouse space.

Economic effect: Reduced storage costs, reduced order processing time, and easier inventory control.

3. Invest in a demand forecasting system [39]

Benefits: Demand forecasting helps avoid overstocking and reduces the risk of shortages. Big data and AI-based systems can accurately predict customer needs and seasonal fluctuations.

Economic effect: Reduced storage and transportation costs, increased replenishment accuracy, and minimized financial losses due to shortages or excesses.

Implementing such a system will help significantly improve the efficiency of logistics operations and reduce costs at all supply chain stages.

III. Optimization of personnel costs in logistics companies

Effective personnel management in logistics to reduce costs, avoid downtime, and increase productivity [40-41]. The main strategies for optimizing personnel costs, their advantages, implementation examples, and expected results are presented in Table 3.4.

Table 3.4.

The main strategies for optimizing personnel costs

Optimization methods	Advantages	Examples of implementation	Expected effect
1. Introduction of flexible work schedules	<ul style="list-style-type: none"> - Minimizing downtime through optimal distribution of working hours. - Increasing employee motivation through a more comfortable work schedule. - Reducing overtime costs. 	<ul style="list-style-type: none"> - Using software for planning shifts based on forecasted workload. - Using a variable work schedule (for example, night shifts for loading and unloading operations). 	<ul style="list-style-type: none"> - Reducing downtime costs by 15-25%. - Reducing overtime costs by 20-30%.
2. Using outsourcing for temporary peak workloads	<ul style="list-style-type: none"> - Flexibility in regulating the number of employees in accordance with the volume of work. - No additional costs for social packages, training and maintaining full-time employees. - The ability to attract highly qualified employees without long-term commitments. 	<ul style="list-style-type: none"> - Cooperation with recruitment agencies for temporary staffing. - Use of contract workers for peak periods. - Outsourcing of some logistics functions (for example, engaging 3PL providers to process orders). 	<ul style="list-style-type: none"> - Reduction of personnel costs by 10-20%. - Reduction of the administrative burden on the HR department.
3. Training employees in effective work methods	<ul style="list-style-type: none"> - Reduction of costs associated with errors in logistics processes (wrong picking, delivery delays, etc.). - Increased customer satisfaction due to improved service quality. - Reduced staff turnover, which allows you to avoid the costs of finding and adapting new employees. 	<ul style="list-style-type: none"> - Introduction of a training program using simulators for drivers (economical driving, safe delivery). - Training for warehouse personnel on correct loading, use of the WMS system and cost reduction. 	<ul style="list-style-type: none"> - Reduction of errors in logistics operations by 30-50%. - Increase in staff productivity by 15-25%.

Flexible schedules allow you to adapt the working hours of drivers and warehouse staff to the company's actual needs, reducing the cost of paying for downtime.

There are periods of increased workload (holidays, seasonal sales, harvest periods in agricultural logistics). Outsourcing most temporary workers allows you to avoid the costs of maintaining employed personnel during off-peak periods.

Developing staff qualifications helps reduce the number of errors, reduce the time to complete tasks, and increase work efficiency.

Overall results from the implementation of these strategies:

- Reduction of total personnel costs by 15-30%.
- Reduction of downtime and overtime costs.
- Improvement of service quality and reduction of staff turnover.

Thus, flexible work schedules, outsourcing for peak periods, and training programs allow logistics companies to reduce costs and increase staff efficiency.

IV. Reducing fuel and maintenance costs in logistics companies

Reducing fuel and maintenance costs is a critical factor for increasing logistics transportation's profitability.

The main methods for optimizing fuel and maintenance costs in logistics companies are presented in Table 3.5.

Eco-driving is a set of skills and driving methods that allows you to reduce fuel consumption, reduce vehicle wear and tear, and increase road safety.

Purchasing fuel under contracts directly from suppliers allows you to reduce costs due to wholesale discounts and stable prices.

Timely technical maintenance will help prevent expensive emergency repairs and minimize transport downtime.

General results of implementing these strategies:

- Reduction in fuel costs by 15-25%.
- Reduction in maintenance and repair costs by 20-40%.
- Increase in fleet efficiency and minimization of spaces.

Table 3.5.

