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MASTER THESIS

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OF GRADUATE OF ACADEMIC DEGREE
«MASTER»

THEME: «Formation of a fresh logistics subsystem for a logistics company»

Speciality 073 «Management»

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Kyiv 2023

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
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Київ 2023

NATIONAL AVIATION UNIVERSITY
Faculty of Transport, Management and Logistics
Logistics Department

Academic Degree Master

Speciality 073 «Management»

Educational and Professional Program « Logistics »

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TASK

FOR COMPLETION THE MASTER THESIS OF GRADUATE

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1. Theme of the master thesis: «Formation of a fresh logistics subsystem for a logistics company» was approved by the Rector Directive №1952/CT. of September 27, 2023.
2. Term performance of thesis: from October 02, 2023 to December 31, 2023.
3. Date of submission work to graduation department: December 10, 2023.
4. Initial data necessary for writing a thesis: general and statistical information about the logistics market of Ukraine, information about the company "General Trans Alliance Logistics", financial and economic indicators of the company "General Trans Alliance Logistics", literary sources on logistics and process. customer service, source online.
5. Content of the explanatory note: introduction, essence of customer service chains; specifics of logistics for the transportation of goods of the fresh category; general principles for the formation of cold supply chains at the enterprise; identifying deficiencies in the customer service chain; application of business process reengineering in a logistics company; construction of new routes; calculation of the economic effect of the proposed measures; conclusions and additional
6. A list of mandatory graphic materials: tables, diagrams, graphs, diagrams illustrating the current state of problems and methods of solving them.

7. Calendar schedule:

| № | Assignment | Deadline for completion | Mark on completion |
|----|---|-------------------------|--------------------|
| 1 | 2 | 3 | 4 |
| 1. | Study and analysis of scientific articles, literary sources, normative legal documents, preparation of the first version of the introduction and the theoretical chapter | 02.10.23-18.10.23 | Done |
| 2. | Collection of statistical data, timing, detection of weaknesses, preparation of the first version of the analytical chapter | 19.10.23-09.11.23 | Done |
| 3. | Development of project proposals and their organizational and economic substantiation, preparation of the first version of the project chapter and conclusions. Editing the first versions of master thesis | 10.11.23-30.11.23 | Done |
| 4. | Preparing the final version of the master thesis, checking by standards inspector | 01.12.23-08.12.23 | Done |
| 5. | Approval for a work with supervisor, getting of the report of the supervisor, getting internal and external reviews, transcript of academic record | 05.12.23-09.12.23 | Done |
| 6. | Submission work to Logistics Department | 10.12.23 | Done |

Graduate _____
(signature)

Supervisor of the master thesis _____
(signature)

8. Consultants of difference chapters of work:

| Chapter | Consultant (position, surname and name) | Date, signature | |
|-----------|--|--------------------|-----------------------|
| | | The task was given | The task was accepted |
| Chapter 1 | Associate Professor, Savchenko L. V. | 02.10.23 | 02.10.23 |
| Chapter 2 | Associate Professor, Savchenko L. V. | 19.10.23 | 19.10.23 |
| Chapter 3 | Associate Professor, Savchenko L. V. | 10.11.23 | 10.11.23 |

9. Given date of the task October 02, 2023.

Supervisor of the master thesis: _____
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Task accepted for completion: _____
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ABSTRACT

The explanatory notes to the master thesis «Formation of a fresh logistics subsystem for a logistics company» comprises of 111 pages, 26 figures, 18 tables, 105 references.

BUSINESS PROCESS REENGINEERING, SUPPLY CHAIN MANAGEMENT, CUSTOMER RELATIONSHIP MANAGEMENT, CUSTOMER SERVICE, CUSTOMER SERVICE CHAIN MANAGEMENT, FRESH LOGISTICS.

The theoretical part devoted to the methodological issues about re-engineering of the company and its organizational structure as well as introducing the fresh logistics department into the structure.

The analytical part contains a comprehensive analysis of the object of the research, namely its financial, technical, organizational and logistical indicators.

The last part consists of the particular proposals about the topic with the financial proofs of the feasibility of the project ideas.

The purpose of the research is to design a fresh logistics subsystem for a logistics company.

The subject of the investigation is the re-engineering of business processes in customer service chains of the logistics company “General Trans Alliance Logistics”.

The object of the research is the business processes in customer service chains of the logistics company “General Trans Alliance Logistics”.

Methods of research are scientific inquiry, empirical, analysis and synthesis, modeling, expert assessments, extrapolation of time series.

It is recommended to use materials of the Master Qualification Paper for scientific investigations, in an educational process and in expert’s practical activity of logistic departments.

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NOTATION

| | |
|------|-------------------------------------|
| BPR | – Business Process Reengineering |
| USD | – United State Dolar |
| CEO | – Chief Executive Officer |
| GTAL | – General Trans Alliance Logistics |
| CSCM | – Customer Service Chain Management |
| ERP | – Enterprise Resource Planning |
| IT | – Information technology |
| KPI | – Key Performance Indicators |
| MIS | – Management Information Systems |
| MRP | – Material Requirements Planning |
| NPV | – Net present value |
| SCM | – Supply Chain Management |

INTRODUCTION

Transport is one of the most important branches of the national economy of Ukraine. It provides production and non-production needs of material production, non-production sphere, as well as the population in all types of transportation. Transport is a necessary prerequisite for the functioning of both material production and the service sector, including passenger transportation. The production value of transport is determined by the objective need to move goods from the place of production to the places of consumption. The main task of transport is timely, high-quality and full satisfaction of the national economy and population in transportation. For its effective solution, it is necessary:

- to ensure the development of the unified transport system of the country, its interaction with other branches of the national economy, to improve the coordination of all types of transport, to reduce irrational transportation, to shorten the terms of cargo delivery and to ensure their preservation;
- to speed up the creation and introduction of modern equipment and technologies, to increase the rate of renewal of rolling stock;
- more widely apply progressive methods of cargo transportation, increase the volume of transportation in containers and in package form;
- to develop and improve centralized automobile transportation, to increase the efficiency of the use of motor vehicles, primarily due to the widespread use of trailers and semi-trailers, reduction of non-productive downtime, empty vehicle runs and irrational transportation.

Transport is a necessary condition for specialization and comprehensive development of national economic complexes of regions, formation of TECs of both local and regional importance. It promotes the social territorial division of labor, the formation of connections between settlements and within them. Without transport, Ukraine's integration into the global economy is impossible system. This requires the modernization of old and the construction of new transport highways of interstate

importance. Along with other types of transport, it ensures rational production and turnover of industrial and agricultural products, meets the needs of the population in transportation. Transport should contribute to the fastest integration of Ukraine into the pan-European economic system, which requires the creation of railway and road routes from the central parts of Western Europe - to the countries from the north of Western Europe - to the countries of the Middle East.

The consequence of the operation of transport is not a new product, but a certain useful effect, consisting in the movement of goods and people. Transport does not use raw materials, but only means of production and auxiliary materials. With its activity, transport continues the production process of industry and agriculture in the sphere of circulation. It is characterized by a linear arrangement and universality of production connections with other branches of the economy.

Transport products cannot accumulate, and the efficiency of its development depends on the formation of cargo and passenger flows. As a result, there is an interaction between the placement of transport and productive forces. Thanks to the maintenance of various forms of social organization of production (specialization, concentration, cooperation and combination), it affects the increase in the efficiency of placement of various branches of production. Transport plays an extremely important role in the formation of foreign economic relations of Ukraine. Without transport, the integration of Ukraine into the global economic system is impossible. It forms economic, cultural, recreational and other ties, as well as accelerates the socio-economic development of society. Freight transport is a branch of production infrastructure. Without directly producing material products, freight transport is the fourth branch of material production after mining, processing industry and agriculture. None of the named three main branches of material production is able to function without transportation. The product is ready for consumption only when it is delivered to the consumer.

Modern cities with developed industry, the presence of various administrative, social, cultural and educational institutions have their own specific transport problems. Today, the concept of "fresh logistics" is widely used in the logistics

services market. Fresh logistics, or "cold logistics" is a combination of all elements of the supply chain (supply, warehouses, manufacturer, transport and forwarding company) with the sole purpose of delivering a material flow from one logistics system to the end consumer, while ensuring compliance with the relevant temperature regime, taking into account all the features of the consumer product, its properties, the possibility of deterioration due to improper temperature regime or long-term delivery.

This is an extremely complex process that requires responsible work and accurate planning of all participants of the "cold supply chain". In recent years, demand for products in the fresh category has been growing exponentially. This is due to many factors, in particular:

Healthy Lifestyle: Today more people are aware of the importance of healthy eating and leading a healthy lifestyle. Products in the "FRESH" category are often associated with natural, fresh and minimally processed products, which makes them attractive to those who watch their nutrition.

Growing awareness of food quality: More consumers are becoming more conscious about what they eat and want higher quality products. "FRESH" products are often associated with freshness, quality and high standards, which makes them attractive to the target audience.

The "foodism" and gourmet trend: The growing number of people who appreciate gastronomy, new tastes and exclusive products forces companies to offer more diverse, fresh and refined products that can satisfy this demand.

Environmental awareness: Many consumers are becoming more aware of the environmental aspects of product production. "FRESH" products, often associated with environmentally friendly production and packaging methods, can attract the attention of this group of consumers.

The development of the fresh sector in the domestic retail trade increases the requirements for warehouse and transport logistics, technological processes, equipment and infrastructure. The lack of a national distribution system and quality platforms for processing and cross-docking of "fresh", "chilled" and "frozen" goods

at the intersection of the largest commodity flows is reflected either in the quality of the goods on the shelves, or in their cost. Responding to the growing needs of customers, retailers are actively improving the management of business processes, which includes automation, improving quality and expanding sales through the launch of own production and optimization of supply logistics, which allows maintaining the quality of goods.

The object of the research is the process of integration of Fresh logistics in the structure of supply chains of the transport forwarding company. The subject of the study are approaches that will contribute to the improvement of the organization and management of the process of delivery of goods in the fresh category. To achieve the goal, the following tasks were set:

- consider the essence of the concepts "fresh logistics" and "fresh goods";
- study the specifics of the company's fresh category goods delivery organization;
- to conduct an analysis of the transportation market of products of the fresh category;
- identify "bottlenecks" in the company's structure;
- develop recommendations for the introduction of a new direction of delivery in the company;
- carry out an assessment of the effect of the proposed solutions.

Work results. According to the results of the conducted research a project was developed and proposed, which involves the expansion of the company's own fleet of vehicles, with the aim of integrating fresh logistics into its own supply chains. Options for expanding one's own vehicle fleet were proposed with the help of a comparative analysis in the conclusion of which a semi-trailer with a truck was proposed. A comprehensive approach to increase the efficiency of the work process, which includes changing the organizational structure of the enterprise, is also proposed. In the process of writing the thesis, materials from the company's internal reporting, data from statistical directories, and materials from practitioners in the field of logistics and management, published in periodicals, monographs, textbooks, and electronic sources, were used.

CHAPTER 1

THEORETICAL BASIS OF FORMATION OF A FRESH LOGISTICS SUBSYSTEM FOR A LOGISTICS COMPANY

1.1 The essence of the "Fresh" goods category

In the modern world, where consumers pay more and more attention to their health and nutrition, the logistics of "fresh" goods acquires a new level of importance. The change in the attitude of consumers towards the quality of products requires not only the supply of fresh products, but also ensuring their safety and quality at every stage of transportation. This means a responsible attitude to storage conditions, the right choice of packaging, as well as ensuring the optimal temperature regime in order to guarantee the highest quality of products for the consumer.

The technologies of storage and transportation of "fresh" goods are constantly evolving. The implementation of modern innovations in logistics processes helps to increase the efficiency of deliveries and reduce the risk of loss of quality of goods during transportation. Drivers, confidently possessing temperature control technologies in cars, become an important link in this process, ensuring the safety and quality of products during transportation. [3]

Understanding the importance of innovation in the field of "fresh" logistics opens up new opportunities for the development of the industry. Optimizing the processes of storage and transportation of fresh products allows supply companies to adapt to the growing demands of consumers. The constant development of technologies and discreet control over logistics processes allow us to ensure the quality and safety of products, as well as to maintain the reputation of a reliable supplier on the consumer goods market.

Thus, "fresh" logistics becomes not only a key industry in the world of logistics, but also an innovative direction that defines modern standards of safety, quality and efficiency in the supply of fresh products for all of us.

Fresh logistics, or "cold logistics" is a combination of all elements of the chain supplies (supply, warehouses, manufacturer, transport forwarding company) with the sole purpose of delivering a material flow from one logistics system to the final one consumer, while ensuring compliance with the appropriate temperature regime, taking into account all the features of the consumer the product, its properties, the possibility of deterioration under improper temperature conditions or long delivery. This is extraordinary a complex process that requires appropriate work and accurate planning of all participants of the "cold supply chain".

The peculiarity of this service is explained by "comprehensive service of fresh products with observance of the temperature from +2 °C to +6 °C and from 0 °C to +2 °C ("ultra-fresh") during the entire "logistics chain" [4]. Products that require specific conditions of transportation and storage at a temperature of +2 °C to +6 °C are sausages, dairy products, confectionery, as well as fresh vegetables and fruits. Transportation in the mode from 0 °C to +2 °C requires fresh vacuum-packed meat. The transport service in the mode of -18 °C (Frozen) is used for frozen food products - meat, ice cream, fruits or vegetables.

The "fresh logistics" service has a seasonal nature and is characterized by smaller volumes of sales in the winter period (Fig. 1.1), and reaches peak values at the end of summer - beginning of autumn. This is directly related to the air temperature and the temperature regime at which perishable goods need to be delivered.

Figure 1.1 - The dynamics of the volume of the "fresh logistics" service for one client of Raben Ukraine LLC, thousand UAH

Fresh products today include the following products:

- meat / fish;
- milk;
- homemade dairy products;
- bakery products;
- self-prepared food;
- freshly squeezed juices, smoothies.

Fresh direction is an excellent product for buyers, but for retailers there are a lot of difficulties in this type of business:

- the minimum shelf life of the product (products require quick sale, because they have a short "life");
- transportation (vegetables and fruits can easily lose their attractive appearance);
- storage (careful observance of temperature regimes);
- repackaging (except when the manufacturer offers ready-made packaging for the buyer) [6].

Fresh logistics for retailers is one of the most difficult business processes, because in most cases you have to deal with a low level of organization of the entire supply chain. On the one hand, retail is forced to deal with low-quality production and logistics of suppliers, and on the other hand, it must offer quality products to end consumers. The solution to the above-mentioned problems can be the automation of the ordering system for fresh goods, which is the basis of the movement of goods in the supplier (production) - retail outlet chain. The automated workplace of the purchasing manager facilitates and improves the calculation of the number of ordered goods, taking into account the optimal delivery time.

First of all, we must not forget that fresh products have a rather short shelf life. For this reason, the goods must arrive at the final moment in a quality component and with an expiration date that will make it possible to sell the goods. Most importantly, when working with fresh product, there is no room for error at any stage of the supply chain - transportation, storage or repackaging - as this can cause serious problems in the form of subsequent write-offs of the products, and therefore lead to losses both from themselves retailers, as well as from any logistics provider operating in this segment.

Table 1.1 – Dangerous factors in case of improper transportation of products[7]

| No. | Cause of occurrence | Factor |
|-----|--|--------------------------------------|
| 1 | May occur due to condensation during temperature fluctuations in refrigeration equipment, storage under climatic conditions that do not meet established requirements, cross-contamination from dirty packaging material, packaging damage during storage. | Molds, fungi. Rotten microflora. |
| 2 | Contact of raw materials or finished products with chemicals having a strong foreign odor. | Strong-smelling chemical substances. |
| 3 | Cross-contamination with allergens under improper storage conditions. | Allergens. |
| 4 | Packaging damage during storage or transportation. | Foreign objects. |
| 5 | Too low oxygen concentration or excessively high carbon dioxide content. | "Suffocation" of products. |
| 6 | Arises when fruits and vegetables are susceptible to temperatures below the critical permissible threshold, depending on the product - but above the freezing temperature. | Damage from overcooling. |

Improper or careless handling of products during storage and transportation can lead to cargo damage and unnecessary losses. For example, with incorrect transportation of "fresh" products, the situations depicted in the table may occur.

1.2 Transportation of "Fresh" products

There are several main factors that affect the complexity of the organization of the business process in working with goods of the fresh category:

The first is quality, assortment and prices. This is especially important for maintaining a certain level of trade network. Due to the specific characteristics of the fresh group, maintaining the range and, most importantly, the quality of fresh and chilled products often brings tangible problems both in terms of money and image.

Secondly, it is a quality logistics system. For large retailers, especially in the regions, the specificity of fresh products also imposes rather strict requirements for the organization of a high-quality logistics system, where the solution to the problem does not always lie in the conditions of transport and delivery.

The third is own production. The observed shift in consumer demand from frozen meat and vegetable semi-finished products to fresh products necessitates the organization of own mini-factories in supermarkets and hypermarkets. It is believed that the products produced there have better quality due to the absence of preservatives.

Factors affecting the results of storage and transportation of perishable goods:

- quality, condition and preparation of the product for storage or transportation, its container and packaging;
- temperature, humidity, air circulation and ventilation in the room where the product is stored or transported, as well as air cleanliness in vehicles (absence of microbes, mold, dust, gases and odors emitted by products);

- sanitary condition of vehicles, methods of placing products in them;
- duration of storage or transportation.

The main criterion that must be observed is the temperature regime. Today, there are about four types of products in the fresh category with different temperature regimes. For example, at a temperature of 0C + 2C and + 2C + 4C, you can work with dairy and meat products, canned fish, fresh fish products and some types of exotic fruits, vegetables and herbs. At a temperature of + 6C + 8C - with the bulk of vegetables and fruits most in demand by customers. There is a separate temperature regime for bananas, + 10C + 14C.

Raw materials and packaging materials arrive at the enterprise from approved and approved suppliers by road transport. The delivery of cargo is determined by the delivery contract specifying the name, supplier company, destination. Acceptance of raw materials and materials at the enterprise, as well as their control and further storage, is carried out by an appointed responsible person. Failure to comply with entry control procedures can affect the safety of existing food products through cross-contamination.

All supplied products must be accompanied by appropriate accompanying documents of the supplier's company or the manufacturer's company, namely: a consignment note, a manufacturer's declaration or any other regulatory and technical documents certifying the safety and quality of the goods (sanitary objects measures), works and services regarding (in accordance with the specifications). Marking must be in accordance with the established requirements of the legislation of Ukraine.

