



# **Warehousing at the airport terminal. Optimizing processes based on the analysis of two warehouses.**

**Case for DSV Air and Sea Russia**

Ekaterina Lopukhova

Bachelor's thesis

May 2022

Engineering and technology

Bachelor's Degree Programme in International Logistics

**Lopukhova Ekaterina**

**Warehousing at the airport terminal. Optimizing processes based on the analysis of two warehouses.  
Case for DSV Air and Sea Russia**

Jyväskylä: JAMK University of Applied Sciences, May 2022, 63 pages

Technology, Communication and Transport. Degree Programme in Logistics Engineering. Bachelor's thesis.

Permission for open access publication: Yes

Language of publication: English

### **Abstract**

Warehouse plays a significant role in the airport infrastructure. Located at the airport terminal, their performance affects a lot of parties involved in case of any possible issues that may occur.

This study aimed to analyze the current situation at the Sheremetyevo International Airport by obtaining all the available information from various sources and conducting interviews and questionnaires. Concerns were raised by DSV Air and Sea as the company noticed the difference in the performance of the warehouses. In addition, it aimed to suggest a development plan that can be implemented by the warehouses or used as a reference point or reflection for them to understand the undergoing issues.

The theoretical part of the study explains the role of the airport as a system element and provides information on warehousing. The main part of the study is focused on the case study.

The findings of this study identified the issues that were affecting the performance of the warehouses as well as affecting the relationships with the clients. Thus, based on the data gathered and analyzed during this study, the solutions were suggested to all the parties involved in the case study. This study further highlighted that investing in project implementation to boost operational efficiency is considerably less expensive than fixing the consequences of major failures

### **Keywords/tags (subjects)**

Warehouse processes, optimization, warehouse optimization, airport terminal, warehouse

### **Miscellaneous (Confidential information)**

-

## Contents

<b>1</b>	<b>Introduction .....</b>	<b>4</b>
<b>2</b>	<b>Research overview.....</b>	<b>5</b>
2.1	Research questions .....	5
2.2	Scope and limits of the research.....	6
2.3	Theoretical framework.....	6
2.4	Research methods.....	7
2.5	Quantitative research.....	7
2.6	Qualitative research .....	8
2.7	Methods of data collection .....	8
2.7.1	Interviews .....	9
2.7.2	Observation .....	9
2.7.3	Documents and records.....	9
2.7.4	Focus groups.....	10
2.7.5	Questionnaires.....	11
2.7.6	Selected methods .....	11
<b>3</b>	<b>The role of the airport as a system element .....</b>	<b>12</b>
3.1	The airport as an economic factor .....	12
3.2	The role of the airport as an element of the air transport system.....	13
<b>4</b>	<b>Warehousing management.....</b>	<b>14</b>
4.1	Warehouse processes .....	15
4.1.1	Receiving.....	15
4.1.2	Put-Away.....	16
4.1.3	Storage.....	16
4.1.4	Picking.....	16
4.1.5	Packing.....	16
4.1.6	Shipping .....	16
4.2	Warehouse layout .....	17
4.3	Classification of warehouses .....	17
<b>5</b>	<b>Optimization processes.....</b>	<b>18</b>
<b>6</b>	<b>Case study .....</b>	<b>19</b>
6.1	Moscow Cargo.....	20
6.1.1	Background information.....	23
6.2	Sheremetyevo Cargo.....	27
6.2.1	Background information.....	29

6.3	The Interview .....	34
6.4	The questionnaires.....	35
6.5	Comparison .....	39
<b>7</b>	<b>Solutions .....</b>	<b>42</b>
<b>8</b>	<b>Conclusion .....</b>	<b>44</b>
8.1	Reliability of the research .....	44
	<b>References .....</b>	<b>46</b>
	<b>Appendices .....</b>	<b>49</b>
	Appendix 1. Warehouse classification. ....	49
	Appendix 2. Open questionnaire .....	51
	Appendix 3. Reliability analysis of the sources .....	52
	Appendix 4. Interview transcript.....	55

## Figures

Figure 1.	Moscow Cargo terminal.....	20
Figure 2.	ASRS system .....	21
Figure 3.	PCHS .....	22
Figure 4.	Financial situation, Moscow Cargo .....	25
Figure 5.	Inspections at Moscow Cargo .....	26
Figure 6.	Arbitration cases .....	27
Figure 7.	Sheremetyevo Cargo warehouse .....	29
Figure 8.	Financial situation, Sheremetyevo cargo .....	31
Figure 9.	Inspections at Sheremetyevo Cargo .....	32
Figure 10.	Arbitration cases .....	32
Figure 11.	Moscow Cargo and Sheremetyevo cargo. ....	33
Figure 12.	Questionary results for Moscow Cargo .....	36
Figure 13.	Questionary results for Sheremetyevo Cargo .....	37
Figure 14.	Reliability analysis, p.1 .....	53
Figure 15.	Reliability analysis, p.2 .....	54
Figure 16.	Reliability analysis, p.3 .....	54

## Tables

Table 1.	Main technical characteristics. Adapted from Infrastructure-Moscow Cargo, 2022 ...	22
----------	--	----

Table 2. Facilities for handling special categories of cargo. Adapted from Infrastructure-Moscow Cargo, 2022 .....	23
Table 3. Moscow Cargo information.....	23
Table 4. Characteristics Sheremetyevo Cargo .....	28
Table 5. Sheremetyevo cargo information .....	29
Table 6. Comparison .....	40
Table 7. Warehouse classification adapted from Stepanov, 2007 .....	50
Table 8. Publication types .....	52
Table 9. Years of publications .....	52

# 1 Introduction

When it comes to setting up distribution channels, the corporation must address several challenges concerning delivery. It is crucial that the mode of transportation, ways of organizing the transportation, and vehicle types are selected accordingly. The safety of commodities, the most efficient use of transportation capacity and carrying capacity, and the reduction of transportation costs are the major criteria. Air freight delivery is the quickest and most reliable mode of cargo delivery. The capacity to fly great distances in a short amount of time, as well as the non-aggressiveness of the transportation environment, make air transportation incredibly profitable and convenient.

However, it should be underlined that warehousing plays a significant role. In fact, it can be one of the most crucial components of logistics systems. A contemporary warehouse is a complex organism that requires regular monitoring and management. Warehouse issues have a substantial influence on the movement of material flows across the logistics chain.

Warehousing at the terminal is a critical part that needs to be executed on a prominent level. It affects the other parties involved in the operations. The potential problems of the warehouse may result not only in immediate losses for the terminal and the companies it is working with but also for other contractors.

The main goal of this thesis was to find answers to the research questions and develop a plan to improve and optimize the processes at the warehouses. The study was implemented as a case study. The research process involves gathering and analyzing a vast number of information sources as well as conducting interviews and questionnaires.

The need for and importance of this thesis is based on the lack of communication between all the parties involved as well as the vast difference in the performance with similar companies' setups. The divergence of performance affects the relations of a company with its clients and affects the future of an organization. While this area has been thoroughly researched before, the adaptation of innovative technologies and practices varies significantly.

Both companies working at the airport terminal would be thoroughly examined and analyzed based on publicly available documentation, interviews with the workers, and questionnaires. A literature review would be conducted to better understand the theoretical basis and aid in the evaluation of the current situation.

The outcome of the study is the development plan that while tailored to the situation described in the case study, can be used for other companies with the adjustments made.

## **2 Research overview**

Research is the process that is done to obtain the latest information while undertaking a methodical analysis. There are many definitions of what research is. However, what is similar in all of them is that it requires collecting, organizing, and analyzing the information in order to answer the questions of the research. Kumar (2008) states that research is an intensive and focused process, focused on the search for knowledge, needed to understand any social or physical phenomena. Selecting research questions is a crucial part as it will affect the direction that the research will take. Methods that are selected should reflect the type of data necessary for answering the research questions.

In addition, it is critical to evaluate the sources utilized during research. It is needed to guarantee that chosen sources do not have any negative effects on the quality of the research and the solutions that would be proposed for all the parties involved. The sources used need to be relevant to work.

### **2.1 Research questions**

The main purpose of this study is to determine the issues affecting the performance of the warehouses and provide solutions to improve the work of the warehouses and establish clear communication between the case company and the warehouses.

**The main question of the research work is as follows:**

- What should be done in order to improve the processes at the warehouses?

**The other question that should be answered in this work are:**

- What advantages and disadvantages of the warehouses can be outlined?
- How the current situation affects the work of the company and the relationships with its clients?
- What are the issues affecting the performance?

## **2.2 Scope and limits of the research**

The study was implemented based on the main case study on a company working with two different warehouses at the airport terminal in Moscow, Russia. The main limitations that may follow are the availability of public data documentation as well as the confidentiality of some of the data.

During the case study, the main big interview would be conducted as well as questionnaires with workers. In that situation, some of the data that can be used for the research can also fall under the confidentiality policy. In addition, some of the workers might not be willing to answer some of the questions for distinct reasons or give answers influenced by their personal feelings. Besides that, a limitation that occurred during the process of work involved the availability of the workers willing to participate in the interview. The research project was done during the period when the company was still influenced by the reorganization. In addition to that, the availability of workers correlated with the ongoing political issues influencing the work of the company.

## **2.3 Theoretical framework**

The research is focused on the question of understanding warehouse processes and their optimization as well as understanding the role of the warehouse for the airport terminal. The theoretical framework of the research consists of definitions of warehouse management, warehouse process and classification, and optimizations that can be implemented.

However, as the warehouses in question are a part of the airport system, the role of the airport as a system element needs to be clarified for a better understanding of the situation. Thus, the focus

of chapter three is on understanding the role those modern airports play and what impact they play on economics.

The focus of chapter six is on the case study as the main aim of it is to understand what are the issues that are affecting the performance. The information is compiled and analyzed to provide solutions that can be seen in chapter seven of the work.

## **2.4 Research methods**

Several scientific approaches must be used to get answers to the research questions. The main goal of the research is to find previously unknown pieces of information or knowledge that would be applicable to current research. The approaches that would be used are chosen by the one performing the research (Kothari, 2004).

As was briefly mentioned before, the methods that would be utilized are dictated by the nature of the study and the information that is needed to answer the main research questions. There are certain methods that are better suited for one purpose and ones that can be used in a number of scenarios. Two main methods of research can be outlined – qualitative and quantitative. However, there are cases when those methods needed to be combined, making the method used for the research mixed. (Kothari, 2004)

To clarify in case the researcher needs to answer questions with numerical data, the quantitative approach will be used. However, in case the answer requires textural data, the qualitative method will be used (Williams, 2007). There would occur a situation when answering the research question requires both types of data (numerical and textural). Then the mixed methods approach is used (Kothari, 2004).

## **2.5 Quantitative research**

As was previously mentioned, quantitative research methods are used when statistical data is utilized. It is applied when the phenomena that are being researched can be expressed in terms of quantity. There are several ways that can be utilized for this strategy. For instance, statistics in tables, mathematical or computational tools, or even online questionnaires with a single reply

option or with yes or no questions. The collected data is then processed and statistically analyzed. (Kothari, 2004)

Following the analysis, the results can be shown in the form of tables, charts, or graphs. It makes the data more visible and easier to comprehend. There are different areas that can benefit from that approach. For example, it is ideal for pattern classification, comparison, and identification (Brannen, 1995).

## **2.6 Qualitative research**

A qualitative research technique is different from quantitative-based on the means that are needed to gather and process the information on the subject. Qualitative research methods concern the phenomena that are related to the quality of any kind. The underlying motives are looked at during the qualitative research. The main methods that are utilized in qualitative research are participant observation and interviews. (Brannen 1995)

In qualitative research, text materials, interviews, internet pages, or other sources can be analyzed. In comparison to quantitative research, the questionnaires are open, and the responders are not limited when answering the questions. The main point is to gather more in-depth information that would help the researcher understand the bigger picture. (Kothari 2004,)

The purpose of the method is to explain the relationship between numerous factors in a case study. However, this method has its limitations, the main one being the participants' reactivity as they may be behaving differently based on the fact that they know they are being observed. (Kothari, 2004)

## **2.7 Methods of data collection**

There are different methods of data collection that can be utilized based on the need of the research. One type of data collection is from primary sources, which include observations, interviews, and surveys. Secondary sources include books, papers, and previous research. (Kramel, 2021)

Data for this study were gathered from both primary and secondary sources.