The main methods for optimizing fuel and maintenance costs

Optimization methods	Advantages	Implementation methods	Expected effect
1. Implementing an economical driving style (eco-driving)	<ul style="list-style-type: none"> - Reducing fuel costs by 10-25%. - Changing tire, brake and engine wear. - Increasing transportation safety and reducing the risk of accidents. 	<ul style="list-style-type: none"> - Training drivers in eco-driving principles (smooth acceleration and braking, optimal speed, rational use of the gearbox). - Implementing a driving style monitoring system (telematics, GPS trackers, sensors reading traffic parameters). - Motivational programs for drivers (bonuses for economical driving). 	<ul style="list-style-type: none"> - Reduction of fuel costs by 10-25%. - Extension of the service life of cars by 15-20%. - Reduction of CO₂ emissions and improvement of the company's environmental balance.
2. Use of fuel under contracts with suppliers	<ul style="list-style-type: none"> - Less dependence on fluctuations in market prices for fuel. - Saving additional discounts for large volumes of purchases. - Optimization of costs using fixed contract prices. 	<ul style="list-style-type: none"> - Conclusion of long-term contracts with large oil traders or gas stations. - Implementation of fuel cards to control costs and eliminate misuse. - Monitoring the fuel market to choose the optimal time for purchase. 	<ul style="list-style-type: none"> - Savings on fuel up to 5-15% due to discounts. - Reducing costs for administrative control of fuel consumption. - Preventing fuel fraud among drivers.
3. Regular planning of technical maintenance (TO) of transport	<ul style="list-style-type: none"> - Reducing the risk of serious breakdowns and accidents. - Extending the service life of vehicles. - Optimizing repair costs through preventive maintenance. 	<ul style="list-style-type: none"> - Automate maintenance planning using the Fleet Management System (FMS). - Periodic technical inspection according to the manufacturer's regulations. - Using high-quality spare parts and consumables to reduce the frequency of repairs. 	<ul style="list-style-type: none"> - Reducing the cost of emergency repairs by 30-50%. - Increase in the service life of transport by 20-30%. - Reduction in the number of unexpected spaces in the fleet.

Implementing these measures allows logistics companies to significantly reduce operating costs, increase competitiveness, and ensure sustainable business development.

V. Control of warehouse logistics costs

Effective management of complex logistics allows you to significantly reduce operating costs, optimize resource use and minimize the risk of losses.

The introduction of modern warehouse automation technologies reduces losses due to the human factor, increases accounting accuracy and reduces order processing costs.

The location of the warehouse has a significant impact on transportation costs and the speed of customer service.

Companies often overpay for warehouse space rental due to inefficient use of space or unprofitable lease agreements.

The main methods for control of warehouse logistics costs are presented in Table 3.6.

Table 3.6.

The main methods for control of warehouse logistics costs

Optimization methods	Advantages	Implementation methods	Expected effect
1. Use of automated warehouse systems (WMS, RFID) to reduce losses due to errors and theft.	<ul style="list-style-type: none"> - Change in warehouse accounting errors due to automatic inventory control. - Acceleration of order processing and reduction of downtime due to accounting inaccuracies. - Reduction of the risk of theft using RFID systems and video surveillance. 	<ul style="list-style-type: none"> - Using WMS (Warehouse Management System) - inventory management software that automates all warehouse processes. - Implementing RFID (radio frequency identification) for accurate accounting and quick inventory of goods. 	<ul style="list-style-type: none"> - Reducing the cost of goods in the warehouse by up to 30-50%. - Acceleration of order processing by 20-40%. - Reducing the cost of manual accounting and minimizing the human factor.
2. Optimize the location of warehouses closer to key markets to reduce transportation costs.	<ul style="list-style-type: none"> - Reducing transportation costs by reducing distances to the main sales markets. - Increasing the speed of delivery to improve the level of service. - Optimization of logistics routes and more efficient transport management. 	<ul style="list-style-type: none"> - Analysis of the geographical location of warehouses to reduce distances to customers. - Consideration of the construction of regional hubs to optimize the distribution of goods. - Application of mathematical models to calculate the optimal location of warehouses. 	<ul style="list-style-type: none"> - Reduction of logistics costs by 10-30%. - Reduction of delivery time to customers. - Reduction of fuel and transport maintenance costs.
3. Review of lease terms and optimize the use of warehouse space to avoid unnecessary costs.	<ul style="list-style-type: none"> - Reduction of financial costs due to the correct distribution of warehouse space. - Rational use of premises to optimize logistics processes. - Reduction of costs for utilities and maintenance. 	<ul style="list-style-type: none"> - Review and optimization of lease agreements (for example, transition to a long-term lease to reduce costs). - Introduction of vertical storage (using racking systems to reduce the occupied area). - Sharing warehouse space with partners or other companies. 	<ul style="list-style-type: none"> - Reduction of warehouse rental costs by 15-30%. - Rational use of each square meter of warehouse space. - Optimization of costs for warehouse equipment and utilities.