All packaging materials that come into contact with food products must meet the sanitary and hygienic requirements for materials that come into contact with food products. The packaging of raw materials and auxiliary materials should not affect the organoleptic properties of the product and should not be a source of dangers (biological, physical, chemical) or allergens. The integrity of the packaging of goods must not be violated in order to guarantee the safety of the product during the entire storage period. [9]

All packaging materials that come into contact with food products must be sufficiently inert to prevent the migration of components into the food product.

The type of transport is specified in the supply contract. Transportation must be carried out at the temperature conditions established by the product manufacturer. [10]

Various types of transport are used to transport products of the "Fresh" category:

- Automobile transport;
- Railway;
- Marine;
- Air.

When transporting Fresh, a ref unit is used to maintain the required temperature.

Refrigerated trucks (Fig. 1.2) are a special type of trucks designed for the transportation of fresh products, which must be stored under certain temperature conditions in order to preserve the freshness and quality of the product throughout the delivery route. Here are some key aspects of these trucks:

Refrigeration systems: They are equipped with special cooling systems that can maintain different temperature regimes depending on the type of products. This can be from freezing to maintaining a certain temperature within refrigeration conditions.

Temperature control: There are special control panels in the driver's cab that allow you to adjust and control the temperature inside the truck.

Monitoring systems: Some modern trucks have monitoring systems that monitor temperature parameters throughout the route and can automatically notify of any changes if the temperature deviates from a set range.

Load capacity: These trucks have different sizes and load capacities, which allows you to transport different volumes and types of products.

These trucks are used to transport products that require special storage conditions, such as fresh fruits, vegetables, meat, fish, dairy products, etc. They are an integral part of the fresh produce supply chain, ensuring that it reaches the consumer in optimal condition.

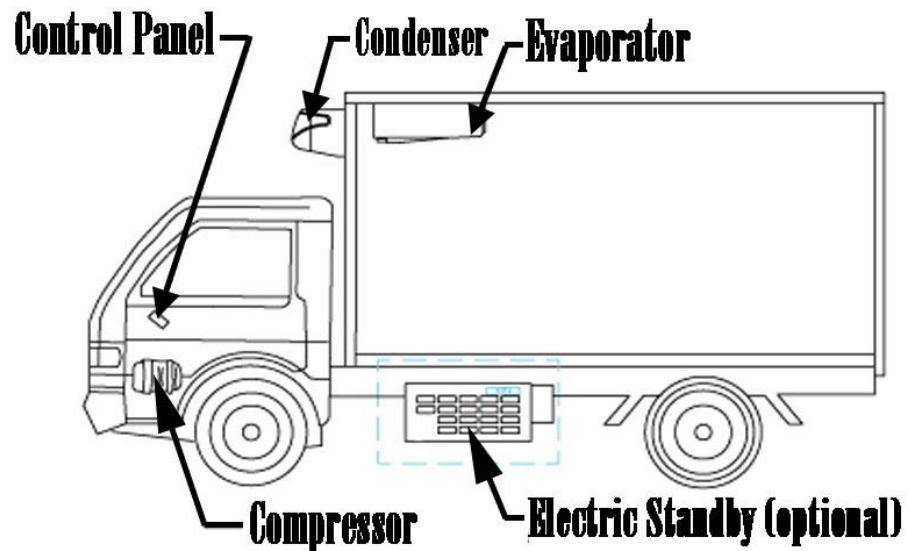


Figure 1.2 - Working principle of the ref installation

A refrigeration unit on a semi-trailer is a cooling system that is installed on a cargo trailer or semi-trailer to ensure the necessary temperature conditions inside the trailer during the transportation of products.

The basic principle of operation of a refrigeration plant is that it uses compression cooling systems similar to those used in refrigerators, but on a larger scale. [11]

Here are the key stages of operation of a refrigerated installation on a semi-trailer:

- **Gas Compression:** The unit uses a compressor to compress the cooling gas, which increases the pressure and temperature of the gas.
- **Condensation:** Compressed gas is fed to a condenser where it cools, turning into a liquid and removing heat.
- **Gas expansion:** The liquid is passed through an expansion valve, where the pressure is reduced and it turns into a low-temperature gas.
- **Cargo cooling:** This cold gas enters the cooling unit inside the trailer, where it circulates through special ventilation systems, cooling the room and the products inside.

- Evaporation of the gas: Finally, the gas returns to the compressor, where the cycle begins again.

This process creates a closed system that ensures constant cooling of the cargo during the entire period of transportation. Controlled temperature conditions allow you to preserve the freshness and quality of products, reducing the risk of spoilage or deterioration of their properties during delivery.

Refrigeration units have different modes of operation, which allow you to adjust the temperature according to the needs of transporting specific types of products. Here are some of them:

- Freeze Mode: This mode is designed to store products at very low temperatures, usually below 0°C. It is used to transport frozen products such as meat, fish, frozen vegetables or fruits.

- Refrigerator Mode: This mode maintains the temperature around 0°C or slightly above, designed for storing products that do not need to be frozen, but must be kept cold, for example, fresh vegetables, fruits, dairy products.

- Conditioning mode: Some refrigeration units may have the ability to adjust the temperature and humidity to create optimal storage conditions for certain types of products that require special conditions, for example, for fruits and vegetables that can spoil quickly at high humidity.

- Transport mode with shutdown mode: This mode allows you to turn off the cooling system during transport, if the products do not need constant cooling during the entire route. This can be used in case of.

These different modes allow you to maintain optimal storage conditions for different types of products during their transportation.

Determining the required mode of operation for a refrigeration unit usually depends on the type of product being transported and its storage temperature requirements. Here are some criteria you can use to choose the mode you want:

- Type of product: Some products, such as frozen meat or fish, require extremely low temperatures. Others, such as fresh fruit or vegetables, may require less cold but

stable temperatures. Evaluating the type of product can help determine the optimal regimen.

- Storage requirements: Some products may have specific temperature requirements, such as a certain temperature range or the need to avoid freezing. Information about these requirements can be printed on the package or indicated in the documentation for transportation.

- Manufacturer's or supplier's recommendations: If you have the opportunity, pay attention to the manufacturers' or suppliers' recommendations for optimal storage conditions. They usually provide temperature recommendations to ensure maximum product quality.

- Consultation with specialists: If you are not sure which mode to choose, it may be useful to consult specialists in the field of transportation of products, who have experience in working with refrigerated transport.

Setting the appropriate mode will help ensure that your products will be stored in optimal conditions during transport and will reach their destination in the appropriate condition.

In order to control the correct operation of the refrigerator and check the compliance of the actual temperature regime with the declared one, additional means are used, such as: thermal logger, or thermal/GPS logger, temperature probes, thermal printouts. [4]

Thermal loggers (Fig. 1.3) are devices used to monitor temperature conditions during the transportation of goods. Their main function is to record temperature data throughout the entire transportation path to ensure compliance with the temperature regimes that are necessary for the storage of a specific type of product. Here's how they're used:

1. Monitoring of conditions: Thermo-loggers are placed inside containers, trucks or trailers next to transported products. They constantly measure the temperature in the selected time interval.

2. Data recording: Thermal loggers collect temperature data throughout the entire transportation route. This data can be written to the device's built-in memory or transferred to an external device for storage and analysis.

3. Data analysis: After the transport is completed, the thermal loggers provide an opportunity to analyze the recorded data. This allows you to determine any deviations in temperature regimes that may have occurred during transportation.

4. Documentation of compliance: Data obtained from thermal loggers can be used to demonstrate the compliance of temperature conditions during product transportation. This is important from the point of view of ensuring the quality and safety of transported goods, especially for products that require certain temperature conditions for storage.

Therefore, thermal loggers help to control temperature conditions during transportation, ensuring compliance with storage requirements for different types of products and helping to avoid possible problems with the quality of goods due to improper transportation conditions.



Figure 1.3- Example of a thermal logger

Thermal probes (Fig. 1.4) are used to monitor temperature conditions in the transportation of various types of goods and products. These devices allow you to

measure the temperature at specific points or spatial areas, which allows you to more accurately determine the storage conditions. Here are some important aspects of using thermal probes in transportation:

1. **Monitoring of temperature conditions in large volumetric spaces:** Thermoprobes can be inserted into the depth of the cargo space or container to measure the temperature at specified points. This is especially useful for large volumes of goods where the temperature can vary.

2. **Control of temperature conditions in different parts of the trailer or container:** Thermoprobes can be located in different parts of the trailer or container for transporting goods, which allows you to monitor the temperature in individual zones. This is especially important for products that require different temperature regimes.

3. **Transportation of temperature-sensitive products:** Thermoprobes are widely used in the transportation of temperature-sensitive products, such as pharmaceutical products, medical preparations, food products, which require precise control of temperature conditions.

4. **Ensuring compliance with standards and requirements:** The use of thermal probes helps to maintain compliance with established standards and requirements for the transport of specific goods, ensuring that the temperature conditions of storage are met.

5. **Ensuring the safety of products:** Temperature monitoring helps to avoid exposure to unwanted temperature fluctuations that can lead to spoilage or deterioration of the quality of goods.

In general, thermal probes are used to create accurate and effective control of temperature conditions during transportation, ensuring the quality and safety of goods during transportation.



Figure 1.4 - Example of thermal probes

Thermal printing (or thermal labeling) is used to create labels or markings that can change their display depending on the temperature conditions during the transportation of goods. This is a useful tool for a number of situations, here are some of them:

1. Products with a limited shelf life: Thermal printing can be used to label products with a limited shelf life, such as foodstuffs, medical devices or chemicals. It allows you to display information about the expiration date, which can change depending on the temperature, which helps to avoid selling or using goods after the expiration date.

2. Storage conditions: Sometimes thermal printing is used to display information about the temperature conditions to which the goods were subjected during transportation. For example, if the product has been exposed to unacceptably high or low temperatures during transportation, this may be reflected on the label.

3. Tracking temperature changes: Thermal labels can be used to track temperature changes during transport, allowing you to observe what temperature conditions goods are subjected to during transport.

4. Storage condition alarms: These can be used to provide information about whether or not goods have been stored at the correct temperature conditions, which can be useful for quality control and product safety.

Thermal printing (Fig. 1.5, 1.6) is used to provide additional information about the conditions of storage and transportation of goods, which can be useful for buyers, sellers and manufacturers during quality and safety control.



Figure 1.5 - Example of Thermal printer



Figure 1.6 - An example of a printed temperature report from transportation

1.3 Standard working hours for drivers

The driver's working time includes:

- a) variable driving time;
- b) preparatory-conclusive period;
- c) time of standstill not caused by the driver;
- d) idle time (at loading and unloading points, boarding and disembarking passengers);
- e) time for medical examinations of the driver before departure on a route (on a trip) and upon return;
- f) time for troubleshooting of vehicle malfunctions on the route (during a trip);
- g) time for guarding the vehicle with or without cargo during stops at terminals and intermediate points when providing intercity transportation, if such duties are stipulated in the employment contract with the driver;
- h) half of the time specified in the task for intercity routes when two drivers are working on a vehicle equipped with sleeping facilities;
- i) other time as specified by the legislation of Ukraine.

The normal duration of drivers' working time should not exceed 40 hours per week. For drivers with a five-day workweek and two days off, the daily working time (shift) is determined by the internal work schedule or shift schedules approved by the Carrier in agreement with the primary trade union organization's elected body (trade union representative) while adhering to the established weekly working time. For drivers with a six-day workweek and one day off, the daily working time must not exceed 7 hours. On the eve of weekends, the working time for a six-day workweek should not exceed 5 hours. On the eve of holidays and non-working days, the working time for drivers is reduced by one hour, both for a five-day and a six-day workweek. The working time (shift) of a driver during nighttime is reduced by one hour.

If, due to work conditions, the prescribed daily or weekly working time cannot

be observed, cumulative recording of working time may be introduced to ensure that the duration of working time during the accounting period does not exceed the normal number of working hours. The decision to introduce cumulative recording of working time is made by the Carrier in agreement with the primary trade union organization's elected body (trade union representative). In the case of cumulative recording of a driver's working time, the normal duration of a working day (shift) should not exceed 10 hours. If the normal duration of a working day includes long breaks, waiting time in a vehicle, or if a driver needs to reach a designated rest area, the duration of the working day (shift) may be extended to 12 hours, provided that the driving time during the day (shift) does not exceed 9 hours.

When using cumulative recording of working time, the work of drivers is regulated by schedules of drivers' shifts for wheeled vehicles (Appendix 1), which are developed for the entire accounting period and determine the duration of daily work (shifts), working days (shifts), and days off.

The schedule of shifts for the accounting period must be communicated to each driver no later than two weeks before the start of the accounting period.

The scope of preparatory-conclusive period tasks, the time required for their completion, and the time for conducting a driver's medical examination are determined by the Carrier in agreement with the primary trade union organization's elected body (trade union representative).

The time spent guarding the vehicle with or without cargo is counted for the driver as 1/3 of working time. The specific duration of time for cargo and vehicle security, which is credited to drivers' working hours, is determined by the Carrier in agreement with the primary trade union organization's elected body (trade union representative).

The presence time at the workplace for drivers when they are not driving the vehicle, in the case of two drivers assigned to a trip, is counted for them as no less than 50% of working time. The specific duration of the presence time at the workplace for a driver when not driving the vehicle, assigned to a trip with two drivers, credited to working time, is determined by the Carrier in agreement with the

primary trade union organization's elected body (trade union representative).

Involvement of drivers in overtime work is carried out in accordance with Articles 62-64 of the Labor Code of Ukraine. Overtime work is considered to be work beyond the established working day (shift) (Articles 52, 53, and 61 of the Labor Code of Ukraine). Overtime work for each driver should not exceed 4 hours within two consecutive days or 120 hours per year, except in cases specified in clause 3.3 of this Regulation.

Driving Period[15]

The driver's variable driving period, including overtime work, should not exceed 9 hours.

For drivers of vehicles transporting heavy and/or oversized and/or hazardous cargo, the variable driving period, including overtime work, should not exceed 8 hours.

The driver's weekly driving duration, including overtime work, should not exceed 48 hours.

Breaks

After driving for four hours, the driver must take a break for rest and meals of at least 45 minutes, if the daily (interchange) rest period has not occurred.

This break can be replaced by breaks of at least 15 minutes each, distributed during the driving period or immediately after it, taking into account the requirements of clause 4.1 of this section.

The break for rest and meals is not counted as part of the driver's working time.

The duration of the break for rest and meals is determined by the Carrier in agreement with the primary trade union organization's elected body (trade union representative). The start and end time of the break are established by the internal work rules.

Drivers have discretion over how they utilize their break time.

Control of working hours

Automotive tachographs are a crucial component of modern transportation infrastructure. These devices are designed to track and record data about the

movement of vehicles, including drivers' working hours, speed, distance traveled, and much more. In this article, we will explore the importance of automotive tachographs, their functions, types, and their impact on the transport industry.

Automotive tachographs play a significant role in ensuring road safety, monitoring drivers' working hours, and efficiently managing a transportation business. They help reduce accident risks, prevent driver fatigue, and enhance road safety.

The first automotive tachographs were developed in the mid-20th century, and they have evolved significantly since then. In this section, we will delve into the historical context of the development of these devices.

One of the primary functions of automotive tachographs is to record drivers' working hours. This helps in complying with driving time restrictions, reducing the risk of fatigue-related accidents, and improving road safety.

Automotive tachographs measure vehicle speed and distance traveled. This information is crucial for speed control and recording routes and distances.

Many modern tachographs are equipped with electronic driver's logbooks, making it convenient to record working hours, breaks, and rest periods for drivers.

Automotive tachographs also record data about the vehicle itself, including VIN codes, license plate numbers, and vehicle specifications.

Tachographs type

Analog tachographs (Fig. 1.7) were popular for many years and used paper discs to record data. They are still in use in some regions but require more manual data handling.



Figure 1.7 - Analog tachographs

Digital tachographs (Fig 1.8) utilize electronic data storage and driver cards. They offer greater accuracy and data convenience, reducing the risk of non-compliance with regulations.



Figure 1.8 - Digital tachographs

GPS tachographs (Fig. 1.8) combine tachograph functionality with Global Positioning System (GPS) technology. They provide real-time tracking of a vehicle's location.



Figure 1.9 - GPS tachographs

Comparison of Tachograph Types

Data Recording Method

Analog Tachographs: Utilize paper discs or drums to record data about driver working hours, speed, and distance traveled. This method requires regular disc replacement and device maintenance.

Digital Tachographs: Record data electronically on special driver cards and digital storage. They provide data convenience and require less maintenance.

GPS Tachographs: Utilize satellite signals to record route, speed, and other data, allowing real-time tracking of the vehicle's location.

Accuracy and Reliability

Analog Tachographs: May be less accurate due to wear and tear of paper discs and the potential for data tampering.

Digital Tachographs: Typically offer higher accuracy and reliability due to the use of electronic data recording.

GPS Tachographs: Provide higher accuracy in determining the vehicle's location and movement but may require a strong GPS signal.

User Convenience

Analog Tachographs: Require manual replacement of paper discs and complex data analysis.

Digital Tachographs: Offer easy access to data through an electronic interface and real-time tracking capabilities.

GPS Tachographs: Enable real-time tracking of the vehicle's location and provide easy access to location-based data.

Cost and Maintenance

Analog Tachographs: Generally less expensive to install but require regular maintenance and the purchase of paper discs.

Digital Tachographs: Initial costs may be higher, but they typically require less maintenance and improve fleet management efficiency.

GPS Tachographs: May have a higher initial cost due to integrated GPS technology but can significantly reduce route tracking costs and enhance safety.

The choice between these tachograph types depends on the specific needs and circumstances of a transportation company. Each type has its advantages and limitations.

The use of automotive tachographs contributes to improved road safety by preventing driver fatigue, overloading, and accidents.

Automotive tachographs enable transportation companies to manage their fleets more efficiently. This helps reduce costs, increase productivity, and enhance customer service.

Automotive tachographs assist drivers and transportation companies in complying with legal requirements related to working hours and driver activity.

Automotive tachographs play a vital role in the modern transport industry. They enhance safety, efficiency, and regulatory compliance. As technology continues to advance, these devices will continue to evolve and impact the operations of transportation companies. It is essential for all stakeholders in the road transportation system to adhere to the requirements and standards related to automotive tachographs to ensure overall safety and efficiency.

Chapter summary

Application of technologies in the field of supply of "fresh" goods is a key factor of modern logistics. It plays an important role in ensuring the continuity and timeliness of delivery, which are critical to maintaining product quality. However, the development of this industry depends not only on technological advances, but also on the development of effective management and personnel strategies, as well as on the improvement of the regulatory and legal environment.