### **2.7.1 Interviews**

One of the most common ways of data collecting is the interview. It is a simple method that can produce remarkable results. There are interviews where the questions are already prepared beforehand. And there are interviews where all the questions and the follow-up questions are spontaneous. Thus, there are structured, unstructured, and semi-unstructured interviews (7 Data Collection Methods & Tools for Research, 2019).

Among the advantages of this method are flexibility of freedom, accurate data, and in-depth information. However, the disadvantages are also present. It can be time-consuming and even expensive to collect (7 Data Collection Methods & Tools for Research, 2019).

### **2.7.2 Observation**

Observation is performed when there is a need to overlook the activity from afar, without interfering with what is happening. During the observation process, all the events, changes, and behavioral patterns that occur throughout the process are documented. In general, observations can determine the dynamics of a situation. The method is often used to understand behavioral patterns. (7 Data Collection Methods & Tools for Research, 2019).

In order for monitoring to be effective, various elements must be considered:

- The observation is conducted in an environment with no interferences;
- A period of time for the observation is set.

### **2.7.3 Documents and records**

Collecting data from documents and records allows for the research to acquire a large quantity of data without any additional steps being taken. Documents can include visit reports, meeting minutes, financial reports, etc. (7 Data Collection Methods & Tools for Research, 2019).

Since using documents and records does not require conducting additional research and the one that has already been done is used, employing such papers and information may be efficient and

economical. However, it must be noted that this method has a major limitation in the fact that the researcher does not have any control over the results. Thus, documents and records can be an incomplete data sources (Ainsworth, 2019)

When working with documents and records, the reliability of information sources needs to be analyzed. The research requires accurate data and relevant data, that would not have any negative effects on the results of the project work. For instance, the method of analyzing the source based on the author, perspective, context, and audience can be used.

#### **2.7.4 Focus groups**

Sometimes focused groups are described as a combination of other methods that are needed to add a collective element to data collection. There is another variation when focused groups are referred to as focusing surveys (Ainsworth, 2019).

The focus groups can significantly vary in size, depending on several factors. Generally, the size of the group is around 7 to 15 people, however, it can be smaller or bigger according to some sources. All investigations are documented to identify qualitative features of customer behavior. (7 Data Collection Methods & Tools for Research, 2019).

All the participants of the focus group make contributions to the conversation at hand. The perspective of an individual supported by provable facts and evidence is valuable information to the research. When focus groups are used as a tool to gather information, the consensus is not required. It brings the factor of backgrounds and experiences of participants, and it is a big advantage. (Ainsworth, 2019)

Moreover, one of the main advantages of this method is that it provides incredibly detailed information. Also, when compared to one-on-one interviews, it is less expensive. It represents the speed and efficiency with which outcomes are delivered. However, bias may still be present, as well as difficulty in organizing a diverse group (7 Data Collection Methods & Tools for Research, 2019).

### 2.7.5 Questionnaires

Questionnaires are used to gather information from big groups of people and the data that is obtained this way can be analyzed using various methods. During a questionnaire, the responder fills in the answers to questions or chooses from a list of responses. (Ainsworth, 2019)

There are two kinds of questionnaires: closed questions and open questions. On the one hand, during the closed questionnaire, there are two ways of doing them. During them, the responder must choose either one of two options, e.g., “yes or no,” or choose one from multiple options. On the other hand, the open questionnaire does not have those limitations and requires the responder to answer the question using their own words. This type would require additional analysis to make the data more comprehensible and more visual (Ainsworth, 2019).

A survey is a data collection procedure that uses a range of data collection tools, including a questionnaire (7 Data Collection Methods & Tools for Research, 2019).

The main advantages of this method are:

- It is cost-effective and may be administered in huge quantities.
- It is simple to visualize and evaluate.
- Respondent anonymity is maintained.
- Questionnaires can cover every aspect of a subject. (7 Data Collection Methods & Tools for Research, 2019).

### 2.7.6 Selected methods

This thesis utilizes mixed methods of collecting data. The focus of the work is placed on finding the reasons the performance of the warehouses has significant negative effects. To successfully obtain the needed information, using only qualitative or quantitative methods is not enough. However, utilizing both would provide significantly more ground to make decisions and provide suggestions.

In this project, the documents and records would be utilized as well as interviews and questionnaires. Observation and focus groups were found not suitable for the purpose.

### **3 The role of the airport as a system element**

The airport is a crucial point in the logistics chain. It serves as a crossroads for many partners' activities and interests. Nowadays, the role of the airport has changed and exceeded all the previous expectations. Thus, it cannot only be a transshipment point. Now it serves as a ground for different parties to combine their actions needed for the development and service of air transportation. Because of that, the airport's duty is to combine the efforts of partners and users to produce a distinctive airport product (The role of the airport as a system element, 2017).

The conventional role of the airport is to offer infrastructure and services such as runways, taxiways, parking lots, hangars, and so on, as well as pre-flight and post-flight maintenance of the carrier's aircraft and commercial loading. Air traffic control in the airport region, weather assistance, fire protection, search, and rescue operations, and first aid are all provided.

The airport is responsible not just for providing infrastructure, but also for ensuring proper safety, quality, and timeliness of service. The airport's mission is to bring together partners and provide the best possible service (The role of the airport as a system element, 2017).

#### **3.1 The airport as an economic factor**

Airports have a far greater economic impact than airlines. The main factor in that is that the airport is self-contained. However, a balance between the different partners' and users' interests should still be maintained. In addition, a balance between business and the environment should also be prioritized. Airports need to serve as "unifying hubs of activity." Their roles are varied, but the airport acts as a unifying principle, compelling the system to function (The role of the airport as a system element, 2017).

There are duties to the owners in addition to obligations to consumers because the airport's owners can influence how the airport operates. In this situation, the airport coordinates user behaviors with respect to the owners and society.

### 3.2 The role of the airport as an element of the air transport system

To understand the role of the airport as an element of the air transport system, the transport system must be defined first. According to the Department of Management and Economics in Air Transport of Ulyanovsk Institute of civil aviation (2003), the transport system is a complex of numerous modes of transportation that are interdependable. The system includes a vast number of engineering constructions and technical methods that enable movement control, loading, reloading, and operating mode in addition to vehicles, trains, aircraft, and ships.

Thus, the airport functions in a particular environment, and its functions and structural parts are determined by it. When a part of a transport system, the airport may be connected to another one (if it is the main-based airport or is connected to one). In such scenarios, those airports have their own aviation maintenance base (ATB), as well as their own passenger and freight terminal. Airlines that have their own main base at one of the airports would want to work with other airports that are connected to the main-based one as it will ensure they are break-even in competition with other carriers. As a result, legislation in a few nations prohibits the creation of commercial facilities that serve the tasks of an airport and an airline at the same time (The role of the airport as a system element, 2017).

The transport system, as mentioned before, has a lot of components. Not all of them are present in all the parts of the system. For example, the airport has four major components of the air transportation system: the airport itself, which may own a portion of the air traffic control system (ATC), the airlines, the ATC system, and users.

The uniformity of all these systems' performance ensures the airport's successful operation. Lacking one of the key elements would result in significant negative effects and would require providing the missing infrastructure in the shortest possible time. In the event of an imbalance, the following outcomes are possible:

- Incomplete operation of the airport and airlines;
- Unsatisfactory conditions for passengers;
- Inadequate conditions for freight customers;
- Insufficient flight support;

- Unreliable functioning of airport systems;
- An increase in the cost of transportation for users;
- Deterioration of the equipment;

Airports in Russia are classified as airports of national importance (strategic) and regional airports. Airports of national importance offer the majority of passenger and aircraft services, serve as the primary nodes of the Russian air transport system, and enable the operation of Russia's most important international and interregional aviation linkages. Strategic airports are part of a worldwide transportation network. Regional airports serve a specific geographic area by providing aviation services (The airport as an element of a transport system, 2017).

## **4 Warehousing management**

The goal of warehouse management is to assist in the operation of the logistics system. The provision of a special infrastructure adequate for the keeping of certain items in the requisite quantities, known as warehouses, is a fundamental requirement for the execution of the movement of certain products within a specific logistics system. (Yauk, 2016). General warehouse management duties include:

- ensure the continuous supply of essential resources to production;
- maintaining the safety of resources (quantitative and qualitative);
- cutting costs and enhancing one's own efficiency;
- and selecting, configuring, dosing, and other activities with products.

The warehouse economy's organization has a direct influence on the company's performance since it assures the smooth functioning of the primary production and timely transportation of final items to the consumer (Filimonov, 2016).

The warehouse complex is a critical component of a logistics system that allows for the storage, processing, and distribution of material flows. Thus, the warehouse economy emerges from the structural changes in material flows. Those structural changes are subsequently produced by the changes that happen to the parameters of the received and delivered a batch of items, such as

size, composition, shelf life, and so on. Big modifications of the parameters mentioned result in higher human costs and an increase in the cost of a unit of flow. At this point, any processes that are connected to the warehouse would also be affected. It will result in an increase in expenses and changes to work efficiency (Yauk, 2016).

According to Smirnov (2003), warehouse management functions are as follows:

- implementation of the supply and distribution plan;
- receiving, storage, release, and accounting of products;
- organization of the most cost-effective transit of materials from
- supplier to consumer;
- allocation of the necessary storage areas;
- various repair and maintenance work.

## **4.1 Warehouse processes**

To create value, the warehouse has five basic functions according to Ackerman (1997). These are - stockpiling, product mixing, consolidation, distribution, and customer satisfaction. The main processes are receiving, put-away, storage, picking, packing, and shipping. The processes carried out by the warehouse differed based on the business.

### **4.1.1 Receiving**

Receiving is the first process that the goods go through when they enter the warehouse. It plays a very crucial role as it affects the following processes, e.g., goods received are damaged, not in the right quantity, etc. (Sunol, 2021). There are a lot of points of interest that need to be considered by the management of the warehouse for this process to go smoothly.

In addition to that, during the receiving process, the responsibility is transferred to the warehouse. From this point on it should maintain the safety and condition of the goods before they proceed to the next step. The warehouse should maintain the condition of the goods the same as it was when they were received. In case anything does happen, it would be extra expenses for the warehouse or may even lead to court cases. (Sunol, 2021)

#### **4.1.2 Put-Away**

The next step is put-away. It involves moving the goods from the receiving area to the place where they would be stored. It is crucial that the most suitable and optimal location is chosen for all the following movements to be efficient. (Sunol, 2021)

#### **4.1.3 Storage**

After being moved from the receiving stage, the goods are stored in the dedicated area. The warehouse must ensure not only that the location of the goods is the most optimal one, but also that the storage conditions are in accordance with the type of product being stored. (Sunol, 2021)

#### **4.1.4 Picking**

Picking is a process of moving goods from the storage area to fulfill the orders. It requires high accuracy and the right handling of the goods. Right methods must be used. (Sunol, 2021)

#### **4.1.5 Packing**

After being moved from the storage area, the goods are consolidated and prepared for further shipment to the clients. During packing, the right materials and technologies must be used to ensure that the products are not damaged during transition. Also, the goods are inspected before shipping so there is no reported damage that would be the responsibility of the warehouse. (Sunol, 2021)

#### **4.1.6 Shipping**

Shipping is the last process that involves the warehouse. It is required for the right goods to be sent to the customer. In addition, they must be loaded properly and of the right quality. According to Sunol (2021), "shipping is considered successful only if the right order is sorted and loaded, is dispatched to the right customer, travels through the right transit mode, and is delivered safely and on time".

## 4.2 Warehouse layout

The design of the warehouse is a crucial point that needs to be considered thoroughly. It is affected by a few points such as the type of warehouse, the location, available space, etc. According to Thomas (2000), "the overall approach to a good warehouse design is heavily impacted by the collection of data, the understanding of business issues, and the development of concepts". Typically, warehouse design consists of three separate phases:

- Pre-engineering;
- Engineering;
- Implementation (Thomas, 2000).

There are several ways of approaching layout design. Each warehouse type varies in requirements for design. However, there are general principles that are common for all of them:

- Larger items need to be moved less
- Stock groupings
- Balancing activities
  - It is necessary to lower the amount of time spent on each activity per unit by increasing run sizes and balancing all the activities happening at the warehouse.
- The shortest path
  - The quickest moving commodities should be nearest to the entrance. In fact, it significantly reduces the amount of travel time required for the handling of the product (Thomas, 2000).

