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School of Business and Management
Program Global Management of Innovation and Technology

Master's Thesis

Development of Imatra`s logistics hub as a part of Nordic region

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ABSTRACT

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This thesis is dedicated to enhancement and development of Imatra`s logistics potential in order to increase its key parameters and improve the efficiency of the region. To find out the most promising logistics projects was proposed a tool "integral-matrix analysis" which enables to make the priority among the list of proposed projects. Description and functionality of the tool are explained in detail.

As a result of analysis, the list of priority projects for the development of the region is presented. Project with the greatest potential is implemented in the thesis work. In conclusion, recommendations for the further development of economic potential of the region are given.

The thesis is basically focused on literature review, overlook of secondary and primary data (including the results of the interviews, which were carried out among companies that represent the logistics market). Primary data was collected in interviews with the representatives of the companies, who regularly use logistics services. Total effects that make various Russian regions and companies on the Finnish logistics is summed up and discussed.

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Separately, I want to thank my friends for their support and useful critique.

Lappeenranta, August 2016

Aleksei Prokhorov

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1. INTRODUCTION

This chapter reveals the theoretical aspects of this work, research questions and objectives of of the thesis. The key goal is to show evidences of the importance and applicability of the chosen topic.

1.1 **Background**

The role of transport in enhancing the competitiveness of the Finnish economy is obvious. Without a stable operation of the transport system (especially without advanced development of transport infrastructure and new effective schemes for the delivery of goods), it is impossible to guarantee the flow of investment to the region.

The development of transport and logistics complex (TLC) of Imatra is crucial both for the region and for the whole country. As a crossroad between Russia and Europe, Imatra provides transportation of international cargo between Russia and the European Union, while contributing to the development of trade and international relations.

Imatra region has a great potential for the development of transport and logistics services. Despite the fact that region's infrastructure is well developed, now Imatra has a purely transit function. The priority is the transformation of Imatra into transport and logistics center. This requires the development of road and rail transport, as well as transport and logistics hubs. Intensive and advanced development of transport - a necessary step to overcome the inefficient transit role of the region and the beginning of large-scale cooperation with Russia. Implementation of the priority projects will lead to the growth of transit flows.

What are the future possibilities of Imatra region? How to create a successful logistic hub in the Nordic region? To answer these questions, we have to look at this region as a logistics crossroads for Russia and Northern Europe. This study is about a project of logistics hub that may stimulate the economic development of Imatra region. It`s also very challenging due to the fact that Imatra is located away from the central logistic routes of Europe and the region has to spend much more efforts on saving and improvement of its positions. In addition, nowadays Imatra stays in high dependency on neighboring countries such as Russia. Therefore, the project of development should be considered together with the development of the neighboring countries and even entire regions. The main problem of the region is supposed to be simple (we have to increase the importance of Imatra as a logistics hub) but to solve the problem we have to act globally.

Many authors have researched the development of logistics in Finland. Consequently, many studies and books can be found on the given scientific problem. Nevertheless, studies about logistics development of certain regions of Finland (like Imatra) are rarely made.

According to the requirements, Imatra has to implement a big range of projects to improve the logistics of the region and to attract new investments. After conversation with the employer supervisor, we have identified the key requirements for logistics projects in the region. They are as follows:

1. All potential logistics projects should not require multimillion investments;
2. A border situation with Russia is a key and it is necessary to get the most profit out of this neighborhood;
3. New logistics routes can give a significant boost to the further development of the region, therefore, it is necessary to identify and evaluate the most promising routes because Imatra can be linked to them;
4. All logistics projects are primarily related to freight, so we need to find new supply channels;
5. Which projects can speed up the work of customs and make the delivery of goods across the border quickly?

Recent studies have shown that many organizations try to implement their strategies through different projects based on specific requirements. As it was mentioned, the employer supervisor has a set of requirements for logistics projects and the author of the thesis has to create a portfolio of them. Hence, selection of right logistics projects and right priority among them is considered very important task.

Despite the importance of all above mentioned requirements, it is impossible to answer all the questions in the framework of one Master`s thesis. That`s why a significant part of the work comes from understanding how to select projects that have the greatest potential for the development of logistics in the region. To solve this problem, the author has proposed an "Integral-matrix analysis"- a project development technique that is used throughout the study. The roots of this tool are coming from Quality function deployment. QFD is a concept that provides a means of translating customer requirements into the appropriate engineering characteristics for each stage of project development. With the help of this tool, the author selected the most promising project (based on the requirement of employer supervisor) and then implemented them in the Thesis. In addition, the results of the thesis provide a clear picture which projects should be implemented further and all this thanks to the "Integral-matrix analysis", details of which are also represented in the work.

1.2 **Research questions and objectives**

Below is presented a table with research questions, which were formulated according to the requirements of employer supervisor and information from background.

Table 1. Research Questions

Main questions	Subquestions
1. *How to compile an effective portfolio of innovative logistics projects to achieve the strategic goals of the region?*	• *Which tool can be used to create an effective portfolio of innovative logistics projects to achieve the strategic goals of the region?* • *How to justify the selection of innovative projects, which supposed to be implemented in Imatra?* • *Which factors will determine a successful logistic hub project from a failed one?*
2. *How to strengthen Imatra`s positions in trading through improvement of logistic system?*	• *What kind of business opportunities does Imatra have in Russian and worldwide market?* • *How to attach Imatra to new logistics routes?*

This study is concentrates on the development of the transport logistics of Imatra region. It begins with the answering the first research question. According to the needs of employer supervisor, a tool for creating a portfolio of innovative projects is needed. Chapter 4 contains information about the tool, which was created by the author of this Thesis and professors from South Ural State University (Chelyabinsk, Russia).The program answers the question-*how to justify the selection of logistics projects and its interdependence with other projects which are planned for implementation in the region?*

Objectives to use this tool is to convert the users` needs (customers` requirements) into quality characteristics at the design stage. This tool helps companies to make the key trade-offs between what the customer demands and what the company can afford to produce. The key advantage of the program- all the results of the analysis are calculated automatically. You should write only customers' requirements and engineering characteristics in proper cells, make an assessment of each value and that`s it, the rest program will do for you. For convenience, the results of the analysis are presented in tabular form.

In chapter five, the “Integral-matrix analysis” is used to simplify the selection of projects, when we need to select the best options. In output, we get the algorithm, which company should follow to reach the best results.

The second research question is covered in chapters 6 and 7. The results about the most perspective projects (which were collected in chapter 4) help us in answering the question. In chapter 7, the results from the surveys and interviews are presented. Based on these results , the rest of the chapter sums up the co-operation and competition issues between Finnish and Russian logistics. Finally the challenges for the future are presented.

1.3 **The scope of the study**

The study is limited for several reasons. First of all, the were limits that did no allow to get deeper into topic in specific subjects. For instance, some international freight shipping require a lot of time and they are offered only as recommendations for further development of the region.

Then, the work presents a tool for selection of projects, and a list of projects, that are realized throughout the paper.

Lastly, several tremendous limitations that were discussed with employer supervisor also affect the project:

- Multi-million projects are not required. We must ignore projects with huge financial investments. We should find opportunities that will start to work for the benefit of Imatra in the nearest future (with moderate spendings);
- New technologies should be used in logistics center. How to speed up logistics services? It is good to have big warehouses but with proper new technologies everything works better and faster;
- Our neighbors have a great influence on us. Close relations can lead to mutual benefits. Marketing research should help us to find these opportunities
- We should try to benefit from the emerging new logistics routes. New “Silk Way” is almost appeared and Imatra can`t miss a chance to become a part of this new logistics era. How to become a part of this “Silk Way”? A question that needs an answer.
- We should find a way to establish partnership with most promising TLC and try to cooperate with them on the most important issues. New logistics routes might appear during such cooperation.

1.4 **Structure of the study**

The following structure was selected for this thesis: theoretical part is not separate from empirical one but mixed and used in such way throughout the whole study. Such approach helps to see more distinctly implement changes. Chapter 1 is focused on introduction. Methodology of the study is described in chapter 2. Chapter 4 describes the given the program which is used for selection the projects.

Chapters 3 and 4 can be considered as a theoretical foundation for the thesis, which set out the basic theoretical features of the chosen theme.

Chapters from 5 to 7 are the core in this project and they are completely based on the theory that has been disclosed in Chapters from 1 to 4. The results of these chapters may be considered as the key for the whole project. Chapters 8 and 9 sum up all the work done.

Structure of the thesis is presented in Table 2. Interconnection between separate chapters is given in figure

Table 2. Structure of the study

Input	Chapter	Output
Background, ,description of central concepts.	**Chapter 1** Introduction	Future steps of the author are explained.
methodologies; ways to make interview, the role of the researcher	**Chapter 2** Research design and methodology	Composition of the methodology and interview questions.
Theoretical background	**Chapter 3** Literature review on project portfolio selection methods and models	Scientific explanation of proposed tool
Explanation of how the tool for selection the priority projects was created, how it works and could be used.	**Chapter 4** The algorithm of choice of innovative projects Selection of priority direction for the development of Imatra`s logistics hub	Ready to use tool that allows to find the most promising logistics projects.
Insert data into the exciting program, evaluation of customer requirements and engineering characteristics of the project, search for the interdependence of different parameters.	**Chapter 5** Use of integral-matrix analysis to establish goals of Imatra`s development as a logistics hub	An algorithm with step-by-step instruction how the possible changes should be done.
Theory related to marketing research, explanations how the research is done	**Chapter 6** Market research on key areas of logistics development of Russia	Analysis of Russian logistics market, behavior of different companies in logistics market, possible future trends that could affect Imatra and the whole region.
Companies' information, annual reports, interviews' data	**Chapter 7** Analysis of companies` interviews	Picture of companies' strategies in Russian logistics market and forecast for future.
Literature review and empirical findings	**Chapter 8** Discussion	Future steps for the development of logistics in Imatra region.
Results and findings	**Chapter 9** Conclusion	Results summary and suggestions for further research.

How all the chapters are interconnected is presented on the scheme below:

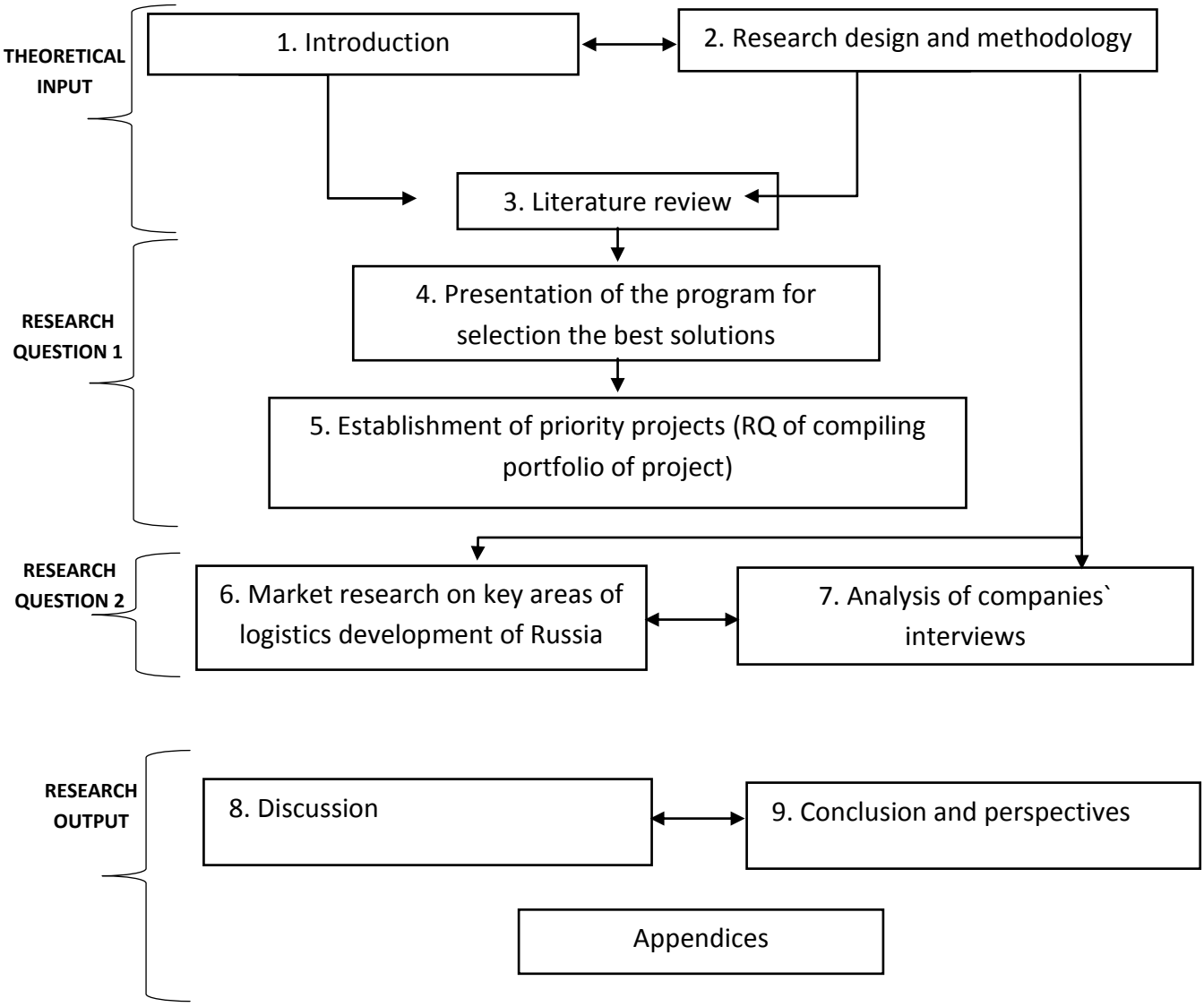


Figure 1. Structure of the thesis

1.5 Key concepts of the study

During the work on this thesis were used the following concepts in order to answer the research questions of the study. Authors' names are given in parentheses.

Logistics

Typically, under the term of logistics we understand the transition of goods from the seller to the buyer through the logistics network (Saarela, 2014). Under such short and simple term hides the whole process of planning, implementing and controlling efficiently the flow of goods and information, the storage of goods and the services related to fulfill the requirements of a customer. (Lummus et al. 2001, 426)

Integral-matrix analysis/House of quality

Quality Function Deployment (QFD) is a management tool which is used to translate customer needs, desires and wants into technical requirements of the future product/service. Usually, this tool is vital for companies that try to improve its efficiency. QFD utilizes the house of quality (HOQ), which is a matrix providing a conceptual map for the design process, as a construct for understanding Customer Requirements (CRs) and establishing priorities of Design Requirements (DRs) to satisfy them (Park and Kwang-Jae, 1998, 569-581).

Benefits of HOQ:

- Helps companies to see the consumers needs and to match them with the capacities that company can produce;
- Increases the effectiveness of cooperation between various divisions of the company and enhances team work;
- Customer satisfaction grows rapidly since customers' demands are actively involved into the process of product development;
- All required data is located where it should be. It allows to speed up all the processes;
- Shortens time-to-market.

(Benner, 2003, 327-339).

2. RESEARCH DESIGN AND METHODOLOGY

This chapter explains which research methodology was selected for the purpose of this thesis. Chapter 2 also serves as a base for the development of research design and for selection of data collection techniques. First, research methodology (which includes data collection method) is explained. Later, the quantitative research method that has been used throughout the study is discussed. Finally, the role of the researcher in this thesis is described and emphasized. Altogether, this gives an idea of how the work was arranged and how the author performed it.

2.1 Research methodology

After a careful comparison of qualitative and quantitative research methods, I made a conclusion that current research should be done as a qualitative study.

COMPARING QUALITATIVE & QUANTITATIVE RESEARCH

Qualitative Research	RESEARCH ASPECT	Quantitative Research
Discover Ideas, with General Research Objects	COMMON PURPOSE	Test Hypotheses or Specific Research Questions
Observe and Interpret	APPROACH	Measure and Test
Unstructured. Free Form	DATA COLLECTION APPROACH	Structured Response Categories Provided
Research is intimately involved. Results are subjective	RESEARCHER INDEPENDENCE	Researcher uninvolved Observer. Results are Objective
Small samples –Often in Natural setting	SAMPLES	Large samples to Produce Generalizable Results [Results that Apply to Other Situations]

Figure 2 Comparing qualitative and quantitative research

An additional argument in favor of choosing this method is that research questions of this thesis are qualitative by nature (they both starting by “how”).

The current study is qualitative and based on interviews. With the assistance of such approach we may obtain necessary information on the topic and thoroughly understand the strategy of companies who use and provides logistics services, to find out the position of each of the companies the Russian and Finnish logistics, analyze the current situation and lack of the relevant data. Qualitative methods help to get opinions about the logistics services that will make the work vivid and relevant for today. (Petrukhina, 2015)

The interview was chosen as a data collection technique in this Thesis. Interview is a purposeful discussion between two or more people (Kahn and Cannel, 1957). Furthermore, interviews help the researcher to collect reliable and appropriate information, which is relevant to the subject of research.(Saunders, 2014)

I have to add, that in this thesis were used structured interviews. More information about interviews and interviewees one can find in section 2.3.2.

It is necessary to pay special attention on the sources of information which were used during the study. Information about resources that were used during secondary data research is presented in section 2.3.1.

2.2 Research design

Research design is a visual presentation of the used methodology and expected results. It also serves as a plan for undertaking the study and collecting data. Research design of this study is presented below:

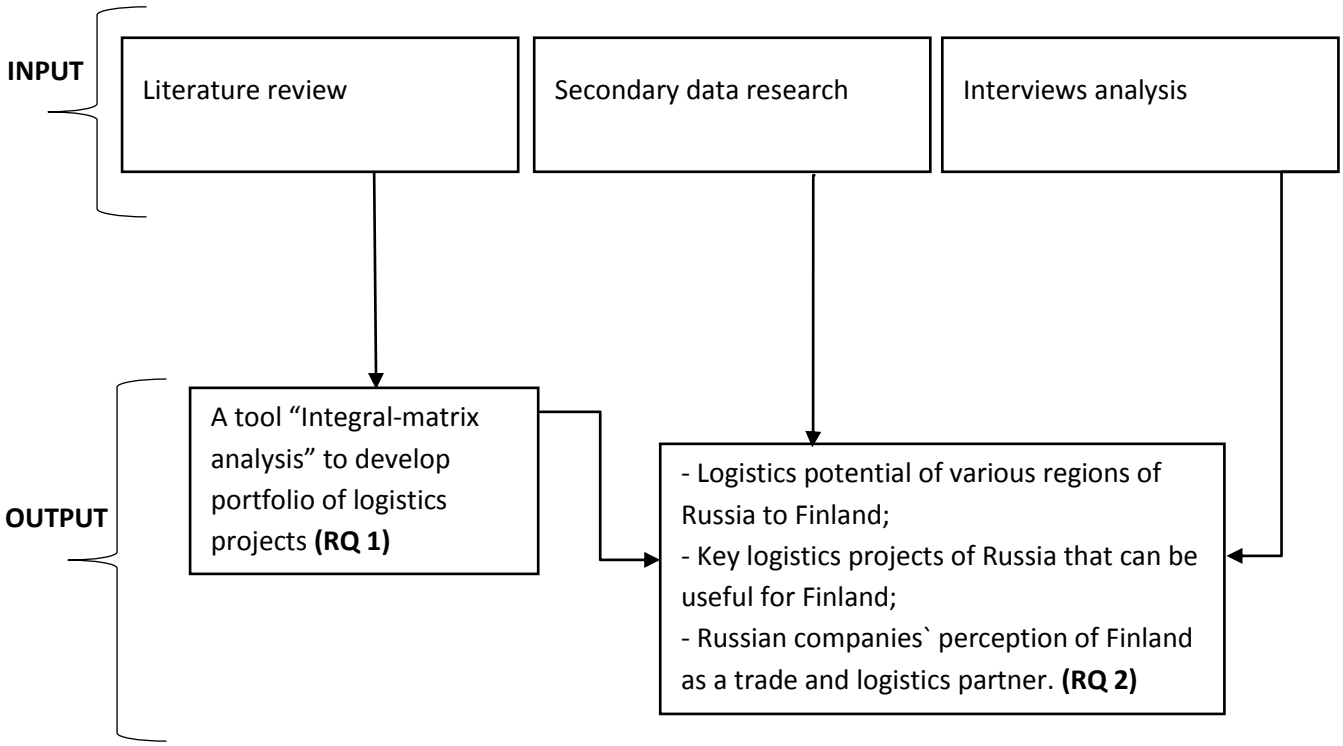


Figure 3. Research design

Literature presents the input for the research. After scrutinized review of literature, the author managed to find out the weak points that exist almost in all tools that help in development of innovative projects` portfolio. Hence, I tried to present a tool which fixes some weaknesses that all previous tools have had. By doing so, we answer the first research question of the thesis. Further, secondary data research and interviews are used to build the foundation for answering the second research question.