The quality of drivers' working time management has a significant impact on the success of "fresh" logistics. Its control is important because it affects the freshness of goods during transportation. Effective distribution of time, taking into account breaks for rest and food, as well as compliance with work regimes form the basis of ensuring the safety of supplies of "fresh" goods. Informing drivers about the technical capabilities and features of the equipment and technologies used to preserve the quality of goods becomes an important component.

For the further development of "fresh" logistics, it is important to consider the integration of the latest technologies, such as artificial intelligence, the Internet of Things (IoT), data analysis, and process automation. These technologies can greatly facilitate the monitoring and management of all stages of the supply chain, ensuring accurate and rapid intervention when necessary.

In addition, management of "fresh" logistics requires a broader approach to

understanding market needs. This means developing individual strategies for different categories of "fresh" goods, as they may have different transport and storage requirements. Producers and suppliers must be ready for challenges in the field of logistics to ensure quality and fresh products in the consumer market.

Considering these challenges, "fresh" logistics remains one of the most important areas for development and improvement. Its successful development not only supports consumer needs, but also defines new standards of quality and efficiency in the supply of "fresh" goods.

CHAPTER 2

ANALYSIS OF HISTORY AND INDICATORS OF A LOGISTICS COMPANY

2.1 History and activity of the company

Today's world of science and research is a boundless ocean of opportunities and challenges, where every graduate student has a chance to equal real scientists and contribute to the development of society. As I embark on this new chapter of my academic career, I aspire to immerse myself in the greatest open fields of science and research. My pre-diploma practice is not only an opportunity to summarize my educational achievements, but also an opportunity to open new horizons in my chosen direction. It will not only be the final chord in my studies, but also the beginning of my research journey, where I intend to open new questions, find scientific answers and influence the world around us.

The object of research is the transport and forwarding company "General Trans Alliance Logistics" on the basis of which the report on pre-diploma practice was written. Since 2014, General Trans Alliance LLC has been engaged in transportation in the market of Ukraine and abroad, and also develops warehouse logistics and additional services such as cross-docking and fulfillment. The subject of my research was the company's clients and work with them, in order to identify problems at the enterprise, analyze and solve this problem.

General Trans Alliance Logistics was founded in 2014 as a transport company. Since its foundation, GTAL has been the general carrier of one client and provided the company with 99% of its transport. At the end of 2014, the company's own fleet consisted of 40 isothermal trucks. Since 2016, the client has changed its supply chains, which contributed to the development of the forwarding department in the company, since it was necessary to pick up its own transport from the regions of

Ukraine. Thus, GTAL began to occupy a larger share in the cargo transportation market. With the increase in the number of clients in the regions, the Company was not able to provide quality work only at the expense of its own transport, therefore, at the end of 2016, a decision was made to open a forwarding department to improve the quality of services. At the end of 2017, GTAL opened its first customs warehouse in the city of Boryspil and entered the international level. In 2019, the second multi-temperature warehouse will be opened in the city of Dnipro and 2 new projects on cross-docking and fulfillment will be launched.

To date, the company is expanding its personnel and its own fleet, occupying an increasing share in the logistics market in Ukraine and beyond.

Company activity[28]

The company has been operating on the market since 2014 and provides its clients with a wide range of services such as:

- Transportation across Ukraine
- International transportation
- Specialized transportation
- Pallet delivery
- Warehouse logistics services
- Multi-temperature warehouse services
- Fulfillment
- Cross-docking
- Customs warehousing services
- Loading/unloading services
- Let's consider each of them in more detail

Freight transportation across Ukraine has become an important and priority area of activity of the GTAL company. The company has a large fleet of vehicles (Tab 2.1) and an experienced team of specialists, which allows us to provide reliable delivery of cargo of any size and weight. We offer competitive prices and guarantee the high quality of our services.

The company is ready to undertake all aspects of the organization of cargo

transportation, including obtaining the necessary permits and documents.

The company offers a wide range of additional services, including cargo storage, insurance, provision of special equipment and loading and unloading operations.

The company has an impeccable reputation in the freight transportation market and guarantees reliable and prompt delivery of cargo. Customers can count on constant support and advice at every stage of the process.

Advantages of freight transportation across Ukraine from the GTAL company:

- Round-the-clock consultation and customer support.
- Personal manager for each order.
- Guarantee of cargo safety in all conditions.
- Convenient logistics routes throughout Ukraine.
- Legal assistance in drawing up documents.
- Reliable transport and professional drivers.
- Competitive tariffs and transparent pricing.
- Additional related services.
- Operational information about the status of the cargo.
- Ensuring confidentiality.

The GTAL company transports all types of cargo - bulk, liquid, oversized (machinery, equipment), dangerous cargo, perishable cargo, food products. We have special equipment for goods that require special conditions for the transportation of goods across Ukraine inexpensively in Kyiv:

tank trucks;

trailers with awnings;

trailers with refrigerators,

isothermal trailers.

International transportation

Today, international transportation is a very popular service, which is the main component of the foreign economic activity of any company. The number of companies that use the service of international transportation of goods in Ukraine is increasing annually due to globalization and international cooperation.

Table 2.1 - Own transport of GTLA

| Vehicle | Quantity |
|---|----------|
| Refrigerated semi-trailer | 1 |
| Multi-temperature refrigerated semi-trailer | 2 |
| Isothermal semi-trailer | 87 |
| Semi-trailers awning | 21 |
| Tankers | 2 |

However, the high-quality performance of the service of international transportation Ukraine is associated with many time-consuming tasks and legal nuances. This is the high competition in the logistics market, when it is sometimes difficult for the client to choose a reliable carrier to carry out the international transportation of goods to Kyiv, and various issues during the preparation of documentation, and various customs procedures that must be responded to promptly, and difficulties with the correct storage of goods, for which require an equipped customs warehouse.

The requirements that exist for the provision of the service of international transportation Kyiv imply significant financial infusions and time costs, and become a significant obstacle to doing business. The most optimal and effective way out of this situation will be to turn to an experienced provider in the field of transport logistics - the company "General Trans Alliance Logistics", which offers a full range of services for international transportation in Ukraine, warehousing services and legal support for international transportation around the world.

We provide complex logistics services:

Organization of cargo transportation at all stages, taking into account the characteristics of the product;

Creation of the optimal route;

Engagement of only professional drivers and high-quality, reliable transport;

Warehousing services, processing and systematization of goods and preparation for shipment;

Customs clearance of cargo and assistance in settling customs issues during international transportation;

Cargo insurance;

Legal support and assistance in drawing up the necessary documents;

Multimodal transportation Ukraine.

Multimodal transportation from the GTAL company

Multimodal transportation is used in cases where there is no direct connection by a single mode of transport, or direct connection is not suitable for the recipient due to high cost or long delivery time. Such international transportation is carried out by various types of transport (air, car, sea, rail) in any combination.

In order to qualitatively satisfy the requests of our partners, and to provide favorable tariffs for multimodal transportation in Ukraine, we constantly monitor the situation on the transport market in the world. We have our own fleet of trucks of various types at our disposal, we have contracts with other transport companies, which allows us to offer our customers optimal logistics solutions.

As part of the multimodal transportation service, we offer such related services as:

Loading and unloading works;

Provision of temporary storage warehouses;

Accounting of goods and operations with goods;

Your personal Ukraine multimodal transportation service manager who accompanies the entire process.

The Company's capabilities

Technical capacities and extensive infrastructure allow us to perform international cargo transportation for each customer as accurately and quickly as possible.

We carry out consolidated and complete international transportation by trucks.

We select the transport that best matches the type of cargo.

We use multimodal transportation, which involves the use of several types of transport under one transportation contract. This transportation option significantly saves the customer's time and finances.

We work with any types of cargo. We provide Fresh-logistics services, carry out international transportation of pre-packaged and complete cargoes, dangerous goods to Kyiv.

We strictly observe the conditions of storage of goods during transportation, conditions of loading and unloading.

International transportation in Ukraine is carried out with constant tracking of the condition of the goods in transit.

The most important goal when performing the service of international transportation by trucks is to deliver the cargo exactly on time, while avoiding even minor damages and overlays on the way.

Specialized transportation

Specialized transportation is an important branch of logistics that focuses on transporting goods that require specific conditions or equipment for their safe and efficient delivery. This type of transportation encompasses various specific tasks and requirements, often related to the nature of the cargo, its size, weight, temperature conditions, and other factors. Here are some main types of specialized transportation:

Oversized Cargo: These are goods that exceed standard container or vehicle dimensions and require special equipment and permits for transportation.

Heavy Cargo: Heavy cargo refers to goods with substantial weight, which also necessitate specialized transport for safe delivery.

Hazardous Materials: Hazardous cargo contains substances or materials that may be harmful to human health or the environment. Special rules and standards must be followed for their transportation.

Technical Equipment: Large or complex technical devices and equipment may require special transport and handling for safe and reliable delivery.

Bulk Materials: Bulk materials like grain, coal, cement, and others require specialized containers and equipment for loading and unloading.

Livestock: Large animals such as horses or cattle require special transportation vehicles and conditions to ensure their comfortable transport.

Medical Equipment: Medical equipment, which can be expensive and delicate, demands particular attention and safety measures during transportation.

Specialized transportation demands carriers with specific skills, experience, and equipment to ensure safety and efficiency. Clients in need of specialized transportation often rely on logistics companies with expertise in this field to guarantee the successful delivery of their goods.

A responsible storage facility and multi-temperature warehouse services (Fig. 1.1), often referred to as a secure or reliable storage facility, plays a crucial role in various industries, including logistics, warehousing, and inventory management. Such a facility is designed to provide a safe and organized environment for the storage of goods, products, and materials. Here are some key aspects of a responsible storage facility:

Security: Security is paramount in a responsible storage facility. It includes measures such as surveillance cameras, access control systems, security personnel, and alarm systems to protect stored items from theft and unauthorized access.

Inventory Management: Effective inventory management systems are often in place to track the location, quantity, and condition of stored items. Barcode scanning, RFID technology, and computerized inventory software are commonly used for this purpose.

Organization: Items in a responsible storage facility are organized systematically to maximize space utilization and ease of access. Shelving, pallet racks, and designated storage areas help maintain orderliness.

Safety: Safety protocols and equipment are implemented to prevent accidents and ensure the well-being of personnel working in the storage facility. This includes fire suppression systems, first-aid stations, and safety training for employees.

Climate Control: Depending on the nature of the stored items, some responsible storage facilities offer climate-controlled environments. This ensures that temperature and humidity levels are maintained within specific ranges to preserve the quality of

sensitive goods like electronics, artwork, or pharmaceuticals.

Cleanliness and Hygiene: Responsible storage facilities are clean and well-maintained. Regular cleaning and pest control measures are taken to prevent damage to stored items.

Customization: Some storage facilities offer customizable storage solutions to meet specific client requirements. This may include options for different storage unit sizes or configurations.

Accessibility: Accessibility is important for clients to retrieve their stored items as needed. Facilities may offer 24/7 access or have set operating hours for clients.

Documentation and Record-Keeping: Detailed records of all stored items are maintained. This includes item descriptions, quantities, condition reports, and any movements in or out of storage.

Insurance: Many responsible storage facilities offer insurance options to provide additional protection for stored items against unforeseen events like fire, theft, or damage.

Compliance: Responsible storage facilities adhere to industry regulations and safety standards, ensuring that all operations are conducted in a legal and ethical manner.

Customer Support: Facilities often provide customer support services to address inquiries, assist with logistics, and facilitate the retrieval or movement of stored items.

At the General Trans Alliance Logistics warehouse complex, there are 4 independent chambers for storing products with a temperature regime:

low-temperature chambers with a mode of -20oC for 600 m2 and 400 m2.

cameras with a mode of 00C - +60C each 400 m2 and 150 m2.

The technical parameters of the warehouse correspond to class B.

Features of the warehouse complex:

Environmental equipment that runs on freon. We do not use ammonia to cool products.

Adjustable and personalized mode from +60C to -250C.

Bulk floors with anti-dust coating, modern warehouse management system -

WMS, high-quality Internet access.

Responsible storage facilities serve a wide range of clients, including businesses, individuals, and organizations that require a secure and reliable space to store their valuable items and assets. These facilities play a crucial role in safeguarding assets, streamlining operations, and maintaining the integrity of stored goods.



Figure 2.1 - Scheme of responsible warehouse service

Crossdocking

Crossdocking is a logistics practice that involves receiving goods at a warehouse or terminal and immediately redirecting them to transport vehicles for direct delivery without storage or with minimal storage time (pic 1.2). The primary goal of crossdocking is to expedite the shipment of goods and reduce storage time, thus optimizing logistics processes and lowering costs.

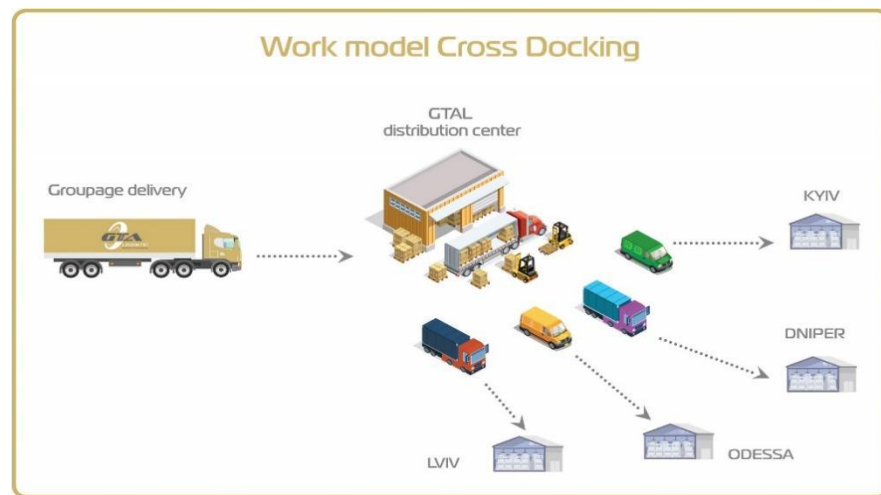


Figure 2.2 - Scheme of cross docking

Key Features of Crossdocking:

Speed: The main advantage is the reduction in the time between the arrival of goods and their dispatch to the final destination point. This is especially crucial in industries where fast delivery is essential, such as retail or the food industry.

Cost Reduction: Crossdocking helps avoid costs associated with additional storage of goods in warehouses and related expenses, such as rent and maintenance.

Inventory Optimization: More accurate inventory management allows companies to reduce the volume of goods held in stock, freeing up capital for other investments.

Logistics Efficiency: Crossdocking reduces the risks of losses associated with complicated storage and inventory management processes and enhances the efficiency of logistic operations.

Collaboration Potential: Companies can share and utilize crossdocking centers jointly, saving costs and increasing flexibility in logistics management.

Crossdocking is widely used in the logistics industry, especially in transportation and delivery sectors, as well as in industries with high inventory turnover and shortened supply cycles.

Fulfillment

Fulfillment is a service provided by logistics companies or e-commerce platforms to process and execute customer orders(pic 1.3). The primary goal of fulfillment is to

provide customers with goods and fulfill their orders quickly and efficiently. An essential component of fulfillment services includes order processing, storage, preparation, and delivery of goods.

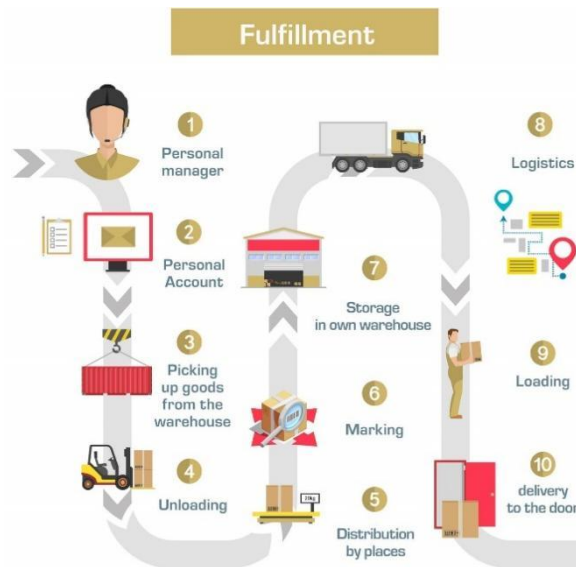


Figure 2.3 - Scheme of fulfillment

Key aspects of fulfillment:

Receiving and Storage: Fulfillment centers receive goods from suppliers and store them until orders are processed.

Order Processing: Companies prepare orders, including selecting products, packaging, and preparing them for shipment.

Delivery: Fulfillment services may include organizing the delivery of goods to customers using various delivery methods, including courier services and postal services.

Inventory Management: Effective inventory management ensures the availability of goods in stock and readiness to ship when orders are placed.

Inventory and Tracking: Fulfillment centers maintain inventory records and provide tracking of the status of goods.

Customer Service: Fulfillment companies may offer customer service, including responding to inquiries and resolving issues.

Returns Handling: When necessary, fulfillment centers may accept returns from

customers and process returns.

Fulfillment services are widely used in the e-commerce industry and help businesses focus on their core operations without expending time and effort on logistical operations. They enable businesses to provide customers with goods and services quickly and efficiently, contributing to revenue growth and customer satisfaction.

In summary, General Trans Alliance Logistics is a comprehensive logistics company with a broad spectrum of services, advanced facilities, and a strong commitment to meeting customer needs efficiently and effectively.

2.2 Organizational structure of the company

The organizational structure of "General Trans Alliance Logistics" includes 11 departments. Each of the departments is closely connected with each other for the most effective work of the company. Below is more detailed information about the departments and their area of responsibility:

1. Administrative and Management Department - This department provides overall management and organizational support to the company. Its functions include strategy development, resource management, addressing administrative issues, and interacting with other departments.

2. Analytics Department - This department analyzes data to provide information for management decisions. Analysts monitor market trends, study the company's internal and external activities, and develop recommendations for improving productivity and profitability.

3. Logistics Department - This department is responsible for organizing transportation and supply chain operations. It considers transportation selection, routing, schedules, and coordination of deliveries to ensure timely delivery.

4. International Transportation Department - Specializes in organizing international transportation of goods, including compliance with customs and legal requirements of different countries.

5. Warehouse Logistics Department - Manages inventory and goods storage. This department ensures efficient management and maintenance of warehouse infrastructure.

6. Technical Control Department - Conducts technical supervision and control over the condition of vehicles and equipment, including safety and compliance with standards.

7. Information Technology Department - Develops, implements, and maintains the company's IT systems, including software, networks, and computing infrastructure.

8. Transport and Expeditions Department for the Western Region - Specializes in organizing transportation and expedition services in the western region, including route planning and cargo delivery.

9. Transport and Expeditions Department for the Central Region - Specializes in organizing transportation and expedition services in the central region of the company.