General results of implementing these strategies:

- Reduction of costs for warehouse logistics by 20-40%.
- Optimization of spatial use of warehouse space.
- Reduction of losses due to theft and errors.
- Increasing the speed of order processing and the level of customer service.

The implementation of these measures allows you to significantly increase the efficiency of warehouse logistics, reduce financial costs and increase the competitiveness of the company.

VI. Procurement and Partnership Management. Use long-term contracts with proven suppliers to obtain favorable prices.

Effective procurement and partner management is a key factor in reducing costs and increasing supply stability. The right choice of suppliers, favorable contracts and strategic partnerships allows companies to minimize risks, reduce costs and improve service quality.

The strategy of procurement and partnership management is presented in the following directions (Table 3.7.).

Concluding long-term contracts with reliable suppliers ensures stable prices and guaranteed supply of goods and materials.

Competitive tenders allow you to choose the most profitable offers, by reducing procurement costs and ensuring high product quality.

Combining resources with partners allows you to reduce logistics costs, reduce the number of empty flights and increase the efficiency of transport operations.

General results of implementing these strategies:

- Reduction in procurement and logistics costs by 15-35%.
- Optimization of supply processes and increasing the stability of supplies.
- Flexibility in choosing partners and the ability to quickly respond to market changes.

Improving cooperation with logistics and production partners.

The implementation of these approaches will help the company not only reduce costs, but also create an effective and reliable procurement and partnership management system.

Table 3.7.

Directions of the strategy of procurement and partnership management

Optimization methods	Advantages	Implementation methods	Expected effect
1.Compare supplier prices and implement competitive tenders.	<ul style="list-style-type: none"> - Fixing favorable prices and reducing the risks of market price fluctuations. - Increasing supply stability and minimizing shortage risks. - Possibility to receive additional bonuses and discounts based on order volumes. 	<ul style="list-style-type: none"> - Conducting a final analysis of supplier reliability before issuing long-term contracts. - Issue contracts with flexible terms for adjusting supplies (for example, changing volumes if necessary). 	<ul style="list-style-type: none"> - Reduction in procurement costs by 10-20%. - Stability in the supply of materials and goods. - Minimization of risks of supply disruption.
2.Cooperate with logistics partners to share resources and reduce costs.	<ul style="list-style-type: none"> - Obtaining the best price offers through competition between suppliers. - Improving the quality of procurement materials by selecting the optimal options. - Flexibility in choosing partners and the ability to quickly change suppliers. 	<ul style="list-style-type: none"> - Organization of open and closed tenders among reliable suppliers. - An automated system for managing tenders, such as SAP Ariba, Oracle Procurement Cloud or similar solutions, is used. - Assessment of not only cost, but also reliability, delivery terms and reputation of suppliers. 	<ul style="list-style-type: none"> - Reduction of procurement costs by 5-15% due to competition. - Improvement of the quality of materials and services. - Flexibility in choosing the best procurement terms.
3.Procurement and Partnership Management	<ul style="list-style-type: none"> - Reduction of logistics costs due to the sharing of transport and warehouses. - Change in the number of empty runs through optimized route planning. - Increase in service level and reduction in delivery times. 	<ul style="list-style-type: none"> - Combining logistics resources with other companies to share warehouses and transport. - Use of outsourcing of logistics services (3PL, 4PL providers). - Implementation of joint transport platforms that can leave passing cargo and reduce transportation costs. 	<ul style="list-style-type: none"> - Reduction in logistics costs by 10-30%. - Optimization of the use of transport and warehouse space. - Increasing the efficiency of goods delivery.