Current approach leads to delivery of outcome- problems resolution, which are presented in this thesis as research question 1 and research question 2.

2.3 Data collection techniques

To carry out mentioned work were used secondary and primary methods of data collection. Secondary research in an “armchair” way of collecting data. You need only access to the Internet and the collection of reliable sources of information. Primary research requires more in-depth and face to face interviews with people who are involved in market. Also depending on the goals of research, interviews can be conducted both with customers and with suppliers.

In practice, any method could reach 100% reliability of collected data. Both methods have disadvantages that decline the reliability of received information. According to the recommendations of different experts, the market research must contain both methods of data collection. In this case, the accuracy of the obtained information rises to 80-85%.

2.3.1 Secondary data

Usually secondary data is collected to build an overall picture of the studied issue and get right to the main problem. It helps a researcher to gain a better understanding of the problem. Due to a wide scope of the study, which aims to obtain information about Russian logistics that can be valuable for Imatra and the whole Finland, secondary data research was divided into two big subtopics. Such approach is extremely valuable because it reveals very carefully the most promising areas that may help in the development of Imatra`s logistics.

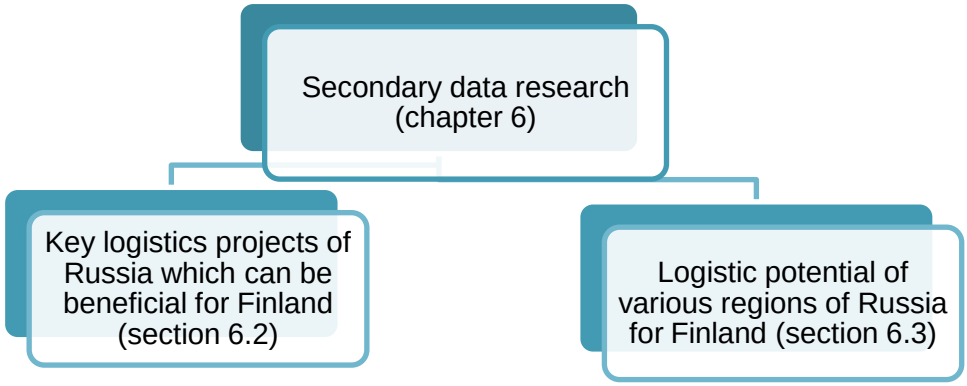


Figure 4. The structure secondary data research

Chapter 6 contains information about secondary data research, which was divided into 2 big subtopics:

1) Key logistics projects of Russia which can be beneficial for Finland (the main goal is to show the current success and failures of "Russian transportation strategy till 2030");
2) Logistics potential of various regions of Russia for Finland (the main goal is to show whether there is a potential for collaboration in logistics between Finland and different regions of Russia).

Secondary data research on *"key logistics project of Russia which can be beneficial for Finland"* contains two main subjects: What Russia has achieved and has not achieved in its logistics strategy and what Russia is planning to implement at the federal level until 2030.

Secondary data research on *"logistics potential of regions of Russia for Finland"* contained six subjects: The capacity of Russian logistics market in tons and in terms of money, the most significant players of the market, parties interested in logistics, logistics services that are most preferred in the market, the most dynamic regions in terms of logistics and the forecast about the development of this logistics centers in medium and long perspectives.

Below is presented the list of sources, which was used for the purpose of secondary data search:

- Federal State Statistics Service (Rosstat) including territorial offices;
- Database of the Federal Customs Service (FCS);
- Ministry of Transport of the Russian Federation; Ministry of Energy of the Russian Federation;
- Mass media: Russian newspapers, magazines, newsletters; Internet resources;
- Databases of JSC "Russian Railways" on railroad cargo transportation;
- Transport Strategy of the Russian Federation for the period up to 2030.

Based on the results of secondary research, the primary research (face-to-face interviews) was done in order to understand more deeply all the benefits that can bring Russia to Finland (in particular to Imatra) in logistics and trade. Primary data research is explained in chapter 7.

2.3.2 Primary data

Primary data has been gathered via interviews with representatives of Russian companies that are involved in logistics.

Primary data research was done to describe how Russian companies' perceive the cooperation with Finland in the fields of logistics and trade.

The scope of primary data research

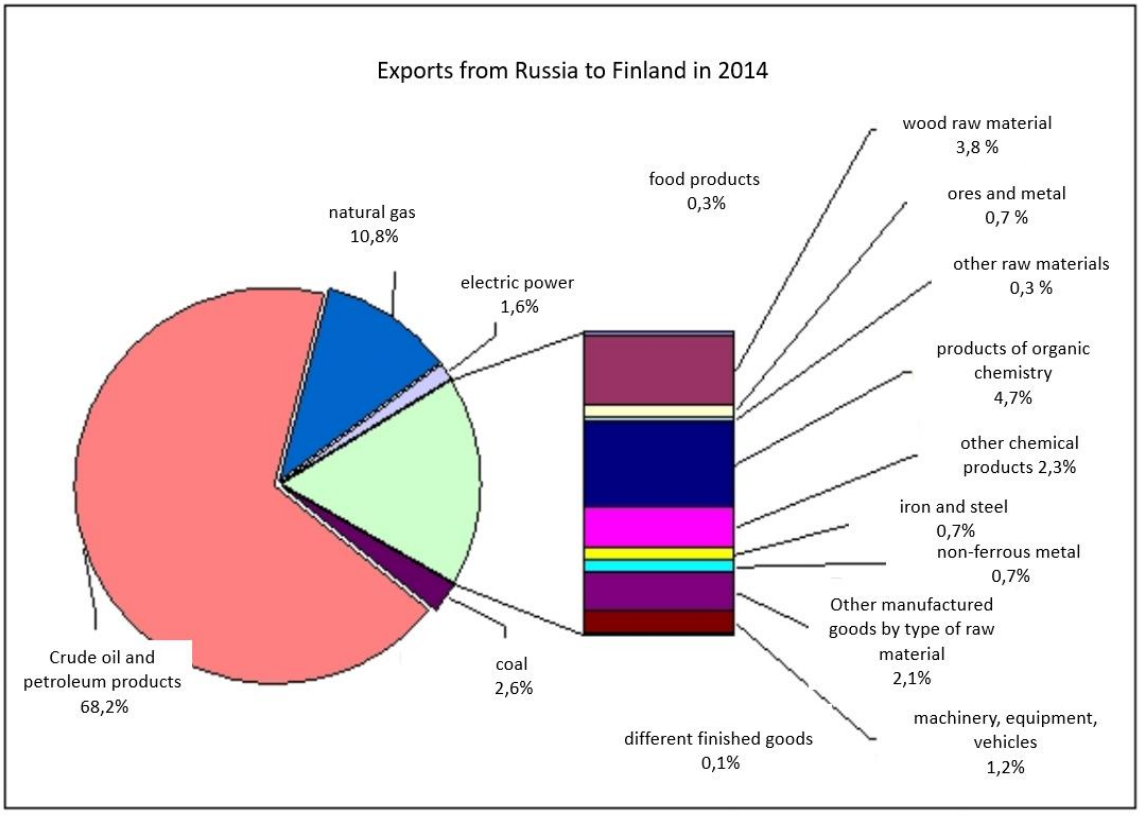


Figure 5. Export from Russia to Finland in 2014 (Source: Finnish custom, March 2015)

The responders were chosen from those fields of activity, whose products are regularly being exported from Russia to Finland. However, from the very beginning were not taken into account companies that are engaged in transportation of crude oil from Russia to Finland. The author of the thesis tried to get in touch with companies that are involved in production of machineries and different manufactured goods.

Sample description

The responders were selected by their relevance to the Russian logistics. All companies were divided into 2 big groups- companies that use logistics services and companies that propose logistics services.

Statistics show that Russian companies are reluctant to communicate when we are not talking about any profit. Few companies understand the importance of such cooperation and express their will to work.

Table 3. Survey description

Type	Sent/returned questionnaires	Response rate %
Companies that use logistics services	9/3	33%
Companies that propose logistics services	5/1	20%

Profiles of interviewees

Companies which I managed to conduct a survey: Automobile Plant "Ural" (produces heavy trucks), company “Force” (engaged in manufacturing of furniture parts), one individual entrepreneur who is engaged in the resale of goods from China to Russia and logistics company which is located in Chelyabinsk. Geographically all surveys have been done in Chelyabinsk region during the period July-August 2015. All interviews were conducted in Russian and translated into English. Later, in the middle of October, I again made contacts with these companies with the help of “Skype” to ask additional questions.

As for truthfulness of answers - all companies can officially confirm the fact of interviews and that all answers were recorded by Prokhorov Aleksei.

About the practical applicability of these responses. The main value of these interviews is that they give a clear picture of how different companies (Ural Automobile Plant-5000 workers; company “Force”-15 factory workers; individual entrepreneur- 1 person who works for himself) see the development of trade and logistics relations with Finland, as well as what they think about changes that may occur in logistics during the next few years.

Table 4. The profile of companies participated in research

Company	Main business	Number of employees	Name of interviewee	Position of interviewed person
The Urals Automotive Plant	Automotive industry, manufacturing of all-wheel-drive	5000	Borovinskii Viktor	Deputy director of production
Furniture company "Force"	Company manufactures steel structures/creates the mechanism for transformation of tables of its own production	15	Volokitin Aleksei	Founder of the company
Individual entrepreneur	Buying and selling of goods from China	1	Sytchov Sergei	Individual entrepreneur
Ltd. Transportation and logistics company "ECOS"	Transportation and logistics	7	Rozhkov Alexander	Transportation engineer

Questionnaire for collecting primary data:

Below is presented the list of questions that enables to determine how Russian companies(which are not from the Northwestern Federal District) perceive Finland as a trade and logistics partner. All the questions were divided into 3 sub-topics and the results of each are presented in separate subchapters of chapter 7.

Finland as a trade partner:

1. What is your involvement in foreign trade?
2. Do you feel that not only Northwest Federal districts, but also other regions of Russia can be involved in trade with North Europe?
3. Do you perceive Northern Europe as a trading partner? (If yes, what caused you think that?)
4. Does Finland have competitive advantages that could attract Russian companies?

Finland as a logistics partner:

1. Do you perceive Finland as a logistics gateway to Europe?
2. What Russia can propose to Finland in logistics?
3. The share of export in the total cargo flow of the company. (Including export to Finland).
4. What stops you from operations in Northern Europe?

Trends in logistics and new possibilities for partnership:

1. Forecast of change in cargo traffic in 2020 perspective, and how it can be changed with Finland.
2. What are the trends in logistics that stimulate the development of your business?
3. Do the new logistics routes can be useful for the development of foreign trade, especially with Finland?

Such approach, when all the question are divided into several groups, helps to get more detailed information and more personal opinion of the interviewee on the topic . For clarity, this questionnaire is presented in appendices in both Russian and English versions (Appendices 3, 4).

2.4 Data analysis

It is not enough just to get correct information. There is also a need in interpretation of all the results. Due to the fact that this thesis is based on qualitative research methods, there was no need in special software for data handling (like SPSS).Content analysis and internals meetings with employer supervisor were used during the study as core methods of data analysis.

Content analysis in the method of qualitative and quantitative analysis of the content of documents, which is used to identify and measure the various facts and trends that are reflected in these documents. One of the features of content analysis is that it studies the documents in their social context. This method can be used as the primary method of a research or in combination with other methods. As it`s been previously mentioned, in this thesis this method is used in combination with internal meetings.

Internal meetings as a method of data analysis is also frequently used by different researches (especially by those who do the research projects for companies). Such method enables to monitor and review progress of the research and helps. In addition, all concerned parties can

contribute to the success of the research during such meetings. Below are explained how both methods were used by the author during the study.

2.4.1. Content analysis

Content analysis has been used to collect primary data from the companies that are connected with Russian logistics. Content analysis can be quantitative or qualitative.

Quantitative is very simple, it means counting words and phrases in the required text. Nevertheless, based on such results, it is difficult to not make any categorical conclusions about the sense of promise or other features of the text. In principle, for this analysis was used Microsoft Word.

During the study also was used quality content analysis, which is far steeper and more difficult. Its task is not only to count lexical items, but also analysis of the relationships between these units. Before you start this analysis, it is necessary to allocate a minimum goal of the research, the semantic categories and vocabulary lexical units.

2.4.2. Internal meetings

During the period May 2015- November 2015, I had several meetings with representatives of «Imatra Region Development Company Ltd. » (Imatra) and «Logistics Development Forum» (Helsinki). The main goal was to ask their opinion about current project, discuss the findings identified during secondary and primary data analysis and consider the possible opportunities for further cooperation in logistics.

The main goal of such meeting was to push the project to a new level and focus on the most important aspects, eliminating insignificant facts. Regular feedback of the experts helped to select the right direction of the research (Khramova, 2014).

2.5 The role of the Researcher

Usually in quantitative studies, the role of the researcher is to be invisible. Because of the nature of quantitate study, participants should act independently of the research, as if he or she does not exist at all. With such approach, the researcher could get the most reliable results. On the contrary, in qualitative studies, the researcher should be extremely active during interaction with responders. Active participation is needed because radical changes are required.

Below presented a table that shows how the author of this thesis acted during the study:

Table 5. Roles of the researcher in this thesis

Role	Description
Scientific	The use of the scientific basis for an explanation of the need to improve logistics in the region. Ability to find satisfied answers to the research question
Manager	Ability to create the portfolio of projects that can be carried out in the region of Imatra
Manager of the external economic affairs	The establishment of contacts between suppliers from Russia and buyers from Finland (Imatra).
Creative	Ability to write a program that facilitates the job of managers in compiling a portfolio of logistics projects
Presenter	Ability to present and prove the importance of the work done

During the research all this roles appeared in one or another way. At first, the scientific role of the researcher has prevailed over all other. There was a need to understand how the whole research can be conducted. Later new duties have appeared and they have been interconnected with the direct researcher`s role of a scientist. All other roles also very challenging and required many time and efforts. Nevertheless, thanks to this multitasking the author managed to get high-quality results that will serve to further development of trade and logistics in Imatra.

3. LITERATURE REVIEW ON PROJECT PORTFOLIO SELECTION METHODS AND MODELS

This chapter explains the role of the theory in the research. One of the most central goals of literature review is to describe the current situation that exists in theory and to show the gaps in it. It is important to create more clarity and understanding about the topic in order to achieve practical and effective outcomes.

Literature review focuses on explaining the methods of project portfolio management and quality management methods. The main purpose of theory is to identify existing gaps in project portfolio selection and to propose future steps to eliminate them.

3.1 **Theoretical framework**

The main aim of theoretical framework is to explain different existing approaches, which are regularly used by companies in creation of innovative projects` portfolios.

In this review, I try to find out how these spheres are connected. The goal is to show interaction between these two fields and to find out how the process of projects portfolio selection can be improved.

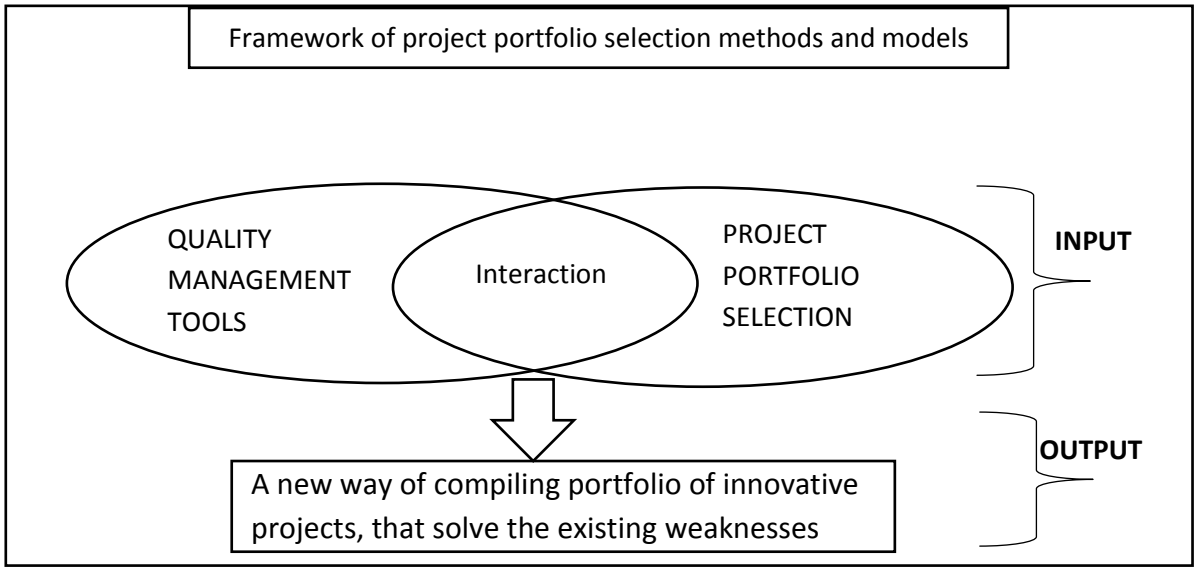


Figure 6. Theoretical framework

Based on our theoretical framework, the following questions should appear in this section:

- Which theoretical framework of project portfolio selection do we have nowadays?
- What are the challenges of project portfolio selection?

- Does the interaction between project portfolio creation and quality management tools exist?
- What can be considered as a qualiy?
- Which quality management tools exist?
- How quality management tools have been developing throughout the history?
- What is project portfolio selection?

By answering these questions, we can find a new way of compiling portfolio of innovative projects that solve the existing weaknesses. At first, in chapter are discovered the topic of “quality management tools” and later “project portfolio selection”. Such approach allows making the structure in the theory.

3.2 Literature review on project portfolio

This part of the chapter provides an overview of key works that have been written on the project portfolios over the past seventy years. The scientific community began to take the first steps in this area in 1950s. For a long time, the given theory has not been claimed. Only in the seventies, with the development of new technologies, companies are beginning to work with project portfolio more closely. At the present time, the value of this theory is undeniable and more and more companies use it in their business strategies. Below are written the key milestones in the development of project portfolio. All of them are discussed in this section further.

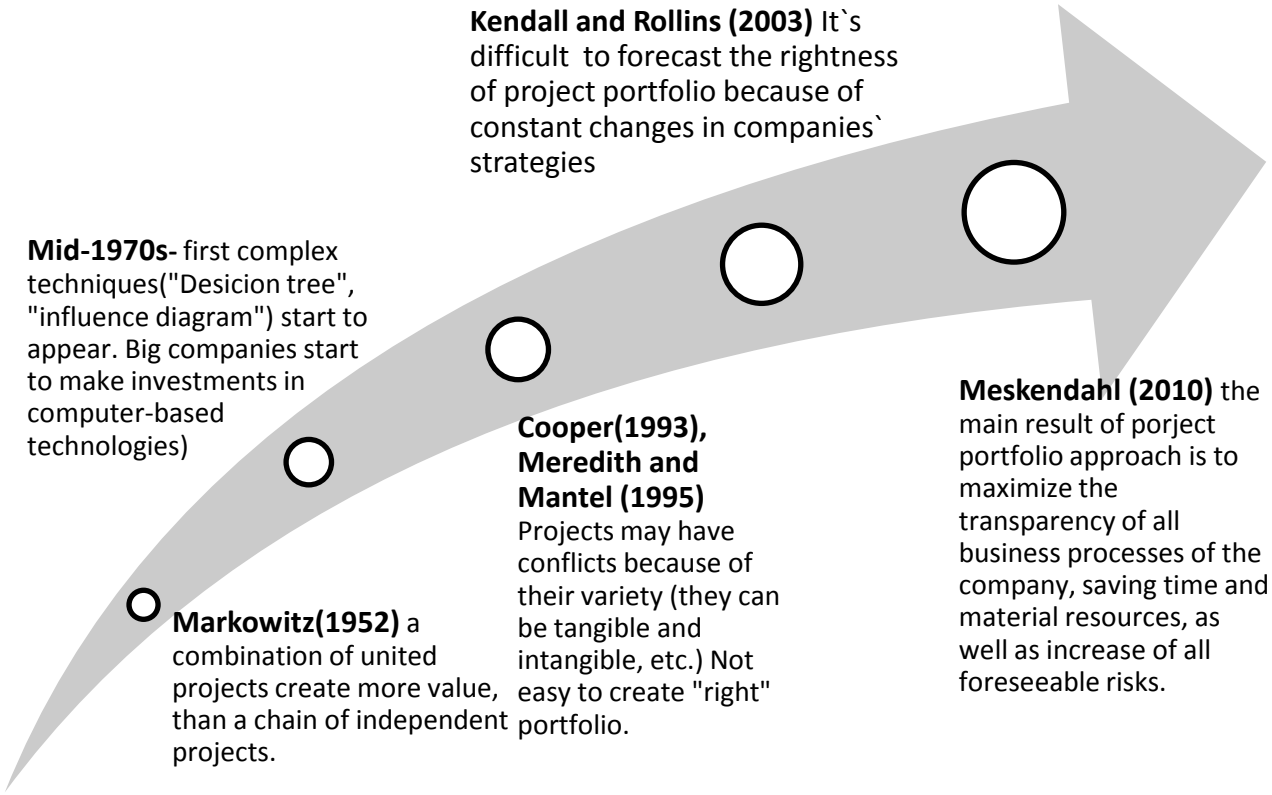


Figure 7. The key milestones in the development of project portfolio

3.2.1 What is a project portfolio?

The importance of choosing the portfolio has been recognized over the last decade. Since the beginning of the 21st century, more and more literature on this topic appears. Particularly worth mentioning is that the choice of projects and the optimization of the portfolio is shown in academics and practitioners literature reviews. (Pennypacker, 2002) Altogether, it speaks about the importance of portfolio selection process in the development of the company`s strategy.