## 4.3 Classification of warehouses

Because the requirement for storage facilities may be found at all stages of the material flow transit, beginning with the source raw materials, and finishing with the final commodity items ready for transportation to the customer, there is a broad variety of warehouse types created for varied demands (Stepanov, 2007).

The warehouses can be classified based on distinct factors such as in relation to the functional areas of logistics, in relation to the participants of the logistics system, by the form of ownership, by ownership of the material flow, by functional purpose, by assortment specialization, by storage mode, by technical equipment, by type of warehouse buildings and structures, by type of warehousing, by the presence of external transport links, by the scale of activity (Stepanov, 2007, 272–273). The full table can be seen in appendix 2.

## 5 Optimization processes

A comprehensive set of measures is targeted at the organization of the warehouse economy, which fulfills the quality performance of warehouse jobs in a certain period with the least amount of labor and money. Warehouse technology optimization is required to improve the efficiency of warehouse resource utilization, warehouse service quality, and warehouse capacity. Specialists are allocated responsibilities for this purpose. (Stepanov, 2007)

The following steps are generally taken:

- Identifying and distributing problems that have a negative impact on productivity, costs, and quality;
- developing the best algorithms for the movement of goods in the warehouse;
- changing the technological and management processes related to reducing costs and improving the quality of the warehouse complex;
- correct adjustment of the warehouse's organizational and management structure;

Typical issues that can arise in the warehouse that is located at the airport terminal are the following:

- There is no information on when the shipment has arrived at the terminal;
- No information on the incoming cargo and its destination;
- Difficulties identifying incoming cargo;
- Inappropriate positioning of the cargo in the warehouse/ No guidelines on the positioning of the cargo;

- The warehouse management information system does not track cargo movements within the facility;
- The date of arrival, choosing orders, and accounting for losses during storage is not considered;
- There is no accounting or analysis of staff and equipment utilization. (Stepanov, 2007)

## 6 Case study

DSV is a multinational transportation and logistics corporation with operations in over 90 countries. Every day, DSV delivers and maintains supply chain solutions for thousands of businesses. The company is structured into three divisions, Road, Air & Sea, and Solutions (About DSV, 2022).

In the case study, the situation at Sheremetyevo airport would be looked at. At that airport, the case company – DSV Air and Sea Russia – is working at both available cargo terminals. The mentioned terminals are Moscow Cargo and Sheremetyevo Cargo. Both are well-known and established companies that have been operating for an extended period. However, the result of the performance of the terminals varies significantly. The main points of interest are the warehouses and their processes.

The case study contains background information on Moscow Cargo and Sheremetyevo Cargo, the infrastructure, and the current financial situation. In addition, there are other pieces of information presented as they are necessary for understanding the advantages and disadvantages of the warehouses and the organization.

The interview with the current workers of the DSV Air and Sea company was carried out. Moreover, the questionnaire was also used to collect the data. It was held among several groups of people to get several diverse points of view. In addition, the relevant data that was obtained from public records or publicly available documentation was analyzed and presented in form of charts.

## 6.1 Moscow Cargo

The freight terminal "Moscow Cargo" is the largest goods complex in Russia, the CIS, and Eastern Europe. The complex has been in operation for a long time. However, the Moscow Cargo that is operating now is a product of renovation. The first stage of the new cargo complex went into operation in September 2017, with the second stage following in 2021.

The terminal has been outfitted with modern warehouse technology, including features that are unique to Russia: an automated system for handling and storing items on warehouse pallets, as well as an automated system for processing packing tools. The freight terminal's production cycle activities are automated to 60 percent (Infrastructure-Moscow Cargo, 2022).



Figure 1. Moscow Cargo terminal

The warehouse has several different methods of storage that are available for use. Then the main one and the big point of interest when the new complex was introduced is the seven-tier ASRS system (Automated storage and retrieval system) installed. This system consists of 3198 cells and three working lines, each of which runs four cranes totally automatically. (Infrastructure-Moscow Cargo, 2022).



Figure 2. ASRS system

The automated PCHS (Pallet Container Handling System) system handles and stores cargo on airplanes and in containers, abbreviated ULD (Unit Load Device).

The PCHS system has 576 cells in total. In this system, there are 60 cells that are dedicated to the handling of temperature-sensitive loads. In addition, there are three automated 20-foot lifting and transport devices ETV (Elevating Transfer Vehicles), each having a lifting capability of 13.6 tons. (Infrastructure-Moscow Cargo, 2022)



Figure 3. PCHS

Moscow Cargo provides its customers with all the necessary equipment and facilities in order to serve all types of cargo, including live animals, temperature-sensitive cargo, dangerous cargo, valuable cargo, and oversized cargo (Services - Moscow cargo, 2022).

Table 1 shows the technical characteristics that Moscow Cargo made public.

Table 1. Main technical characteristics. Adapted from Infrastructure-Moscow Cargo, 2022

<b>Total area</b>	42,300 m <sup>2</sup>
<b>The capacity of the first stage</b>	380,000 tons of cargo per year
<b>Points of reception/delivery of goods</b>	29
<b>Automated cargo handling system on warehouse pallets</b>	3,198 storage locations
<b>Automated system for processing packaging tools</b>	576 storage locations

<b>Workstations for picking/unpacking cargo</b>	37
<b>Conveyor lines with access to the airfield</b>	13

Facilities for handling special categories of cargo are shown in table 2.

Table 2. Facilities for handling special categories of cargo. Adapted from Infrastructure-Moscow Cargo, 2022

<b>Thermosensitive cargo</b>	4,000 m <sup>3</sup>
<b>Dangerous goods</b>	6,412 m <sup>3</sup>
<b>Valuable cargo</b>	435 M <sup>3</sup>
<b>Live animals</b>	435 M <sup>3</sup>
<b>Heavy and bulky loads (including 20" pallets and cars)</b>	

### 6.1.1 Background information

General background information on the company is summarized below and is shown in table 3.

Table 3. Moscow Cargo information

<b>Registration date</b>	10 <sup>th</sup> of November 2009
<b>Organizational and legal form</b>	Limited liability company
<b>The average number of employees</b>	1831 employees

<p><b>Not included in the register of unscrupulous suppliers</b></p>	<p>According to the FAS (Federal Antimonopoly Service), it is not included in the register of unscrupulous suppliers</p>
<p><b>Participant in the public procurement system — supplier</b></p>	<p>The company delivered goods or rendered services in the amount of more than 113,5 million rubles.</p>
<p><b>Bankruptcy reports</b></p>	<p>No</p>
<p><b>Types of OKVED-2 (The All-Russian Classifier of Types of Economic Activity) activities</b></p>	<ul style="list-style-type: none"> <li>- Cargo handling</li> <li>- Construction of residential and non-residential buildings</li> <li>- Dismantling and demolition of buildings</li> <li>- Earthworks</li> <li>- Warehousing and storage activities</li> <li>- The activity of parking lots for vehicles</li> <li>- Airport activities</li> <li>- Provision of maintenance (management) of air traffic</li> <li>- 52.24.1 Container handling</li> <li>- Transport handling of other goods</li> <li>- Public postal service activities</li> <li>- Courier activity</li> <li>- Activities of hotels and other places for temporary residence</li> <li>- Activities for the provision of places for short-term accommodation</li> <li>- Restaurant activities and food delivery services</li> </ul> <p>Total of 51 activities</p>

Financial information about the organization was obtained from the Federal Tax Service and Rosstat data (Federal State Statistics Service, 2022). Revenue grew to 5.7 billion rubles, while net profit increased to RUB 1.3 billion, according to the data. The graph below (figure 4) depicts the company's financial status between 2015 and 2021.

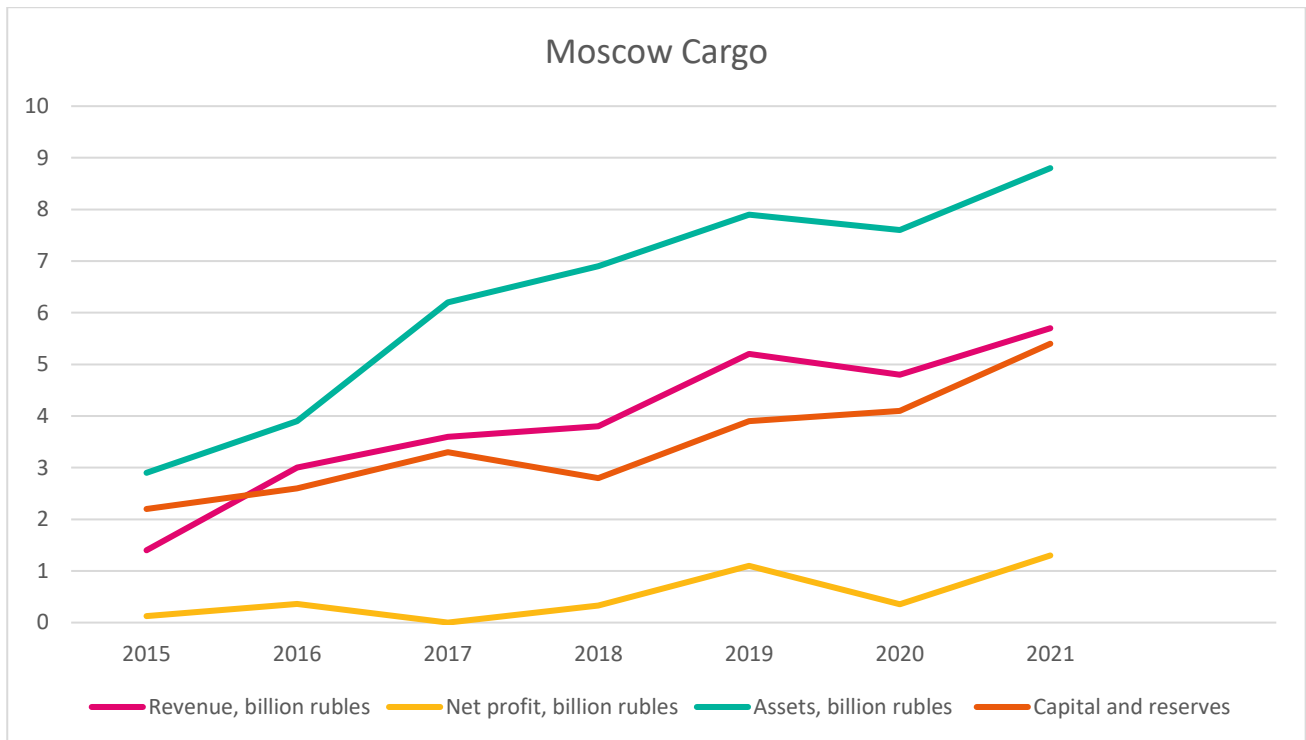


Figure 4. Financial situation, Moscow Cargo

According to the FGIS "Unified Register of Inspections" of the Russian Federation's Prosecutor General's Office, 25 inspections have been undertaken against Moscow cargo since 2015. The breaches were discovered in more than half of the inspections (Figure 5). For instance, the list of technical documentation of the consumer has not been compiled, labor protection requirements were violated, and non-compliance with sanitary and epidemiological requirements when handling

One of the most recent infractions recorded is a safety violation. It states that the reports on the results of the inspection on the implementation of production control do not include the identified causes for inefficient operations (Moscow Cargo. Inspections, 2022).