7. Cost analysis and strategic control

Effective cost management in a logistics company requires constant monitoring, analysis and implementation of strategic decisions. The use of modern technologies and methodologies allows you to reduce operating costs, identify weaknesses, and ensure the stability of financial flows.

Table 3.8.

Directions of the strategy of cost analysis and strategic control

Optimization methods	Advantages	Implementation methods	Expected effect
1. Implement real-time cost analytics through BI (Business Intelligence) systems.	<ul style="list-style-type: none"> - The ability to obtain detailed information about costs in real-time. - Identification of inefficient costs and opportunities for savings. - Improving the accuracy of forecasting the company's financial needs. 	<ul style="list-style-type: none"> - Using a BI system (Power BI, Tableau, QlikView) to analyze costs by various categories. - Integration with ERP systems (SAP, Oracle, Microsoft Dynamics) for data collection and processing. 	<ul style="list-style-type: none"> - Cost reduction by 5-15% due to rapid identification of problem areas. - Improving the transparency of financial flows and company expenses. - Making informed decisions based on current data.
2. Use the Activity-Based Costing (ABC) method to allocate costs and identify inefficient areas accurately.	<ul style="list-style-type: none"> - Accurate distribution of indirect costs by real consumers of resources. - Identification of inefficient business processes and areas of overspending. - Optimization of pricing policy and reduction of operating costs. 	<ul style="list-style-type: none"> - Analysis of all business processes and key cost elements. - Implement a program for automatic cost allocation (SAP ABC, Oracle Costing). - Regularly update the cost model to consider changes in the business. 	<ul style="list-style-type: none"> - Accurate understanding of the real cost of logistics processes. - Optimize resources and increase the efficiency of operations. - Cost reduction by 10-20% by eliminating inefficient costs.
3. Regular cost audits to identify opportunities for savings.	<ul style="list-style-type: none"> - Identification of unjustified costs and opportunities for their reduction. - Prevention of financial losses due to uncontrolled costs. - Increasing the level of financial discipline in the company. 	<ul style="list-style-type: none"> - Conducting quarterly cost audits with the involvement of financial experts. - Using automated cost analysis systems (AuditBoard, IDEA, ACL Analytics). - Formation of cost reduction planning based on the audit results. 	<ul style="list-style-type: none"> - Cost reduction by 5-10% due to eliminating unnecessary expenses. - Improving financial transparency and resource efficiency. - Increasing control over the company's financial operations.

Activity-Based Costing (AVS) allows you to locate which processes and operations consume the most resources and redistribute costs in accordance with the real costs of each unit or activity.

General results of implementing strategic cost control:

- Reducing operating costs by 15-30%.
- Optimizing financial flows and increasing profitability.
- Ensuring cost transparency and efficient use of resources.
- Increasing the company's competitiveness by reducing the cost of services.

Implementing an analytics system, ABC method and regular audit allows the company to control costs and strategically manage financial resources effectively.

The overall effect of implementing cost control strategies is to achieve the following results:

R1. Optimizing routes and vehicle use reduces transportation costs by 10-20%.

R2. Implementing eco-driving and efficient maintenance reduces fuel costs by 5-15%.

R3. Reduce administrative costs by 15-30% by automating processes.

R4. Increase warehouse efficiency and reduce losses through digitalization of accounting.

The relationship between the proposed strategies and expected results is shown in Fig. 8.