Nevertheless, very often instead of project portfolio we can hear another terms such as "project" and "programs". It is understandable, because each project portfolio by its nature consists of projects and programs. Also, the problem of formation of a portfolio of projects in many aspects is similar to the problem of constructing the separate projects and programs. (Morris & Pinto, 2010).

In the most general sense, a project is a temporary activity in the company, aimed at creating a unique product, service, or result contribute to the achievement of strategic objectives

throughout the business system. (Kirsch, 1997). The set of projects that company runs at the moment could characterize its business model (Kirsch, 1997; Hobday, 2000; Ajmal & Koskinen, 2008).

The term "program" is wider and could be explained as a series of connected with each other projects managed by coordinated to achieve the benefits and the degree of control that are not available at managing separately (Ferns, 1991).

A project portfolio is a group of projects of programs joined together in order to maintain the competitiveness of the company and to archive strategic goals. (Archibald, 2015)

There are three basic types of portfolios that organizations use (Cooper et al .1999):

1) Portfolios that create value - is the company's set of scale projects and strategic projects;

2) Operating portfolios – they include projects that meet the basic needs of the functional departments, resulting in increased performance of the company;

3) Portfolios that ensures compliance – such type of portfolio consists of projects that are

necessary to maintain internal standards and specifications, these projects are mandatory.

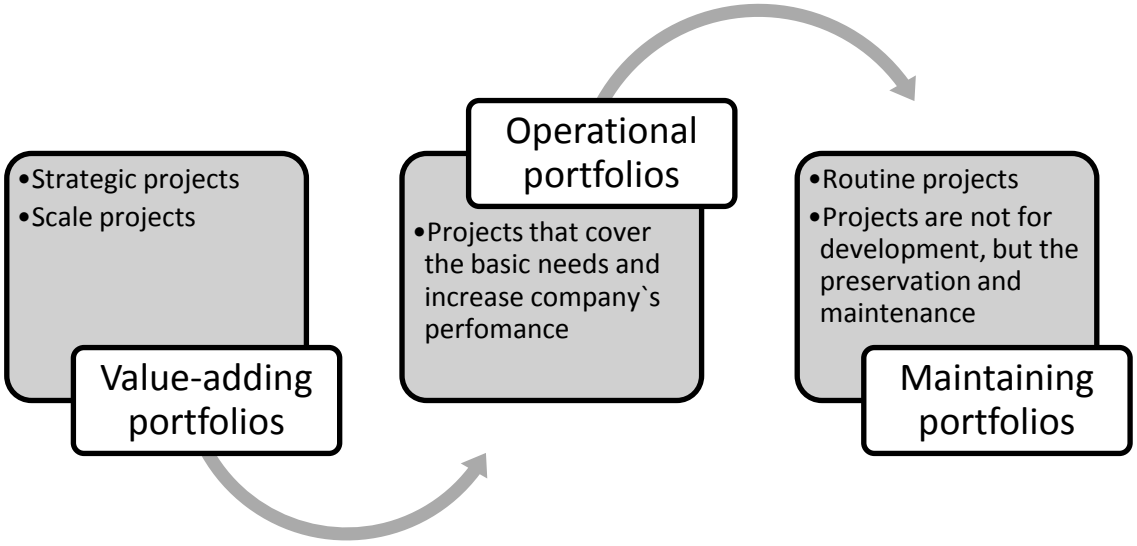


Figure 8. Different types of project portfolio and their interaction

Many articles and books have been published on each of these three terms. However, researches that work with "separate projects" are focused only on projects and do not analyze how different projects can interact with each other and what effect (positive or negative) may bring different sets of projects. The great contributions on these questions were given by Markowitz (1952), Archibald (1992, 2015) Cooper (1992), Archer (1999) and Pennypacker, J. (2002). The main goal of project portfolio is to obtain the best value from the sale of the entire set of projects, while the main goal of a separate project is quite smaller and focused on creation of the product based on required time and budget. (Pennypacker & Dye, 2002).

In order to show the difference between these 3 terms, below is presented a table where separate project, programs and project portfolio are compared.

Table 6. Comparison of projects, programs and project portfolio

Proposed criteria	Separate projects	Programs	Project portfolio
How does it characterized ?	Projects are characterized by a narrow scale with certain components	Programs are characterized by large scale, which can be changed to meet the expectations of the organization	Project portfolio are characterized by business area, which varies with the strategic objectives of the organization
What is the role of a manager?	The project manager is trying to bring changes to a minimum	Project Manager of the program should not only wait for changes but also create them	Portfolio Managers continuously work with all types of changes
What can be called a success?	Success is measured by the respective budgets, time constraints and desired result	Return on investment (ROI)+ new capabilities and benefits that were earned with the help of program	Success is measured in terms of aggregated results
What does the project manager have to do?	Project Managers manage the technical staff, experts, and so on.	Project managers of the program controls project managers	Portfolio managers can supervise a staff of project portfolio management and to coordinate its activities
What is the role of a project manager?	Project Managers - team players who are motivated to use knowledge and skills of participants	Project managers of the program are the leaders, who provide vision and leadership	Portfolio Managers are the leaders that provide insight and synthesis
What are the responsibilities of a project manager?	Project managers carry out detailed planning for the project management of the product	Program managers monitor the projects of the program and work through the current management structure	Portfolio Managers monitor and evaluate total job figures

To sum it up, we may conclude, that project portfolio is much more complex term than “programs” and “separate projects”. That does not mean that separate projects are useless. On the contrary, they serve as the basis for all the programs and later for the creation of project portfolio. In picture such hierarchy might be represented in the following way:

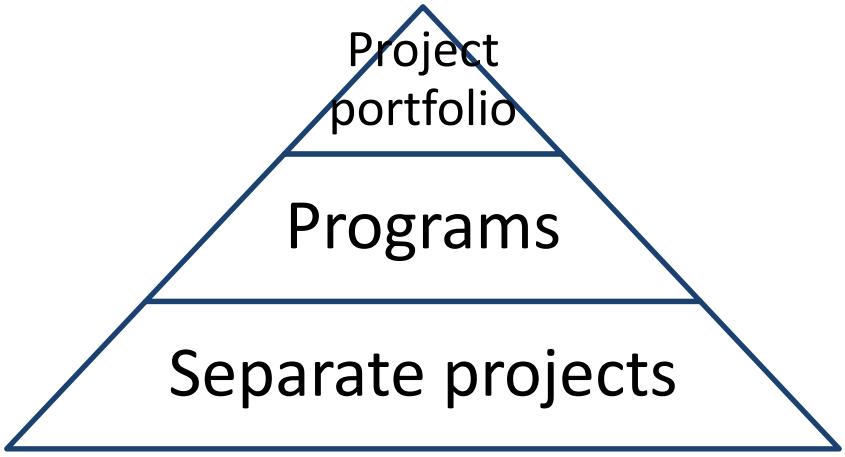


Figure 9. The hierarchy of project portfolio

3.2.2 Analysis of recent research and publications

The concept of project portfolio has emerged as a reaction on changes in business world (Pennypacker & Dye, 2002). Modern portfolio theory has appeared in the 1950`s and associated with the studies of Harry Markowitz, who has won the Nobel Prize in Economics. Actually, he was the first, who showed that a certain combination of projects that are united in one portfolio, could create much more value, than a chain of independent projects. (Markowitz,1952). He stressed out that companies should avoid inefficient portfolios and should try to create those that give the maximum value.

For quite a long time, this theory has not been demanded in large enterprises, that is why new works began to appear only in 1970s. Until the early seventies, there was no answer to the question “how to optimize the portfolio and how to select projects?”

New techniques and tools started to appear. Howard and Matheson (Howard & Matheson, 2005) tell about “influence diagram”- a tool that represents a graph, which is used for making the most objective decisions. Influence diagram allowed to solve complex problems, involving many variables. For different types of variables are used specific geometric figures.

At the same time appeared a ‘”decision tree” tool (also called classification tree or regression tree) - a tool for decision-making support that is used in statistics and data analysis for the predictive models. The tree structure consists of "leaves" and "threads." These decision trees are widely used in data mining. (Mingers, 1989).

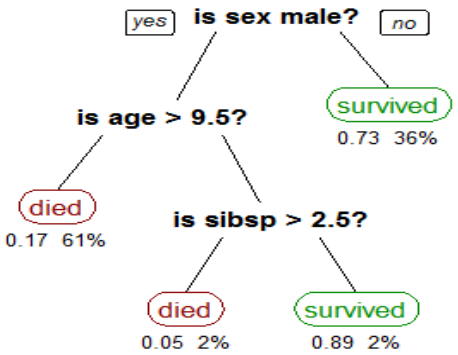


Figure 10. A sample of a decision tree

Later, companies began to think how to choose the most appropriate projects, which together could bring maximum profit (Cooper1993; Meredith and Mantel 1995) and the development of IT industry help with it.

The first computer techniques that allowed to create project portfolios appeared in 1980s (Santos, 1989) but they are not widely known and popular among companies because they were too complex and technologies were not able to work with big amount of data. With the development of technologies, new researches start to appear.

Literature reviews on project portfolio start to increase at the end of the last decade of the twentieth century and very often are associated with the names Archer, Ghasemzadeh, Cooper, Dye and Benko. They were the first who pointed to the fact that many projects within the company are interlinked and that the selection of projects should be associated with the strategy of the company.

The project portfolio of a company is a set of investment projects. It can be viewed from different perspectives: as a group of separate (not interconnected) projects or as a set of projects that are interconnected into a technological chain that increase the value of the company by an amount greater than the sum of the net present value (NPV) of individual projects and lead to an increase of enterprise value. The second

point of view might be considered as a predominant in modern high-tech companies and industries. Formation of the "right" portfolio will help organizations increase its investment and value. According to Benko and McFarlane, project portfolio selection tools are "insufficiently frequently used tools for detecting hidden costs"(Benko and McFarlane, 2003).

The same can be said about the work of Archibald (Archibald, 2015). In his work "*Leading and Managing Innovation: What Every Executive Team Must Know about Project, Program, and Portfolio Management"* he explains the obvious benefits that companies can get by using special methods and tools of project portfolio. The main goal is the performance growth of the company due to the selection of the most promising projects and consideration of all projects as parts of one big system.

Another authors such as Kendall and Rollins (Kendall and Rollins, 2003) highlight some narrow aspects of project portfolio management, sometimes even through mathematical equations. All it proves the existing diversity in project portfolio selection methods and approaches. That`s why, then choose of a method in most cases depends on experience of the person, who is responsible for the compilation of projects portfolio.

The importance of choosing the portfolio has been recognized over the last decade. Since the beginning of the 21st century, more and more literature on this topic appears. Particularly worth mentioning is that the choice of projects and the optimization of the portfolio is shown in academics and practitioners literature reviews. Altogether, it speaks about the importance of portfolio selection process in the development of the company`s strategy. Sommer and Yelin (Sommer, 1999; Yelin, 2005) say that project portfolio must be used to achieve strategic goals of the company:

1. Alignment with company`s strategy: without projects any strategy cannot be implemented. Projects serve as a basement for strategy and they all should contribute to the success of strategy.

2. Get the most out of the value: usually all companies are limited in resources. That is why, every new project should bring the maximum value.

3. Balancing: project portfolio requires balance like any financial investments. Before implementation the project, you should check all possible risks and returns.

With the help of project portfolio management, companies manage to transform organization`s requirements into tangible projects, successful implementation of which can contribute to the corporate strategy. Successes and failures of the company are always

associated with the project. Wrong projects always lead to failure. However, sometimes it happens that even the successful projects do not bring the expected result. Companies need not only to create successful projects, but also to bring them to market in the right sequence.

3.2.2 Benefits and challenges of project portfolio selection in companies

History shows, that companies constantly have to invest in technological projects in order to stay competitive. As a result, many companies start to run plenty of projects at the same time (Bolman & Deal, 1991). Increasingly, companies are suffering from the discrepancy between their objectives and investment. Sometimes it turns out, that top-management of the company can`t even articulate what is included in their project portfolios. (Benko & McFarlan, 2003).

Project portfolio is a set of projects, programs and other work grouped together for effective data management work to achieve strategic goals. (Blichfeldt & Eskerod, 2008). The main task of project portfolio management is to choose the most correct projects, which are able to satisfy to the maximum of available demands of the company.

According to Meskendahl (Meskendahl, 2010) the main result of this approach is to maximize the transparency of all business processes of the company, saving time and material resources, as well as increase of all foreseeable risks.

Based on literature review, three main benefits of project portfolio were pointed out:

1) Prioritization between all projects in line with the strategic objectives of the organization (Cooper et all, 1997);

2) Allocation of resources to projects in accordance with their priorities;

3) Common management practices for all portfolio projects (Martinsuo & Lehtonen, 2007).

Despite of all the benefits, that companies could get with the help of project portfolio, the following problems arise during the selection:

a. Projects can be tangible and intangible. In many cases, the priority among them is hard to establish (Ghasemzhadeh & Archer, 2000);

b. Different projects have different cost and companies may struggle in drawing up the parameters for projects. Incorrect parameters (like price) can lead to a wrong sequence of projects. It may appear that projects with the highest price always get priority.

c. Many projects are extremely inter-independent. The rejection of one project can lead to the problems in another.

Many problems can arise during project portfolio selection process. The great variety of these challenges is discussed in this section. As literature review shows, most of the challenges are likely possible in practice and special attention should be given to them. Companies that are interested in effective project portfolio should remember about them and take into account possible effects and solutions. On the most common problems is connected with unreliable or unavailable data input. The information, which should affect the entire project, can be simply incorrect. Cooper et al. (2001a) claimed that at this stage, companies faced with a huge number of problems, such as lack of information or its unreliability. It also happens that the information can be revalued, and the company pays a lot of money for something insignificant. To these typical problems, we should also add that many companies create problems to themselves because of their ineffective strategies. Regularly, most of the organizations (especially multinational corporations) review strategic plans only on annual basis. Therefore, such approach eliminates any opportunity for new proposals that may come throughout the year from different sources. Only during the typical annual meetings. To be more precise, many valuable projects could appear randomly and companies simply deprive themselves from additional sources of income. Chrusciel, D., & Field, D. W. (2006). To be more efficient, organizations should establish a flexible system that enables to select projects without waiting for any types of planned meetings. Thirdly, we live in highly competitive modern reality, which requires companies to be flexible to any changes and where competition is increasing every day. This is especially true for large international companies, which are often affected by their bureaucracy, which hampers their development. It is mandatory for any type of company to

That means that the choice of portfolio is not always rational and can be caused by the human factor such as lobbying (Englund & Graham, 1999).

3.3 Literature review on quality management tools

As it has been said in theoretical framework (section 3.1), project portfolio selection is closely related with quality management tools. That is why, a certain look on this topic is also important. Different tools start to appear in the 1930s and they were simple enough. The emergence of computer technologies gave a new breakthrough in their development (look at the figure below- new tools start to appear rapidly in the 1980s). Below are presented the key quality management tools and they all are carefully discussed in this section below.

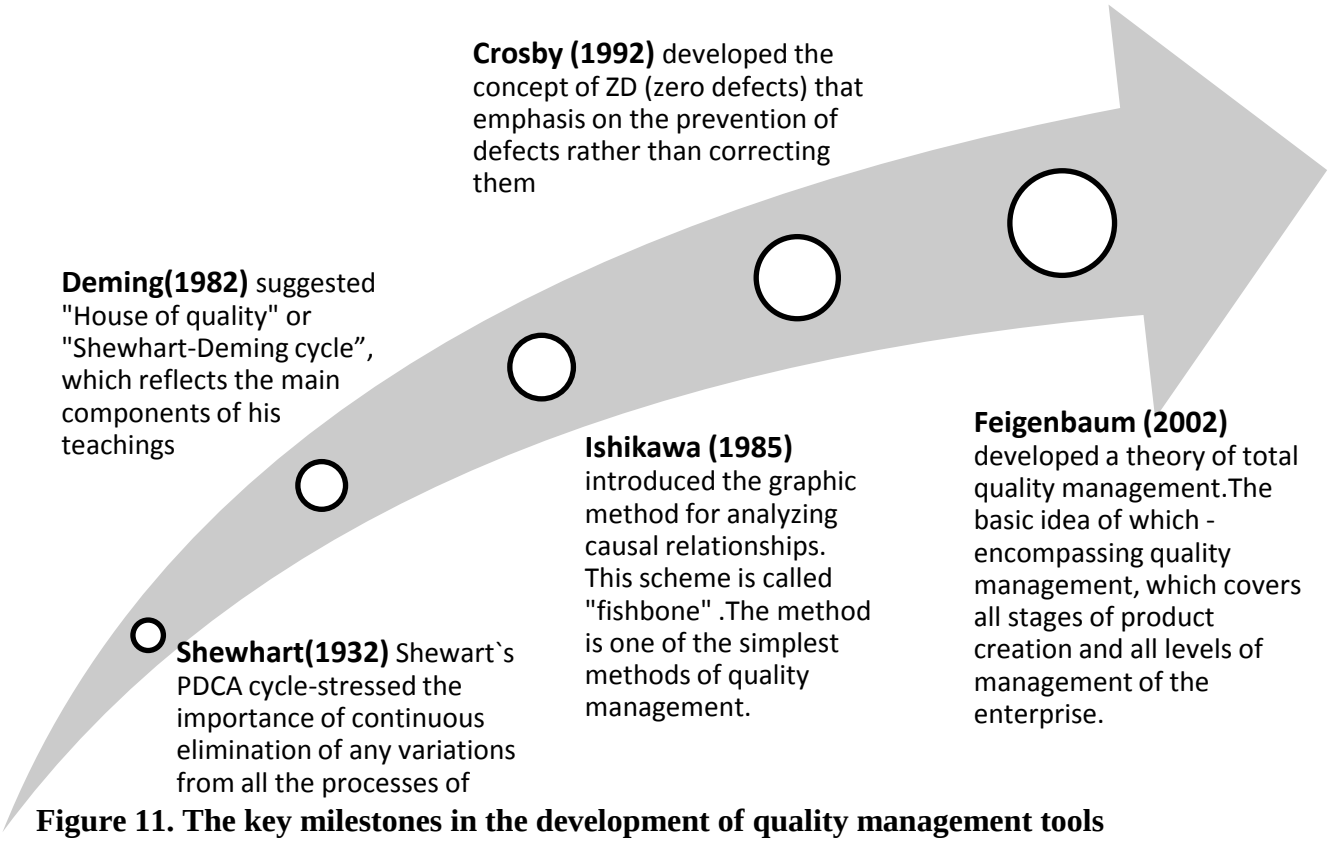


Figure 11. The key milestones in the development of quality management tools

3.3.1 What is a quality?

A number of factors determines stability and success of an enterprise, most important of which is the ability to meet the needs of customers with high quality and safe products. World practice shows that the cost-effectiveness of most organizations is not possible without continuous improvement of their activities, which are connected with products quality. (Imai and Heymans, 1999)

The presence of a competitive environment in a market economy confirms the importance of quality problems. Severe competition in the countries with developed market economies has led to the development of quality improvement programs. There was a need to assess the objective indicators for the production of competitive products. (Vickery and Markland, 1993)

Quality in understanding of a manufacturer and the quality in understanding of a consumer are interconnected. The main difference between them is determined by the terms of the administrative-command and market economy. Under the conditions of administrative-command economy, quality is seen in most cases only from the standpoint of the manufacturer. In a market economy, quality is considered from the standpoint of the consumer. The quality of the product may occur during consumption. The concept of quality from the perspective of its compliance with the requirements of the consumer is formed in a market economy. (Papadopoulos, and Heslop, 1990).