10. Financial and Economic Department - Responsible for financial management, accounting, budget planning, and financial analysis.

11. Legal Department - Provides legal support to the company, including contract negotiations, dispute resolution, and compliance with legal regulations.

Staff job descriptions

Job descriptions are documents that detail the duties, responsibilities and functional responsibilities of employees in the organization. They may contain different sections and clauses, but in general, the following aspects are usually indicated in job descriptions: [22]

General information: The name of the position, subordination (to whom the employee is subordinate and to whom he is subordinate), the structure of the department or unit is indicated.

Basic duties: The main tasks and duties associated with this position are described. This can include all aspects of the work process that the employee must perform.

Qualification requirements: The necessary qualifications, skills, education and experience that an employee must have to occupy a given position are indicated.

Reporting: Specify to whom and how often the employee must submit reports or information about his work.

Conditions of employment: May include information about work schedule, location, working conditions, safety regulations, and information about compensation and benefits.

Powers and responsibilities: The powers that the employee has in his position, and the responsibility for the performance of duties and the answer for possible errors or shortcomings are indicated.

Procedures and instructions: May contain references to standard procedures, instructions or regulations that the employee must follow in the performance of his duties.

Validity period and changes: The validity period of the job description and the procedure for making changes to it are indicated.

Signatures and Approvals: The job description may include a section with signatures and approval dates that confirm that the employee has read his job description.

Job descriptions are essential for effective management and defining roles and responsibilities in an organization. They help to ensure consistency in the performance of tasks and increase the quality of work[25].

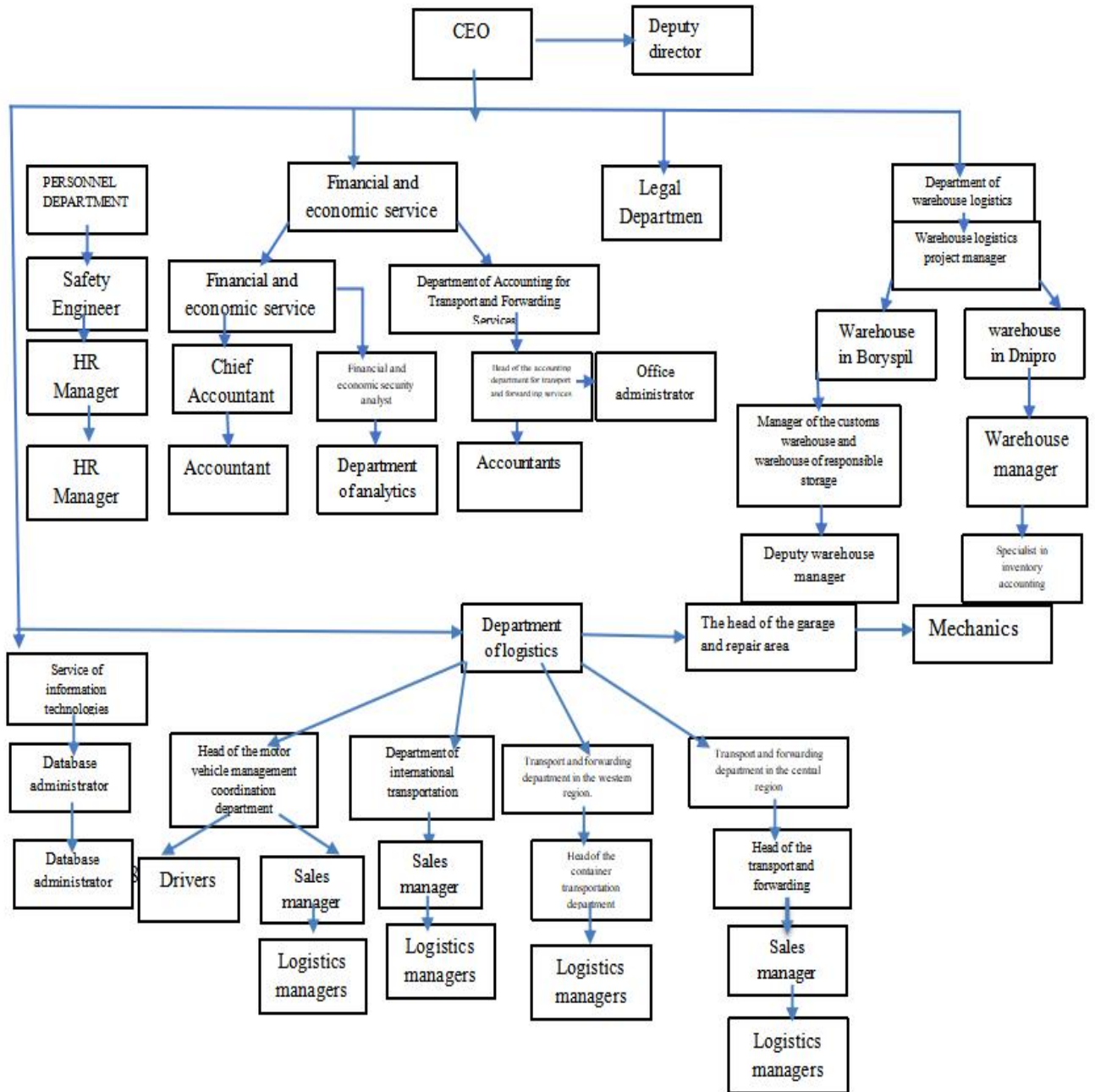


Figure 2.2 - Organizational structure of GTAL

2.3. Analysis of financial and economic indicators of the company

A company's economic indicators reflect its financial condition, productivity and overall efficiency. The main economic indicators for the company include the following:[25]

Net Income: This is the amount of money a company has left over after deducting all expenses, taxes, and interest. Net profit is a key indicator of a company's financial health.

Sales volume (Revenue): This is the company's total income from the sale of goods or services. It can be broken down into different segments or geographic markets.

Gross Profit: This is the difference between sales revenue and costs of production or purchase of goods. This indicator indicates the efficiency of production. [26]

Profitability: Profitability can be measured in various ways, such as return on assets, return on capital, return on sales, etc. It indicates how efficiently the company generates profit from invested capital.

Asset Turnover: This indicator indicates how efficiently the company uses its assets to generate income. It is calculated as the ratio of sales volume to total assets.

Net Working Capital: This is the difference between current assets and current liabilities. Indicates the financial liquidity of the company.

Debt-to-Equity Ratio: Indicates the degree of financial leverage of the company and its dependence on borrowed funds.

Return on Equity (ROE): This indicator indicates the profitability for the company's shareholders and investors.

Production/Service Volume: Important for manufacturing companies, this indicator indicates the amount of goods a company produces or services it provides.

Stock Price: The value of a company's shares on the stock market can be an important indicator of a company's financial health and investment attractiveness.

These indicators help company management and investors determine how well the company is meeting its financial goals and strategies, and they can be used to make decisions about the future development of the company[24 25].

Table 2.3 - Main financial indicator of GTAL

| № | Indicator | Years | | | Deviation | |
|---|--|---------|---------|---------|-----------|-----------|
| | | 2019 | 2020 | 2021 | 2019/2020 | 2020/2021 |
| 1 | Net income from product sales | 600 880 | 573 633 | 597 253 | -4,50% | 4,12% |
| 2 | Cost of goods sold | 550 146 | 529 523 | 578 178 | -3,70% | 9,19% |
| 3 | Gross profit | 50 734 | 44 110 | 19 075 | -13,10% | -56,76% |
| 4 | Administrative expenses | 19 524 | 15 568 | 13 379 | -20,30% | -14,06% |
| 5 | Selling expenses | 17 655 | 16 388 | 13 135 | -7,20% | -19,85% |
| 6 | Other operating expenses | 3 355 | 6 197 | 4 263 | 84,70% | -31,21% |
| 7 | Profit from operating activities | 8 012 | 12 011 | 9 821 | 49,90% | -18,23% |
| 8 | Profit from discontinued operations after taxation | 10 146 | 5350 | 13 038 | -47,30% | 143,70% |
| 9 | Net financial result | 8 265 | 4 406 | 13 038 | -46,70% | 195,91% |

Percentage Change= $\frac{\text{New Value}-\text{Old Value}}{\text{Old Value}} \times 100$. [27]

1. Net Income from Product Sales:

Net income from product sales decreased by 4.5% from 2019 to 2020 but increased by 4.12% from 2020 to 2021. The recovery in 2021 is a positive sign.

2. Cost of Goods Sold:

The cost of goods sold decreased by 3.7% from 2019 to 2020 but increased significantly by 9.19% from 2020 to 2021. This suggests cost management challenges.

3. Gross Profit:

Gross profit decreased by 13.1% from 2019 to 2020 and further decreased by a substantial 56.76% from 2020 to 2021. This is a critical concern and indicates profitability issues.

4. Administrative Expenses:

Administrative expenses decreased by 20.3% from 2019 to 2020 and decreased by 14.06% from 2020 to 2021. Cost reduction in administrative expenses is positive.

5. Selling Expenses:

Selling expenses decreased by 7.2% from 2019 to 2020 and decreased further by 19.85% from 2020 to 2021.

6. Other Operating Expenses:

Other operating expenses increased significantly by 84.7% from 2019 to 2020 but decreased by 31.21% from 2020 to 2021. There is still room for further cost reduction.

7. Profit from Operating Activities: Profit from operating activities increased by 49.9% from 2019 to 2020 but decreased by 18.23% from 2020 to 2021. This suggests that while there was recovery in 2020, profitability declined again in 2021.

8. Profit from Discontinued Operations after Taxation:

Profit from discontinued operations showed a significant decrease of 47.3% from 2019 to 2020 but a substantial increase of 143.7% from 2020 to 2021. This indicates volatility in this area.

9. Net Financial Result:

Net financial result decreased by 46.7% from 2019 to 2020 but increased substantially by 195.91% from 2020 to 2021. This could be due to fluctuations in investment or financing activities.

Conclusions:

1. The company's financial performance has been volatile, with both positive and negative trends.

2. There was a recovery in 2020, but profitability declined again in 2021, especially evident in gross profit and profit from operating activities.

3. Cost management has been effective in reducing administrative and selling expenses.

4. Other operating expenses showed significant fluctuations, indicating a need for better cost control.

5. Profit from discontinued operations and net financial results experienced significant volatility.

Recommendations:

1. Conduct a detailed analysis of the factors impacting gross profit and profitability.

2. Continue efforts to manage administrative and selling expenses efficiently.

3. Investigate and stabilize other operating expenses to reduce fluctuations.

4. Carefully evaluate the impact of discontinued operations and investment activities on financial results.

5. Develop a more stable and sustainable financial strategy to ensure consistent profitability over time.

6. Consider seeking financial advice to address the volatility and uncertainty in the financial performance.

It's crucial for the company to address the challenges in cost management and profitability to maintain long-term financial stability and growth. Regular financial monitoring and adjustment of strategies will be essential in achieving these goals

2.4 SWOT analysis

A SWOT analysis is a strategic tool employed to gauge a company's competitive standing and formulate strategic plans. This framework evaluates both internal and external factors, as well as current and future possibilities.

SWOT analysis aims to provide an objective, data-driven assessment of an organization's strengths and weaknesses, whether within the company itself, its

initiatives, or its industry. It's crucial to maintain the accuracy of the analysis by steering clear of preconceived notions or vague assessments and instead grounding it in real-world scenarios. Businesses should view it as a helpful guideline rather than a rigid formula. [19]

Table 2.4 - SWOT analysis of GTAL

| | Strengths | Weaknesses | |
|---------------|--|--|------------|
| Strengths | <p>1)What makes your organization, product or project unique? General Trans Alliance Logistics is a reliable 3PL provider of logistics services including warehouse, transport and multimodal services.</p> <p>2)What advantages do you have compared to your competitors? Competent and experienced employees. Fast processing of applications for transport. Client base of both customers and carriers in all corners of Ukraine.</p> <p>3)What internal resources and assets can be used to achieve success? All available resources contribute to achieving a competitive advantage and providing the highest level of service. Such as a large fleet that is constantly updated, which reduces the risks of force majeure when performing transport services, or own warehouses for additional services to campaign clients.</p> | <p>1)Where does your organization or product fall behind the competition? Longer payment terms to carriers than competitors. It is more profitable for a hired carrier to take an order a little cheaper, but with shorter terms for payment of services. GTAL pays in 20 calendar days after receiving the original documents, while the nearest competitor pays in 10 days.</p> <p>2)What flaws do you need to fix? Despite the large fleet, the company lacks refrigerator semi-trailers to provide better service to all customers. For example, for customers of the fresh category, we cannot provide sufficient service, as there are no own refrigerators in the region. In this case, the time for processing orders increases.</p> | Weaknesses |
| Opportunities | <p>1)What external factors or trends could become beneficial for your organization? Ukraine's entry into the European Union will be beneficial for the organization. This is an opportunity to expand in the market and build new supply chains.</p> <p>2)What new opportunities can you exploit in the market? The use of E-Invoices will reduce the time for processing documents and simplify the bureaucracy with both customers and carriers.</p> <p>3)What opportunities arise from changes in the environment or technology? Modern technologies allow monitoring the work of all organizational units in real time. This helps to detect a problem or malfunction in the early stages and to eliminate it in a timely manner.</p> | <p>1)What external factors or circumstances might threaten your success? Unstable situation in the country, hostilities, rising prices. These conditions prevent the full development of the logistics market.</p> <p>2)What competitors or trends could negatively affect your business? If competitors significantly lower their prices, this may negatively affect development and cause financial losses.</p> <p>3)What are the possible threats in your industry or market segment? Decrease in demand from the final buyer, closure of enterprises, as well as force majeure events such as traffic accidents, breakdown of equipment and the human factor.</p> | Threats |
| | Opportunities | Threats | |

Recommendations:

Payment Terms Adjustment: Consider revising payment terms for carriers to be more competitive, aligning with industry standards or shortening the payment period.

Invest in Refrigerated Trailers: Address the shortage of refrigerated semi-trailers to better serve fresh category customers and expand market reach.

Market Expansion Planning: Prepare for potential opportunities arising from Ukraine's EU entry by researching and developing strategies to enter new markets.

E-Invoice Implementation: Swiftly adopt E-Invoices to improve operational efficiency, reduce paperwork, and enhance customer and carrier relationships.

Technology Integration: Maximize the benefits of modern technology by

investing in real-time monitoring systems to detect and address issues promptly.

Diversification: Explore options for diversifying revenue streams, such as offering value-added logistics services or expanding into related industries.

Risk Management: Develop comprehensive risk mitigation plans to address the impact of political instability, economic fluctuations, and other external threats.

Competitive Pricing Strategy: Continuously monitor market trends and competitor pricing to adjust your pricing strategy to remain competitive.

Client Retention: Strengthen relationships with existing clients through excellent service and communication, as well as attracting new clients to ensure a robust customer base.

Emergency Response: Establish emergency response plans to manage unforeseen events like accidents and equipment breakdowns to minimize disruptions.

By implementing these recommendations, GTAL can enhance its strengths, address its weaknesses, capitalize on opportunities, and mitigate threats, positioning the company for sustainable growth and success in the dynamic logistics industry in Ukraine.

2.5 Clients analysis of the company

What makes it possible to work in the freight transportation market? Availability of trucks, experienced and responsible staff, developed routes, all this is very important, but without the client, this whole structure simply will not work. The company General Trans Alliance Logistics has been on the market for more than 9 years, and during this time it has developed many clients in different parts of the country, as well as different types of products supplied (Tab 2.5).

Table 2.5 - Main clients of GTAL

| Clients | Region | Product type/Conditions of transportation |
|----------------------------|----------------------------|--|
| Успот | Trebuhiv, Kyiv reg. | Frozen products and Fresh products (meat with mode -18, 0+2) |
| Житомирський м'ясокомбінат | Zhitomyr | Sausage and meat products at a temperature of 0+2(Fresh) |
| Оптіма фарм | Kyiv | Medicines with a temperature regime of +8+10(Fresh) |
| ДАНОН ДНІПРО ТОВ | Kremenchug | Dairy products with a temperature regime of +2 +4 (Fresh) |
| ЮФК | Kyiv | Fish with a temperature regime of -2 +1 (Fresh) |
| АВК | Dnipro | Confectionery in the isotherm mode |
| Лакталіс | Pavlograd, Mykolayv | Dairy products with a temperature regime of +2 +4 (Fresh) |
| Чумак | Khmelnitskiy | sauces/pasta products, on any covered truck |
| КОНТІ ТБ ТОВ | Kaniv, Dnipro | Confectionery, on an isothermal truck |
| ЛВН ЛІМІТЕД ТОВ | Nemiriv | Alcoholic drinks on any covered truck |
| БІОЛА ТД ТОВ | Dnipro, Kiyv | drinks, on any card truck |
| Нестле Україна | Smoligiv, Kharkiv, Malehiv | food products, on any map truck |
| ЦЕРСАНІТ ІНВЕСТ ТОВ | Novograd-Volynskiy | Plumbing, on any map truck |
| Транс Логістик ПП | All regins of Ukraine | food products, household goods, any map truck |
| САНТРЕЙД ДП | Dnipro | sunflower oil, for any covered truck |
| Радехівський цукор ТзОВ | Radehiv | Sugar, on any covered truck |
| АЛЪАНС МАРКЕТ ТОВ | Lviv | Cookies, in the isotherm mode |
| КІЇВМЛІН ТОВ | Kyiv | Flour, on any covered truck |
| КАПАРОЛ УКРАЇНА ДП | Dnipro, Bilogorodka. | paint for any covered truck |
| ЛУНАПАК ТГ ТОВ | Dnipro | Corrugated cardboard for any covered |

| | | |
|--|--|-------|
| | | truck |
|--|--|-------|

Based on the list of clients, it can be seen that 6 out of 20 clients have the Fresh category, which is 30% of the total number. For a more accurate assessment, let's take data on customers for the last 8 months and make an ABC analysis for the exact distribution of the company's customers.

ABC-XYZ analysis is an inventory and inventory management method that helps categorize products or customers based on their importance and projected popularity. This method helps companies make decisions about which goods to produce or stock, how to place them, and manage demand.[20]

ABC analysis identifies products or customers based on their impact on the business. Usually, the following categories are used:

1. Category A (High Profit): These are products or customers that generate the largest amount of profit for the company. They may only be a small part of the inventory or customer base, but they generate the most revenue.

2. Category B (Average Profit): This category includes products or customers that generate an average level of profit. They are important to the business, but not as defining as the A category.

3. Category C (low profit): Products or customers in this category have the lowest impact on the company's profit. They may make up a large portion of the inventory or customer base, but bring in the least profit.