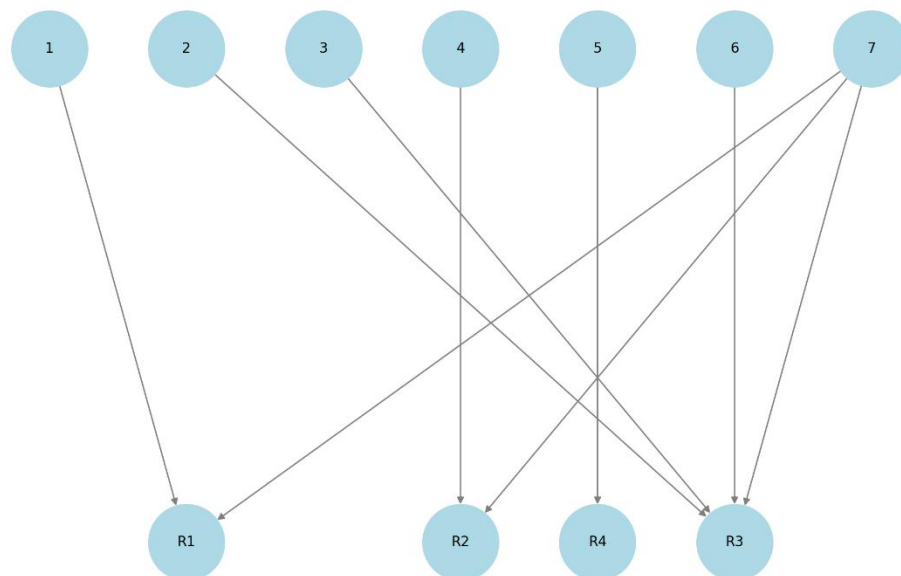


Fig. 8. The relationship between the proposed strategies and expected results

Implementing these strategies will help Keli Company reduce costs, increase competitiveness, and improve financial results.

Thus, developing and implementing key cost control strategies are relevant and necessary steps for Keli Company, which will contribute to increasing its competitiveness and improving financial performance in the long term.

Implementing the proposed measures contributes to improving Keli's operational efficiency and competitiveness in the navigation engineering field. Implementing a subcontractor evaluation system allows for improving the quality of work, reducing control costs, and increasing the responsibility of partners. Modern logistics technologies, such as automated inventory management systems and predictive analytics, will improve the supply chain's transparency, minimizing delays and more accurate resource planning. Improving personnel skills through targeted training programs will ensure the effective use of new technologies and the formation of a culture of continuous improvement. In addition, implementing card-based value streams (VSM) will help eliminate inefficient processes and optimize costs. Strict financial control and compliance with regulatory requirements will ensure the company's stable development. In general, the implementation of these measures requires initial investments. Still, in the long term, they strengthen Keli's market position, ensure stable growth, and improve service quality.

Conclusions for section 3.

Keli provides training to its employees but does not have a comprehensive program focused on new industry trends, such as AI-powered project management or IoT-enabled monitoring equipment. Expanding training initiatives can increase workforce adaptability and drive innovation. Investing in training programs in lean manufacturing and automation methodologies and rigorously applying lean management principles significantly improves cost control and operational efficiency. Incorporating these practices into the company culture will help increase profitability, strengthen competitiveness, and reduce costs. Over time, Keli will be able to increase its market position and achieve sustainable growth in the navigation equipment sector.

Implementing cost control strategies leads to significant efficiency gains in various areas of activity. Optimizing routes and vehicle usage reduces transportation costs by 10-20% while eco-driving and efficient maintenance practices reduce fuel costs by 5-15%. Automation of administrative processes reduces overhead costs by 15-30%, and accounting digitalization increases warehouse efficiency, minimizing losses.

Implementing the proposed measures contributes to increasing the efficiency and competitiveness of Keli Company in the navigation equipment field. The assessment of subcontractors increases the quality of work and the responsibility of partners while reducing control costs. The use of modern logistics technologies ensures transparency of supply chains and improves resource planning. Training programs ensure the effective implementation of new technologies and form a culture of continuous improvement. Process optimization through value stream mapping (VSM) eliminates inefficiencies, and financial control and compliance with regulatory requirements guarantee sustainable development. Although implementing the measures requires initial investments, in the long term, they strengthen Keli Company's market position and contribute to growth and improvement of service quality.

CONCLUSIONS

Effective cost control is a key factor in the competitiveness of logistics enterprises. Today's rising fuel prices, increasing personnel costs, and global logistics challenges require effective cost-management strategies.

Logistics cost control includes optimizing transportation, warehousing, cargo handling, and personnel management processes. The main strategies include Lean logistics, outsourcing, process automation, supply chain management (SCM) systems, and demand forecasting technologies.