World experience shows that in many countries scientific and technological progress was connected with a breakthrough in the management of product quality, which allowed them dramatically increase consumer demand inside the country as well as around the world. (Bell and Albu, 1999). The role and importance of quality for the formation of country's economy are now becoming dominant. Quality - the main indicator of evaluation of products, works and services. It determines the level of life of every person and of a society as a whole.

The consumer should be central to the quality management system, the purpose of which should be continuous improvement of customer satisfaction. Products based on customers' requirements will ensure a high level of quality and competitiveness in the management of product quality, as well as allow to minimize possible adjustments of the product after its appearance on the market.

3.3.2 Quality management tools

There are different concepts of quality management. The basic concept is a universal quality management systems based on "TQM", the ideology that was developed by American scientists Walter Shewhart and William Edward Deming. (Shewhart and Deming, 1939.)

The main idea of the concept of W. Shewhart is to "improve the quality by reducing process variability." (Shewhart, 1931). Reasons of the variability may be general or specific. Shewhart stressed the importance of continuous elimination of any variations from all the processes of production and services. In 1924, the scientist has developed the concept of the production control relevant to the invention and the subsequent use of statistical control charts named "Shewhart individuals control chart." The statistical control methods make it possible to focus on how to increase the number of good products by minimizing variations. Shewhart was the first who has separated the cyclic model of quality management into 4 stages:

1. Plan;
2. Implementation (Do);
3. (Check);
4. Action.

Most widely, this model has been used in Japan.

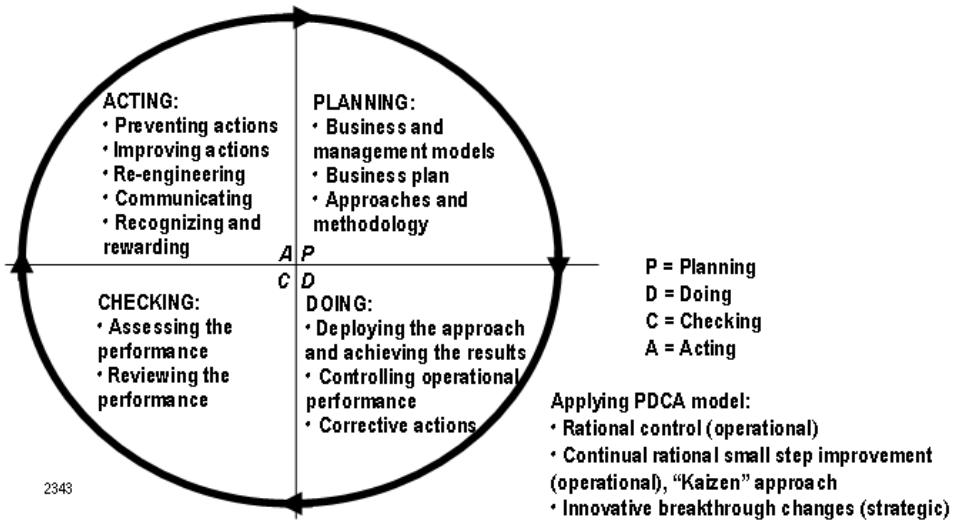


Figure 12. Shewart`s PDCA cycle

In turn, E. Deming developed and proposed a program aimed to improve the quality of work, which is based on three pragmatic axioms:

- Any activity can be considered as a process, and therefore can be improved.
- Production should be considered as a system in a stable or unstable state, so the solution of concrete problems is not enough - you still get only what will give the system. Fundamental changes are needed in the process.
- Senior management of the enterprise must take responsibility for their actions in all cases.

E. Deming suggested so-called "House of Quality" or "Shewhart-Deming cycle", which reflects the main components of his teachings

In 1982, under the editorship of E. Deming (Deming, 1982) was released book "The quality, productivity and competitiveness», which contains 14 postulates that allow companies to organize market research.

Japanese school of management also have success in the development of quality management tools. Kaoru Ishikawa in his book "*What is total quality control?: the Japanese way*" Vol. 215. (Ishikawa, 1985) identified the following conceptual provisions:

1. The main feature is the participation of workers in quality management;
2. The need for regular internal audits of the system of quality;
3. Continuous training of personnel;
4. The widespread introduction of statistical control.

K. Ishikawa introduced the original graphic method for analyzing causal relationships. This scheme is called "fishbone" .His method is one of the simplest methods of quality management.

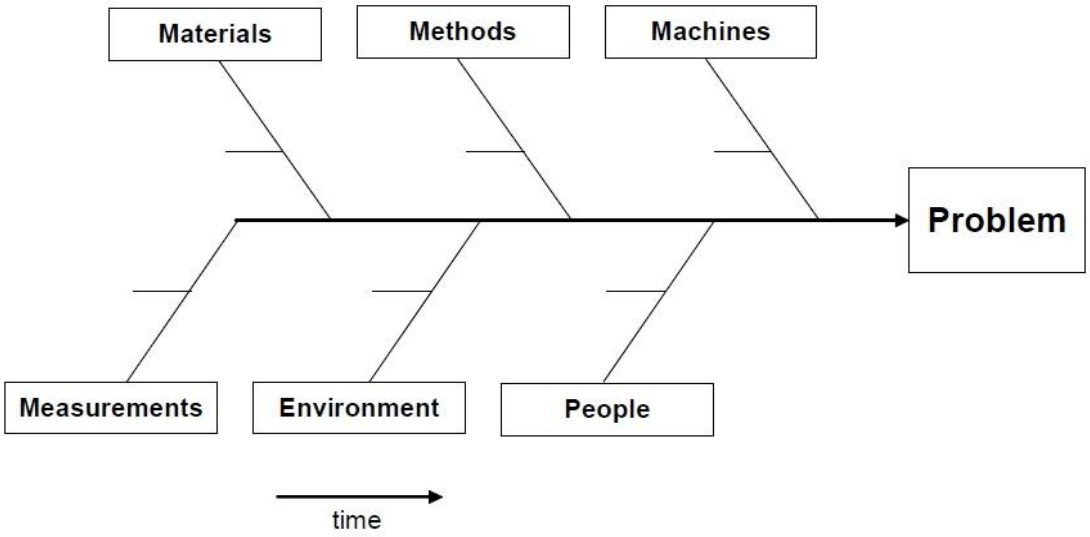


Figure 13. Ishikawa`s "Fishbone"

Joseph Juran was the next, who bring additional value to this concept (Juran, 1988).
This concept is called "AQL- annual improvement of quality." Its main idea - to provide high competitiveness and long-term results. The main principles are:

1. To plan the quality improvements at all levels and in all areas of the company;
2. The development of measures aimed at the prevention and elimination of errors;
3. The transition from the administrative to the systematic management of all activities in the field of quality.

Another scholar of quality management was P. Crosby, who developed the concept of ZD (zero defects) - "zero-defect manufacturing products» (Crosby, 1992).This concept is based on the following assumptions:

1. Emphasis on the prevention of defects rather than correcting them;
2. Focus efforts on the reduction of defects in production;
3. Justification of the needs of consumers in defect-free products;
4. Formation of clear objectives to improve the quality for a long period;
5. Understand that the quality of the campaign is determined not only by the quality of production; processes, but also the quality of the activities of non-production units;
6. Recognizing the need for analysis of financing activities in the field of quality.

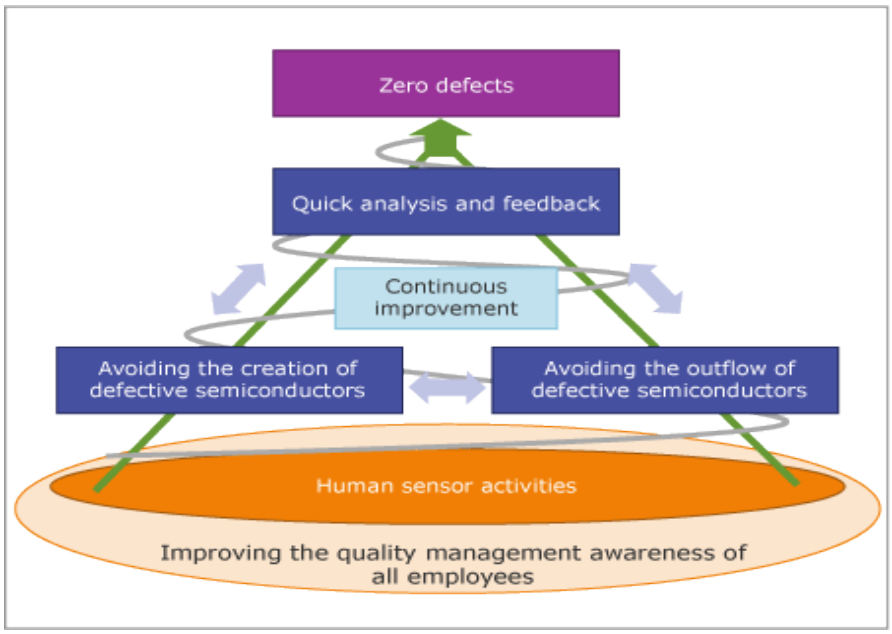


Figure 14. Steps to ensure zero defects

The beginning of the 21 century is connected with work of Armand Feigenbaum who has developed a theory of total quality management (Feigenbaum, 2002). The basic idea of which - encompassing quality management, which covers all stages of product creation and all levels of management of the enterprise in the implementation of technical, economic, organizational, social and psychological interventions.

The development of this conception was the method QFD - "quality function deployment". Its essence is in the planning of the product characteristics on the basis of

market research in order to meet the requirements of customers with the highest quality in the shortest possible time and at the lowest cost producers.

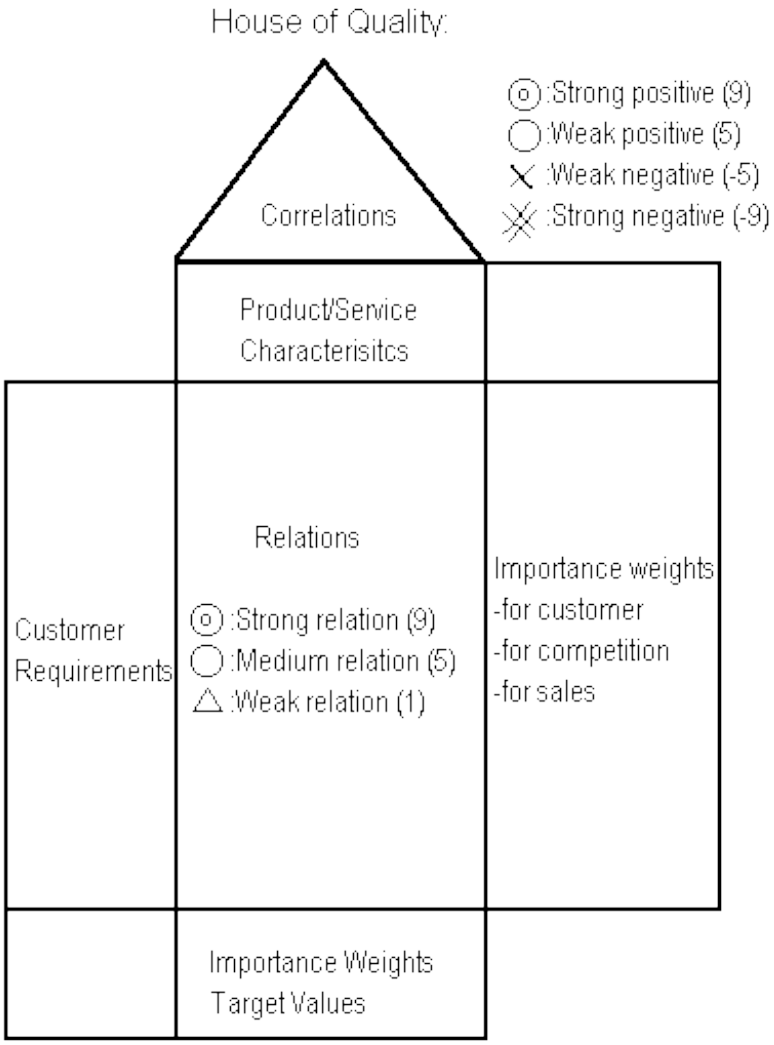


Figure 15. Feigenbaum`s House of quality

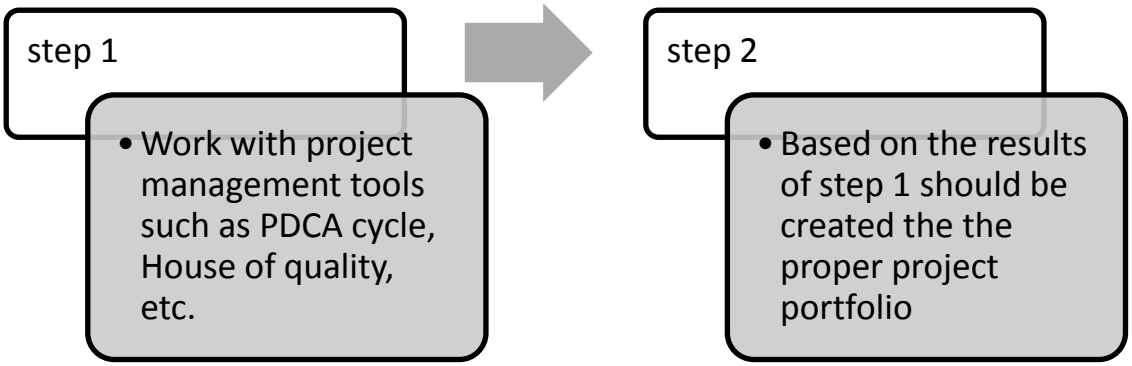
This method- a tool by which the received information is processed and the obtained result is what the user really wants. During the deployment of QFD wishes of consumers are transformed into specific requirements for product development. The study formed the market demands of consumers for quality products, which often contradict each other. For a visual representation of the requirements of consumers is suggested to use QFD "House of Quality", which is a three-dimensional matrix containing the demands of consumers and the

possibility of meeting them. With a score of nature depending on customer requirements on the properties of products get a visual picture of the best variant of the project, translating customer requirements into specific properties of the products.

3.4 Overview of project portfolio methods and models and proposals for their improvement

Different management tools nowadays are extremely interrelated and mutually benefitial (Archer & Ghasemzadeh, 1999).. For quite long period, quality management tools and project portfolio selection techniques were isolated from each other. The given literature review shows that between these two research areas exists the strong cooperation that could bring benefits to many companies. (Archer & Ghasemzadeh, 1999).

Schematically, the interaction can be proposed as the following:



Such approach to management may save a lot of time and money and also increase the total efficiency of the company. Nevertheless, it is still difficult to work with these two research areas at the same time. There is a problem- how to make a shift from step 1 to step 2? This problem is also expressed below:

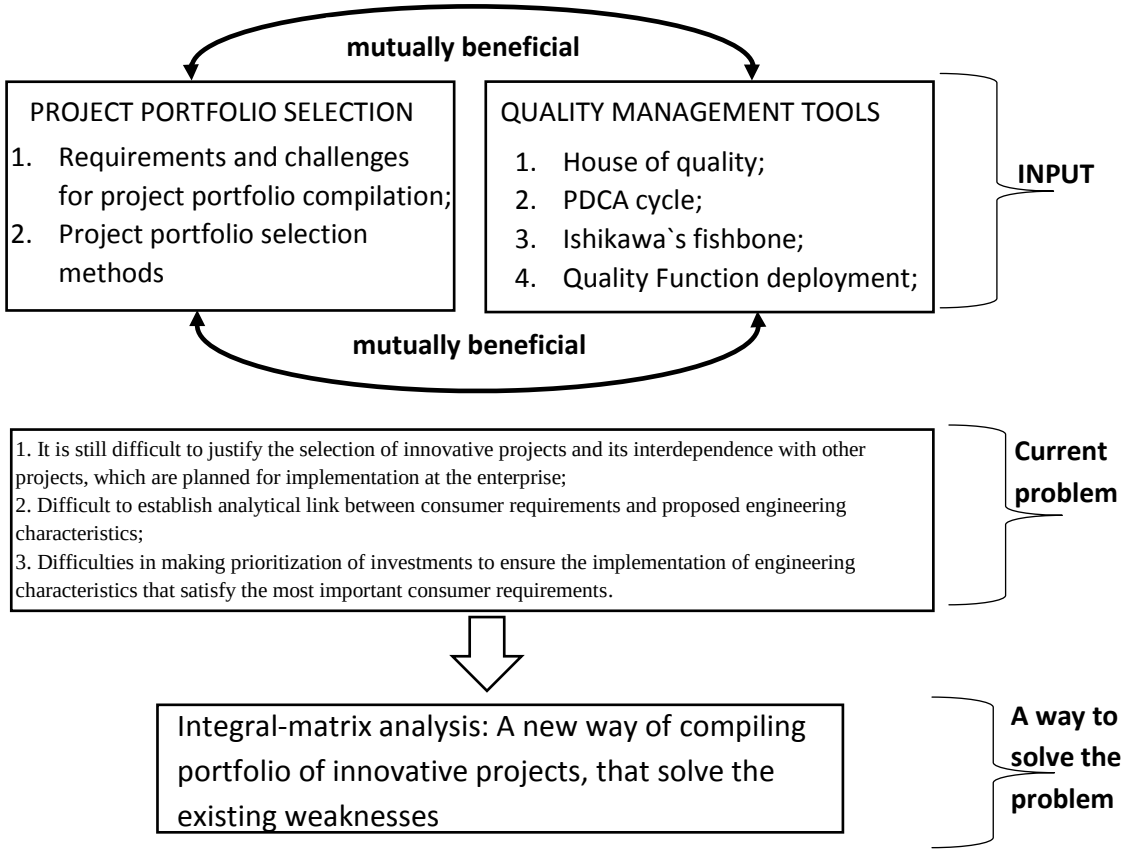


Figure 16. Description of the main findings of literature review

Despite the fact that these two topics are well described, there are still unsolved issues like:

1. How to justify the selection of innovative projects and its interdependence with other projects, which are planned for implementation at the enterprise?
2. How to select project in resource-limited settings?
3. How modern technologies can simplify the work with such tools?
4. How this methods and models can be used in logistics?

In accordance with the above, one of the aims of this Thesis is to create a tool, which simplifies the selection of the most promising logistics projects.

3.5 Proposals for future development of project portfolio methods and introduction of a new tool

Most of the management decisions are accepted in conditions of limited resources and high uncertainty since they depend on many factors, the dynamic of which is not always possible to estimate with reasonable accuracy. Innovative projects are among the most high-risk investments. Therefore, there is a necessity in compiling an effective portfolio of innovative projects to achieve the strategic goals of the enterprise. **How to justify the selection of innovative projects and its interdependence with other projects, which are planned for implementation at the enterprise?** Making management decisions on the choice of the innovative project can be seen as a process that consist of several stages. In accordance with the definition of the algorithm, the algorithm of choice of innovative project can be understood as a sequence of mathematical and logical operations, leading to the problem of the choice of an innovative project in a finite number of steps.

Integral-matrix Analysis is a tool, which is used to identify the logical connections between different parameters. The method of integral-matrix analysis, based on international experience, allows to formalize the process of management decision in terms of innovative product development. Proposed analysis allows to create an algorithm in accordance with which companies can select the most promising projects which meets the customer requirements. The projects can be of any type (organizational, structural engineering, economic, etc.).

The general direction of changes

Objectives to use- to convert the users` needs (customers` requirements) into quality characteristics at the design stage)

Making management decisions on the choice of the innovative project can be seen as a process or algorithm. The purpose of this algorithm - selection of the most cost-effective innovative project. The advantage of this technique in comparison with the well-known method of quality function deployment (House of quality) is the availability of analytical coefficients of mutual connection between separate engineering characteristics and customer requirements. In addition, this method shows not only an interdependency

between engineering characteristics and customer requirements, but also reveals how different engineering characteristics are connected with each other. This is also very important aspect because some characteristics of the future project could be mutually exclusive and it`s better to see it at the stage of planning and not during implementation phase.