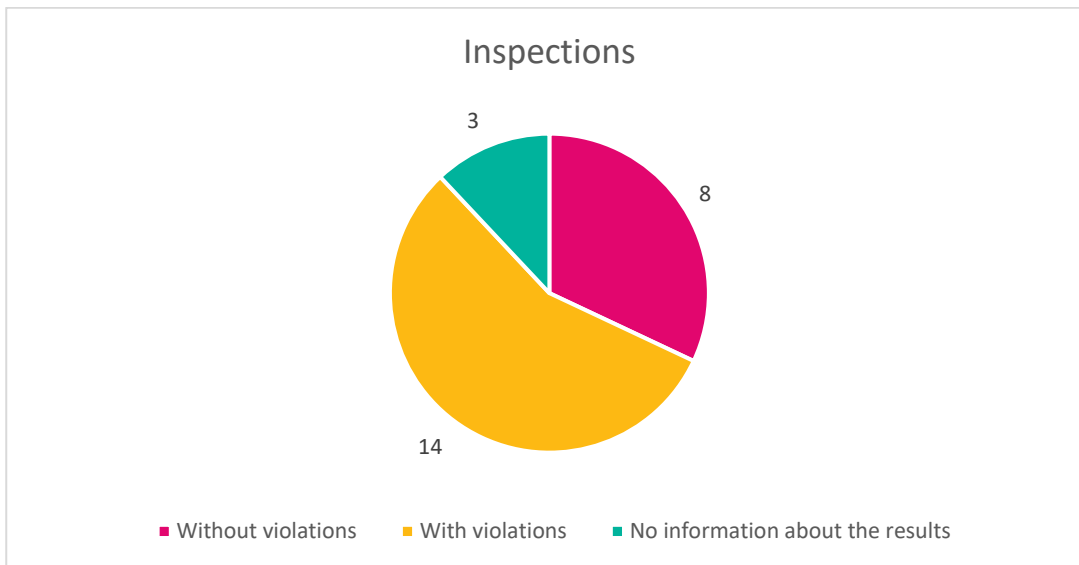


Figure 5. Inspections at Moscow Cargo

Any company can be involved in a court case. However, situations like that affect the reputation of the company itself as well as the companies it is involved with. Moscow cargo is no exception and has been involved in several cases.

Arbitration cases, in addition to the material provided above, are open to the public. In the Russian Federation's arbitration courts, 40 court cases involving Moscow cargo were heard (Figure 6). The most recent case included economic conflicts over civil legal relations (Arbitration cases. Moscow Cargo, 2022).

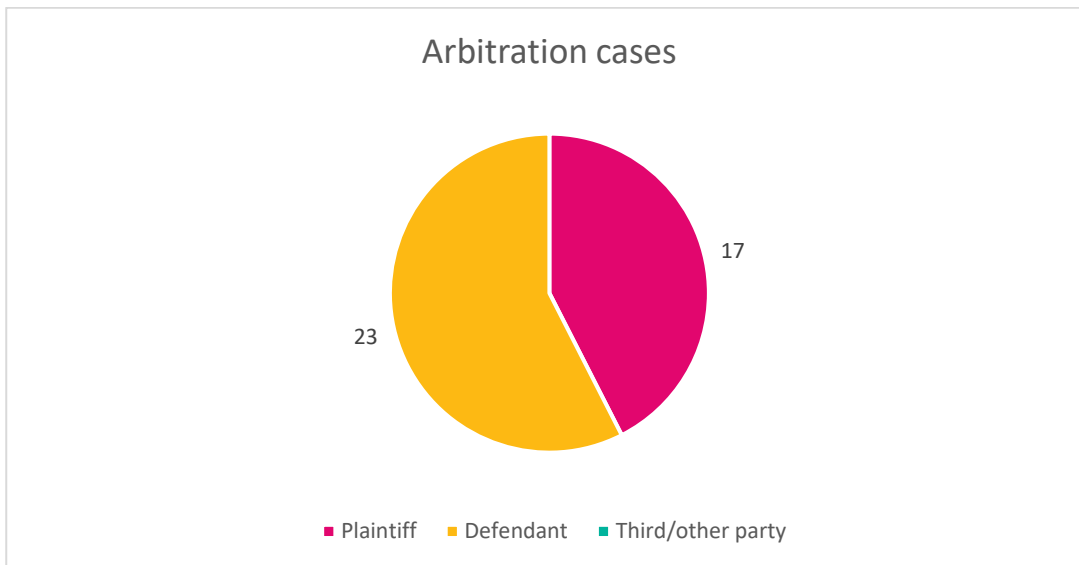


Figure 6. Arbitration cases

Moscow cargo obtained the following licenses:

- TAPA FSR Certificate (Cargo terminal)
- TAPA FSR Certificate (Transfer terminal)
- ISO 9001:2015
- Handling of nuclear materials and radioactive substances
- Postal services
- Placement, construction, operation, and decommissioning of nuclear installations
- Activities in the field of the use of ionizing radiation sources
- Veterinary certificate
- Certificate of inclusion in the register of owners of temporary storage warehouses

## 6.2 Sheremetyevo Cargo

Sheremetyevo cargo is the company that began its operation earlier than Moscow cargo. It has been operational for almost 29 years. It is located at Sheremetyevo International Airport, which is one of the busiest airports in the country. In addition, it is a strategic airport. (Sheremetyevo-Cargo, 2022).

The valuable goods warehouse is a separate chamber with secure storage and a multi-level access mechanism. Separate chambers for animal overexposure in which the temperature and humidity are regularly managed. Regardless of the main freight flow, dangerous products are handled in a separate warehouse.

Receiving and shipping cargo is available for legal entities (e.g., general cargo, perishable, dangerous, live animals, valuable, heavy, and diplomatic) and individuals (pets, personal items, and human remains) (Sheremetyevo-Cargo, 2022).

The publicly available characteristics are summarized and presented in table 4.

Table 4. Characteristics Sheremetyevo Cargo

<b>Main terminal area</b>	28 000 m <sup>2</sup>
<b>The volume of perishable cargo storage areas</b>	2500 m <sup>3</sup>
<b>Thermosensitive cargo storage areas</b>	34
<b>The time when the cargo is ready for delivery for cargo flights</b>	450
<b>Average preparation time for delivery of cargo and documents from ATA</b>	4 minutes



Figure 7. Sheremetyevo Cargo warehouse

### 6.2.1 Background information

To summarize the available information, publicly available records from the unified state register of legal entities (USRLE, rus. - ЕГРЮЛ) were analyzed. The gathered information is shown in table 5.

Table 5. Sheremetyevo cargo information

<b>Registration date</b>	5 <sup>th</sup> of August 1993
<b>Organizational and legal form</b>	Non-public joint-stock company
<b>The average number of employees</b>	977 employees
<b>Not included in the register of unscrupulous suppliers</b>	According to the FAS (Federal Antimonopoly Service), it is not included in the register of unscrupulous suppliers
<b>Participant in the public procurement system — supplier</b>	The company delivered goods or rendered services in the amount of more than 15.3 million rubles.

Bankruptcy reports	No
<b>Types of OKVED-2 (The All-Russian Classifier of Types of Economic Activity) activities</b>	<ul style="list-style-type: none"> <li>- Cargo handling</li> <li>- Carriage by scheduled air passenger transport</li> <li>- Cargo air transport activities</li> <li>- Activities of road freight transport and transportation services</li> <li>- Warehousing and storage activities</li> <li>- Other auxiliary activities related to transportation</li> <li>- Auxiliary activities related to air and space transport</li> <li>- Carriage by scheduled air cargo transport</li> </ul>

Financial information about the organization was obtained through the records of the Federal Tax Service and Rosstat (Federal State Statistics Service, 2022). According to the information, revenue increased to 3.6 billion rubles, while net profit increased to RUB 410.6 million. The graph (Figure 8) represents the financial situation of the company in the period from 2015 to 2021.

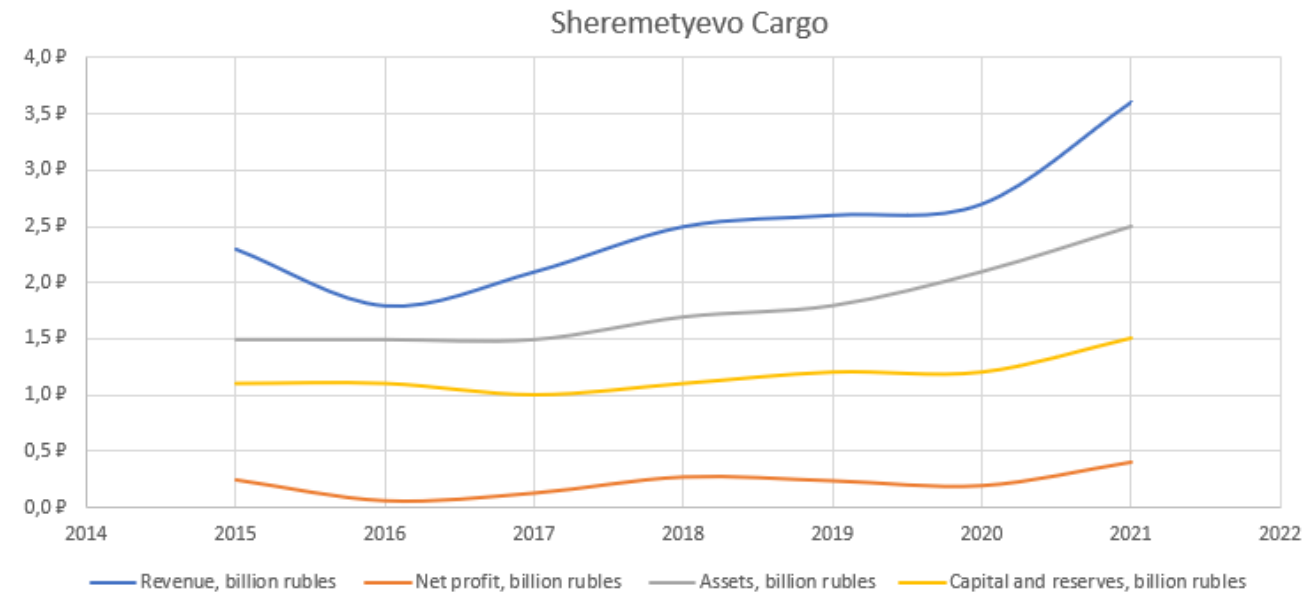


Figure 8. Financial situation, Sheremetyevo cargo

According to the FGIS "Unified Register of Inspections" of the Prosecutor General's Office of the Russian Federation, 15 inspections have been initiated against Sheremetyevo cargo since 2015. More than half of the inspections (53%) resulted in the violations found (Figure 9). Examples of violations are the following:

- The implementation of industrial safety requirements during the operation of buildings and structures at a hazardous production facility
- The training alert for the operational part of the action plan in the event of an emergency has not been carried out

One of the latest violations reported is a safety one. It reads: the reports on the results of the inspection on the implementation of production control do not contain the specified reasons for inefficient activities (Sheremetyevo Cargo. Inspections, 2022).

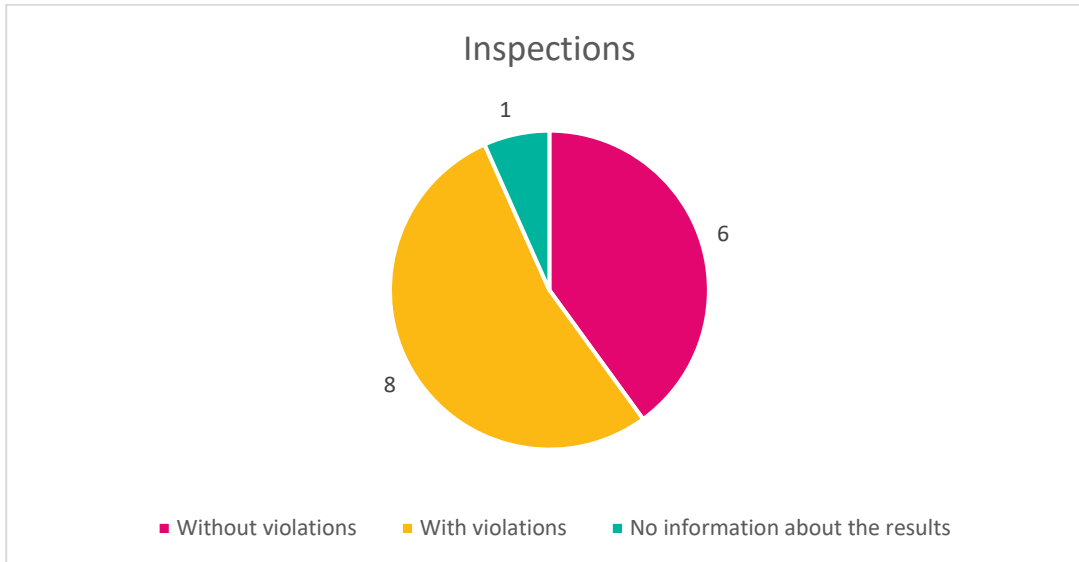


Figure 9. Inspections at Sheremetyevo Cargo

In addition to the information above, arbitration cases are publicly available. 51 court cases involving Sheremetyevo-cargo were considered in the arbitration courts of the Russian Federation (Figure 10). The latest case concerned economic disputes on administrative legal relations (Arbitration cases. Sheremetyevo Cargo, 2022)