XYZ analysis extends ABC analysis by adding demand analysis:

1. Category X (stable demand): Products or customers in this category have stable and predictable demand. Forecasting their demand is quite simple.

2. Category Y (variable demand): This category includes products or customers for which demand may fluctuate. Forecasting their demand is more difficult and they require more active inventory management or customer service.

3. Category Z (unpredictable demand): This category includes products or customers for which demand is not very predictable. They are difficult to predict and may require the greatest level of inventory management or customer service.

Combining ABC and XYZ analysis helps companies develop effective strategies for inventory management, production planning and customer service, taking into account the importance of products or customers and their level of predictability.

Table 2.6 - Revenue from each clients

| Client | period | period | period | period | period | period | period | period | Total by period |
|----------------------------|-----------|-----------|-------------|-----------|-------------|-------------|-----------|-----------|-----------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| | Revenue | Revenue | Revenue | Revenue | Revenue | Revenue | Revenue | Revenue | |
| Успот | 1 867 500 | 1 702 500 | 1 829 000 | 2 523 500 | 3 679 500 | 4 361 000 | 4 312 500 | 4 062 000 | 24 337 500 |
| Житомирський м'ясокомбінат | 450 000 | 686 000 | 561 000 | 560 000 | 578 500 | 503 650 | 429 000 | 556 250 | 4 324 400 |
| Оптіма фарм | 1 169 400 | 2 085 600 | 2 054 500 | 2 514 400 | 1 879 180 | 1 522 640 | 1 388 880 | 1 226 060 | 13 840 660 |
| ДАНОН ДНІПРО ТОВ | 616 104 | 1 730 680 | 1 418 715,0 | 846 020,0 | 1 195 339,6 | 1 604 238,4 | 592 770 | 591 417,6 | 8 595 285 |
| ЮФК | 617 100 | 711 700 | 470 300 | 904 700 | 472 300 | 236 800 | 243 400 | 670 800 | 4 327 100 |
| АВК | 583 000 | 747 000 | 655 000 | 1 306 200 | 1 191 100 | 1 145 200 | 984 500 | 905 000 | 7 517 000 |
| Лакталіс | 1 903 740 | 1 486 500 | 1 306 074 | 1 360 644 | 1 055 730 | 1 419 990 | 1 316 622 | 1 169 736 | 11 019 036 |
| Чумак | 106 900 | 277 600 | 385 000 | 441 900 | 346 100 | 464 200 | 261 300 | 327 100 | 2 610 100 |
| КОНТІ ТБ ТОВ | 72 000 | 126 000 | 115 000 | 240 300 | 358 900 | 420 400 | 122 000 | 181 000 | 1 635 600 |
| ЛВН ЛІМІТЕД ТОВ | 1 599 500 | 1 484 500 | 1 400 000 | 1 488 200 | 1 391 000 | 1 091 500 | 901 000 | 756 200 | 10 111 900 |
| БІОЛА ТД ТОВ | 75 350 | 201 000 | 190 000 | 271 300 | 786 400 | 283 800 | 306 200 | 592 624 | 2 706 674 |
| Нестле Україна | 5 724 372 | 2 966 520 | 1 563 204 | 1 687 126 | 2 227 380 | 1 680 054 | 2 147 232 | 2 471 532 | 20 467 420 |
| ЦЕРСАНІТ ІНВЕСТ ТОВ | 156 000 | 148 000 | 127 000 | 345 458 | 323 400 | 492 720 | 355 400 | 277 900 | 2 225 878 |
| Транс Логістик ПП | 16 500 | 55 500 | 16 998 | 164 580 | 306 618 | 100 500 | 142 200 | 108 300 | 911 196 |
| САНТРЕЙД ДП | 78 900 | 55 298,4 | 369 070,8 | 583 890 | 337 300 | 504 000 | 764 491 | 470 494 | 3 163 444 |
| Радехівський цукор ТзОВ | 1 352 600 | 1 241 800 | 836 100 | 1 441 050 | 1 229 600 | 1 000 650 | 465 500 | 603 500 | 8 170 800 |
| АЛЬЯНС МАРКЕТ ТОВ | 0 | 0 | 215 000 | 111 600 | 232 000 | 190 000 | 240 000 | 230 000 | 1 218 600 |
| КИЇВЛІН ТОВ | 78 000 | 20 000 | 101 500 | 383 000 | 31 500 | 55 000 | 95 500 | 24 000 | 788 500 |
| КАПАРОЛ УКРАЇНА ДП | 112 100 | 134 400 | 87 100 | 171 300 | 244 600 | 497 500 | 377 600 | 404 100 | 2 028 700 |
| ЛУНАПАК ТГ ТОВ | 315 400 | 191 900 | 73 600 | 188 300 | 109 500 | 298 600 | 428 200 | 107 800 | 1 713 300 |
| | | | | | | | | total | 131 713 093 |

Table 2.6 presents information about the company's revenue for different time periods and the total amount of revenue for those periods. Each row of the table corresponds to a different customer of the company, and each column represents the revenue received from those customers in the last 8 months. Based on this table, you can analyze the financial performance of clients, determine which of them bring the most income, and make strategic decisions regarding further cooperation with clients. It is also possible to study the trends in the growth or decline of income from different customers during different periods and discover which ones are the most stable or the most variable.

Table 2.7 - ABC analysis of clients

| Client | Share of each client in the total | Group |
|----------------------------|-----------------------------------|-------|
| Успот | 18,48% | A |
| Нестле Україна | 15,54% | A |
| Оптіма фарм | 10,51% | B |
| Лакталіс | 8,37% | B |
| ЛВН ЛІМІТЕД ТОВ | 7,68% | B |
| ДАНОН ДНІПРО ТОВ | 6,53% | B |
| Радехівський цукор ТзОВ | 6,20% | B |
| АВК | 5,71% | B |
| ЮФК | 3,29% | C |
| Житомирський м'ясокомбінат | 3,28% | C |
| САНТРЕЙД ДП | 2,40% | C |
| БІОЛА ТД ТОВ | 2,05% | C |
| Чу мак | 1,98% | C |
| ЦЕРСАНІТ ІНВЕСТ ТОВ | 1,69% | C |
| КАПАРОЛ УКРАЇНА ДП | 1,54% | C |
| ЛУНАПАК ТГ ТОВ | 1,30% | C |
| КОНТІ ТБ ТОВ | 1,24% | C |
| АЛЬЯНС МАРКЕТ ТОВ | 0,93% | C |
| Транс Логістик ПП | 0,69% | C |
| КИЇВМЛІН ТОВ | 0,60% | C |

The following conclusions can be drawn from the table you provided:

Classification of customers by importance:

Group A contains the most important customers, which generate more than 18% of total revenue.

Group B includes customers with significant, but not the highest incomes, contributing about 10-8% of total income.

Group C contains the lowest-income customers who generate less than 4% of total revenue.

Concentration of income: We see that groups A and B constitute a significant part of the total income of the company, about 34%. Group A, although small in number of customers, generates more revenue than Group B, which has a much larger number of customers.

Diversification of risk: Another important aspect is the distribution of risk. According to the existing classification, groups A and B may be less sensitive to fluctuations in income, since they are represented by a more limited number of customers who bring the highest income.

Potential for growth: Group C consists of smaller customers that bring in less revenue, but it can also indicate potential for growth and development of cooperation with these customers.

With this information, the company can develop a customer management strategy, focusing on maintaining and increasing cooperation with A and B customers, as well as exploring growth opportunities for C customers.

Table 2.8 - XYZ analysis calculation

| Client | Revenue in 8 month | Avarage Revenue | Standard deviation | U |
|-----------------------|--------------------|-----------------|--------------------|------|
| Успот | 24337500 | 3042187,5 | 1178052,81 | 39% |
| Житомирський м'ясокс | 4324400 | 540550 | 80749,3609 | 15% |
| Оптіма фарм | 13840660 | 1730082,5 | 477624,852 | 28% |
| ДАНОН ДНІПРО ТОВ | 8595284,6 | 1074410,575 | 473896,233 | 44% |
| ЮФК | 4327100 | 540887,5 | 231417,035 | 43% |
| АВК | 7517000 | 939625 | 264139,523 | 28% |
| Лакталіс | 11019036 | 1377379,5 | 252532,477 | 18% |
| Чумак | 2610100 | 326262,5 | 113986,953 | 35% |
| КОНТІ ТБ ТОВ | 1635600 | 204450 | 125823,595 | 62% |
| ЛВН ЛІМІТЕД ТОВ | 10111900 | 1263987,5 | 308326,642 | 24% |
| БІОЛА ТД ТОВ | 2706674 | 338334,25 | 234201,025 | 69% |
| Нестле Україна | 20467420 | 2558427,5 | 1362620,65 | 53% |
| ЦЕРСАНІТ ІНВЕСТ ТОВ | 2225878 | 278234,75 | 127218,456 | 46% |
| Транс Логістик ПП | 911196 | 113899,5 | 94874,2156 | 83% |
| САНТРЕЙД ДП | 3163444,2 | 395430,525 | 241749,544 | 61% |
| Радехівський цукор Тз | 8170800 | 1021350 | 357801,784 | 35% |
| АЛЬЯНС МАРКЕТ ТОВ | 1218600 | 152325 | 102455,785 | 67% |
| КІІВМЛИН ТОВ | 788500 | 98562,5 | 119207,034 | 121% |
| КАПАРОЛ УКРАЇНА ДП | 2028700 | 253587,5 | 154143,203 | 61% |
| ЛУНАПАК ТГ ТОВ | 1713300 | 214162,5 | 123276,865 | 58% |

Average Revenue: Average revenue indicates the average amount a company receives from each customer. The average income for the entire sample is about 1,307,000.

Standard deviation: A low standard deviation indicates stability of income among customers, while a high standard deviation can indicate significant variability in income.

Taking into account the above indicators, it can be noted that some clients have stable incomes, since the standard deviation is low (for example, Lactalis or Zhytomyr meat processing plant). While other clients have greater variability in income, which may be related to certain factors or terms of cooperation.

The overall analysis of revenue stability data helps the company better understand its customer portfolio and develop strategies to maintain stable relationships and grow business with the most important customers.

Table 2.9 - XYZ classification of the clients

| Client | σ | XYZ analysis |
|----------------------------|----------|--------------|
| Житомирський м'ясокомбінат | 15% | X |
| Лакталіс | 18% | X |
| ЛВН ЛІМІТЕД ТОВ | 24% | Y |
| Оптіма фарм | 28% | Y |
| АВК | 28% | Y |
| Чумак | 35% | Y |
| Радехівський цукор ТзОВ | 35% | Y |
| Успот | 39% | Y |
| ЮФК | 43% | Y |
| ДАНОН ДНІПРО ТОВ | 44% | Y |
| ЦЕРСАНІТ ІНВЕСТ ТОВ | 46% | Y |
| Нестле Україна | 53% | Z |
| ЛУНАПАК ТГ ТОВ | 58% | Z |
| КАПАРОЛ УКРАЇНА ДП | 61% | Z |
| САНТРЕЙД ДП | 61% | Z |
| КОНТІ ТБ ТОВ | 62% | Z |
| АЛЬЯНС МАРКЕТ ТОВ | 67% | Z |
| БЮЛА ТД ТОВ | 69% | Z |
| Транс Логістик ПП | 83% | Z |
| КИЇВМЛИН ТОВ | 121% | Z |

Based on the data provided, which includes indicators of standard deviation (σ) and XYZ classification, the following conclusions can be drawn:

XYZ classification: The given customers were classified based on their standard deviation (σ) and divided into three XYZ categories:

Group X: Customers with a low standard deviation (15% - 18%). This may indicate a steady demand for their products or services.

Group Y: Customers with an average standard deviation (24% - 44%). They have moderate variability in demand and require more active inventory management and customer service.

Group Z: Customers with a high standard deviation (53% - 121%). Their orders can fluctuate significantly and require advanced inventory management and planning.

Importance of customers: A conclusion can also be made regarding the importance of each customer. For example, although some customers from group X (Zhytomyr meat processing plant, Lactalis) have stable demand, their contributions to total revenue may be small.

Risk Management and Strategy: This classification helps the company determine how to manage its client portfolio. Groups Y and Z may require more active inventory management, customer service, and development of retention and growth strategies.

Risk Diversification: Classification also helps in spreading risks among clients. By having customers with different levels of variability, the company can reduce the risks associated with fluctuations in demand.

In general, this classification will help the company to understand how to manage its customer portfolio, optimize processes and develop strategies for different categories of customers.

Table 2.10 - ABC-XYZ analysis of the clients

| Client | ABC-XYZ |
|----------------------------|---------|
| Успот | AУ |
| Нестле Україна | AZ |
| Лакталіс | BX |
| Оптіма фарм | ВУ |
| ДАНОН ДНІПРО ТОВ | ВУ |
| АВК | ВУ |
| ЛВН ЛІМІТЕД ТОВ | ВУ |
| Радехівський цукор ТзОВ | ВУ |
| Житомирський м'ясокомбінат | CX |
| ЮФК | СУ |
| Чумак | СУ |
| ЦЕРСАНІТ ІНВЕСТ ТОВ | СУ |
| КОНТІ ТБ ТОВ | CZ |
| БІОЛА ТД ТОВ | CZ |
| Транс Логістик ПП | CZ |
| САНТРЕЙД ДП | CZ |
| АЛЬЯНС МАРКЕТ ТОВ | CZ |
| КИЇВМЛИН ТОВ | CZ |
| КАПАРОЛ УКРАЇНА ДП | CZ |
| ЛУНАПАК ТГ ТОВ | CZ |

ABC-XYZ client classification is a strategic client portfolio management tool that helps determine strategies and approaches to each client based on their importance and stability.

Based on the ABC-XYZ classifications provided, the following conclusions can be drawn:

Customer Importance (ABC): Customers are divided into three ABC groups:

Group A: Uspot and Nestlé Ukraine. These customers are classified as Group A, which indicates their high importance to the company in terms of profit or sales volume.

Group B: Lactalis, Optima Pharm, DANON DNIPRO LLC, AVK, LVN LIMITED LLC, Radekhivsky sugar LLC. These clients are classified as Group B, indicating their moderate importance.

Group C: The rest of the clients (Zhytomyr meat processing plant, Yufk,

Chumak, CERSANIT INVEST LLC, CONTI TB LLC, BIOLA TD LLC, Trans Logistic PP, SUNTRADE SE, ALLIANCE MARKET LLC, KYIVMLIN LLC, KAPAROL UKRAINE SE, LUNAPAK TG LLC). These customers are classified as Group C, indicating their lower importance.

Stability of customers (XYZ): Customers are also classified according to the XYZ method:

Group X: Zhytomyr meat processing plant. This customer is categorized as X, indicating stable demand or low variability in demand for their products or services.

Group Y: Lactalis, Optima Pharm, DANON DNIPRO LLC, AVK, Chumak, Radekhivsky sugar LLC, Uspot, YuFK, TERSANIT INVEST LLC. These customers are categorized as Y, indicating moderate variability in demand.

Group Z: The rest of the clients (Nestle Ukraine, LUNAPAK TG LLC, KAPAROL UKRAINE SE, SANTRADE SE, CONTI TB LLC, ALLIANCE MARKET LLC, BIOLA TD LLC, Trans Logistic PP, KYIVMLIN LLC). These customers are classified as group Z, which indicates high variability in demand.

Customer management: According to the ABC-XYZ classification, the company can develop individual management strategies for each customer. Groups A and X, which are characterized by high importance and stability, may require retention and growth strategies, while groups C and Z may require more active risk management and planning.

This classification will help the company better understand its client portfolio and determine optimal strategies for each client in order to maximize profits and reduce risks.

Table 2.11 - ABC-XYZ matrix

| | X | Y | Z |
|---|-------------------------------|---|---|
| A | | Успот | Нестле Україна |
| B | Лакталіс | Оптіма фарм ДАНОН ДНІПРО ТОВ АВК ЛВН ЛІМІТЕД ТОВ Радехівський цукор ТзОВ | |
| C | Житомирський м'ясокомбінат | ЮФК Чумак ЦЕРСАНІТ ІНВЕСТ ТОВ | КОНТІ ТБ ТОВ БІОЛА ТД ТОВ Транс Логістик ПП САНТРЕЙД ДП АЛЬЯНС МАРКЕТ ТОВ КИЇВМЛИН ТОВ КАПАРОЛ УКРАЇНА ДП ЛУНАПАК ТГ ТОВ |

According to the analysis matrix, we can observe the following, clients of the Fresh category are far from the last places, namely AY, BX, BY(2), CX and CY. Thus, it can be concluded that these customers bring a large part of the company's income and their development will have a positive effect on the company's financial indicators and may be the basis for future development.

Chapter summary

General Trans Alliance Logistics (GTAL) is a company with many years of

experience in the field of logistics and freight transportation. Founded more than 9 years ago, it managed to establish itself on the market as a reliable partner in the field of transportation.

The company's organizational structure has several levels of management, including senior management, managers, and personnel responsible for operational activities. This structure allows effective project management and coordination of activities to meet customer needs.

Financial analysis of GTAL shows fluctuations in its financial performance. Profit from the sale of goods showed a decline in 2020, but recovered with growth in 2021. However, what is important is that gross profit and profit from operations show a distinct decline in 2021, which can be attributed to low profitability or higher costs.

A SWOT analysis of GTAL showed that the company has its strengths and weaknesses. Strengths include experienced staff and an expanded client base. However, weaknesses include high costs and fluctuations in financial performance. There are opportunities to optimize payment terms and use modern technologies to increase efficiency.

GTAL's client portfolio includes a wide range of clients in various industries such as food, pharmaceuticals, alcoholic beverages, and many others. Customer analysis has shown that there are important customers that generate more profit, but there are also less important customers that may have growth potential.

The general conclusion is that GTAL is an experienced company with a diverse client portfolio, but it must pay attention to cost optimization, financial performance improvement, and the use of modern technologies to achieve sustainable growth and success in the logistics market. It is also important to consider customer management strategies, particularly focusing on important and stable customers, as well as developing less important customers with growth potential.

According to the analysis of all areas of the company's activity, a problem with transport was identified, namely, the company does not have enough refrigerated semi-trailers. Their insufficient number prevents the company from providing services to clients of the Fresh category at a sufficient level.

CHAPTER 3

FORMATION OF A FRESH LOGISTICS SUBSYSTEM FOR A LOGISTICS COMPANY

3.1 Integration of Fresh logistics into the general organizational structure of the company

Having analyzed the GTAL's activities with the help of SWOT analysis, ABC analysis, and analyzing the organizational structure of the enterprise, we can say that the work in the company is focused on results. This work is facilitated by a large number of clients of different levels and different directions in logistics. The identified problem, solving which, can raise the overall turnover in the company, as well as improve work with clients.