Information support of the analysis is based on market research, information about competitive products (projects), opinions of experts and organizations. A formal algorithm of integrated-matrix analysis allows you to automate the analytical calculation of the interconnection of consumer requirements and helps to improve efficiency.

In comparison with conventional methods, the method of integral-matrix analysis provides the following advantages:

- Enables to established analytical link between consumer requirements and proposed engineering characteristics;
- Makes prioritization of investments to ensure the implementation of engineering characteristics that satisfy the most important consumer requirements.

The results of the analysis could be used to determine the best sequence of projects in resource-limited settings.

In order to conduct the analysis it is needed to insert the required grades into the block of input data. Initial data should be entered in the appropriate cells, and then the results of the analysis are calculated automatically. For convenience, the results of the analysis are presented in tabular form. Calculations carried out by a numerical method for the general equation.

4. THE ALGORITHM OF CHOICE OF INNOVATIVE PROJECTS. SELECTION OF PRIORITY DIRECTIONS FOR THE DEVELOPMENT OF IMATRA`S LOGISTICS HUB

The goal of this chapter is to make the description of "Integral-matrix analysis", and to show in which circumstances it is more preferable to use this tool. The biggest part of the chapter discovers the stages, according to which the analysis should be done in order to get a proper list of projects. The proposed algorithm will be used as the basis for chapter five, the main goal of which is to create a portfolio of logistics projects for the region of Imatra.

4.1 Description of the tool

To achieve the goals of the project **was written** a program **(named "integral-matrix analysis")** that facilitates the choice of projects**.**

This program enables:

- To set the relationship between customer requirements and engineering characteristics of the product based on the methodology of quality function deployment;
- To define the requirements for the new product;
- To rank consumer requirements on the quality of the project and set weighting coefficients;
- Scientifically prove consumer preferences and correlation between the quantifiable indicators.

The program was written in 2014 in South Ural State University (Chelyabinsk, Russia).All the members of the team are connected with South Ural State University. The project is under constant improvements since 2014 (Topuzov, 2005).

Table 7. List of project participants

Name	Position	Responsibilities
Viktor Tomashev	Position: Associate Professor. Degree: Ph.D. of Science	Project director, senior programmer
Dvornichenko Alexander	Position: Associate Professor. Degree: Ph.D. of Science	Methodological description of the project, a proof of the scientific validity
Skorniakov Aleksei	Masters student	Assistance in the development of the algorithm
Prokhorov Aleksei	Masters student	Writing program in Visual Basic , Translation of instructions from Russian into English
Vyacheslav Orlov	PhD student	Working with Mathematical Functions (Visual Basic)
Evgeniy Dzenov	Masters student in LUT	Tester

This program is most useful for determining the optimal sequence of projects in resource-limited settings.

To perform the analysis initial data should be entered in the appropriate cells, after filling them, the results are calculated automatically. For simplification all, the results are presented in tabular form. Calculations carried out by a numerical method of the general equation relating the unknown parameters with administered rates.

Matrix Analysis is a tool, which is used to identify the logical connections between different parameters. The method of integral-matrix analysis, based on international experience, allows to formalize the process of management decision in terms of innovative product development. Proposed analysis allows you to create an algorithm in accordance with which you can select the most promising projects which meets the customer requirements. The projects can be of any type (organizational, structural engineering, economic, etc.).

More detailed description of the tool and its use are presented in chapters 5 and 6.

Scientific novelty

In comparison with conventional methods, the method of integral-matrix analysis provides the following advantages:

• Enables to established analytical link between consumer requirements and proposed engineering characteristics;

• Makes prioritization of investments to ensure the implementation of engineering characteristics that satisfy the most important consumer requirements.

The results of the analysis could be used to determine the best sequence of projects in resource-limited settings.

In order to conduct the analysis it is needed to insert the required grades into the block of input data. Initial data should be entered in the appropriate cells, and then the results of the analysis are calculated automatically. For convenience, the results of the analysis are presented in tabular form. Calculations carried out by a numerical method for the general equation.

Approbation of the tool

The results are discussed and suggested with supervisor employee, the director of international service of «Imatra Region Development Company Ltd. ». The program has been presented to «Logistics Development Forum» - a collaboration network specialized in strategic development and leadership in Northern Europe. By common agreement, both companies can use freely this tool in order to deal in a better way with logistics project.

4.2 Stages of implementation of the analysis

The integral-matrix analysis is divided into 8 separate steps. The result is visualized in the form of a scheme (algorithm) that should be followed during the implementation of the project. At the end, the algorithm can be repeated again, but at a deeper level. In this case, the most important engineering characteristic should be presented as a customer requirement and then we should create new engineering characteristics for it. By doing so, we move away from general statements to specific problems that need to be done. This section describes all the stages of the "Integral-matrix analysis" as well as the key features that should simplify the work with the program.

Stage 1. Formulation of research objectives

At this stage, we formulate the objectives of the project in which we are planning to add innovative changes. The overall objective - to select the conditions under which increases the probability of successful commercialization of new (modernized) project.

In this project out research objective is _____(name of research objective)

Stage 2. Analysis of customer requirements

The main goal of this stage is to determine the key requirements that customers/stakeholders impose on project. It can be achieved with the help of conducting surveys among experts or participants of this market. In output we`ll get ranked list of customer requirements. In the program, which is implemented in Excel, we should insert all this information in Table 1-"Customer requirements (CR) and their evaluation". It looks as follow:

Table 8. Matrix INPUT of customer requirements

№	**Name of customer requirement (*CR*)**	Score (0-10)		
		Current state of affairs	**Desirable state of affairs**	**The results of calculation**
1	Customer requirement 1			
2	Customer requirement 2			
3	Customer requirement 3			
4	Customer requirement 4			
5	Customer requirement 5			
6	Customer requirement 6			

In this table, the key columns are "Name of customer requirement (*CR*)", "Current state of affairs", "desirable state of affairs" and "the results of calculation". The user should insert the information only in the first three columns. The last column will be calculated automatically.

In the project, description of each requirement and an explanation of each mark (current and desired) is obligatory.

For instance, it can be done the following way:

1. Consumer requirement __ of the project – **(**name of the customer requirement and brief explanation). In this project, current state of affairs of CR __ equals __, while desirable state of affairs is __.

When the table is filled, one can move to the next stage.

Stage 3. The choice of engineering characteristics that provide consumer requirements of the project.

At this stage, we have to work with engineering characteristics. Simply speaking, engineering characteristics are the projects, through which can be implemented customer requirements. In the program "Integral-matrix analysis", this is the Table 2 "Characteristics to ensure implementation of the chosen consumer requirements".

Table 9. Characteristics ensuring the realization of selected consumer demands in the market

№	Name of engineering characteristic (EC)	The result of calculation of EC
1	*EC 1 of product*	
2	*EC 2 of product*	
3	*EC 3 of product*	
4	*EC 4 of product*	

As with previous stage, an explanation of each of the selected engineering characteristics is necessary.

For example, the following form can be used for description of characteristic:

Under engineering characteristics we understand the following:

1. EC 1 of the project. It is_____ (general definition).

2. EC 2 of the project. It is_____ (general definition).

3. EC 3 of the project. It is_____ (general definition).

4. EC 4 of the project. It is_____ (general definition).

5. EC 5 of the project. It is_____ (general definition).

When all customer requirements and engineering characteristics are defined, it is necessary to make correlation between them. Correlation is crucial to understand how different characteristics could match different requirements.

Stage 4. Correlation between customer requirements and engineering characteristics (score from 0 to 1)

Correlation of engineering characteristics and customer requirements is made with the help of matrix which is performed in table №3 where vertically laid customer requirements *CRi* and horizontally- engineering characteristics *ECj*. At the crossing are written interconnection coefficients *Aij*.

The coefficient reflecting the effect of mutual influence and ensure consumer characteristics, can vary from zero to one. Unit means the maximum (full) interaction factors. When zero is any connection missing. Intermediate values show the tendency of mutual dependence.

Stage 5. Correlation of engineering characteristics

Table 10. Correlation between customer requirements and engineering characteristics (score from 0 to 1)

Correlation between customer requirements and engineering characteristics (score from 0 to 1) Where i - number of customers requirement; j - number of engineering characteristic							
			Engineering characteristics (table 3)				
№	Customers requirements CRi (goals), to be achieved	designation (i - line number, j - column number)	EC 1	EC 2	EC 3	EC 4	EC 5
i	Yi, INPUT	Aij	Ai1	Ai2	Ai3	Ai4	Ai5
1	CR 1	A1j					
2	CR2	A2j					
3	CR 3	A3j					
4	CR 4	A4j					
5	CR 5	A5j					
6	CR 6	A6j					

Since the implementation of certain features ensuring affect the feasibility of others, it is necessary to reveal how much they influence each other. The relationship can reflect the characteristics of the coefficient Kij, which is entered in the table 6.

Table 11. Correlation between the chosen engineering characteristics (from -1 to +1)

№	Name of engineering characteristic	*EC 1*				
1	***EC 1***	*X*	***EC 2***			
2	***EC 2***		***X***	***EC 3***		
3	***EC 3***			***X***	***EC 4***	
4	***EC 4***				***X***	***EC 5***
5	***EC 5***					X

Below should be explained the reason of different correlation results.

Stage 6. Estimation of weights of consumer requirements

Estimation of weights of consumer requirements takes into account both basic condition of the CR and the necessary degree of improvement of each requirement in the project.

The program, implemented in the format of Microsoft Office Excel calculate the degree of improvement according to the following formula:

$$K_{pi} = P_{npi} / P_{бi..}$$

Further, we rate the share of each costumer requirement of total with the use of formula:

$$R_{nmi} = P_{npi} / \sum P_{npi}$$

To determine the weight (*Vmni)* of each customer requirement was used the formula:

$$Vmni = Kpi \times Rmni .$$

It also important to determine the share of each customer requirement of total. If *ΣVmni is the total and Vmni (oe)* is the share of single customer requirement, though we got the formula:

$$Vmni(oe) = \frac{Vmni}{\sum Vmni}.$$

Therefore, requirements, that have the greatest weight and the biggest share of total should be considered as the most promising and selected among the first for implementation.

Stage 7. Assessment of priority projects

According to calculations, in output we get a list of customer requirements with the highest priority. (Below should be presented a list)

1. Customer requirement 1;
2. Customer requirement 2;
3. Customer requirement 3

To implement this requirements, the following engineering characteristics should be done in our project (the list of priority characteristics should be written)

1. Engineering characteristic 1;
2. Engineering characteristic 2;
3. Engineering characteristic 3

Stage 8. Drawing an algorithm of projects implementation

The purpose of this algorithm - visualization of the priority among the most innovative project. Below is presented a scheme of how the selected projects should be implemented (so-called step-by-step instruction).

These are all the stages of the tool, which will be used next in the text chapter.

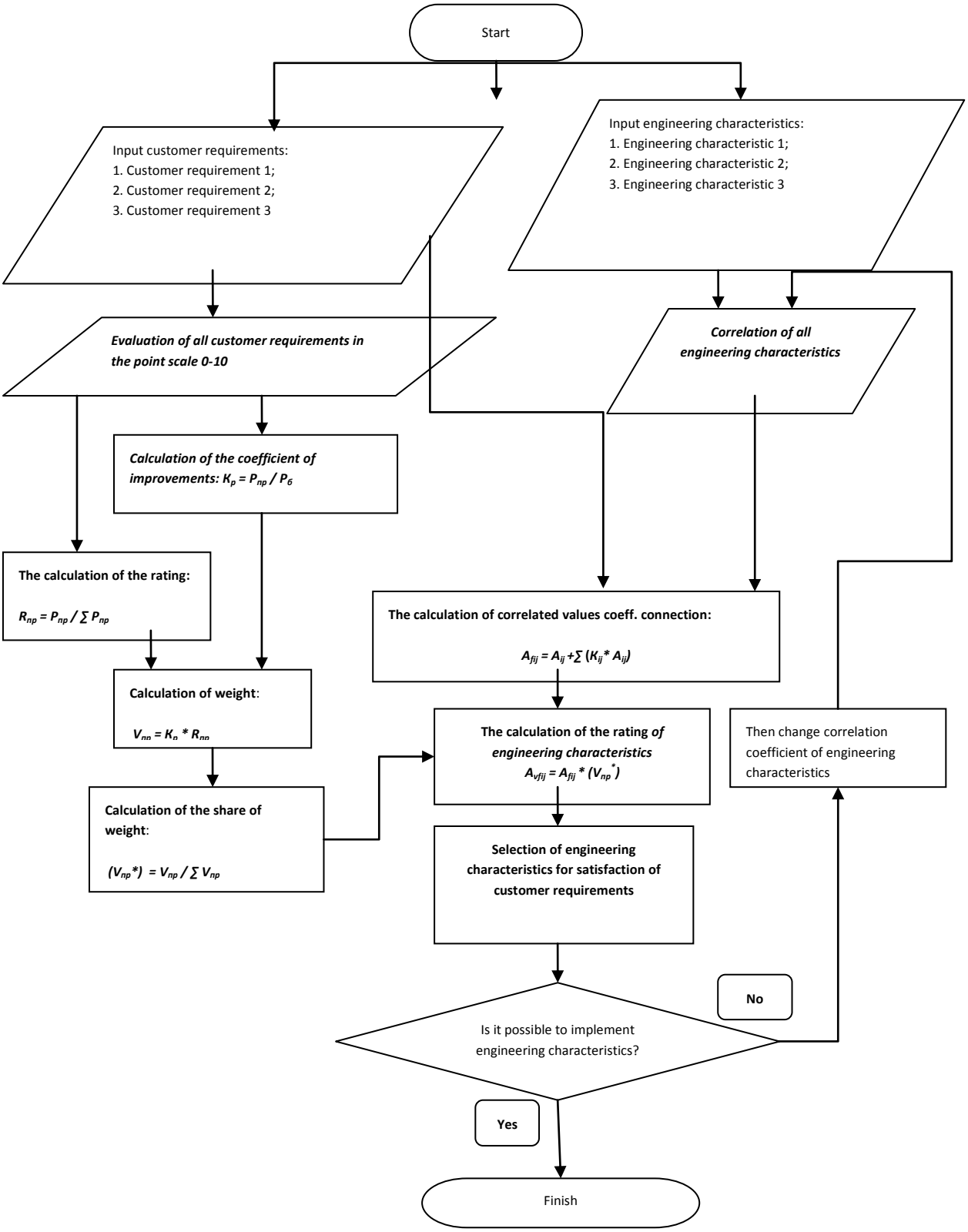


Figure 17. Possible algorithm of projects implementation

5. USE OF INTEGRAL-MATRIX ANALYSIS TO ESTABLISH GOALS OF IMATRA`S DEVELOPMENT AS A LOGISTICS HUB

This chapter uses "Integral-matrix analysis" to find out the most promising logistics projects. The chapter is divided into 8 stages (as it`s been explained in previous chapter). In output, we will get a ready-made project portfolio of Imatra`s logistics development. Overall objective of the project is to strengthen local and regional logistics by implementing the most effective projects. Overall, chapters 4 and 5 answer the first research question of the thesis and serve as a foundation for the second research question.

5.1 Use of "Integral-matrix analysis"

The whole analysis is done according the stages that have been presented in chapter 4.

Stage 1. Formulation of research objectives

At this stage, we formulate the objectives of the project in which we are planning to add innovative changes. The overall objective - to select the conditions under which increases the probability of successful commercialization of new (modernized) project.

In this project out research objective is the development of Imatra`s logistics hub through implementation of several projects

Stage 2. Analysis of customer requirements

According to the information, which was obtained during conversations with employer supervisor, the consumer requirements to the project of region`s development are the following (Table 12).

Table 3. Consumer requirements (CR) and Score

Table 12. Matrix INPUT of customer requirements

№	Name of consumer requirement (*CR*)	Score (0-10)	
		Current state of affairs	Desirable state of affairs
1	Active cooperation with Russia	*6*	*10*
2	Establishing business networks with other logistics centers	5	7
3	Participation in new logistics routes	4	8
4	Attracting new cash flows to the Imatra region	7	9
5	Speeding up border logistics	5	7
6	Ensure full capacity utilization of the LC	7	10

In this project, under the requirements of the consumer accepted the following:

1. Consumer requirement 1 of the project – Active cooperation with Russia. Russia seems as a big influential neighbor whose projects can cause dramatic changes in Finnish logistics chains. . In this project, current state of affairs of CR 1 equals 6, while desirable state of affairs is 10.

2. Consumer requirement 2 of the project – Establishing business networks with other logistics centers. This project will facilitate the development of transnational logistics centers and increase accessibility of remote areas for transportation. The transfer of knowledge between partners and multinational players in the market, as well as cooperation in the field of harmonization of multinational logistics services are important additional effects. In this project, current state of affairs of CR 2 equals 5, while desirable state of affairs is 7.

3. Consumer requirement 3 of the project – Participation in new logistics routes. From time to time appear new routes, participation in which could be very attractive in

terms of additional money flows. In this project, current state of affairs of CR 3 equals 4, while desirable state of affairs is 8.

4. Consumer requirement 4 of the project – Attracting new cash flows to the Imatra region. In this project current state of affairs of CR 4 equals 7, while desirable state of affairs in 9.

5. Consumer requirement 5 of the project – Speeding up border logistics. How to speed up border logistics and which technologies are among the best for it? In this project current state of affairs of CR 5 equals 5, while desirable state of affairs in 7.

6. Consumer requirement 6 of the project – Ensure full capacity utilization of the LC .It may happen that logistics center has well-equipped warehouses but there are no consumers for these spaces. In this project current state of affairs of CR 6 equals 7, while desirable state of affairs in 10.

Stage 3. The choice of characteristics that provide consumer design features of the new product (service)

Below is presented a list of engineering characteristic (projects) that can be used to strengthen Imatra`s logistics.

Table 13. Matrix INPUT of engineering characteristics

№	Name of Engineering characteristic
1	Introduction of new technologies in the border logistics (for its acceleration)
2	Market research on key areas of logistics development of Russia
3	Negotiations about cooperation with the new logistics centers
4	Carrying out commercial transactions in order to join the new trade routes
5	Measures to attract new suppliers to the region

For this project, the following engineering characteristics were selected:

Engineering characteristic 1 of the project – Introduction of new technologies in the border logistics (for its acceleration);

Engineering characteristic 2 of the project – Market research on key areas of logistics development of Russia;

Engineering characteristic 3 of the project – Negotiations about cooperation with the new logistics centers;

Engineering characteristic 4 of the project – Carrying out commercial transactions in order to join the new trade routes;

Engineering characteristic 5 of the project – Measures to attract new suppliers to the region.

Stage 4. Correlation of engineering characteristics and customer requirements

Correlation of engineering characteristics and customer requirements is made with the help of matrix which is performed in table №3 where vertically laid customer requirements *CRi* and horizontally- engineering characteristics *ECj*. At the crossing are written interconnection coefficients *Aij*.

The coefficient reflecting the effect of mutual influence and ensure consumer characteristics can vary from zero to one. Unit means the maximum (full) interaction factors. When zero is any connection missing. Intermediate values show the tendency of mutual dependence.

Table 14. Correlation between Customers' requirements and engineering characteristics (score from 0 to 1)

№	Customers' requirements CRi (goals), to be achieved	Name of engineering characteristics (EC) and the connection between EC and CR				
		Events for the introduction of new technologies in the border logistics (for its acceleration)	Market research on key areas of logistics development of Russia	Negotiations about cooperation with the new logistics centers	The search for new logistics routes	Measures to attract new suppliers to the region
1	Active cooperation with Russia	0,7	1	0,7	0,7	0,7
2	Establishing business networks with other logistics centers	0,3	0,6	1	0,5	0,5
3	Participation in new logistics routes	0,6	0,5	0,7	1	0,6
4	Attracting new cash flows to the Imatra region	0,2	0,5	0,1	0,5	1
5	Speeding up border logistics	1	0,3	0,2	0,2	0,7
6	Ensure full capacity utilization of the LC	0,5	0,1	0,1	0,5	0,9

Stage 5. Correlation of engineering characteristics

Since the implementation of certain engineering characteristics affect the feasibility of others, it is necessary to reveal how strong they influence each other. The relationship can reflect the characteristics of the coefficient Kij that is entered in the table 4

Table 15. Correlation matrix of engineering characteristics

		1				
№	**Name of engineering characteristics (EC)**	Introduction of new technologies in the border logistics (for its acceleration)	2			
1	Introduction of new technologies in the border logistics (for its acceleration)		Market research on key areas of logistics development of Russia	3		
2	Market research on key areas of logistics development of Russia	0,7		Negotiations about cooperation with the new logistics centers	4	
3	Negotiations about cooperation with the new logistics centers	0,8	0,4		Carrying out commercial transactions in order to join the new trade routes	5
4	Carrying out commercial transactions in order to join the new trade routes	0,5	0,8	1		Measures to attract new suppliers to the region
5	Measures to attract new suppliers to the region	0,7	0,4	0,2	0,5	

Stage 6. Estimation of weights of consumer requirements

Estimation of weights of consumer requirements takes into account both basic condition of the CR and the necessary degree of improvement of each requirement in the project.