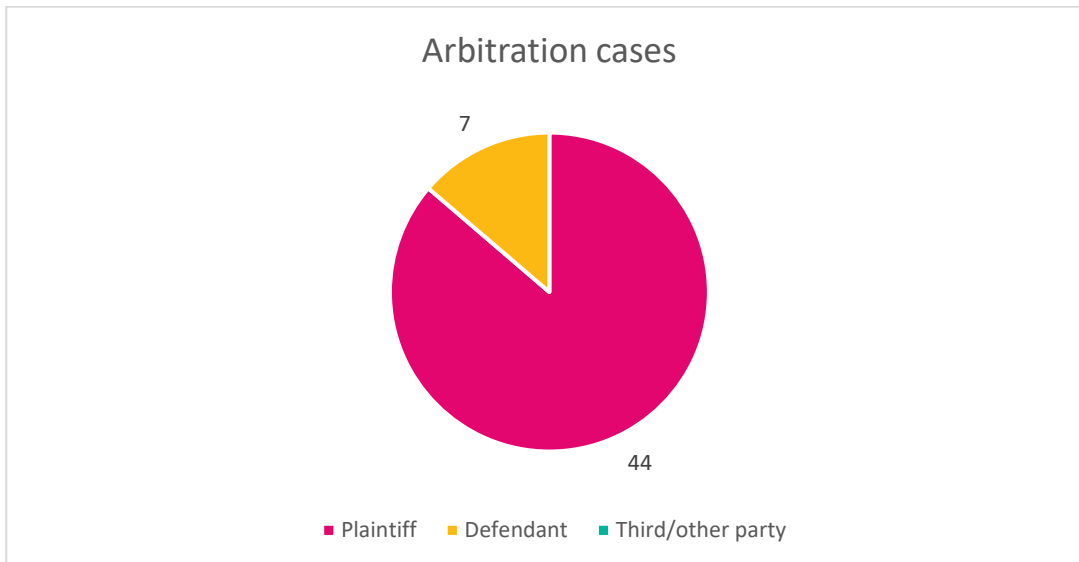


Figure 10. Arbitration cases

Sheremetyevo Cargo obtained the following certificates:

- Bus transportation of passengers and other persons
- Medical activity
- Postal services
- Handling of nuclear materials and radioactive substances
- Educational activities
- Activities in the field of the use of ionizing radiation sources
- IATA Certificate
- ISO 9001:2015
- ISAGO Certificate
- Certificate of the customs carrier
- Certificate for the implementation of airport activities
- Certificate of inclusion in the register of owners of temporary storage warehouses

To make the information presented above more visible and easier to compare between both warehouses, the following graph was made (Figure 11).

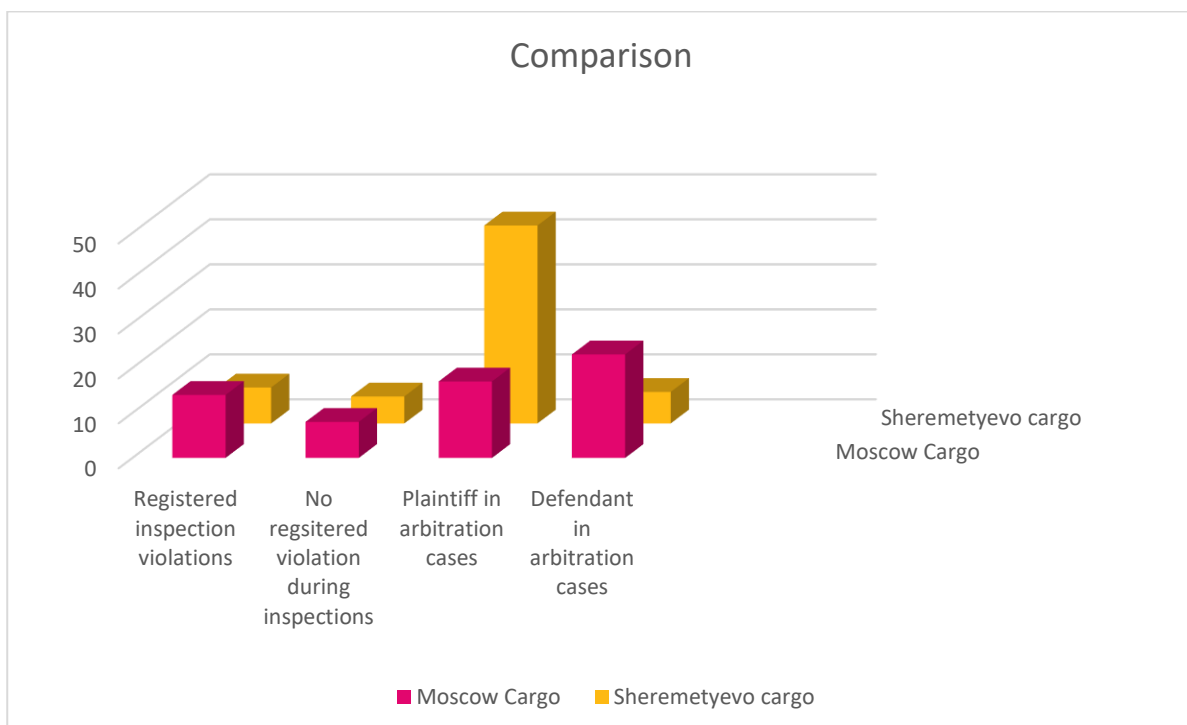


Figure 11. Moscow Cargo and Sheremetyevo cargo.

### 6.3 The Interview

The interview with the representative of DSV Air and Sea Russia was carried out in order to gain a more in-depth understanding of the current situation at the warehouses. The interview was done anonymously in order to protect the worker from any potential negative results.

Initially, there were supposed to be several interviews with different workers that have been working for the company for varying periods of time. However, the situation has changed as it was affected by political issues. In the end, only one interview was done, while other workers provided answers to the questions in the open-end questionnaire (see chapter 6.4).

The employee interviewed has been working for the company for more than 15 years and in that time had the role of freight forwarder and broker. Thus, they had to interact with the warehouses daily. The information obtained from the interview would be able to show the real situation. The interview was semi-structured with some of the questions prepared in advance and some spontaneous questions. The full interview transcript can be seen in Appendix 4.

From the interview, we can gather that the situation at hand at the Sheremetyevo Cargo is mostly positive and matches the results of the questionnaires that would be discussed below. The process of working with that warehouse is said to be easy and logical. " And even a person who does not know how to do it will be able to do so." (What was later qualified in the interview, they meant that someone who has never worked as a freight forwarder would be able to follow the processes with the information that is provided by the warehouse as well as receive help from workers if needed). The warehouse is said to work fast and efficient, with about 15 minutes to process the goods – "It takes 15 minutes from the moment of my arrival at the terminal to receipt of the cargo (including receipt of documents, payment for terminal services, removal of cargo from the warehouse)".

The online services are working properly as declared on the website of Sheremetyevo cargo. Highly skilled personnel were also mentioned in the interview when asked about the main advantages of Sheremetyevo Cargo.

One of the main problems of Sheremetyevo Cargo, the location was mentioned. For someone new working there, it would be difficult to get to as well as on the busy days. In addition, the parking lot was said to be far from the warehouse. Some truck drivers may not find space to park the car while awaiting the cargo to be prepared.

When asked about Moscow cargo, the replies were mixed. The employee said that the situation there changed with the renovation done. The warehouse was not prepared to withhold the amount of work upon the opening, thus some big companies working there sustained big losses. "When the move to Moscow cargo was done, Aeroflot sustained significant losses." The interviewee also mentioned that online services were not properly working.

The main issue points that were identified from the interview were untrained personnel not ready to operate a semi-automatic warehouse, lack of workers in the warehouse, thus queues for 1.5 hours to receive the cargo. The handling and warehousing conditions were also mentioned to be not ideal. "The cargo was laying around, with no systemization whatsoever... perishable goods and much more could be not placed inside, but instead just laying outside. There were situations when we had to look for our own cargo on the runway."

In addition, one of the big problems was that the cargo gates/port mentioned on the website of the warehouse and working are different. ". If Sheremetyevo cargo has 15 of them, then Moscow cargo has 6-7. They [Moscow cargo] have a problem with cargo gates and platforms as those are not designed for small or exceptionally large trucks." However, the warehouse has a lot of government projects that go through it, unlike Sheremetyevo cargo.

#### **6.4 The questionnaires**

To gather more information and make an informed decision, the questionnaires were carried out. Separate groups of people were questioned to receive more points of view. People were asked to answer simple yes or no questions, rate their experience on distinctive characteristics as well as provide their additional comments as to why they gave such a score.

For the "Yes and No" questionnaire, a total of 150 people were contacted. However, only 125 ended up partaking in the questionnaire. In addition to that, due to a mishap with the interviews,

an additional three responses were added. They were also given the opportunity to answer a closed questionnaire. Then, for an open questionnaire, without set answers, a total of 20 people were contacted initially. 15 of them ended up making their responses.

Then, the questionnaire was held amongst the workers of both Sheremetyevo Cargo and Moscow Cargo, and amongst freight forwarders and individuals who happened to use the services of all the parties involved in the case study. The questionnaire is anonymous for people to give their honest opinions and comments not influenced by their concerns.

For the yes or no questionnaire carried out, the main points of interest were established. Participants were asked if they liked the service, personnel, location, and queues at both locations. Then they could rate the overall rating of their experience and provide any additional comments.

The results for Moscow Cargo were the following:

55% of people had positive experiences with the service, 50% with personnel and location. However, with the queues, only 28% percent had no issues (Figure 12).

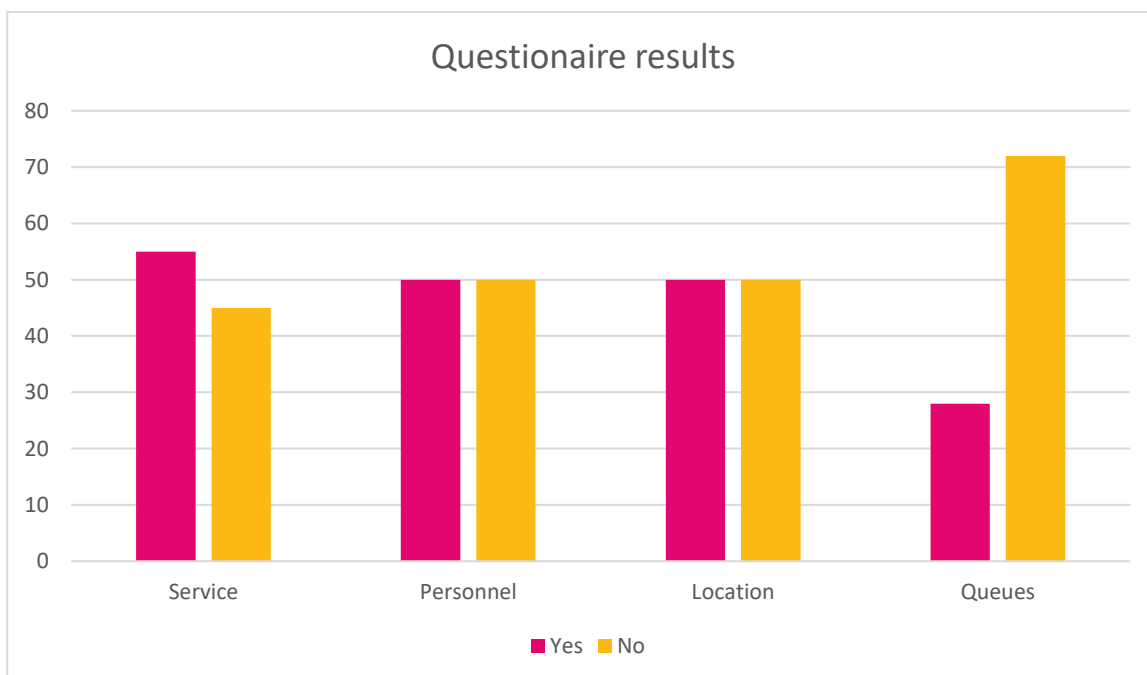


Figure 12. Questionnaire results for Moscow Cargo

The overall rating that was given by the people, however, was 3.8 out of 5. Amongst the main reasons for the rating improvement with the renovation were mentioned. The main concern mentioned by most of the respondents was the queue time and the disorganized state of the warehouse – no systemization in placement, and a lack of work to process the incoming goods. The waiting times in some of the comments were said to be no less than 1.5 hours. Some of the respondents pointed out that entry to the warehouse premises is not organized properly and sometimes it is hard for the trucks to get in.