Logistics costs are influenced by external and internal factors that determine the overall efficiency of a company's operations. To reduce these costs, businesses must adapt to changes in the external environment, leverage modern technologies, and refine internal logistics processes. Key strategies for controlling and reducing logistics costs include implementing innovative inventory management techniques, route optimization, digital solutions, and effective personnel management. These tools are essential for improving cost efficiency in logistics activities.

The study is devoted to analyzing cost control strategies in logistics companies using the example of "Kelly Company". Keli Company, a subsidiary of the First Navigation Engineering Bureau of China, has a rich history that reflects its evolution in the navigation engineering sector. Founded in the early 2000s, Keli emerged in response to the growing demand for specialized engineering services in navigational construction, focusing on integrating modern technology with traditional methods. Over the years, the company has established itself as a leader in providing innovative solutions that address the complex challenges of navigation infrastructure development. The mission of Keli is to deliver high-quality engineering services that enhance maritime operations' safety, efficiency, and reliability. By prioritizing technological advancements and sustainable practices, Keli aims to support the strategic goals of the First Navigation Engineering Bureau while contributing positively to the global navigation engineering landscape.

The current management system at Keli Company demonstrates a structural alignment with the organization's overarching goals, although several areas require

further optimization. Keli Company's primary objective is to enhance its competitive stance in the navigation engineering sector while fostering innovation and efficiency. The existing management framework emphasizes a top-down approach where senior management formulates strategic decisions and disseminates them downward through the organizational hierarchy. While this facilitates a clear direction and unified purpose, it may inadvertently stifle creativity and responsiveness among lower-level employees who often interact directly with operational challenges.

Kelly Company's financial results for 2022 demonstrate efficient operations and high business profitability. The gross margin is 40%, which indicates the company's ability to maintain a high-profit level after considering the cost of production. Operating profit amounted to CNY 80 million, and its margin of 26.7% demonstrates effective management of operating expenses. Net profit of CNY 65 million with a margin of 21.7% confirms the company's financial stability and ability to generate significant income after paying taxes and other financial expenses. The financial indicators indicate high business profitability, creating favorable conditions for further growth and development.

Keli can reduce costs by implementing lean management, focusing on waste management and improving efficiency. Optimizing inventory management based on the just-in-time principle minimizes storage costs. Mapping processes will increase logistics bottlenecks, and improving work with subcontractors will increase the convenience of deliveries. Encouraging continuous improvement through employee training will help increase productivity. Using value stream mapping will allow for better analysis of supply chains, reducing unnecessary costs. Implementing a performance control system through KPIs ensures continuous monitoring and adaptation of processes. Collaborating with subcontractors and agreeing on operational goals will strengthen supply chain efficiency. Thanks to these measures, Keli reduces costs and achieves competitiveness.

Cost control strategies that were proposed for "Kelly Company".

Process automation: using transport and warehouse management systems (TMS, WMS) allows for the reduction of delays, the optimization of routes, and the increase of labor productivity.

Route optimization: data analysis and intelligent GPS navigation systems contribute to reducing fuel costs and delivery time.

Outsourcing of logistics services: transferring some functions (for example, storage of goods) to third-party companies helps to avoid unnecessary infrastructure costs.

Use of alternative energy sources: the use of electric transport and fuel-saving technologies significantly reduces the costs of operating the transport fleet.

Personnel efficiency control: introducing KPI and automated productivity control systems ensures the efficient use of labor resources.

By implementing the above measures, Kelly Company could reduce fuel costs by 15%, optimize the use of the transport fleet by 20%, and increase the overall delivery efficiency. Process automation reduces the need for manual data entry, reducing errors and increasing labor productivity.

Keli provides training to its employees but lacks a comprehensive program covering the latest industry trends, such as AI-based project management and IoT equipment monitoring. Expanding training initiatives will help increase staff adaptability and drive innovation. Investments in programs focused on lean manufacturing and automation and implementing lean management principles will improve cost control and operational efficiency. Implementing these practices into the company culture will contribute to increased profitability and strengthened competitiveness, allowing Keli to enhance its position in the market and ensure sustainable development in the navigation equipment sector.

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