The program, implemented in the format of Microsoft Office Excel calculate the degree of improvement according to the following formula:

$$K_{pi} = P_{npi} / P_{бi..}$$

Further, we rate the share of each costumer requirement of total with the use of formula:

$$R_{nmi} = P_{npi} / \sum P_{npi}$$

To determine the weight (*Vmni)* of each customer requirement was used the formula:

$$Vmni = Kpi \times Rmni .$$

It also important to determine the share of each customer requirement of total. If *ΣVmni is the total and Vmni (oe)* is the share of single customer requirement, though we got the formula:

$$Vmni(oe) = \frac{Vmni}{\sum Vmni} .$$

Therefore, requirements, that have the greatest weight and the biggest share of total should be considered as the most promising and selected among the first for implementation.

Stage 7. Assessment of priority projects

According to calculations, in output we get a list of customer requirements with the highest priority. (Below should be presented a list)

1. Active cooperation with Russia;

2. Introduction of new technologies in the border logistics;

3. Commercial transactions to enter new routes.

№	Name of engineering characteristics (EC)	Note	The result of calculation of EC
i	Yi, INPUT		Importance of each charct-s
1	Introduction of new technologies in the border logistics (for its acceleration)		21,42%
2	Market research on key areas of logistics development of Russia		24,11%
3	Negotiations about cooperation with the new logistics centers		18,18%
4	Carrying out commercial transactions in order to join the new trade routes		19,43%
5	Measures to attract new suppliers to the region		16,86%

Table 16. Results of the analysis and rating of the projects

To implement this requirements, the following engineering characteristics should be done in our project (the list of priority characteristics should be written)

As we see from the table 16, "Market research on key areas of logistics development of Russia" is the project with the highest importance;

Stage 8. Drawing an algorithm of projects implementation

Below is presented an algorithm of how the whole project should be done.

Based on this analysis, we can say that the priority project in our conditions will be **Market research on key areas of logistics development of Russia.**

The project can stimulate the development of logistics hub in Imatra. According to the structure of the thesis, chapters 6 and 7 are focused on market research, while in chapter 2 was explained the methodology of the research. Once again, it is crucial to admit, that with the help of integral-matrix analysis we managed to cut-off all unnecessary actions and go directly to the potential project.

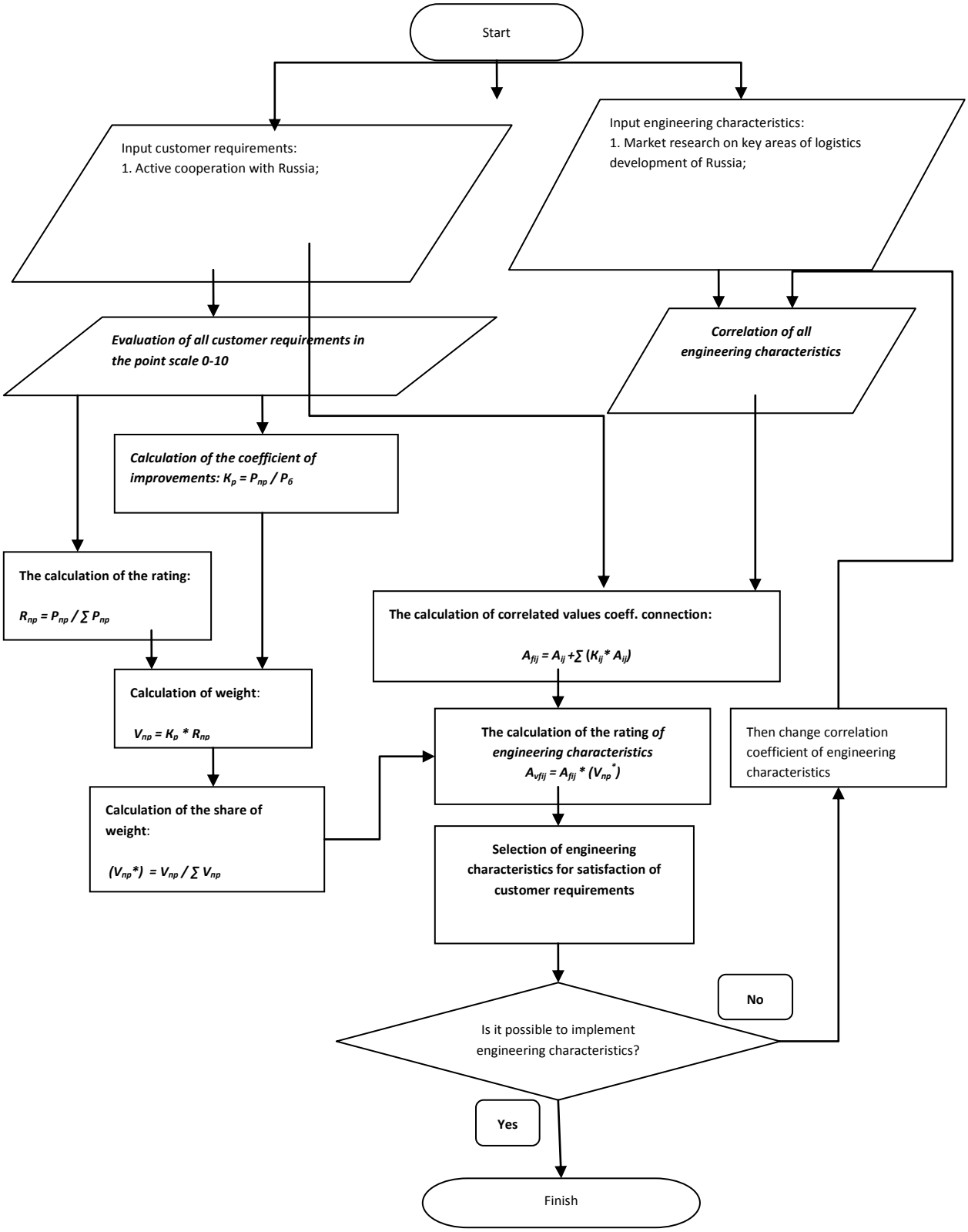


Figure 18. Algorithm of project`s implementation

6. MARKET RESEARCH ON KEY AREAS OF LOGISTICS DEVELOPMENT OF RUSSIA

This chapter starts answering the second research question. Based on the results of "integral-matrix analysis" the author of the thesis has decided to make market research of logistics development of Russia in order to strengthen Imatra`s positions in logistics and trade. At first glance, it may seem that this is quite a controversial decision, which is unlikely to enhance the region's logistics. However, according to the requirements of employer supervisor and the results of the analysis from chapter 5 (that reveals that market research on Russia is the project with the highest priority in these conditions) this project was done in chapters 6 and 7.

The aim of this market research is to show the real impact of Russia on logistics potential of Imatra and Nordic region.

Market research is done in accordance with the research design and methodology of chapter 2 (subchapter 2.3). In chapter 6 is presented secondary data research, which is divided into two big subtopics ("key logistics projects of Russia which can be beneficial for Finland" and "Logistics potential of various regions of Russia for Finland"). The main objective of secondary data research is to find out how Imatra could use the emerging logistics potential of Russia- what are new business opportunities, which may stimulate financial investments. Based on the results of subtopics, the common conclusion on secondary data research is done.

6.1 Background

Logistics and transport infrastructure play an important role in the economy of Finland. According to the Ministry of Transport and Communications of Finland, the share of the transport complex traditionally accounts for about 10% of the gross domestic product of the country, more than 15% of energy consumption and about 40% of the total consumption of petroleum products.

The transport and logistics market of Finland has a number of unique features. These include the transit role of the country in the transportation of goods and passengers between the East and the West, economic dependence on foreign trade, relatively low intensity of the traffic flows in comparison with other European countries, as well as the significant costs of construction and maintenance of highways and other infrastructure in cold climates.

Due to the fact that the transport routes that link Russia and Finland do not fully meet the bilateral trade between two countries, there is a significant potential for development of logistics infrastructure.

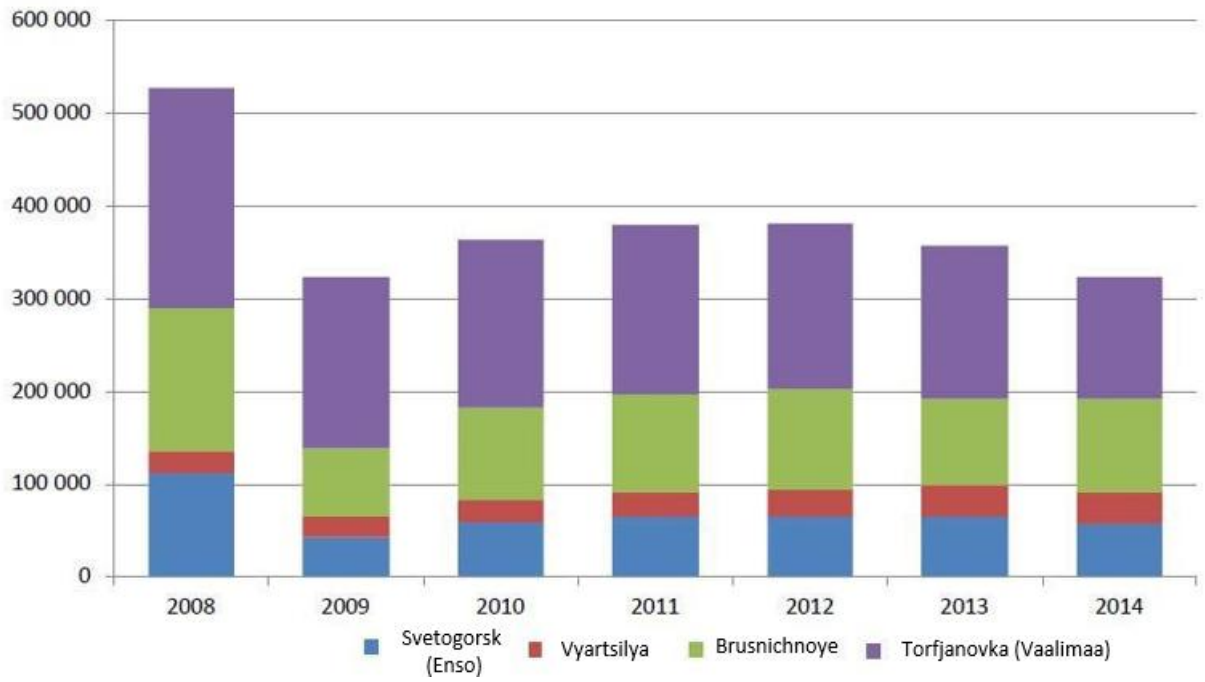


Figure 19. The number of trucks (in units) crossing the Russian-Finnish border (adopted from statistics of Finnish customs, 2015)

It seems that one of the brakes of the promotion is the lack of the necessary harmonization of national transport strategies of Russia and the Nordic countries. First of all I mean "Transport Strategy of the Russian Federation for the period till 2030", "Strategy of socio-economic development of the North-West Federal District until 2020" and the "State program on development of Finland's road transport infrastructure until 2020". Despite the fact that these documents are very fully and comprehensively take into account the peculiarities of transport systems in our countries, as well as economic dependence on foreign trade, they, nevertheless, are not fully interconnected, which reduces the mutual competitiveness of our neighboring countries.

In recent years, Russia and Finland adopted measures to reduce transport costs, primarily by improving the interoperability of different transport modes, improving the efficiency of the transport market and the use of information technology. Successfully tried out innovative approaches to Russian-Finnish transport cooperation, including the organization of a high-speed passenger rail

service between St. Petersburg and Helsinki, the ferry service between the cities and implementation of projects for the use of intelligent transport systems.

Active work carried out by the Finnish Government to increase the attractiveness of transport and logistics routes for Russia primarily by improving the interoperability of different transport modes, improving the efficiency of the transport market and by using modern information technologies. The success of such projects in our countries depend on the continuation of the work on simplification of customs procedures, visa regime and introduction of new services in transport, as well as the overall modernization of the transport and logistics infrastructure. In some areas, by working together we have achieved some success.

The aim of this market research is to show the real impact of Russia on logistics potential of Imatra and Nordic region.

As a rule, logistic operations that concern Russia always offer great opportunities to Finland. Despite the great risks, (such as instability of Russian currency, or inevitable bureaucracy) Russia still is very attractive for Finnish actors because of its enormous population and relatively strong economic growth. This marketing research shows the current situation in Russian logistics and reveals the opportunities that Finland could have there.

In 2008, Russia has accepted new transport strategy until 2030 with billion investments in logistics infrastructure. This marketing research actually show the future steps of Russian logistics at the state level. The main question is whether there is enough willingness of Finland to participate in these projects as a financial investor.

In addition, the major part of the work is connected with understanding how different companies operate in logistics and the search of key drivers that shape Russian logistics. The topic is quite extensive and different sources of information were used.

6.2 Secondary data research. Key logistics projects of Russia which can be beneficial for Finland

Transport Strategy of Russia for the period up to 2030 was approved and adopted by the Russian government in 2008.Later, in 2012 has appeared the need in amendments for the forecasts due to Russia's entry into the WTO. The objectives remained the same, but became more extensive and related to the development of all transport infrastructure - from footpaths to the air and water ports, pipelines and, of course, the rail network. The key objective is to create a single organically articulating space in the country. Not surprisingly, in general, the strategy has met almost unanimous approval in expert circles as prescribed results amaze even the most demanding professionals.

The goal of this subchapter is to show what has been achieved and what is not in this strategy. For this purpose, I have studied how effectively were implemented the key projects of the strategy which should be completed by the end of 2015.

Finally, I tried to answer the question- "What Russia will do next with transport strategy at Federal Level?" To answer this question, I made a research on the main projects that Russia will launch during the period from 2015 to 2030. For greater clarity, all the results are formed into separate tables (See Appendix 1). These results also provide a clear picture of how Russia is going to cooperate with Finland during the next decade.

All obtained results have practical applications - based on them, the border regions of Finland will be able to build a more effective system of relations with Russia.

In addition, the Finnish development companies may use tables for searching the most promising projects, in which they can invest their finances and obtain the highest profit.

Scenarios

Transportation system may be called one of the basic drivers of economic development, since the transport components are included in all economic activities. For Russia, transportation system is traditionally a sensitive issue: it has long been considered that Russia has no roads, only directions, and even these directions go not in all parts of the country. Therefore, the adoption of the Transport Strategy in 2008 was used to raise the image of authorities in the eyes of the electorate.

When you read the expected results of the strategy, it seems that you see a fabulous dream: planes fly almost in all directions and they constantly take off from airports (even in small towns and

district centers), rivers and seas are full of cruising ships, and in the cities operate water taxis. Vehicles densely load cities, but they all are moving without traffic jams. The railway covers almost all towns and villages, even Siberia`s "emptiness", it is fast, reliable, and cargo logistics is decentralized among different economic zones.

I must say that some of the steps to the approximation of this fabulous future are already done. Since 2009, the strategy was implemented in several federal target programs - "The development of the transport system", "Economic and social development of the Far East and Trans-Baikal" and "South of Russia". Thanks to these programs were built and reconstructed railways, roads, airports, sea and river ports, logistics terminals. In rail transport were completed large infrastructure projects, including construction of new Kuznetsovsky tunnel at the Komsomolsk-on-Amur - Sovgavan and organization of high-speed passenger trains on the route St. Petersburg - Helsinki. As a result, according to the Ministry of Transport, the turnover of the transport complex has grown over the last 10 years by 35%, it reached 2.7 trillion ton-kilometers. The pre-crisis level of 2008 exceeded by almost 4%. Passenger traffic exceeded nearly 530 billion passenger-kilometers.

The new edition of the Transport Strategy aims to achieve six major objectives:

1. Formation of a single transport space in Russia based on a balanced advanced development of efficient transport infrastructure.
2. Ensuring the availability and quality of transport and logistics services in the field of freight traffic on the level of the needs of the developing economy.
3. Ensuring the availability and quality of transport services to the public in accordance with the social standards.
4. Integration into the global transport space, realization of the transit potential of the country.
5. Increase the level of security of the transport system.
6. Reducing the negative effects of the transport system on the environment.

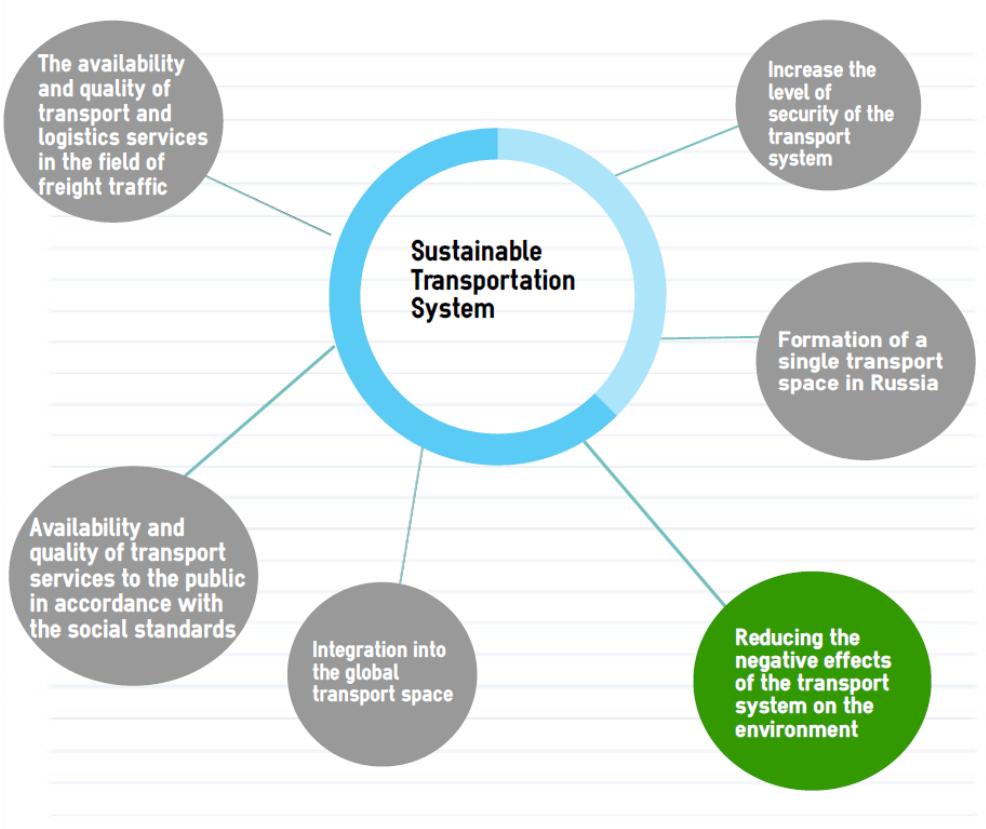


Figure 20. The elements of sustainable transportation system

The strategy plans for the development of the transport complex linked to the development plans of other sectors - industry, agriculture, energy. The strategy takes into account the needs and regions, including the formation of the largest urban agglomerations. However, in this respect there are doubts:

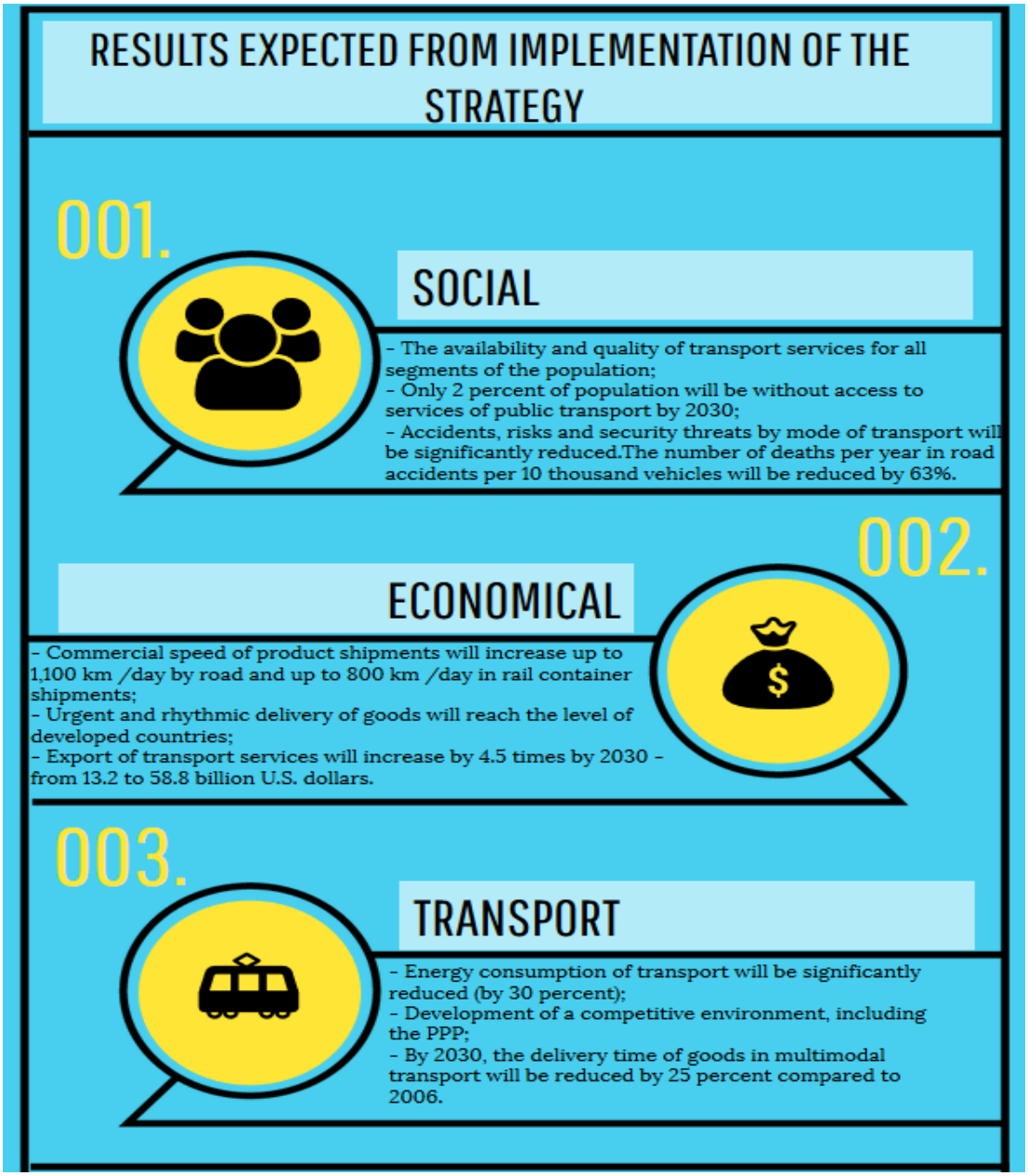


Figure 21. Expected economic results of the implementation of the transport strategy

6.2.1 Results of the first stage of transport strategy of Russia. Expectations and reality

The actual implementation of the current Transport Strategy has begun in 2009. Nevertheless, what are the current results of this strategy? According to the document, the year 2015 is the end of the first phase of the strategy and the beginning of the second phase (2015-2030). Simply speaking, strategy consists of two groups of projects - projects that must be

Geographic location	Project name	Current status	Comment
Central Federal District- Northwest Federal district	*High speed line from Moscow to St. Petersburg*	**Canceled**	Reason- “Sapsan” already exists on this route, the Government decided to focus on high-speed line from Moscow to Kazan.
Central Federal District- Volga Federal District	*High-speed train from Moscow to Nizhny Novgorod*	Successfully done	On June 1st, 2015, a new high-speed train "Strizh" (translated as “Swift”) has made its first trip from Moscow to Nizhny Novgorod.
Central Federal District- Northwest Federal district	*High-speed highway Moscow - St. Petersburg*	Partially done	Speed highway will start its work at full capacity no earlier than 2018.
Central Federal District	*Central Ring Road*	**Delayed**	The beginning of construction was scheduled for 2011, and then moved to 2016; Estimated completion of construction – 2022.
Central Federal District- Southern Federal District	*The federal highway M-4 "Don" Moscow - Voronezh - Rostov-on-Don - Krasnodar - Novorossiysk*	Partially done	Highway with total length 1,500 kilometers already has a number of high-speed sections of categories IB, IA and IB, and by 2019 will be completed.
Siberian Federal District	*The bridge across* the *Nadym River*	Done	The length of *the bridge* is 1340m. It has 12x110m span. Was done in time.
Siberian Federal District	*Bugrinsky Bridge across the Ob River*	Done	*Opened in 2014.*
Siberian Federal District	*Start of construction of the North-Siberian Railway*	**Delayed**	*Presumably designing of the North-Siberian railway will begin in 2016.*
Siberian Federal District	*Boat lift machine for transporting boats between water (Krasnoyarsk dam ship lift)*	**Delayed**	*No fresh information neither in press no in official web sites.*
Central Federal District	*Reconstruction of The Moscow Canal*	**Delayed**	A sensational case involving the theft of about 70% of the funds allocated from the budget for the reconstruction of infrastructure facilities of the Moscow Canal.
Siberian Federal District	*Reconstruction of the railway crossing points across the state border "Naushki"*	**Delayed**	Reconstruction will begin in 2017.
Ural Federal District	*Start of construction speed railway Yekaterinburg - Chelyabinsk*	**Delayed**	During summer 2015 this project was only officially approved, no data about possible start.

Far Eastern Federal District	*Amur-Yakutsk mainline railway*	Almost done	August 30, 2014 was opened for freight trains. Also, the president of Yakutia Yegor Borisov told reporters that the passenger traffic scheduled to open in 2016.

completed before 2015 and projects with deadline in 2030. In this section, I have selected 13 the most important projects of the first phase and checked the level of completion. Below is presented the table with the obtained results (for more information about these projects see Appendix 2).

Interpretation of the results

Figure 22. 13 the most important projects of the first phase of "Russian transport strategy"

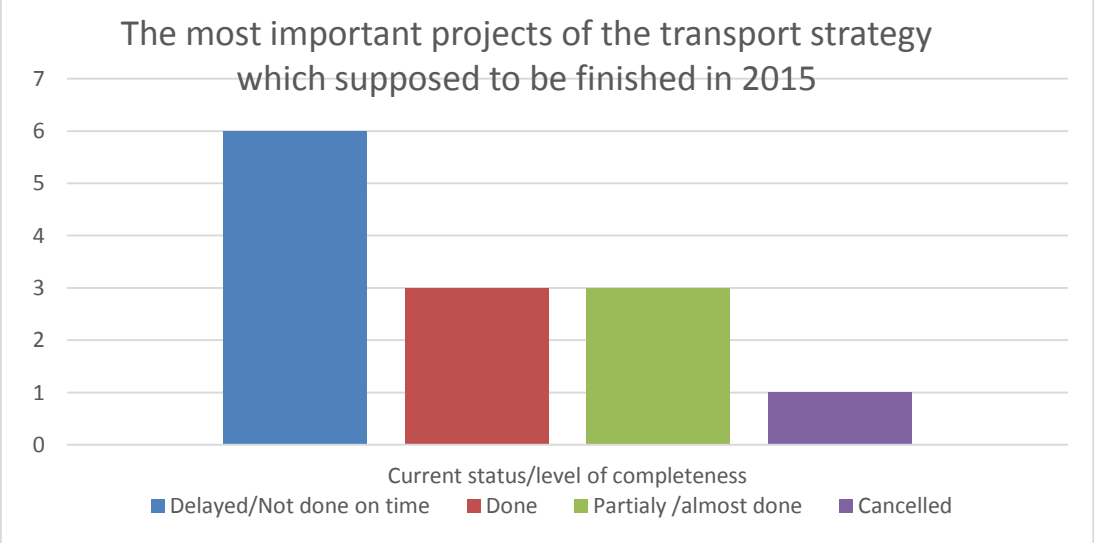


Figure 23. The most important projects of the transport strategy, which supposed to be finished in 2015

As we can see, **7 out of 13** the most important projects that supposed to be finished in 2015 are delayed or cancelled. In most cases, the date of completion of works extended for 2-3 years and even more. In addition we should keep in mind that that the most labor-intensive projects will begin in the period from 2015 to 2030. All this suggests that The Ministry of Transport of the Russian Federation (with the head Maksim Sokolov) inefficiently fulfill its responsibilities and duties.

6.2.2 What Russia will do next with transport strategy at Federal Level?

Previously we successfully figured out, that most of the projects, which form the skeleton of the whole transport strategy, are not completed now. Nevertheless, time flies and soon new projects have to begin. - "What Russia will do next with transport strategy at Federal Level?" To answer this question, was done a research on the main projects that Russia will launch during the period from 2015 to 2030. For greater clarity, all the results are formed into separate tables. These results also provide a clear picture of how Russia is going to cooperate with Finland during the next decade. (The list of these projects is presented in Appendix 1).

6.2.3 Summary on "Key logistics projects of Russia which can be beneficial for Finland"

As it`s been already said, when you read the expected results of the strategy, it seems that you see a fabulous dream. Unfortunately for Russia, not all expected results may become true in the nearest future. Based on the data about the current situation of Russia`s logistic system, as well as the level of completion of key projects, we can safely say that with such slow pace the implementation of the strategy could be delayed for many years.As we know, EU sanctions together with Russian counter-sanctions caused a destructive impact on the Russian market of international transport. Moreover, the road freight was damaged the most. The fact is that before these sanctions 59.2% of all imported EU goods were transported by road. As a result, in 2015 the European sector of international road transport already reduce by 30% and apparently will be reduced up to 65-70%. In addition, road freight pulls the other services into the abyss.

About the strategy we may say that actual implementation of the Transport Strategy began in 2009. The priority (if not the main objective) is to achieve economic growth, increase the competitiveness of the national economy and quality of life through the provision of transport services. It is obvious that, in spite of the active implementation of many projects, the Transport Strategy continues to collapse. Too many core projects are cancelled or delayed. What is worse, Russian economy crisis is raging for a year and it`s not going to slow down the pace.

This part also gives an understanding what Finland should expect from Russia. Russia has a big list of projects for the nearest decade, but Finland practically does not appear in this plans. Anyway,

most of projects will have public-private partnerships sources of financing and that means that Finnish developing companies could try to make investments in them.

6.3 Secondary data research. Logistic potential of various regions of Russia for Finland

Below is presented the checklist of questions that was covered during marketing research of logistics potential of various regions of Russia for Finland:

1. What is the capacity of this logistics market in tons and in terms of money (euros)?
2. Who are the most significant players in this market?
3. Who are interested in logistics services (companies, group of companies)?
4. Which logistics services are the most preferred in the market (warehousing, transportation, packaging, etc.)? What is the share of each service?
5. Which regions are the most dynamic in terms of logistics?
6. What is the forecast about the development of this logistics centers in the medium and long terms (until 2020 and 2025)?

1. What is the capacity of this logistics market in tons and in terms of money (euros)?

According to the estimates of Russian experts, by the end of 2015 the Russian market of logistics services should reach USD 115 billion what is twice bigger than figures that were presented in 2012 (USD 48.5 billion). These figures are higher than world average (before 2013 the annual growth was around 15-30 %. Therefore, the Russian logistics market was among the most promising at the global scale until 2014. Nevertheless, we should take into account sanctions, which were imposed on Russia during the political crisis in Ukraine. Consequently, predictions, which were given before the sanctions, are unlikely to be fulfilled. According to different resources, now the growth rate does not exceed 5 percent. With such pace, we should not expect USD 115 billion market of logistics services earlier than in 2018-2020.

2. *Who are the most significant players in this market?*

Today, the segment of logistics services (warehouses and services in transportation) is represented by two big groups

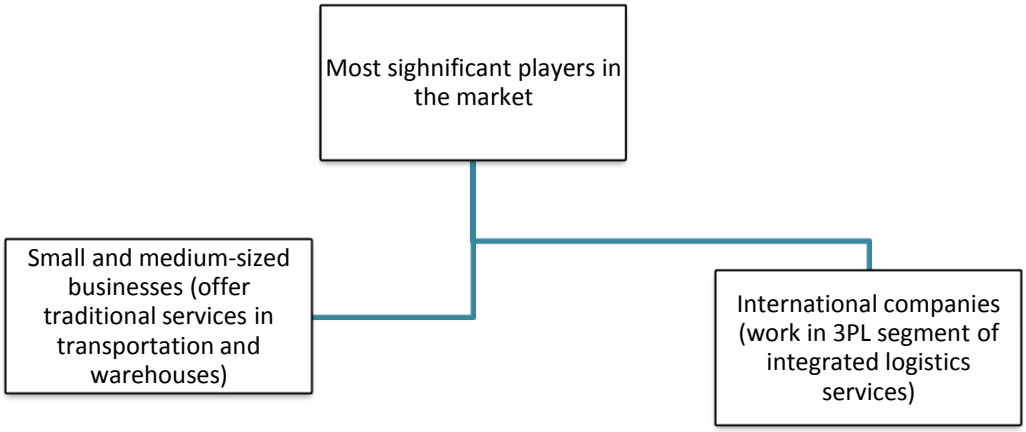


Figure 24. Most significant players of Russian logistics market

These two groups almost do not compete against each other in the Russian market. 3PL companies mainly work in Moscow and Saint- Petersburg with big multinational companies, while small and medium sized companies occupy almost the entire regional market. The key players in the segment of 3PL-services are considered to be the western logistics providers, with extensive experience in solving problems of maintenance of large industrial and commercial companies with which they are working around the world.

According to Rosstat, today the Russian market of logistics includes 3.8 thousand companies providing forwarding services (companies registered in the Russian Federation, including their branches in the regions). About 800 companies position themselves as warehouse operators. The bulk of the freight forwarding and logistics companies is located in Moscow and St. Petersburg, in the port cities and regional centers of Russia.

3. *Who are interested in logistics services (companies, group of companies)?*

It is easier to say which regions are more interested in logistics services and which are less. Particularities of Russian centralization, when all the key resources first flock to the capital and then distributed among regions, are also typical for transportation and logistics services. In addition, this is the reason of current gap- the changes in logistics, which have become the standard for Moscow and St. Petersburg, did not become the standard in the region.

Companies (and even the whole regions) do not understand the benefits of transferring logistics functions to intermediary companies. Therefore, the problems that emerged in Russian regions are:

1. International 3PL companies exist and work in Russia, but none covers the whole country's territory;

2. Reluctance of working with 3PL companies is connected with fear to give commercial information;
3. In regions exists the common vision that everything should be done by myself.

4. *Which logistics services are the most preferred in the market (warehousing, transportation, packaging, etc.)? What is the share of each service?*

In Russia, the bulk of the services lays in the field of transportation. Transportation services produce about 72% of the total volume of logistical operations. In combination with freight forwarding service, we obtain 82%.

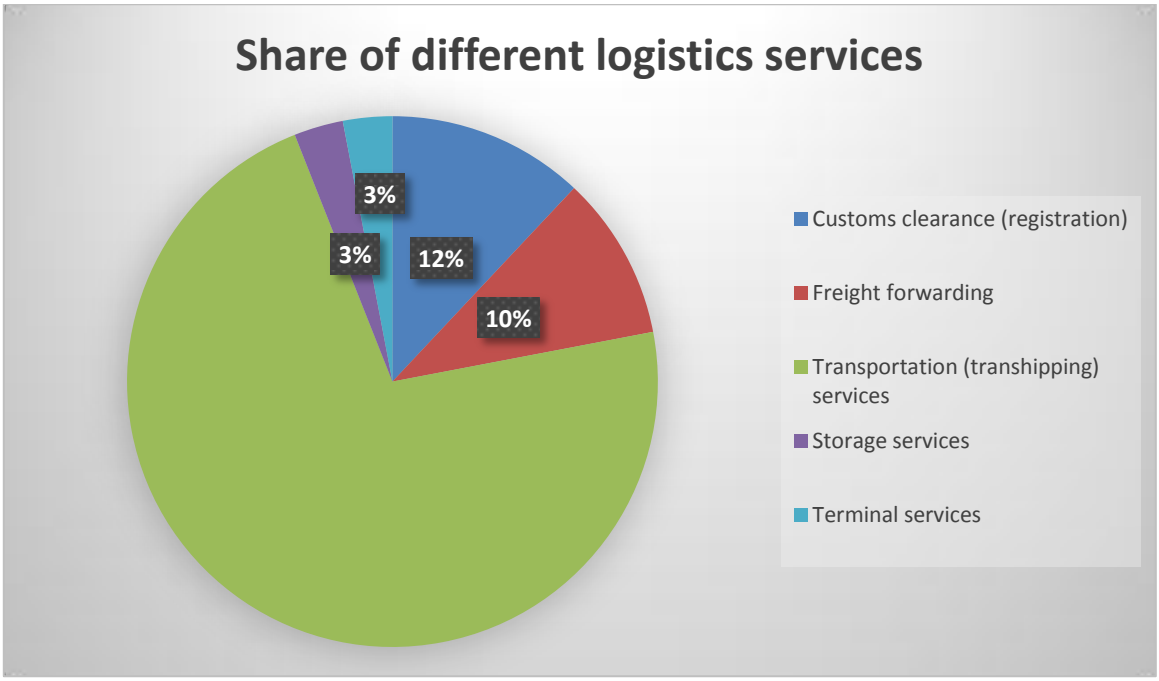


Figure 25. Share of different logistics services (Source: RBC.research)

5. *Which regions are the most dynamic in terms of logistics?*

In this case, the author tried to define the most dynamic regions in several steps. Each step has its own criteria for selection.

The first sample was made according to the following criteria:

1) Total amount of warehouse space Of Class “A” and “B” that exist in region
2) Vacancy rate of these warehouses

During the analysis, the following results were obtained:

The market volume of warehouses and vacancy rate		
City	Square	Vacancy rate,%
Moscow	10 000 000	6
Saint- Petersburg	2 400 000	9
Yekaterinburg	800 000	1
Novosibirsk	700 000	3
Kazan	370 000	<1
Chelyabinsk	300 000	5
Nizhny Novgorod	240 000	<1
Samara	290 000	6
Rostov-on-Don	210 000	<1
Perm	90 000	<1

Table 17. The market volume of warehouses and vacancy rate

As usual, Moscow and Saint Petersburg are the most dynamic regions in terms of logistics (but even these two regions suffer from the lack of modern logistics space and vacancy rate proves it).

Further sampling was carried out among these cities on the following criteria:

1) The importance of new projects;

2) Possible contribution to regional and global logistics.

After that, five selected regions have been mapped:

Figure 26. Regions with most dynamic growth

Below are written all current projects in these regions and possible contribution to regional and global logistics.

Table 18. Regions with most dynamic growth

Region	Main projects	Possible project´s contribution to regional and global logistics
Moscow	PNK; Radius; North Domodedovo logistics park.	
Saint- Petersburg	PNK Shushary; *Logopark Osinovaya Roscha.*	
Yekaterinburg	Ural Industrial park.	International transport hub, new production sites with the largest centers of supply and distribution of finished products.
Novosibirsk	Increasing the area warehouses at 500,000 square meters, capacity of container terminals to 200,000 TEU / year.	to intercept flows from the Far East and Kazakhstan
Chelyabinsk	Yuzhnouralsky logistics center	Changing trends in international trade flows of China-Russia-EU.