Amongst positive comments, people wrote about good parking spaces and waiting zones. In addition, the entry permits system was mentioned as “good-working and easy to understand.”

The results for Sheremetyevo Cargo were the following:

85% of respondents were satisfied with the service and personnel, 43% with location, and 65% with queues (Figure 13).

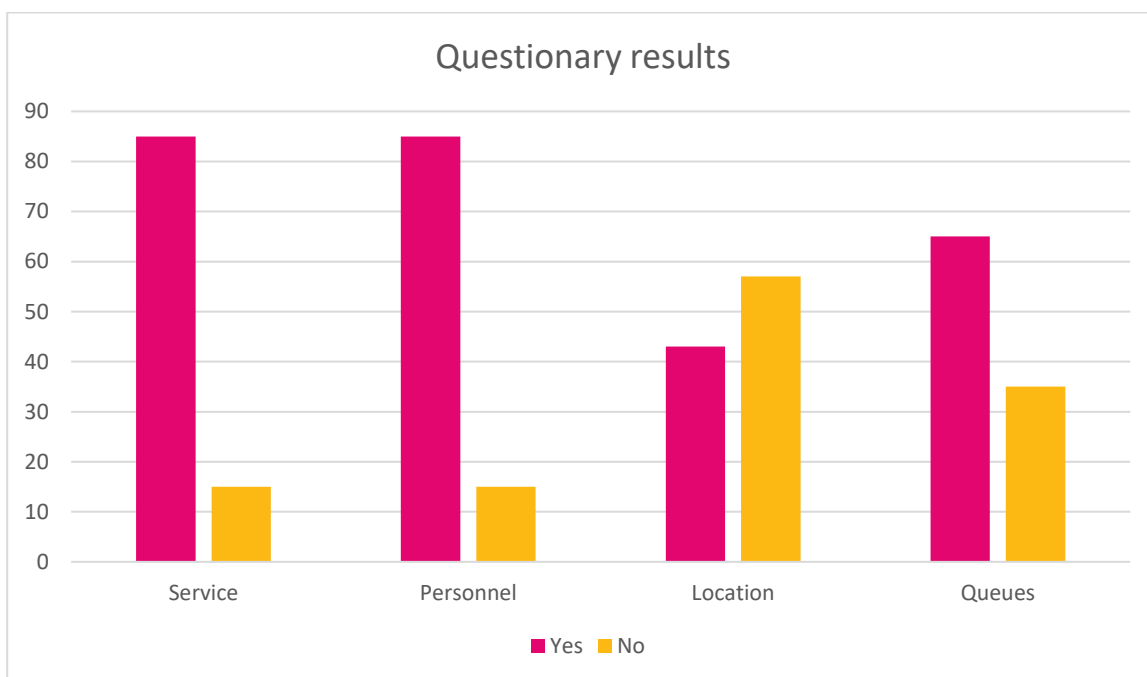


Figure 13. Questionary results for Sheremetyevo Cargo

The overall rating given to Sheremetyevo cargo was 4.6 out of 5. The respondents pointed out the qualifications of the personnel to be remarkably high, fast loading and unloading as well as efficient work of the warehouse.

One of the key issues pointed out by the people was the location. It was described as hard to get to, and the parking lots were said to be quite far from the main building. The infrastructure was said to be old and in some places, modernization needs to be done.

Then the workers of the warehouses were asked to participate in the questionnaire where they were asked their opinion about their job and the advantages and disadvantages they found. The comments provided by them were then generalized, and similar points were underlined. This part was also carried out anonymously in order not to compromise the working position of the responders.

When answering about Sheremetyevo Cargo, responders had several common points in most of the answers. Overall, the responses were positive. However, some disadvantages were also present.

#### Advantages:

- Good social package and caring about health problems
- Corporate transport
- Training center
- Briefing before starting work
- Modern technologies are constant improvement
- The work of employees is monitored
- Competitive and decent wages
- Many young and talented employees

#### Disadvantages:

- Long time to get to work
- A lot of personal questions are asked during the interview

The responses for Moscow Cargo were mixed. Some of the workers were satisfied with their working conditions, while others pointed out the more disadvantages.

Advantages:

- There is corporate transport to some destinations
- The possibility of part-time work
- Recreation area

Disadvantages:

- Small salary
- Labor safety is extremely low
- Fines

For both warehouses, the DSV employees pointed out unclear communication. The examples were that there would be untraceable goods, goods that were not registered, lost documentation, and communication channels delay (the waiting time for response was exceedingly high). This situation happened less frequently with Sheremetyevo cargo.

Sheremetyevo cargo has its own warehousing system, while Moscow cargo utilizes one of the common ones. There is a probability pointed out by some of the responders that their own system may not be compatible with some others, thus creating some miscommunications.

## **6.5 Comparison**

The comparison part of the case study utilizes the information obtained in the previous parts as well as additional information from the Annual report of Sheremetyevo airport. The main goal is to assess performance and gain an understanding of potential areas of issues.

Cargo traffic at Sheremetyevo International Airport in 2020 was serviced by two operators: Moscow Cargo LLC and Sheremetyevo-Cargo JSC. (Sheremetyevo International Airport, 2020). In the following years, no new operators were added. As of May, the annual report for 2021 was not

officially released, thus the information about cargo turnover varies from the current one, as it was influenced by the pandemic.

ROA and ROA were calculated based on the financial report of the companies.

Table 6. Comparison

	<b>Moscow Cargo</b>	<b>Sheremetyevo Cargo</b>
<b>Total Area</b>	42,300 m <sup>2</sup>	28 000 m <sup>2</sup>
<b>Throughput capacity</b>	about 380,000 tons of cargo and mail	about 200,000 tons of cargo and mail
<b>Share of cargo turnover in Sheremetyevo International Airport</b>	~70%	~30%
<b>Main partners</b>	<ul style="list-style-type: none"> <li>- "Aeroflot",</li> <li>- "Russia",</li> <li>- AirBridgeCargo,</li> <li>- "Volga-Dnepr ",</li> <li>- "Atran",</li> <li>- CargoLogicAir,</li> <li>- China Eastern Air Holding,</li> <li>- Emirates,</li> <li>- "Aviastar-TU",</li> </ul>	<ul style="list-style-type: none"> <li>- Moalem Aviation</li> <li>- Bamboo Airways</li> <li>- Etihad Airways</li> <li>- Xiamen Airlines</li> <li>- Azur Air</li> <li>- Korean Air</li> <li>- AirBridgeCargo</li> <li>- Air China</li> <li>- China Southern</li> <li>- Air France</li> </ul>

	- Nordwind, - Pegas Fly.	- DHL - Hainan
<b>ROA</b>	14.99%	16.72%
<b>ROE</b>	24.32%	26.82%

The fundamental issues that were found by comparison and analysis of the available information are the following for Moscow Cargo:

- Disorganized loading and unloading parts of the warehouse.
- Proper working equipment needed
- Untrained personnel
- Storage facilities not working properly
- Miscommunication between the companies
- Safety violations
- Infrastructure for various cargo transportation methods
- High waiting times

The fundamental issues that were found by comparison and analysis of the available information are the following for Sheremetyevo Cargo:

- Old infrastructure and safety
- Location
- Miscommunication between the companies

## 7 Solutions

The information described in previous chapters shows that both warehouses are well-established companies that have been working for a long time. The main point of interest is that those are the main and only operators that are handling all the cargo coming through the Sheremetyevo International Airport. That means that the performance of that warehouse would affect the performance of the whole airport and, in addition, its reputation.

The airport is responsible for ensuring proper safety, quality, and timeliness of service. Thus, the same extends to the warehouses operating at the airport terminals.

Moscow Cargo and Sheremetyevo Cargo are different in size, however, all the data and obtained information show that while Sheremetyevo Cargo is smaller, it is more efficient in its operations.

The cargo terminal technology has already been developed; however, this does not preclude the implementation of some cargo terminal development projects. The following initiatives might provide the foundation for the terminal's development:

- New storage facilities to be built
- Increase the number of locations used for freight handling.
- Increase the number of cargo receipt channels equipped with dynamic cargo weight and dimension measurement equipment.
- Increased use of packaged freight handling.
- Modification of the shelf storage system to improve storage facility use.
- Development of business information systems to maximize resource use.
- Further development of interactive services for airlines, cargo agencies, shippers/consignees, and others that enable the execution of transportation paperwork remotely.
- Establishing a clearer line of communication between DSV and the terminals.

The suggestions above are general and suggestions that can be implemented by both warehouses as they would help increase the quality of the work as well as reach their maximum potential. However, there are also specific solutions for each of the warehouses individually.

For Moscow cargo, one of the main points of interest that need to be addressed is untrained personnel. While Sheremetyevo cargo has a learning facility and license that allows them to work on the qualification of their employees, Moscow cargo does not. It is highly suggested to work in that area. In addition, another big problem mentioned was the disorganized state of the warehouse. While the available main area of the terminal is significantly larger than the one Sheremetyevo Cargo possesses, it is not used to its full potential.

Based on that information, the following are the specific suggestions:

- Modifying the technical and managerial processes connected to decreasing costs and increasing the quality of the warehouse complex
- Right adjustment of the warehouse's organizational and management structure
- Listening to the reviews and concerns of clients and customers
- Creation of a staff incentive system
- Introduction of innovative technologies
- Staff training, personnel training, and advanced training

For Sheremetyevo cargo, the crucial issues were concerning the infrastructure and location. While the location of the terminal cannot be changed and the possibility of adding new facilities in other locations would only introduce more logistical problems, there is a possibility to make it easier to findable by introducing more signs along the way as well as having detailed information on this matter on the website of the warehouse.

The company might need to start the work on the renovation plan of some of the facilities and introduce modern technologies in order to gain an advantage.

For DSV Air and Sea, the suggestion would be to improve communication between the company and the warehouses. As the two of them are one of the main working points, the suggestion is to have joint meetings, internal and external training events, and psychological training.

## **8 Conclusion**

Experience has shown that timely investment in project implementation to increase operational efficiency is far less expensive than repairing the repercussions of significant failures. It helps to prevent difficulties, assisting the employees to become more skilled. It is important to start working on the problem before it becomes so overpowering that it cannot be changed with the reorganizing of the whole organization.

Proper warehouse organization has a considerable influence on the company's competitiveness, the development of cost optimization, and the overall efficiency of the operation. In the case of the warehouse at the airport terminal, it also affects the overall competitiveness and reputation of the airport. The companies working at the airport would also be affected in cases where something negative happens.

It is critical to properly arrange warehouse workers' jobs - logical workplace organization, supply of appropriate equipment, communication means, and inventory, comfortable layout, sufficient lighting, and development of safe working conditions for human health. These variables have a major influence on the level of weariness, the time spent conducting warehouse activities, and the efficiency of warehouse personnel themselves.

### **8.1 Reliability of the research**

The mixed-method research included interviews, questionnaires, and document analysis. The core data for the study was gathered through an interview with a representative of DSV Air and Sea Russia. The interviewee is a trustworthy source, as they have been working for the company since 2008. However, the responses provided by them were limited by confidential information that could not be shared. The surveys were distributed to all of the parties involved' workers and clientele. It was passed on to them by a reliable source. Again, the constraints are the sensitive

information. Furthermore, it should be noted that replies may be impacted by personal feelings toward the organizations.

Secondary data sources included articles, blog posts, books, annual reports, and corporate websites. The reliability check was performed to guarantee that the sources used are reputable. It can be seen in appendix 3. When deciding which sources to utilize, the date of publication was also taken into account. There are a lot of publications that are deemed ancient, yet they are still relevant to the issue. Thus, it can be concluded the information gathered can be trusted.