Since in GTAL, customers of the FRESH category make up more than 30%, there is an urgent need to reorganize the structure of the enterprise, allocating a separate manager for FRESH customers.

An incorrect structure in an enterprise can lead to numerous threats and problems that can negatively affect its activities and results. Some of the possible threats include:

4. Ineffective management: Failure to effectively manage and coordinate the work of divisions can lead to inefficiencies in decision-making and strategy implementation.

5. Duplication of work and waste of time: In an improperly structured enterprise, there may be many duplicated tasks and functions, which leads to a waste of time and resources.

6. Conflicts and low staff morale: The wrong structure can lead to conflicts between departments, competition for resources and low morale among employees.

7. Heterogeneity and inability to adapt: If the structure does not meet the current needs of the company or the changing conditions in the market, it can make it difficult to adapt and innovate.

8. Costs of redundant functions: The wrong structure can lead to redundant administrative costs, such as redundant managers and departments.

9. Loss of opportunities: For example, poorly organized internal marketing can lead to missed product or market development opportunities..

10. Loss of innovativeness: The wrong structure can inhibit the development and implementation of innovations.

11. Political risks: If the structure of the enterprise is vulnerable to changes in the political environment, it can create threats to the company's operations.

To prevent these threats, it is important to constantly evaluate and optimize the structure of the enterprise, paying attention to its current needs, development strategy and changes in the market. Effective management of the organizational structure can help the company maintain competitive advantages and achieve sustainable growth.

In the modern market of logistics services, the loss of competitiveness or poor communication with the client is a serious blow to the company.

Among the advantages of a competently changed organizational structure, the following points can be highlighted:

1. Optimization of routes and resources: The new structure can help to choose more optimal routes and allocate resources more efficiently.

2. Improved logistics: An optimized structure can contribute to a better organization of logistics processes, reducing delivery time and transportation costs.

3. Improved customer service: Optimization can improve the speed and reliability of delivery, leading to customer satisfaction.

4. Effective cost management: The new structure can help reduce fuel, machinery and maintenance costs, increasing profit margins.

5. Creating flexible and adaptive teams: An optimized structure can create teams that quickly respond to changes in customer needs and market conditions.

6. Improved safety and control: An optimized structure can provide better control over transport operations, increasing the safety of transport.

7. Technological improvements: The new structure can enable the introduction of new technologies for cargo tracking, fleet management and data analysis.

8. Development of innovations: An optimized structure can create conditions for the development of new methods and technologies in the transport industry.

9. Increased cooperation with partners: An optimized structure can facilitate better cooperation with partners and enterprises, which will increase opportunities for joint development.

10. Increased competitiveness: All the advantages of an optimized structure can contribute to strengthening the company's position on the market and increase its competitiveness.

When making a decision to change the organizational structure, one should take into account various factors that can affect the success of this process. Here are some of them:

Current problems and goals: Before changing the structure, it is important to carefully analyze the current problems of the organization and determine the goals you want to achieve. This will help you understand what changes need to be made and how they will affect the organization.

Planning, design and communication: After defining the problems and goals, you can develop a new organizational structure. During this process, it is important to consider the existing staff, their roles and relationships. In addition, it is necessary to ensure effective communication about changes, starting with the management of the organization and ending with all employees.

Understanding the size and stage of development of the company: The size and stage of development of the company also affect the organizational structure. For example, small companies or start-ups may operate in an all-hands-on-deck basis, where all employees perform different tasks. At the same time, large companies may have a hierarchical structure with managers and department heads.

Business strategy: The organizational structure should correspond to the company's business strategy. For example, if a company operates in a fast-moving industry, it may make sense to use flexible teams to quickly implement new ideas and innovations.

Organizational culture: The organizational structure should correspond to the company's culture. For example, if you want to create a stable and predictable environment, a hierarchical structure may be the best option.

These factors should be carefully considered and weighed when deciding to change the organizational structure. Each company When making a decision to change the organizational structure should take into account various factors that can affect the success of this process. Here are some of them:

1. **Current challenges and goals:** Carefully analyze the current challenges facing your organization and determine the goals you want to achieve with the change in structure.

2. **Plan and Design Development:** Plan for change with current challenges and goals in mind. Develop a new structure that meets these goals and solves existing problems. Consider bringing in new employees or redistributing roles.

3. **Communication:** It is important to communicate effectively about structural changes within the organization. Make sure all stakeholders understand the reasons for the changes and their role in the new structure. Ensure broad communication so that all employees receive the same information.

4. **Company size and stage of development:** Consider your company's size and stage of development when deciding whether to restructure. For example, it may be appropriate for small companies or startups to have a flexible structure without many levels of management, while for large companies it may be necessary to establish a hierarchical structure with managers and department heads.

5. **Business strategy:** Consider your company's strategy when deciding on a change in structure. For example, if your company operates in an industry of rapid technological development, it may make sense to use cross-functional teams to rapidly innovate.

6. Location: In a global era, it is important to consider the location of employees and offices when changing structures. Consider how this will affect communication, management and work organization.

Based on ABS XYZ analysis, we determined that customers of the fresh category occupy a large share among all the company's customers. According to the analysis matrix, the following can be observed, the customers of the Fresh category occupy far from the last places, namely AY, BX, BY(2), CX and CY. which is more than 30% of all clients. This is a good reason to consider changing the organizational structure of the enterprise by moving the fresh category to a separate division. in the case of GTAL, this can lead to positive changes such as:

1. Increasing focus on customers of the "Fresh" category: Customers of this category occupy a significant share among all customers of the company. The allocation of a separate unit for this category will allow focusing on their needs and requirements, which will contribute to the improvement of service and customer satisfaction.

2. More effective communication and coordination: Separating the "Fresh" category into a separate department will allow for more effective communication and coordination between employees working with this category. This will contribute to a faster response to changes in customer needs and solving their problems.

3. Specialized knowledge and skills: The Fresh category may require specific knowledge and skills to provide effective customer service. The creation of a separate unit will allow to attract specialists who have expertise in this field and develop their skills, which will contribute to the improvement of the quality of service.

4. Innovation potential: The "Fresh" category can be a source of new innovation and development for the company. A separate unit dedicated to this category will create a favorable atmosphere for stimulating creativity and generating new ideas that can lead to the introduction of new products or services.

Changing the organizational structure (Fig. 3.1) is the first step towards effective organization of work with clients of the Fresh category. First of all, this will be handled by qualified employees who know the intricacies of organizing fresh

transportation. Second, it will relieve other employees and allow you to improve work with other customers, which in turn will increase sales.

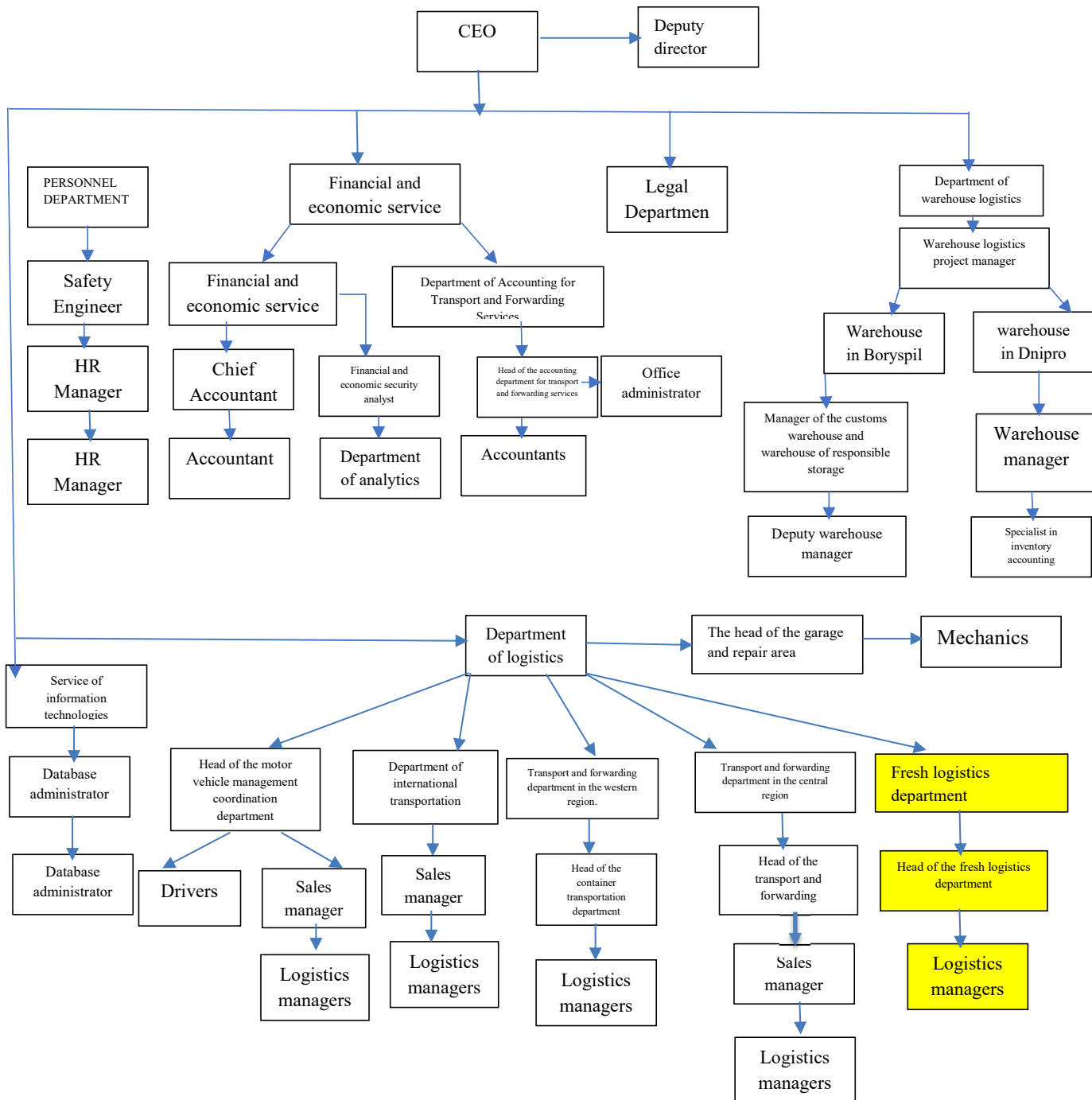


Fig. 3.1 - Organizational structure of GTAL with the fresh logistics department

For the new department and new employees, new job descriptions must be written regarding their work, and the criteria for a potential candidate are also

different from an ordinary logistician.

Job instructions for a Logist working with clients of the Fresh category may include the following duties and responsibilities:

1. Coordination of delivery and installation of goods: The logistician will be responsible for organizing the delivery and installation of fresh goods at customer locations.
2. Quality control: The logistician must ensure that fresh goods meet quality and safety requirements.
3. Transport Planning and Scheduling: The Logist will be responsible for planning and scheduling transport to deliver fresh goods to customers.
4. Inventory management: The logistician must ensure proper management of fresh product inventory, including inventory control, orders, and returns.
5. Problem solving: A logistician must be ready to solve problems that arise during the movement of goods and constantly improve the processes of delivery and inventory management.
6. Cooperation with customers: The logistician must maintain contact with customers, solve their requests and ensure a high level of customer satisfaction.
7. Record keeping: The logistician must ensure proper record keeping, including delivery reports, orders and other important documents.

The requirements for the Logist to work with clients of the Fresh category may vary depending on the specific company and position. However, basic requirements may include:

1. Education: A bachelor's degree or an associate's degree may be required for this position.
2. Experience: Experience in logistics or related fields such as sourcing, warehousing or supply chain management is usually required.
3. Knowledge of Logistics Processes: The candidate must have an understanding of logistics processes, including transportation, warehousing, inventory management, and cargo tracking.

4. **Communication skills:** It is important to have the ability to communicate effectively with customers and other team members, both in writing and verbally.
5. **Organizational skills:** A logistician must have the ability to manage many tasks at the same time, plan and organize work while meeting deadlines.
6. **Software Knowledge:** An understanding of and ability to use logistics-related software such as inventory management systems or freight tracking systems may be a requirement for the position.
7. **Physical Endurance:** Logisticians may be required to lift and carry heavy objects, so physical endurance may be an important requirement.
8. **Industry Knowledge:** Additional knowledge of Fresh customer specifics, such as fresh storage and transportation requirements, may be a requirement for the position.

The separation of Fresh customers into a separate structure is the first step for the introduction of cold supply chains into the organizational structure of the enterprise for the comprehensive integration of these chains. This means that cold supply chains become not just separate elements of the process, but are integrated into the main structure of the enterprise, which allows to ensure their effective operation and coordination with other functional areas.

3.2 Expansion of own vehicle fleet to lead fresh logistics customers

From the company's analysis, another problem was identified, the solution of which will help to gain a foothold in the Fresh Transportation market and increase its competitive advantage. Analyzing our own fleet, a critical shortage of cars with refrigerated semi-trailers was discovered.

The lack of cars with refrigerated semi-trailers can significantly limit the company's ability to transport fresh goods or products that require special storage

conditions. This problem can lead to the loss of customers, as well as reduce the company's reputation in the field of transportation.

Refrigerated semi-trailers are a key element for ensuring optimal conditions for transporting products that require a certain temperature regime. The solution to this problem may be the expansion or renewal of the vehicle fleet by purchasing additional vehicles with refrigerated semi-trailers.

Investing in this direction will allow the company to ensure the quality of transportation, increase the volume of customer service, and also create an opportunity to enter new markets or expand the range of services.

Not solving this problem can lead to several negative consequences for the company:

1. **Loss of customers and market position:** If the company is unable to meet the demand for transportation of fresh goods or products that require refrigeration, customers may turn to competitors who provide such services. This can lead to loss of market position and loss of customer trust.

2. **Damage to reputation:** Failure to comply with the requirements to ensure proper transportation conditions for certain goods can lead to damage to the company's reputation. This may affect its image as an unreliable partner in the field of transportation.

3. **Losses due to non-compliance:** In the event that products or goods are damaged due to improper transportation conditions, the company may suffer large financial losses through compensation to customers or loss of the goods themselves.

4. **Restrictions on business development:** Insufficient volume of refrigerated vehicles may limit the possibility of expansion or entry into new markets where the demand for transportation of such goods is high.

5. **Decrease in competitiveness:** All this together can lead to a general decrease in the company's competitiveness compared to other market participants that provide a full range of services in the field of transportation.

Therefore, solving this problem is critical for maintaining and increasing the competitiveness and stability of business.

To solve this problem, we will use a comparative approach. This approach will help us evaluate our own selection criteria and choose the best option based on our needs. The main advantages of this method are:

1. Objectivity of decision-making: Comparative analysis allows you to compare different alternatives based on specific criteria, which makes the decision-making process more objective.

2. Maximizing the effectiveness of solving the problem: This approach allows you to identify and choose the most optimal option, taking into account costs, risks and benefits.

3. Minimization of risks: Comparative analysis allows you to pre-evaluate the possible risks associated with each option and choose a strategy that will help reduce their impact on the business.

4. Optimizing the use of resources: Taking into account all possible options allows more efficient use of company resources, such as money, time and personnel.

5. Increased confidence in decisions: A company can have more confidence in the chosen path because it is based on the analysis of several alternatives, rather than just intuition or limited choices.

6. Stimulating innovation: Benchmarking may reveal new ideas or opportunities that stimulate development and innovation within the company.

Step 1: Defining the purpose of the analysis

Selection of a refrigerated trailer, the most effective for the transportation of products of the Fresh type.

Step 2: Identification of alternatives

Let's consider 4 variants of semi-trailers:

- 1) Krone (ref)
- 2) Schmitz (ref)
- 3) Schwarzmuller(ref)

Step 3: Selection of comparison criteria/ Weight of criteria

- 1) Price-1
- 2) Carrying capacity- 3

- 3) Fuel consumption (for 1 hour of operation)-5
- 4) Guarantee-2
- 5) Frequency of routine maintenance-4
- 6) Service price- 6

Step 4: Data collection and analysis

Krone (Fig. 3.1).



Figure 3.1 - Semi trailer refrigerator Krone

- 1) Price – 18000 USD
- 2) Carrying capacity- 21 700 Kg.
- 3) Fuel consumption (for 1 hour of operation)- 2,8 L/h
- 4) Guarantee- 3 year or 500 000 km
- 5) Frequency of routine maintenance- it is recommended to carry out a comprehensive inspection every 750 hours, a routine technical inspection and an oil change every 1,500 hours or once a year, whichever comes first

- 6) Service price- 16500 UAH

Schmitz (Fig. 3.2).



Figure 3.2 - Schmitz semi trailer refrigerator

- 1) Price- 22 000 USD
 - 2) Carrying capacity- 22 200 kg
 - 3) Fuel consumption (for 1 hour of operation)- 3.5 l/h
 - 4) Guarantee- 2 year or 350 000 km
 - 5) Frequency of routine maintenance- Inspection, scheduled maintenance and oil change every 3,000 hours or every two years, whichever comes first
 - 6) Service price- 25 000 UAH
- Schwarzmueller (Fig. 3.3).



Figure 3.3 - Semi trailer refrigerator Schwarzmueller

- 1) Price- 20 000 USD
- 2) Carrying capacity- 22 300 kg
- 3) Fuel consumption (for 1 hour of operation) 2.5 l/h
- 4) Guarantee- 5 years or 750 000 km

- 7) Frequency of routine maintenance- - Inspection, scheduled maintenance and oil change every 3,500 hours or every two years, whichever comes first
- 5) Service price- 20 000 UAH

Table 3.1 - Comparative analysis of the semi-trailers

| | Krone | Schmitz | Schwarzmuller |
|---|-------|---------|---------------|
| Price | | | |
| Carrying capacity | | | |
| Fuel consumption (for 1 hour of operation) | | | |
| Guarantee | | | |
| Frequency of routine maintenance | | | |
| Service price | | | |

The proposed comparative analysis of various options of refrigerated semi-trailers (Krone, Schmitz, Schwarzmuller) provides an opportunity to make an informed decision regarding the choice of the best option for the company.

Based on a comparative analysis that takes into account price, load capacity, fuel consumption, warranty, service frequency and service cost, it can be concluded that Schwarzmuller is the most optimal choice for the company.

It offers reasonable cost and carrying capacity, has the lowest fuel consumption, the longest warranty period and less frequent maintenance, which can generally provide a more efficient and economical operation for the company.

Also, for a semi-trailer, you also need to pick up a truck. There are no special criteria for trucks for transportation of fresh products. However, my advice is to buy a Euro 5 environmental standard truck

Conditionally suitable "Euro-5" cars can be defined as follows. As a rule, these

are machines of European production since 2010, American - since 2009.