## References

7 Data Collection Methods & Tools for Research. (2019). Formplus

<https://www.formpl.us/blog/data-collection-method>

About DSV. (2015). DSV. <https://www.dsv.com/en/about-dsv>

Ackerman, K. B. (1997). Practical handbook of warehousing (4th ed.). Chapman & Hall. ISBN 0412125110

Ainsworth, Q. (2020). Data Collection Methods. JotForm. <https://www.jotform.com/data-collection-methods/>

Arbitration cases. Sheremetyevo Cargo. (2022). The file of arbitration cases.

<https://kad.arbitr.ru/Card/48c327d9-d311-4b48-9c5e-d3b80099a692>

Arbitration cases. Moscow Cargo. (2022). The file of arbitration cases.

<https://kad.arbitr.ru/Card/531e49c3-3f3b-44e4-85c3-951d568cb855>

Brannen, J. P. (1995). Mixing Methods: Qualitative and Quantitative Research (1st ed.) Routledge Publisher. ISBN 9781859721162

Filimonov N.A. (2016) Analysis and improvement of warehouse activities. Volga State University of Water Transport

Joint-stock company "Sheremetyevo-cargo". (2022). Extract from the Unified State Register of Legal Entities. <https://egrul.nalog.ru/index.html>

Infrastructure-Moscow Cargo. (2022). Sheremetyevo Moscow Cargo. <https://www.moscow-cargo.com/infrastruktura>

Kothari, C. R. (2004). Research Methodology-Methods and Techniques. (2nd ed.) New Age International Publishers. [https://repository.dinus.ac.id/docs/ajar/Kothari -  
\\_Research Methodology Methods and Techniques - 2004.pdf](https://repository.dinus.ac.id/docs/ajar/Kothari_-_Research_Methodology_Methods_and_Techniques_-_2004.pdf)

Kumar, C. R. (2008). Research Methodology. Published by APH Publishing Corporation. ISBN: 8131304191.

Moscow Cargo. Inspections (2022). FGIS "Unified Register of Inspections" <https://proverki.gov.ru>

The airport as an element of a transport system. (2017). Vuzlit. [https://vuzlit.com/973574/aero-  
port element transportnoy sistemy](https://vuzlit.com/973574/aero-port_element_transportnoy_sistemy)

Theory of transport systems. (2003). Department of Management and Economics in Air Transport. [http://www.uvauga.ru/docs/Material\\_sam\\_raboti/magistratura/3\\_sem/3s Teor transp sistem.d](http://www.uvauga.ru/docs/Material_sam_raboti/magistratura/3_sem/3s_Teor_transp_sistem.d)  
[OCX](#)

The role of the airport as a system element. (2017). Studwood. [https://stud-  
wood.net/1647344/tehnika/rol\\_aeroporta\\_sistemnogo\\_elementa](https://stud-wood.net/1647344/tehnika/rol_aeroporta_sistemnogo_elementa)

Thomas L. (2000). Warehouse Layout and Design. [http://www.freeseinc.com/images/Warehouse Layout and Design.pdf](http://www.freeseinc.com/images/Warehouse_Layout_and_Design.pdf)

Services - Moscow cargo. (2022). Moscow-Cargo.com <https://www.moscow-cargo.com/services>

Sheremetyevo-Cargo. (2022). Shercargo.ru. <https://www.shercargo.ru/en/>

Sheremetyevo Cargo. Inspections (2022). FGIS "Unified Register of Inspections" <https://proverki.gov.ru>

Sheremetyevo International Airport (2020) Annual report. [https://www.svo.aero/bitrix/up-  
load/sprint.editor/984/984ffe73d96d040481cb20c537844569.pdf](https://www.svo.aero/bitrix/upload/sprint.editor/984/984ffe73d96d040481cb20c537844569.pdf)

Smirnov E.A. (2003). Fundamentals of the theory of organization.

<https://obuchalka.org/2011062556817/osnovi-teorii-organizacii-smirnov-e-a.html>

Stepanov V.I. (2007) Logistics in commodity science. [https://www.studmed.ru/stepanov-vi-logistika-v-tovarovedenii\\_249d062.html](https://www.studmed.ru/stepanov-vi-logistika-v-tovarovedenii_249d062.html)

Sunol, H. (2021). 6 Primary Warehouse Processes & How to Optimize Them. Cyzerg.com.  
<https://articles.cyzerg.com/warehouse-processes-how-to-optimize-them>

Williams, C. (2007). Research Methods. Journal of Business & Economic Research.  
<https://clutejournals.com/index.php/JBER/article/view/2532/2578>

Yauk I.A. (2016) Improving the organization of warehouse management at the enterprise.  
<http://earchive.tpu.ru/bitstream/11683/26555/1/TPU178849.pdf>

## Appendices

### Appendix 1. Warehouse classification.

The classification of the warehouses in accordance with Stepanov, 2007.

Classification sign	Types of warehouses
<b>in relation to the functional areas of logistics</b>	<ul style="list-style-type: none"> <li>- Supply warehouse</li> <li>- Production warehouse</li> <li>- Distribution warehouse</li> </ul>
<b>in relation to the participants of the logistics system</b>	<ul style="list-style-type: none"> <li>- Manufacturer's warehouse</li> <li>- Warehouse of a trading company</li> <li>- Warehouse of the transport company</li> <li>- Warehouse of the forwarding company</li> <li>- Logistics operator's warehouse</li> </ul>
<b>by the form of ownership</b>	<ul style="list-style-type: none"> <li>- Own warehouse</li> <li>- Rented warehouse</li> </ul>
<b>by ownership of the material flow</b>	<ul style="list-style-type: none"> <li>- Closed warehouse for the products of one company</li> <li>- An open warehouse for many businesses</li> </ul>
<b>by functional purpose</b>	<ul style="list-style-type: none"> <li>- Warehouse for long-term storage</li> <li>- Transshipment warehouse</li> <li>- Distribution warehouse</li> <li>- Special warehouse</li> </ul>
<b>by assortment specialization</b>	<ul style="list-style-type: none"> <li>- Specialized warehouse</li> <li>- Universal warehouse</li> <li>- Mixed warehouse</li> </ul>
<b>by storage mode</b>	<ul style="list-style-type: none"> <li>- Unheated warehouse</li> <li>- Heated warehouse</li> <li>- Refrigerated warehouse</li> <li>- Warehouse with a fixed temperature regime</li> </ul>

<b>by technical equipment</b>	<ul style="list-style-type: none"> <li>- Non-mechanized warehouse</li> <li>- Mechanized warehouse</li> <li>- Automated warehouse</li> <li>- Automatic warehouse</li> </ul>
<b>by type of warehouse buildings and structures</b>	<ul style="list-style-type: none"> <li>- Open warehouse</li> <li>- A warehouse under a canopy</li> <li>- Closed warehouse</li> </ul>
<b>by type of warehousing</b>	<ul style="list-style-type: none"> <li>- Outdoor storage</li> <li>- Shelving warehouse</li> <li>- Mixed warehouse</li> </ul>
<b>by the presence of external transport links</b>	<ul style="list-style-type: none"> <li>- Warehouse with berth</li> <li>- Warehouse with railway tracks</li> <li>- Warehouse with road entrances</li> <li>- Complex warehouse</li> </ul>
<b>by the scale of activity</b>	<ul style="list-style-type: none"> <li>- Central Warehouse</li> <li>- Regional warehouse</li> <li>- Local warehouse</li> </ul>

Table 7. Warehouse classification adapted from Stepanov, 2007

## Appendix 2. Open questionnaire

The table shows the translation of the open questionnaire that was given to the workers of the warehouses. The answers here are already analyzed.

<b>Sheremetyevo Cargo/Moscow Cargo</b>	<b>How would you describe working conditions at the warehouse? Highlight the main points</b>	<b>What are the advantages of the warehouse in your opinion?</b>	<b>What are the disadvantages?</b>
<b>Moscow cargo</b>	Good conditions. Okay, conditions but employee turnover is very high. Bad conditions.	Corporate transport. Part-time work. Possibility to meet new people. Advantages:	Salary is small compared. The salary is small for the location of the facility. Labor safety. A lot of workloads. Fines for mistakes
<b>Sheremetyevo Cargo</b>	Good working conditions with all social packages provided. Good attitude towards workers. Fair treatment. Good. / The workload can be too high. Long time to get to, otherwise good. A lot of work. Our work is constantly monitored.	Corporate transport. Training. Relationship with the management team. Relationships with other workers. Talented employees. Good wages. Possibilities for improvement. Technologies we use.	The workload can be too high. Workload. Hard interview to get through to work here. Location is not an idea if you do not live nearby.

### Appendix 3. Reliability analysis of the sources

Table 8. Publication types

<b>Publication type</b>	<b>Total</b>
<b>Blog post</b>	5
<b>Public records</b>	5
<b>Book</b>	8
<b>Interview</b>	1
<b>Article</b>	3
<b>Annual report</b>	1
<b>Information from company website</b>	4
<b>Total</b>	27

Table 9. Years of publications

<b>Year of publication</b>	<b>Total</b>
<b>1995</b>	1
<b>1997</b>	1
<b>2000</b>	1
<b>2003</b>	2
<b>2004</b>	1
<b>2007</b>	2
<b>2008</b>	2
<b>2015</b>	1
<b>2016</b>	2
<b>2017</b>	2
<b>2019</b>	1
<b>2020</b>	2

<b>2021</b>	<b>1</b>
<b>2022</b>	<b>8</b>

Source	Author/Origin	Perspective	Context	Audience
7 Data Collection Methods & Tools for Research	Exact author is unknown. However, it is a blog post of the company that provides solutions for data collection	Forum post provides solutions for e-signatures, forms, online surveys and data collection.	The blog post is a supporting material for their data collection solutions.	The blog post is meant for the potential and already existing clients. It is made to provide them with additional information.
About DSV	Exact author is unknown. It is a post on the company website	It is done by the representatives of the company providing logistics services	The post is done to share the information about the company	It is meant for potential clients
Practical handbook of warehousing (4th ed.).	The author is known and credible source - Ackerman, K. B	From a perspective of an author	Handbook	It is made for those studying the warehousing
Data Collection Methods	The author is known - Ainsworth, Q. Not a lot of information can be found.	Blog post on the forum for educators that also provides solutions for data collection.	Supporting material for data collection solutions	For potential and existing clients of the service.
Arbitration cases. Sheremetyevo Cargo	The official file of arbitration cases in Russia. Credible source	File of arbitration cases service	Webarchive	Any entity interested in arbitration cases
Arbitration cases. Moscow Cargo.	The official file of arbitration cases in Russia. Credible source	File of arbitration cases service	Webarchive	Any entity interested in arbitration cases
Mixing Methods: Qualitative and Quantitative Research (1st ed.)	The author is known and credible source - Brannen, J. P. Edited by Julia Brannen	From the perspective of two specialists in the area.	Book publication in social sciences.	For sociologists involved in research methods
Analysis and improvement of warehouse activities	The author is known - Filimonov N.A. Not a lot of information can be found.	Made as a work for Volga State University	Overlook warehousing activities in connection with water transport	Students and teachers of the university.
Joint stock company "Sheremetyevo-cargo".	Extract from the Unified State Register of Legal Entities. Credible source	Service providing extracts from registers	Webarchive	Entities interested in extracts from registers

Figure 14. Reliability analysis, p.1

Joint stock company "Sheremetyevo-cargo".	Extract from the Unified State Register of Legal Entities. Credible source	Service providing extracts from registers	Webarchive	Entities interested in extracts from registers
Infrastructure-Moscow Cargo.	Exact author is unknown. It is a post on the company website	It is done by the representatives of the company providing logistics services	The post is done to share the information about the company	It is meant for potential clients
Research Methodology-Methods and Techniques. (2nd ed.)	The author is known and credible source - Kothari, C. R.	From a perspective of an author	Textbook	It is meant for people conducting Academic Research
Research Methodology	The author is known and credible source - Kumar, C. R	From a perspective of an author	Textbook	It is meant for people conducting Academic Research
Moscow Cargo. Inspections	Extracts from FGIS "Unified Register of Inspections. Credible source.	It is provided by the service of FGIS	Online service providing extracts	For any entities interested
The airport as an element of a transport system.	The exact author is unknown	Blogpost on the webarchive for students	Blog post on the website are ment to help student studying various subjects	Students of the universities
Theory of transport systems.	The exact author is unknown. However, it is posted by Department of Management and Economics in Air Transport on the official website of the university.	The information is made as a supporting material for students	Introduced to help students prepare for certification	Materials for intermediate certification for undergraduates by correspondence
The role of the airport as a system element.	The exact author is unknown	Blogpost on the webarchive for students	Blog post on the website are ment to help student studying various subjects	Students of the universities
Warehouse Layout and Design	The author is known - Thomas L	From a perspective of management consulting firm	Supporting materials for the solutions of the firm	For potential clients
Services - Moscow cargo	Exact author is unknown. It is a post on the company website	It is done by the representatives of the company providing logistics services	The post is done to share the information about the company	It is meant for potential clients
Sheremetyevo-Cargo	Exact author is unknown. It is a post on the company website	It is done by the representatives of the company providing logistics services	The post is done to share the information about the company	It is meant for potential clients
Sheremetyevo Cargo. Inspections	Extracts from FGIS "Unified Register of Inspections. Credible source.	It is provided by the service of FGIS	Online service providing extracts	For any entities interested
Sheremetyevo International Airport	The exact author is unknown. Made by the representatives of the company and posted on the official website	From the perspective of the Airport	Annual report for 2020	Public press release for investors

Figure 15. Reliability analysis, p.2

Fundamentals of the theory of organization.	The author is known and credible - Smirnov E.A	The textbook was used as a main book on management course in the university.	Textbook on management	For university students
Logistics in commodity science	The author is known and credible - Stepanov V.I.	The textbook was used as a main book on management course in the university.	Academic textbook	The textbook is intended for university students.
6 Primary Warehouse Processes & How to Optimize Them. Cyzerg.com.	The author is known - Sunol, H. The article on the company website.	The company provides warehouse technology solutions and services	Supporting material for their solutions	The blog post is meant for the potential and already existing clients. It is made to provide them with additional information.
Research Methods. Journal of Business & Economic Research	The author is known and credible - Williams, C.	From a perspective of a specialist with several publications.	Journal publication.	For the readers of Journal of Business & Economic Research
Improving the organization of warehouse management at the enterprise	The author is known - Filimonov Yauk I.A. Not a lot of information can be found.	Made as a work for Tomsk national research university.	Project work	Students and teachers of the university.

Figure 16. Reliability analysis, p.3

## Appendix 4. Interview transcript

Semi-Verbatim Transcript

Translation of the audio recording

Audio Length: 0:30:57

Date: 27/ 04/ 2022

Interviewer: Hello, thank you for coming today and agreeing to do the interview.

Interviewee: It's no problem at all.

Interviewer: Shall we start? I have a few questions for you that I'd want to discuss.

Interviewee: Yes.

Interviewer: Great. You've worked for DSV for a long time, so you are quite familiar with both terminals. How would you describe them in general? Maybe some advantages and disadvantages.

Interviewee: It's hard to describe them shortly. They are very different so you should not expect the same results from those warehouses. There are pros and cons everywhere. You can never say that one is absolutely bad, and the other is absolutely good. Of course, there are more advantages to Sheremetyevo cargo in my opinion. Everything is clearer and more logical there. There are logical actions and rules for each step for the shipper and the consignee. And this makes the task much easier. And even a person who does not know how to do it will be able to do so. Everything is located there logically, there are pointers everywhere...

[inaudible]

Interviewee: From the point of view of the logic of both import and export it's easier. Moscow cargo can be very confusing and to such an extent...

[inaudible]

Interviewee: There is no structure, and the logistics chain is not fully built, i.e., a lot of extra steps are being taken.

Interviewer: Can you approximate how much time is needed to perform your job at both of those warehouses?

Interviewee: Well, I actually timed it on several occasions [laughing]. It takes 15 minutes from the moment of my arrival at the terminal to receipt of the cargo (including receipt of documents, payment for terminal services, and removal of cargo from the warehouse). To be frank, it happens that the overall time can be increased but it is not that often. That's in case I am working at Sheremetyevo cargo. On Moscow Cargo, this process can take from 1.5 - 2 hours. On the days when they do not have a lot of work, it sure is faster.

Interviewer: Both Sheremetyevo cargo and Moscow cargo offer online services in order to make the job easier. Have you ever used those services? If so, how would you describe your expertise with them?

Interviewee: Of course, I've used them before. At Sheremetyevo cargo, I can order cargo from home, so when I come to the terminal I do not have to go through the whole process. I'll just have to make sure it's in proper condition and overview how it's loaded onto the truck and ensure the driver has all the necessary documents. It is done through my personal account on the terminal's website. Basically, the payment is made online; all documents are filled in there automatically. Sheremetyevo cargo charges 500 rubles<sup>1</sup> for this service. At Moscow cargo, many of the declared online services often do not work. As for my job, I have not gotten to use those services there.

Interviewer: Interesting. I would have thought that it would be more expensive.

[inaudible as another employee walked in]

Interviewer: Moving on. Moscow cargo is a newer warehouse. Did a lot of companies decide to work there when it became possible?

Interviewee: Actually, many companies have gone there. They were promised huge discounts, 15 days of free storage, etc. [laughing]. They also made an automated warehouse which was appealing to some of them. But honestly, they have not hired the staff who will work there properly. There were cases when the cargo was stored in an automated warehouse, but the crane broke down or did not work for any other reason. As you can imagine, we were not happy when we could not access our cargo. There was no way to get it from the automated warehouse until it was properly working. Also, there were cases when the cargo was laying around, with no systemization whatsoever.

Interviewer: Right, I understand how bad of a situation it would be.

Interviewee: Yeah. And of course, it brought some losses.

Interviewer: Customs inspections are very important tasks that are carried out at the airport terminal. What is the situation with them?

Interviewee: Customs inspections are carried out in different ways. Sheremetyevo Cargo has all the necessary tools that are needed to do the job. In Moscow cargo, it often happened that there was not enough of something.

Interviewer: Has there been any talks about that situation? Maybe with the administration.

Interviewee: Of course! We discussed our concerns with them. However, we were told that due to the workload they have, they usually do not have the time to replenish things.

Interviewer: Okay. What else would you say about the different approaches to the customs inspections?

Interviewee: I would like to particularly point out the customs inspections with cargo opening and subsequent repackaging. At Moscow cargo those operations are carried out by a private company, a subcontractor basically. From my experience, I can give an example. I had 480 kg of cargo, 17 pallets. We were charged 63 000 rubles<sup>2</sup> for the opening and subsequent repackaging of the cargo. Which is quite a lot. Opening one cargo space in “Moscow cargo” costs 2 000 rubles<sup>3</sup> plus, packaging. In Sheremetyevo Cargo, this is done depending on the situation. If serious repackaging and additional materials are used, then the money is taken for it. In some situations, it can even be free.

Interviewee: Also [coughs] we have Hamilton<sup>4</sup> that sends heat exchangers to America as one of our clients. They were surprised by the additional costs. Again, this is a private company that delivers that service and sometimes it's hard to predict whether they will be in place when needed. The same service in Sheremetyevo cargo works 24/7 and the price is not so noticeable in the overall picture.

Interviewer: Why do you think some choose one terminal, one warehouse over the other?

Interviewee: I can't say for each company individually. But I believe that everyone chooses what is cheaper and more affordable for them. On the other hand, some airlines do not have alternatives.

Interviewer: What do you mean by “do not have alternatives”?

Interviewee: Well, Aeroflot<sup>5</sup>. They do not have an option to not work at Moscow cargo as all their operations were moved there. And they also cannot make it so that some of their cargo is sent through one warehouse and the other half through another one. So, when move to Moscow cargo was done, Aeroflot sustained significant losses. A lot of news reported on that actually.

Interviewer: Are there any other similar examples?

Interviewee: No that I can think of at the moment. However, there is another situation that I can describe. At the same time that Aeroflot was making the transition, AirBridgeCargo<sup>6</sup> was offered to do the same. However, they did not want to fully move. So, in the end, the flights were split in

half – half of the operations were done through Sheremetyevo cargo and half through Moscow cargo.

Interviewer: Were there any situations when your customers wanted DSV to work with a certain terminal?

Interviewee: Actually, yes. There were some cases when people canceled their bookings because of that. Sometimes, if there was an option to choose between terminals, then the majority chose Sheremetyevo cargo.

Interviewer: Are there any particular problems with the infrastructure there?

Interviewee: Yes. There are some problems here and there. But the one that was important for me since I use my own car for work is the problem with parking. To be honest, parking at both terminals is not ideal. Sheremetyevo cargo allocates enough space, but it is located far away. So, you'll have to walk a lot. In Moscow, there was very little parking space, and it was especially hard for the waiting drivers. But now they have corrected the situation and there are plenty of parking spaces.

Interviewer: Is that the only problem that you can think of at the moment?

Interviewee: No, of course not. There is more than just one. Also, there is one issue that is connected not only to the infrastructure. There were often problems during the delivery of the cargo that were connected to the loading and unloading parts of the warehouse. Moscow Cargo has a small number of cargo gates. If Sheremetyevo cargo has 15 of them, then Moscow cargo has 6-7. They [Moscow cargo] have a problem with cargo gates and platforms as those are not designed for small or very large trucks. For small ones, it is too high to load or unload. And for those the top-loading, a crane manipulator will be required. For additional funds.

Interviewer: We've discussed quite a lot of different situations and issues. But how would you describe the advantages of Moscow cargo?

Interviewee: I would say that it would be cheaper to use it if you did not have any extra unplanned services. Also, the waiting area is way better designed there. It is very comfortable to work at, since you have all that, you might need to wait for the cargo. Some freight forwarders even sleep there if there are any mishaps And I would say that it can be beneficial for the companies that are working with the government. Currently, there are a lot of governmental suppliers that are working in Moscow cargo.

Interviewer: I have one more question that I forgot to ask before. When we were discussing the transition of some airlines to work in the new terminal, you mentioned that it brought some losses. Could you, please, elaborate on that?

Interviewee: It's a tricky topic to discuss if I am honest with you. And I cannot tell you some of it. But during the transition, they could not cope with the load. There was too much work for them that they did not anticipate. So, naturally, problems occurred. For example, perishable goods and much more could be not placed inside, but instead just laying outside. There were situations when we had to look for our own cargo on the runway. They could not leave the plane loaded. Even problems with lost pets, exotic animals, and more.

Interviewer: Lost animals? I think it would be a huge problem not only for the warehouse but for the company as well.

Interviewee: It sure was. But I won't go into the details on that topic. All I'd want to say is that I have arranged transportation for many circuses in the years I have been working for the company. For instance, for the Zapashny brothers<sup>7</sup>. DSV always worked with them and there were no problems since the transportation went through Sheremetyevo cargo. My colleague also worked with the ethnopark<sup>8</sup>.

Interviewer: Unfortunately, I don't think we have time for another question. Thank you for the interview and for agreeing to spend your time with me here. It was very informative.

Interviewee: It was my pleasure.

---

<sup>1</sup> 500 rubles is an equivalent of 6,5 euros based on the exchange rate of 27/04/200.

<sup>2</sup> 63 000 rubles is an equivalent of 821,7 euros based on the exchange rate of 27/04/2022

<sup>3</sup> 2 000 rubles is an equivalent of 26 euros based on the exchange rate of 27/04/2022

<sup>4</sup> Hamilton or “Hamilton Standard – Science” is one of the leading Russian manufacturers of heat exchangers that are used for air conditioning systems of civil aircrafts.

<sup>5</sup> Aeroflot or PJSC Aeroflot - Russian Airlines – is the biggest Russian airline and a flag carrier. It has its hub at Sheremetyevo International Airport.

<sup>6</sup> AirbridgeCargo – is the largest cargo airline in Russia. It also works on the international market. It has its hub at Sheremetyevo International Airport.

<sup>7</sup> The Zapashny Brothers Circus was founded by the brothers Edgard and Askold Zapashny, members of the famous circus family, lion and tiger trainers.

<sup>8</sup> Ethnopark "Nomad" is a one-of-a-kind ethnographic project in the open air that allows visitors to learn about actual houses, daily life, customs, and culture of nomadic peoples from around the world.