Buying a Euro 5 tractor for transporting fresh produce has several advantages that can be useful for transporting fresh produce. Here are some arguments that support this idea:

Environmental friendliness: Euro 5 tractors meet the requirements for emissions of harmful substances regulated by European standards. This means they have lower emissions of harmful gases such as nitrogen oxides and particulate matter compared to older tractor models.

Fuel economy: Euro 5 tractors have more efficient engines that reduce fuel consumption. According to studies, they can provide up to 10% fuel savings compared to older models.

Lower operating costs: Thanks to fuel savings and lower emissions, Euro 5 tractors can help reduce overall operating costs. This is especially important for farmers and agribusiness owners who depend on efficient transportation to transport fresh produce.

Environmental protection: Reducing emissions of harmful substances helps to protect the environment. The use of Euro 5 tractors for the transportation of fresh produce helps to reduce the impact on air pollution and supports the sustainability of ecosystems.

Compliance with standards: Many countries and regions impose restrictions on the use of old vehicles that do not meet modern environmental standards. Buying a Euro 5 truck unit allows owners to meet these requirements and avoid fines or transport restrictions.

Step 1: Defining the purpose of the analysis

The purpose of the analysis is to make a justified choice of a tractor that meets the needs of the company, helps to ensure the quality of transportation and effective management of resources.

Step 2: Identification of alternatives

In this analysis, the choice will be between the 3 most popular models of trucks on the Ukrainian market, namely:

- 1) DAF XF
- 2) Volvo FH 460
- 3) Scania G 410

Here are a few reasons why these models were chosen for analysis:

- Reputation and Reliability: Each of these models has a strong reputation as a reliable and efficient vehicle. They are known for their quality, long service life and overall reliability.

- Fuel efficiency: All three models are known for their fuel efficiency, which is a key factor in reducing operating costs.

- Technological Innovations: Each of these models includes advanced technologies and innovations in safety, driver comfort and overall transportation efficiency.

- Popularity on the market: These models are among the most popular among owners and operators of transport companies on the Ukrainian market, which indicates their high return and recognition.

Step 3: Selection of comparison criteria/ Weight of criteria

- 1) Price-4
- 2) Fuel consumption with cargo- 1
- 3) Fuel consumption without cargo-5
- 4) Frequency of routine maintenance-2
- 5) Safety-3

Step 4: Data collection and analysis.

DAF XF (Fig. 3.4).

Engine: The DAF XF is equipped with powerful PACCAR MX-11 and MX-13 engines with various outputs, including a 390 kW/530 hp variant. These engines provide high torque at low revs, which contributes to economical fuel consumption.

Chassis: The DAF XF tractor has a strong chassis construction made of high-quality steel. It is stable, stable and lightweight. In addition, the chassis has features that facilitate the body building process.

Cab: The DAF XF offers comfortable cabs in a variety of sizes, including XG

and XG+. These cabins provide drivers with comfortable conditions during long journeys and have modern technologies and control systems.

Use: The DAF XF tractor is used in various industries, including long-haul and freight transport. It is known for its reliability, performance and efficiency. The DAF XF tractor is a popular choice among drivers and owners of transport companies.



Figure 3.4 - DAF XF Euro 5

- 1) Price- 38 000\$
- 2) Fuel consumption with cargo- 34 l/100km
- 3) Fuel consumption without cargo- 28 l/100km
- 4) Frequency of routine maintenance- On DAF Euro-5 trucks (DAF XF), maintenance is performed once every 90,000 km or once a year.

5) Safety- DAF XF is equipped with various safety systems such as adaptive cruise control system, collision warning system, emergency braking system and others. These systems help ensure the safety of the driver and cargo while driving.

Volvo FH 460 (Fig. 3.5).

The Volvo FH 460 tractor has several features that make it attractive to drivers and carriers. The main characteristics and features of this tractor include:

Engine: The Volvo FH 460 is equipped with a powerful 6-cylinder D13 engine with a volume of 12.777 cm³, which develops 460 hp. This engine is known for its reliability and efficiency.

Gearbox: The tractor is equipped with an I-Shift automatic gearbox with 12

gears, which ensures smooth and efficient operation.

Cab: The Volvo FH 460 has a Globetrotter XL cab with two berths. The cabin is equipped with comfortable heated seats, air suspension and independent Webasto heating. In addition, it has electric heated rearview mirrors, electric windows, LED headlights and many other features.

Comfort and convenience: The Volvo FH 460 has a number of additional features that ensure comfort and convenience for the driver. Among them - navigation system, on-board computer, multi-wheel, CD/MP3 radio, refrigerator, central locking, airbags.



Figure 3.5 - Volvo FH 460

- 1) Price- 35 000\$
- 2) Fuel consumption with cargo- 38 l/100 km
- 3) Fuel consumption without cargo- 33 l/100 km
- 4) Frequency of routine maintenance- maintenance is performed once every 75 000 km or once a year
- 5) Safety- The Volvo FH 460 is equipped with a variety of active and passive safety systems, such as ESP stability control system, ASR traction control system, EBS electronic braking system and many others

Scania G 410 (Fig. 3.6).

Powerful engine: The tractor is equipped with a 13-liter diesel engine with a capacity of 410 horsepower, which ensures high productivity and work efficiency.

Efficient transmission: The Scania G 410 is equipped with an advanced transmission that allows smooth gear changes and ensures efficient transmission of power to the wheels.

Comfortable cabin: The tractor has a comfortable cabin with comfortable seats and large windows, which provides the driver with comfortable conditions during long trips.

Economic efficiency: The tractor is known for its economic efficiency due to its high fuel efficiency and low emissions.

Flexibility in configuration: Scania G 410 offers various configuration options, which allows you to choose the optimal model for specific needs and conditions of transportation.



Figure 3.6- Scania G 410

- 1) Price- 33 000 USD
- 2) Fuel consumption with cargo- 37l/100 km
- 3) Fuel consumption without cargo-30l/100 km
- 4) Frequency of routine maintenance maintenance is performed once every 60 000 km or twice a year

5) Safety- Safety technologies: The Scania G 410 is equipped with various safety technologies such as stability control system, automatic braking system and tire pressure monitoring system to ensure safety while driving.

Step 5: Compare and choose the best option

Table 3.2 - Comparative analysis of the trucks

| | DAF XF | Volvo FH 460 | Scania G 410 |
|----------------------------------|--------|--------------|--------------|
| Price | | | |
| Fuel consumption with cargo | | | |
| Fuel consumption without cargo | | | |
| Frequency of routine maintenance | | | |
| Safety | | | |

Considering the comparison criteria, DAF XF Euro 5 may be the best choice for transporting fresh products. It has the lowest price among the analyzed models and optimal fuel consumption both with and without cargo. In addition, the DAF XF has a lower frequency of regular maintenance, which can reduce overall maintenance costs. However, all three models (DAF XF, Volvo FH 460 and Scania G 410) are reliable and efficient.

Thus, our primary costs will be \$56,200. This amount includes:

- Truck (\$38,000)
- Semi-trailer (\$18,000)
- Renewal of the set (\$50)
- Mandatory insurance (\$150)

The analysis dives deep into the critical problem of a shortage of refrigerated semi-trailers in the company's fleet, which poses a risk to the transportation of fresh goods. By utilizing a comparative approach, the company can identify the most

suitable refrigerated semi-trailer option. After evaluating criteria such as price, carrying capacity, fuel consumption, warranty, maintenance frequency, and service cost, it was determined that the Schwarzmuller semi-trailer offers the most benefits for the company. With its reasonable cost, high carrying capacity, low fuel consumption, extended warranty, and less frequent maintenance requirements, it stands out as the optimal choice.

Additionally, the analysis extends to the choice of trucks for fresh produce transportation. The DAF XF Euro 5 emerges as a favorable option due to its competitive pricing, efficient fuel consumption, and lower maintenance frequency, contributing to reduced operational costs. While the other models (Volvo FH 460 and Scania G 410) are also reliable, the DAF XF Euro 5 appears to be the most feasible choice based on the outlined criteria.

The thorough examination of both refrigerated semi-trailers and trucks for fresh produce transportation underscores the critical importance of making informed decisions to maintain the company's competitiveness, improve service quality, and expand its market reach.

3.3 Routs system modification

Modern freight transportation requires not only efficiency, but also a deep understanding of economic aspects related to the production process.

One of the key aspects in the field of transport is the calculation of the cost of transportation. We will explore various factors that affect the cost of transportation, such as distance, type of transport, weight and volume of cargo, fuel costs and others. This will help us understand how to determine the best price for our transportation services.

To achieve success in the transportation industry, it is important to analyze customer routes. We will look at various aspects, such as the popularity of certain

routes, delivery times, and other factors that influence the choice of a route by customers. This will allow us to understand how to optimize routes and ensure that customer needs are met.

One of the important aspects of development in the transport industry is owning your own transport. We will calculate the profitability of transportation using our own transport, taking into account the costs of purchasing, maintaining and operating vehicles. This will help us understand whether it is profitable to own transport and how we can maximize the profit from using it.

Let's consider the formation of prices for customers of the category AY “TOB YCHHOT”. “TOB YCHHOT”, or the Ukrainian Society for the Promotion of Combined Transport Operations, is a non-profit organization that unites participants in the transport market for joint transportation. This organization promotes the unification of transport consignors, carriers and other market participants in order to ensure more efficient and optimal freight transportation.

“TOB YCHHOT” is working on creating common standards, agreeing on tariffs, and developing cooperation between various participants in logistics processes. Its main goal is to simplify cargo transportation processes and help reduce costs for all participants in the freight transportation market.

Company activities:

- 1) Bringing together market players: USPOT cooperates with various participants in the logistics and transport market, such as carriers, shippers, logistics companies and other stakeholders.

- 2) Optimization of transport operations: The organization directs its efforts to the development and implementation of optimal solutions in the field of transport and logistics in order to improve the efficiency of transportation.

- 3) Development of standards and regulations: USPOT is actively working on standardization and harmonization of regulations in the field of logistics and transport to ensure greater unity and efficiency in these processes.

4) Lobbying and consulting: The company promotes lobbying of the interests of market participants in interaction with government bodies and provides consulting on logistics and transport issues.

5) Development of innovations: USPOT stimulates the introduction of the latest technologies and innovations in the field of logistics and transport to increase the productivity and competitiveness of the industry.

The main warehouses and production facilities are located in: Trebukhiv, Zimna Voda, Malehiv, Dnipro, Nerubaiske. USPOT orders 60 to 70 shipments to meet market demand during the month.

Table 3.3 - Main routes of fresh logistics

| Point of departure | Point of arrival | Distance | Price |
|--------------------|------------------|----------|-----------|
| Trebukhiv | Malehiv | 612 km | 27500 UAH |
| Trebukhiv | Dnipro | 515 km | 28000 UAH |
| Trebukhiv | Nerubaiske | 505 km | 36000 UAH |
| Zimna Voda | Trebukhiv | 641 km | 24000 UAH |
| Dnipro | Nerubaiske | 500 km | 26000 UAH |
| Dnipro | Trebukhiv | 515 km | 21000 UAH |

Taking into account information about routes and prices for transportation, it is possible to form round trips for optimal use of transport opportunities. One of it:

Trebukhiv(load)- Malehiv(unload)- Zimna Voda(load)- Trebukhiv(unload/load)- Dnipro(unload/load)- Trebukhiv (unload) (Fig. 3.7).

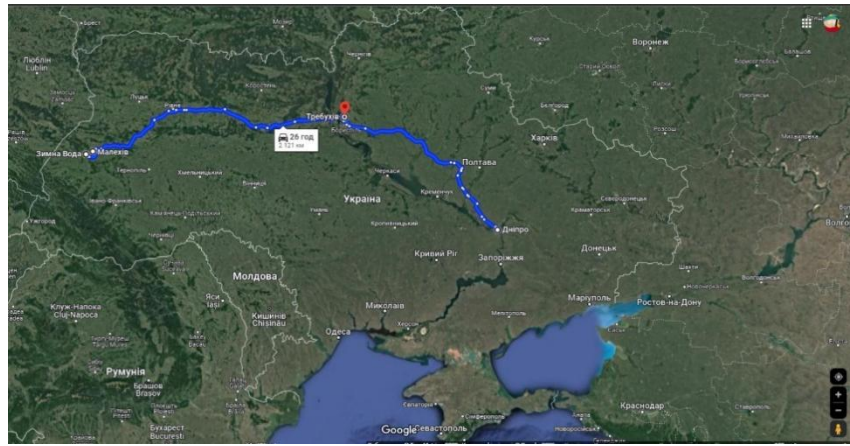
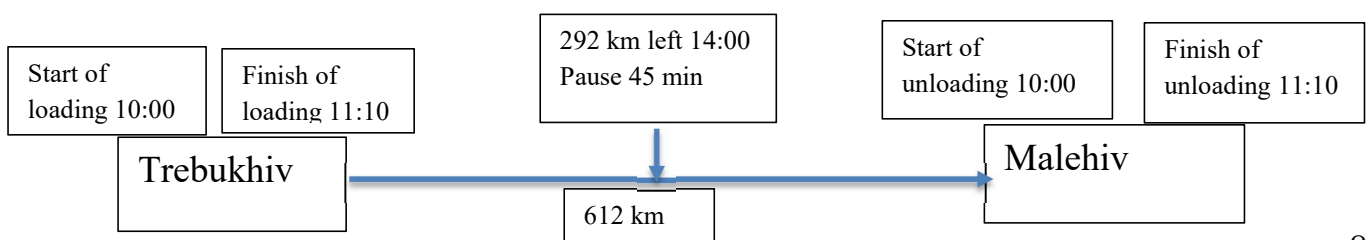


Figure 3.7 - Example of a round trip

Taking into account the comprehensive approach to the efficiency of transportation and management of logistics processes, it is worth considering the possibility of optimizing routes. Analysis of key destinations and their cost allows you to create the most profitable round trips for optimal use of transport opportunities. For example, considering the distance and cost of transportation between Trebukhiv, Malehiv, Zimna Voda and Dnipro, choosing a specific route can be a step towards efficient use of resources and reduction of transport costs. Let's prepare a schematic view of the optimal route, which will help to visually imagine its structure and appearance. First road will be Trebukhiv- Malehiv (Fig. 3.2). For the exact calculation of the first route, we have the following initial data:

- 1) The average speed of the car is 80 km/h
- 2) The number of pallets is 33
- 3) The speed of loading and unloading pallets - 2 min
- 4) The norm of working hours is 9 hours of working time, including a 45-minute mandatory break/9 hours of rest
- 5) Curfew - 00:00-05:00
- 6) Warehouse opening hours - 10:00-18:30
- 7) Distance- 612 km



Time of arriving:
19:35

Figure 3.8 - Trebukhiv-Malekhiv route

Next road will be Zimna Voda- Trebukhiv (fig3.3) For the exact calculation of the first route, we have the following initial data:

- 1) The average speed of the car is 80 km/h
- 2) The number of pallets is 33
- 3) The speed of loading and unloading pallets - 2 min

Malekhiv the norm of working hours is 9 hours of working time, including a 45-minute dry break/9 hours of rest

- 5) Curfew - 00:00-05:00
- 6) Warehouse opening hours - 10:00-19:00
- 7) Distance- 641 km

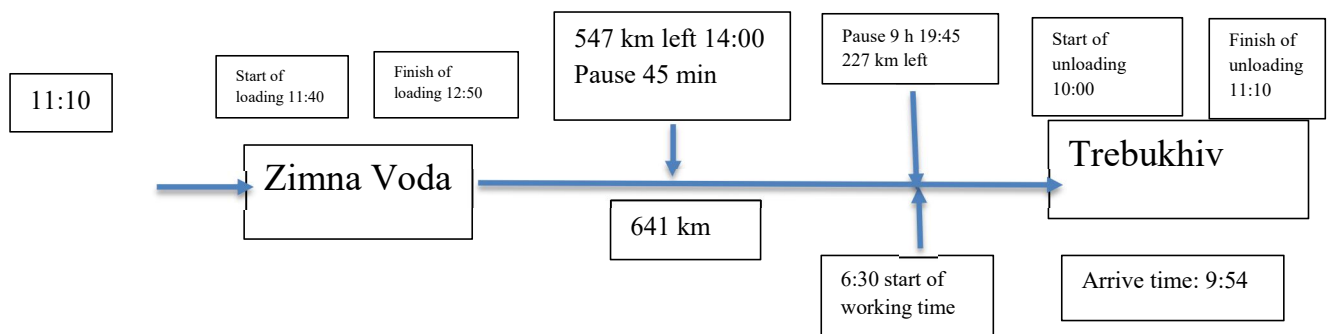


Figure 3.8 - Malekhiv- Zimna Voda-Trebukhiv route

Next road will be Trebukhiv - Dnipro (Fig. 3.4). For the exact calculation of the first route, we have the following initial data:

- 1) The average speed of the car is 80 km/h
- 2) The number of pallets is 33
- 3) The speed of loading and unloading pallets - 2 min

- 4) The norm of working hours is 9 hours of working time, including a 45-minute mandatory break/9 hours of rest
- 5) Curfew - 00:00-05:00
- 6) Warehouse opening hours - 10:00-19:00
- 7) Distance- 515 km

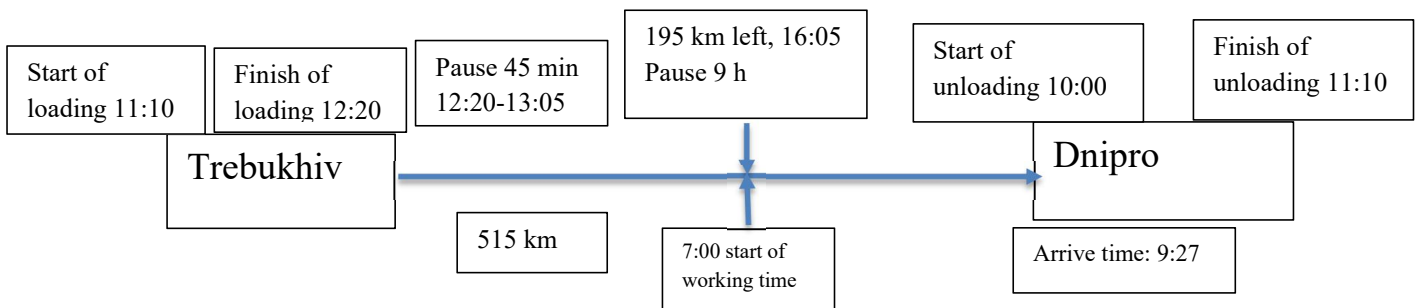
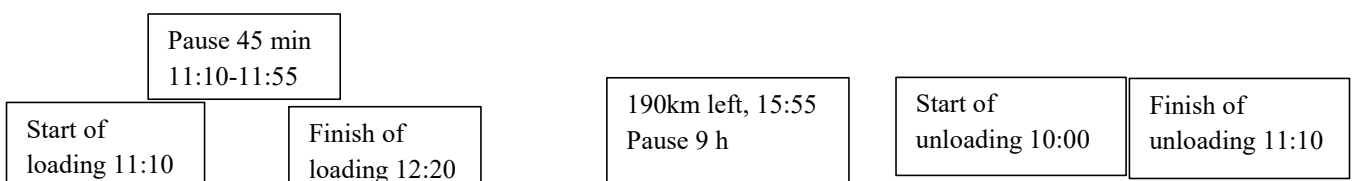


Figure 3.9 - Trebukhiv- Dnipro route

Next road will be Dnipro-Trebukhiv (Fig. 3.10). For the exact calculation of the first route, we have the following initial data:

- 1) The average speed of the car is 80 km/h
- 2) The number of pallets is 33
- 3) The speed of loading and unloading pallets - 2 min
- 4) The norm of working hours is 9 hours of working time, including a 45-minute mandatory break/9 hours of rest
- 5) Curfew - 00:00-05:00
- 6) Warehouse opening hours - 10:00-19:00
- 7) Distance- 515 km



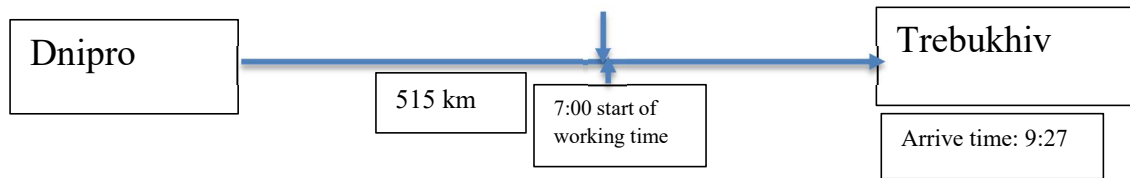


Figure 3.10 - Dnipro-Trebukhiv route

Thus, the car travels 2,324 km in 5 working days, taking into account the move from Malekhov to Zimnaya Voda, without violating the current legislation on the working hours and rest of drivers. And after 5 days of hard work, the driver gets 48 hours of rest according to the regulations of work and working hours, he can put the car in the garage and spend the weekend with his family, which is very important nowadays. Schematically, the working week of a driver looks as follows (Fig. 3.7)

By analyzing these routes and constraints, you can see that planning is a key aspect of trucking efficiency. Optimizing time routes and taking into account various constraints will help avoid delays, ensure efficient use and resources, and increase customer satisfaction with speed and accuracy of delivery.

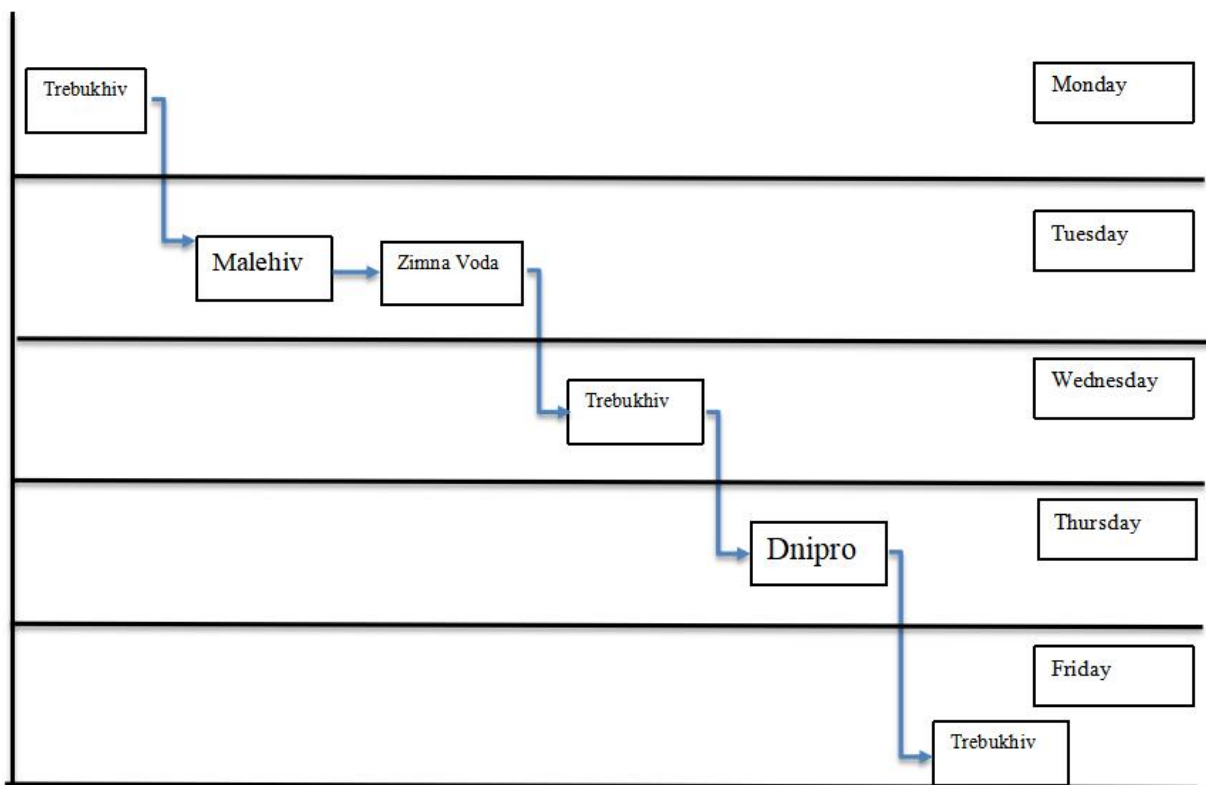


Figure 3.11 - Driver's work schedule for the week

The order of all these routes is executed by an expedited car. This means that trucks provide the necessary logistical and technical support for transporting goods from one destination to another. The freight forwarder is responsible for organizing the entire transportation process, including choosing the optimal route, time management, and compliance with all regulations and requirements.

The freight forwarder ensures that the cars arrive on time, meeting the requirements regarding work schedules and restrictions on routes. They are responsible for loading, transporting and unloading cargo, as well as ensuring the safety and reliability of the delivery of goods to their destination.

The basic approach we take is that we don't bear all these costs associated with the forwarded cars, but our profit from this type of transport is about 10%(tab3.4). This approach allows us to provide optimal conditions for transportation, while keeping our profit at a level satisfactory to us.

Table 3.4 - Marginality when using expedition trucks

| Point of departure | Point of arrival | Distance | Price | Profit |
|--------------------|------------------|----------|-----------|----------|
| Trebukhiv | Malehiv | 612 km | 27500 UAH | 2750 UAH |
| Trebukhiv | Dnipro | 515 km | 28000 UAH | 2800 UAH |
| Zimna Voda | Trebukhiv | 641 km | 24000 UAH | 2400 UAH |
| Dnipro | Trebukhiv | 515 km | 21000 UAH | 2100 UAH |

From the table we see the following. The client pays us UAH 100,500 for the work performed, the net profit from the round trip is UAH 10,050, and the carrier

who performed the flight is UAH 90,450. now let's calculate how much the company would earn using its own transport on the same route.

To calculate profit from own transport we need to calculate the costs of maintaining the truck. These costs are divided into two types: fixed and variable (Tab. 3.5).

Fixed costs include:

Depreciation: Expenses associated with the decrease in value of a car or vehicle over time. This does not change in proportion to the use of the car for a certain distance or time, but is taken into account in the calculations of the total costs.

Insurance: Fixed costs for vehicle insurance that cover risks depending on the terms of the policy.

Variable costs include:

Fuel: Fuel costs are variable as they change in proportion to the distance traveled or vehicle operating time.

Drivers' wages: Variable costs for the wages of drivers, which arise only during the execution of transportation and depend on the number of loads or distance.

Maintenance: Vehicle maintenance costs, which depend on actual operation, include oil, spare parts, repairs and maintenance.

Table 3.6 - Fixed and variable costs of the project

| Fixed cost | Price | Variable cost | Price |
|--------------|----------------|----------------|-------------------------------------|
| Depreciation | 301285UAH/year | Fuel | 53,36 UAH/l |
| Insurance | 5500 UAH/year | Drivers' wages | 3 UAH/km |
| | | Maintenance | 60000 UAH/year Or 5000 UAH/month |

"To calculate the depreciation of a cargo truck with a semi-trailer, given it travels 10,000 km per month, the equipment price is 2,109,000, and its service life is 7 years."

Firstly, we determine the annual depreciation cost of the vehicle based on its value and service life using the formula:

$$\text{Annual Depreciation} = \text{Vehicle Cost} / \text{Service Life} \quad (3.1)$$

With your provided figures:

$$\text{Annual Depreciation} = 2109000 / 7.$$

$$\text{Annual Depreciation} = 301285 \text{ UAH/year}$$

Next, to calculate the depreciation for 10,000 km per month, you divide this annual amount by the expected yearly mileage:

$$\text{Depreciation for 10000 km} = \frac{\text{Annual Depreciation}}{\text{Annual Mileage}} \times \text{km per month} \quad (3.2)$$

Given that you want the monthly value = 25100 UAH/Month.

Therefore, the depreciation expenses per month for this truck with a semi-trailer covering 10,000 km amount to 25100 UAH.

Knowing the consumable part, we can calculate how much we can earn if the car and semi-trailer that we previously chose will drive along the route that we calculated.

The entire route is 2324 km and takes 97 hours of refrigerator operation. With a truck fuel consumption of 34 L/100 km, and 2.5 L/h of refrigerator operation, we have 740 L of tractor fuel consumption, as well as 243 L of refrigerator fuel consumption per week.

Table 3.7 - Monthly car expenses

| Item | Expenses for the month |
|------------------------|------------------------|
| Depreciation per month | 25100 UAH |
| Insurance per month | 460 UAH |

| | |
|----------------|----------------------------------|
| Fuel | 209800 UAH(3932 liter per month) |
| Drivers' wages | 28000 UAH |
| Maintenance | 5000 UAH |

Summarizing the calculations, the total expenses for a month of work are UAH 268,360, and we receive UAH 402,000 from the client for the fulfillment of all orders. Net profit before tax is UAH 133,640. The margin is 33.24%. And the initial investment of USD 56,200, or UAH 2,076,590, will pay off in 16 months.

Chapter summary

In conclusion, an in-depth study of the integration of new logistics into the organizational structure of GTAL reveals several key findings. The high share of Fresh customers, which exceeds 30%, emphasizes the need to allocate a special manager and optimized business processes to serve this customer segment.

By evaluating the alternatives through a comparative analysis, the Schwarzmuller refrigerated semi-trailer becomes the optimal choice to solve the critical shortage of refrigerated vehicles in the GTAL fleet. With a reasonable price, high load capacity, low fuel consumption and favorable warranty and maintenance conditions, it offers the most feasibility. In addition, the Euro 5 DAF XF tractor unit is the most suitable truck option due to its competitive price, efficiency and lower maintenance costs.

A cost-benefit analysis of USPOT LLC's client's transportation operations demonstrates the importance of route optimization, scheduling constraints, and fleet ownership rather than outsourcing. Formulating optimal round-trip routes allows efficient use of resources, and consideration of operational constraints helps avoid delays and service issues. Although freight forwarders initially have a lower initial investment, detailed calculations show significantly higher profitability potential for GTAL's own fleet of vehicles in the long term.

In general, the integration of advanced cold chain logistics requires strategic realignment in several business dimensions – organizational structure, fleet composition and transportation economics. Through systematic analysis, GTAL can make informed decisions to adapt its business model and assets to the distinct requirements of Fresh's fast-growing customer segment. This will ultimately strengthen its competitive position and profitability.

Basic recommendations:

1. Restructure the organization with the help of a special Fresh Logistics manager.
2. Buy a Schwarzmuller refrigerated semi-trailer.
3. Buy a Euro 5 DAF XF tractor for transportation with a thermostat.
4. Optimize transportation planning for maximum use of the fleet.
5. Prioritize fleet ownership to maximize long-term profitability.

Implementing these targeted changes will provide GTAL with the foundation to expand its cold chain capabilities and better serve the needs of Fresh's valued customers.

CONCLUSIONS AND RECOMMENDATIONS

"Fresh logistics" is an indispensable part of today's highly competitive market of perishable goods with a short shelf life, since, by controlling the "cold supply chain", it is possible to satisfy the needs of end consumers in the best and most complete way for a high-quality and fresh product, which will make it possible to gain higher positions on market. The intensive development of the cold logistics market in Ukraine is possible only on the basis of the use of world experience, the introduction of advanced technologies and the unification of all participants of the "cold supply chain". After all, non-compliance with minimum standards and temperature indicators during storage, transportation and sale of goods leads not only to the inconsistency of their organoleptic indicators, but can also pose a threat to the health of the final consumer. Fresh produce logistics is an important and growing area of focus in supply chain management, driven by growing consumer demand for high-quality perishables that require strict temperature control. Companies throughout the fresh produce supply chain, from producers to transporters and retailers, face tremendous pressure and obligations to deliver goods safely while maintaining freshness, preventing spoilage and avoiding waste.

Significant investment in cold chain infrastructure and refrigerated transport capacity is required, as well as strict regulation and monitoring of storage and transport temperature conditions. Innovations in packaging, as well as emerging technologies such as AI and IoT, can improve real-time visibility and rapid response in large-scale distribution networks. Employing qualified drivers and strictly managing working hours are also key to avoiding disruptions.

In general, new logistics require extensive collaborative efforts with increased care in interdependent relationships to meet precise product specifications. Although challenging, building strengthened supply chains to handle increasing volumes of temperature-sensitive perishables can open up great economic opportunities as well as benefit from reduced food loss. The onus is on businesses across the ecosystem to

collectively prioritize and develop improved defenses that ultimately satisfy consumers' desire for premium nutrition.

General Trans Alliance Logistics (GTAL) commenced operations in 2014 providing transportation solutions to clients in Ukraine. In its first years, GTAL honed logistics expertise mainly through serving one anchor company that accounted for over 99% of its initial revenue.

Seeking additional growth avenues, GTAL moved to diversify its customer base and service lines. By 2016, the firm had established its own freight forwarding department to support and consolidate cargo volumes from other regional shippers using a flexible mix of in-house and third-party vehicles. This allowed more responsiveness in meeting demand fluctuations.

Additional service extensions followed to capitalize on market opportunities. GTAL launched international transportation options to handle cross-border cargo flows, touting streamlined customs brokerage and trade compliance processes. The company also invested in warehouse infrastructure, operating temperature-controlled storage sites purpose-built for foods and pharmaceuticals requiring strict climate conditions.

Organizationally, GTAL divides oversight across 11 departments anchored by core transportation, warehousing, and global logistics functions. Units like the Technical Department and Regional Transport Teams embed specialized expertise within operational areas. Support functions including Finance, Legal, IT, and Admin provide infrastructure for business activities.

The departmental structure aids professional development within logistics sub-sectors but can pose communication gaps. Instilling organization-wide cohesion and establishing common success metrics remain imperative for coordination. Opportunities may also exist to consolidate certain back-office teams as operations mature.

In terms of recent financial trends, GTAL exhibited declining profitability in 2021 following a temporary rebound a year earlier. This indicates potential systemic issues in stabilizing performance as the company scales. Examining cost control and

customer retention factors could shed light on these emerging business stability risks.

The in-depth analysis presented examines critical issues and opportunities for GTAL logistics company to improve its competitiveness in the fresh product transportation market.

A key problem identified is the lack of focus and coordination in serving fresh category customers, who comprise over 30% of GTAL's client base. The analysis recommends reorganizing the enterprise structure to create a dedicated fresh logistics department. This can enable better customer service, communication, innovation and growth in this segment.

Additionally, the shortage of refrigerated trailers in GTAL's fleet poses a major limitation for transporting fresh goods. A comparative analysis determines that purchasing Schwarzmuller trailers with high capacity, low operating costs and an extended warranty best addresses this gap. Complementing this, the purchase of DAF XF Euro 5 trucks is advised based on performance, price and maintenance considerations.

Further analyses on route optimization, transportation cost modeling and profitability comparisons provide vital economic insights. The creation of round-trip schedules, detailed cost breakdowns, and assessment of owning versus renting transportation underscore the importance of data-driven decision making.

Overall, the analyses indicate that strategic moves to focus on the high-potential fresh category, methodically expand park of auto and assets, and leverage optimization principles can strengthen GTAL's competitive edge. Targeted investments in this category and dedicated resources to serve fresh customers represent opportunities for improved service quality, customer retention and market expansion.

Recommendations:

Integrate cold supply chains into overall business operations: The documents highlight the importance of cold supply chains and the "Fresh" category for the company, comprising over 30% of clients. I recommend fully integrating cold supply chains into the organizational structure and core operations to improve coordination,

customer service, and innovation. A dedicated cold chain logistics manager and team can focus solely on this critical area.

Expand refrigerated transport fleet capabilities: The analysis identified a shortage of refrigerated trailers as a major gap, limiting fresh product transportation. I recommend expanding the fleet by acquiring additional refrigerated trailers and trucks, such as the Schwarzmuller semi-trailer which offers the best value based on the assessment. Investing in enhanced refrigerated transport capabilities will enable growth, quality, and reliability.

Optimize transportation planning and route efficiencies: Effective route planning and time management is vital for prompt delivery and customer satisfaction. The proposed round trip routes and scheduling approach provide templates to maximize vehicle utilization, meet constraints, and reduce costs through optimized transportation planning. Continual route analysis and efficiency improvements should be prioritized.

Leverage technology for cold chain monitoring and control: Thermal loggers, probes, and printers highlighted in the documents provide temperature visibility and help preserve product integrity during shipping. Further investments in such IoT technologies and data analytics will strengthen cold chain control and traceability.

Ensure rigor in driver working hour management: Strict adherence to regulations around driver shifts, working hours, break times and automotive tachograph usage is essential to prevent fatigue, maintain safety standards and product quality. Disciplined schedules, routing approaches and technology tools can improve compliance.

Adopt customer-centric strategies for "Fresh" products: Develop tailored transportation plans for each "Fresh" product category based on precise temperature, handling and shelf life requirements. A customer-focused approach also entails packaging innovations, inventory buffers and flexibility to meet dynamic needs.

In summary, leveraging cold chain excellence as a core competency, supported by strategic investments in assets, technology and processes, can drive higher margins, growth and competitive differentiation for the business.

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