Here we should pay a little more attention on Yuzhnouralsky logistics center. According to our Framework (which states that we should benefit from the emerging new logistics routes and that we have to learn from the experience of successful logistics centers and try to cooperate with them) this TLC suits us well. In addition, Yuzhnouralsky logistics center and Imatra logistics hub have one very common feature- they both geographically located near borders, though they both have to deal with

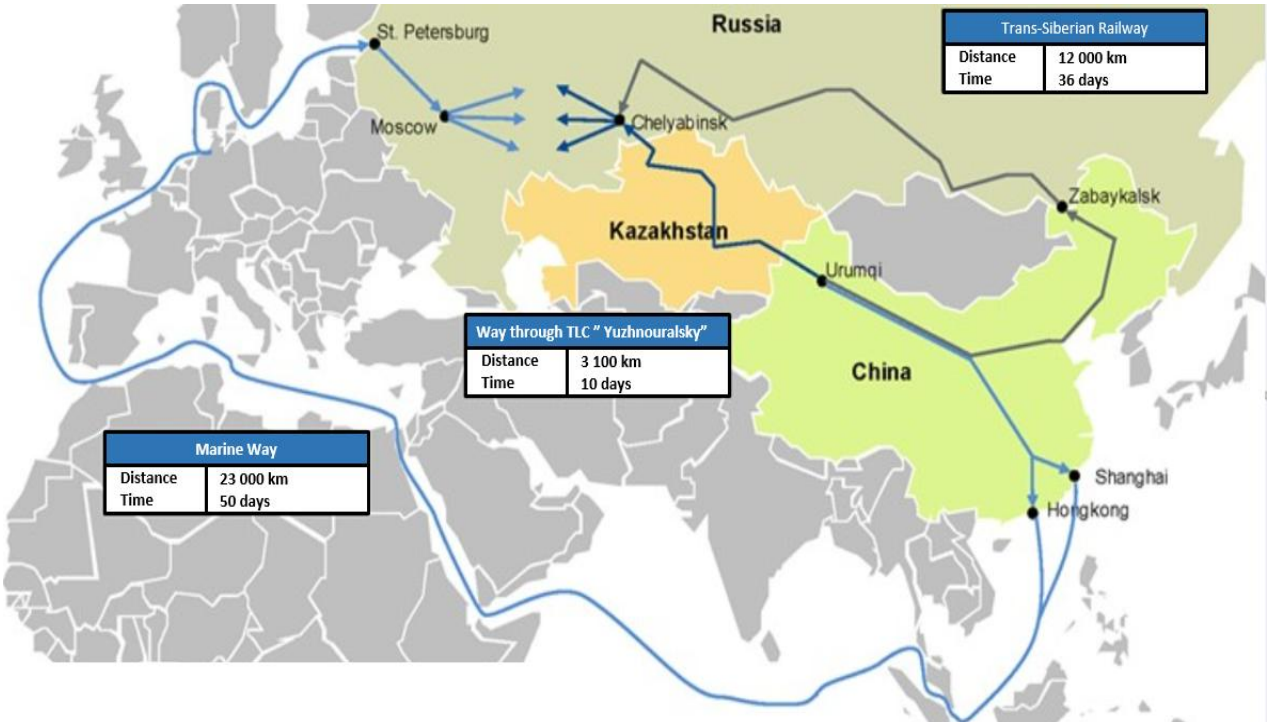


Figure 27. TLC Yuzhnouralsky and its alternatives

customs` procedures. That`s why the experience of Russian TLC might be very useful for Imatra.

6. *What is the forecast about the development of this logistics centers in the medium and long terms (until 2020 and 2025)?*

In the nearest future may significantly accelerate the process of consolidation of the logistics market. We may expect different mergers and acquisitions, which will lead to the emergence of players who have significant resources, great potential and already established reputation.

In the face of rising competition, producers and sellers will pass logistic functions and logistics management for outsourcing. It is expected that this process will lead to the unification of transport, freight forwarders and warehouse operators.

The main requirement for logistics operators - increase the level of customer service and quality of services, eliminate their inconsistency with modern European standards. In the sphere of international transportation and logistics services in Russia, the leading position will occupy the global 3PL-operators, which are able to offer comprehensive logistics solutions for clients.

Potential risks- a lack of market transparency, difficulties with the calculation of prices, the unpredictable actions of the customs and other authorities. Nevertheless, the huge growth potential of globalization and increasing levels of outsourcing heated the interest to the Russian market. With GDP growth, industrial development and well-being also increased consumption of both industrial and consumer goods. Russia is still largely dependent on imports. This means that both the quality and quantity of services should continue to grow, the market is still far from saturation.

6.3.1 Conclusion on "Logistic potential of various regions of Russia for Finland"

Due to the fact of high centralization, Moscow and Saint Petersburg have the biggest potential in logistics. Nevertheless, many other regions show stable growth and Finland could benefit from it. Some regions of Russia are connected with new emerging logistics routs (like Chelyabinsk regions is connected to "New Silk Way") and it could be very beneficial for Finnish actors to start cooperation there in order to get good profit.

Russia is among the countries with high logistics costs, which significantly reduces the efficiency of production and trade (in addition affects the competitiveness of companies and the country as a whole). The share of logistics costs in gross domestic product of Russia reaches 21%, while in China it`s approximately 19.0% in the US - 9.7%, Italy - 8.6% in Japan and Germany - 8.7% and 8.3% respectively. Armstrong & Associates Inc. estimated the world average logistics costs in 2012 around 11.6%.

In spite of the current difficulties in the Russian economy caused by a cyclical downturn and reinforced by Western sanctions and low oil prices, and the associated high inflation and the decline in employment - in the services sector there is a marked increase. Probably so unexpected rise can be explained by high flexibility and mobility of the logistics industry: to transfer to the new transport routes or converted warehouse for other types of goods can be much faster and with a much lower cost than readjust production equipment at the factory or goto the cultivation of new crops.

Accordingly, the logistics could respond to the rapidly changing demands of the market, able to adapt

to the changed circumstances, regroup, and seize the opportunity to take a created or vacated niches. However, no doubt that the industry is still far from being used to optimize all the reserves, and it has all the possibilities to continue to be the main driver of economic growth.

6.4 Summary on secondary data research

The main goal of this market research was to show how Finland (and Imatra in particular) could benefit from big neighbor such as Russia. Despite all the problems that exist in Russian`s logistics, there are still very bright perspectives and we cannot ignore them.

Secondary data research showed consensus with primary data research on the question of the most dynamically developing logistics centers- in both cases Chelyabinsk region is presented as a growing logistics point.

So what unites the Chelyabinsk region with Imatra? Both regions are located on the borders of their countries and serve as logistics gates (Imatra- gateway to Europe, Chelyabinsk region- a gateway to Russia).That`s why the experience of the Chelyabinsk region as a logistics gate can become indispensable to Imatra.

7. ANALYSIS OF COMPANIES' INTERVIEWS

This chapter continues to answer the second research question. Secondary data research managed to show logistics and trade potential of Russia that can be beneficial for Finland but it did not reveal how Russian companies perceive possible collaboration with Finnish companies in the fields of trade and logistics. In order to solve this issue, primary data research was conducted. Primary data research is done in accordance with research design and methodology, which were described in chapter two (subchapter 2.3.2)

7.1 Business opportunities of Russian companies in Finland

Current economic situation in Russia is associated with the collapse of the ruble, which led to the fact that the majority of Russian companies turned their attention to foreign markets. Russian goods became much cheaper and more attractive to foreign consumers. More and more Russia companies prefer to focus on international consumers, not locals. That is why it becomes a topical issue what Russian companies are going to offer to Finland in the fields of logistics and trade.

The results from the interviews made during the study are presented in this chapter. According to the results, an analysis of business opportunities in logistics is made.

The results of the secondary data research (chapter 6) gave a clear picture of the current state of affairs between Finland and Russia at state level. The purpose of primary data collection is to show the possible relations between Russia and Finland at the company level.

7.2 Description of the companies participated in the interview.

Company	The Urals Automotive Plant
Industry	Automotive
Founded	1941
Headquarters	The city of Miass, Chelyabinsk region
Number of employees	5000
Interviewee	Borovinskii Viktor, Deputy director of production

A company is a leading manufacturer of all-wheel-drive heavy trucks in the Russian market. The advantage of the company lies in the fact that its products possess high off-road capability, ability to surmount ditches, to operate efficiently at temperatures ranging from –50°C to +50°C. If we

speak in numbers, the plant annually produce more than 6,000 trucks (or 40-50 trucks per day).Logistics is very important for company. They have personal logistics network around Russia, but also depend on 3PL companies that work abroad. The plant have to outsource its international freight shipping. For some regions like Latin America, they even use multimodal logistics solutions that cost a fortune.

Company	Furniture company “Force”
Industry	Company manufactures steel structures/creates the mechanism for transformation of tables of its own production
Founded	2014
Headquarters	Chelyabinsk region
Number of employees	15 (forecast – 30 by 2017)
Interviewee	Volokitin Aleksei, founder of the company

The company produces steel lifting mechanism for tables and chairs. Usually, such furniture needs a pack of two such mechanisms. The weight of one pack for table varies from 10 to 13 kg. Average annual volume of goods also varies. After the devaluation of the ruble, the demand for the products in Russia increased, because Chinese analogs became more expensive.

Now “Force” has just a little import in the total cargo flow. However, due to the weak performance of ruble, the head of the company is trying to reach new markets. For many companies, it will be much more profitable to buy these products, which are much cheaper than the Chinese analogs.

Company regularly use logistics services of local companies. The company work around Russia and usually use services of truck companies for the purposes of delivery. In cases when the weight of ordered goods exceeds several tons, they use the services of Russian Railways.

Company	Individual entrepreneur
Industry	buying and selling of goods from China
Founded	2013
Headquarters	Chelyabinsk
Number of employees	1
Interviewee	Sytchov Sergei, Individual entrepreneur

When you work for yourself, you have a choice- what to sell. Geographical proximity to China is an advantage for Chelyabinsk region. As for nomenclature-during last several years, it is extremely beneficial to buy metal in China. Ferrous and non-ferrous scrap metal cost several times cheaper in

China than in Russia. Even after all customs duties it is still much more profitable to buy metal there. As for monthly and annual volumes- they varies but do not exceed 60-70 tons of metal per month and 700 tons per year (Usually, the whole metal is transported by railroads, other alternatives are too expensive). In comparison, in 2015, Russian Ministry of Defense get 4 billion rubles from the sale of metall. Most of the scrap metal was sold from the decommissioned equipment. It has been sold more than 289 thousand tons of ferrous and almost 19 thousand tons of non-ferrous metal.

Despite the fact, that entrepreneur work alone, he has to use different logistics services. Until the middle of this year, all the goods that he ordered in China, first came to Yekaterinburg and then to Chelyabinsk. Therefore, for several years, he needed a warehouse in the neighboring region, which also affected the profitability of business. The speed of delivery was also poor. Many logistics companies of the region claims, those goods can be delivered from China to Yekaterinburg within 10-13, but usually it takes 17-20 days-Quite significant time lag. Sometimes there are customers who need the metal in a very short period.

Company	Ltd. Transportation and logistics company "ECOS"
Industry	Transportation and logistics
Founded	2007
Headquarters	Chelyabinsk
Number of employees	7
Interviewee	Transportation engineer: Rozhkov Alexander

Ltd. TLC "ECOS" is a transport and logistics company operating in the logistics of cargo through the territory of Russia, Baltic States and abroad.

One of the main activities of the company is the organization of international cargo transportation. “ECOS” works with both Russian and foreign transport companies. The reliability of the work, the quality and timeliness of delivery is provided by expertise in the field of services and the level of confidence with respect to all participants in international traffic.

The basic scheme of delivery of cargoes by trucks today are:

1. "Door to Door", i.e. from the warehouse shipper to consignee's warehouse.
2. "In the storage (interim) storage in Europe."

The use of one or another circuit depending on the weight, the volume of cargo.
In the first scheme, as a rule, goods are delivered in volume and corresponding weight or volume-duty vehicle. Experience and fruitful cooperation with international carriers in Russia and abroad allows company to claim that they are reliable partners, and you can trust them with cargo.

7.3 Results of the survey

The main idea of the survey was to gain a clear picture of how Russian companies from regions see the potential of cooperation with Finland in logistics and trade. The responders gave reliable information, but they cannot be generalized due to small sample size. Anyways, thanks to this survey I managed to find out the main trends. The questionnaires contained 3 separate subjects**: Finland as a trade partner, Finland as a logistics partner, trends in logistics and new possibilities for partnership**. The results of each of these topics are presented in the following sub-chapters.

7.3.1 Finland as a trade partner

It is a common truth that trade stimulates the development of logistics. In addition, new trade routes facilitate the inflow of additional money. These are the reasons why regions that want to improve logistics must continually search for new trade partners whose products may stimulate the development of the region. Imatra may find such new trade partners in Russian companies that are located far away from North-West Federal district.
The respondents were asked to answer the following questions in this section:

1. What is your involvement in foreign trade?
2. Do you feel that not only Northwest Federal districts, but also other regions of Russia can be involved in trade with North Europe?
3. Do you perceive Northern Europe as a trading partner? (If yes, what caused you think that?)
4. Does Finland have competitive advantages that could attract Russian companies?

Despite the fact that all companies are involved one way or another in international trade, none of them has permanent trade relations with Finland. All the companies pointed out that the current economic situation (the stunning fall of the ruble) contributes to the fact that Russian companies shift their views from the internal to external markets. Naturally, Western Europe with its strong currency becomes a priority market.

The responders perceive Finnish market as quite attractive (especially during current Russian economic crisis) but also highly competitive. Russian companies may cause price competition in the Finnish market. However, very often, it turns out that even the low price of Russian products is not the key reason for purchase. Finnish partners are looking both for quality of the product and its price. The issue of high quality is still challenging for Russian companies.

We have found out, that even weak performance of currency can`t guarantee the successes of Russian companies in Finland. Nevertheless, strong euro currency gives good chances for Finnish companies to make investments in Russian regions. The results of it are obvious for companies. Russian regions are very attractive for Finnish actors because of size of the market.

It was also mentioned, that companies of Chelyabinsk region feel that Finland aims to actively develop its relations with the regions of the Russian Federation. Despite the large geographical distance, Finland show a growing interest to the Chelyabinsk region. The goal - to strengthen the existing cooperation in the field of trade and logistics.

It was pointed out that in Chelyabinsk works Energy Company “Fortum” and Finland is very concerned about the success of this project. Regardless of market fluctuations of the world economy, Finland and Russia are partners, which constantly intensify cooperation, which brings mutual benefits. Finland do everything to promote further development of mutually beneficial economic cooperation.

Companies are unanimous in issue that regional companies have great potential in the development of partnerships in B2B sector with Finnish companies.

Companies mentioned sanctions as a reason for the reluctance of trade with Finland, even though Finland has refused any sanctions against Russia. It merely says that many companies are not fully aware of the current situation.

Several companies have noted the problem of sanctions and it is very confusing, because no one really knows clearly the context of these rules. In fact, Finland did not said to Russia "no," and it`s obvious that the Russian representatives could come to Finland.

Some even say "Finland has refused Russia" and this is how many Russian companies understand European sanctions.

The cooperation between Russian and Finnish companies is possible and has great prospects, because both sides have common interests in trade.

There is almost no knowledge among companies about collaboration between Finland and separate regions of Russia. All companies believe that they may increase their cooperation with Finnish companies and Nordic region.

7.3.2 Finland as a logistics partner

The following questions were asked in this section:

1. Do you perceive Finland as a logistics gateway to Europe?
2. What Russia can propose to Finland in logistics?
3. The share of export in the total cargo flow of the company (including export to Finland).
4. What stops you from operations in Northern Europe?

The responders perceive the Finnish logistics market very attractive, but at the same time highly competed. Now Russian products can compete only in price, but later they can become very attractive because of quality.

Now Finland prefer to utilize quality products, which manufactured not in Russia but in Asia. Nevertheless, even in such conditions, Russian regions could benefit as a transit route from Western Asia to Western Europe.

According to the answers, there is an obvious lack of collaboration between Finnish and Russian companies in the field of logistics. The responders see two ways of development relations with Finland in logistics: use Finnish logistics for transit traffic and for cargo transportation in Finland itself.

All the companies have noted the importance of Finland as a "gateway to Europe". In addition, they said that Finland is not the only logistics partner. Logistics route through Belarus and the Baltic countries are also important, and in most cases, companies give them more preference.

The competitiveness of Finish logistics (reliable services, safety, reliability and speed of delivery) are important for companies.

The responders were asked to point out what stops them from collaboration in Nordic region. The cost of using logistics services, including cost of transit route is higher than other competitors (Belarus) offer.

According to most of the survey answers, companies do not see, in which logistics services Finland is better than competitors from Belarus and the Baltic countries are. All advantages are relatively the same in all countries.

Also linguistic differences affecting the relationship between Russia and Finland. For large companies such as automobile plant "Ural" language is not a problem. However, for small companies, the language barrier is the reluctance to establish international trade.

The responders explained that current tariff system and custom procedures are the main barriers in logistics cooperation with Finland. Constant delays of freights in Russian-Finnish border made a negative image. The speed of delivery was harmed during aggravation of political relations between Russia and the European Union. In addition, red tape at the border crossings is becoming a major problem for regions of Russia, which are several thousand kilometers from Finland. With all of the company noted that the elimination of these problems would increase interest in Finland as a logistics partner.

No doubt that Finland possess better logistics infrastructure and can offer high quality logistics services, but for Russian companies all these competitive advantages do not differ much from those, that can offer Belarus and the Baltic countries. In addition, delays caused by bureaucracy in customs also decrease the total attractiveness of Finland in logistics.

Answers of respondents about the use of logistics services varies. For some companies whose products do not require a great variety of logistics services, mentioned that they need only one service of Finnish companies- service of transportation. However, for automotive company that produces complex heavy trucks, the need for different logistics services is obvious.

7.3.3 Trends in logistics and new possibilities for partnership

Finally, the last block of question is presented below:

1. Forecast of change in cargo traffic in 2020 perspective, and how it can be changed with Finland.
2. What are the trends in logistics that stimulate the development of your business?
3. Do the new logistics routes can be useful for the development of foreign trade, especially with Finland?

Based on the answers, the following emerging routes were identified:

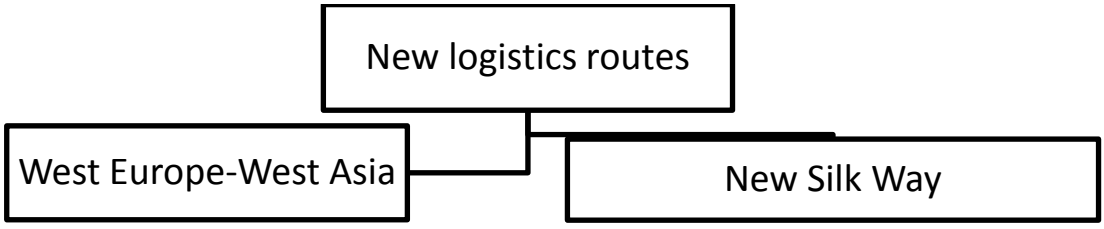


Figure 28. New logistics routes

It was mentioned that very soon the speed of delivery of goods from China to Europe would dramatically increase. Logistics route from China to Europe through Afghanistan is of little interest. The road through Pakistan is problematic, and all variants of transporting goods through the Suez Canal are connected with political and military blemish. That`s why routes through Kazakhstan, Russia and Belarus are the most attractive options with minimal political risk.

I may assume, that companies mentioned “New Silk Way” and new logistics route “Western Europe- Western China”. The visual description of both is presented below:

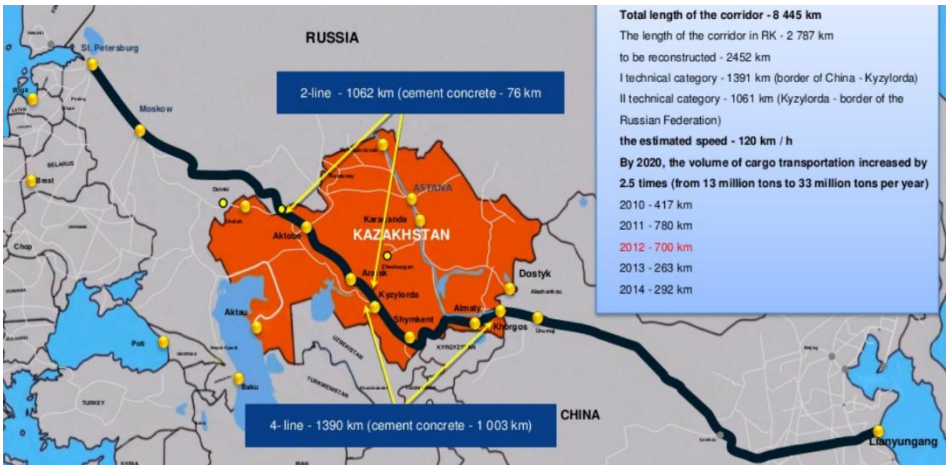


Figure 29. New logistics route "Western Europe- Western China"

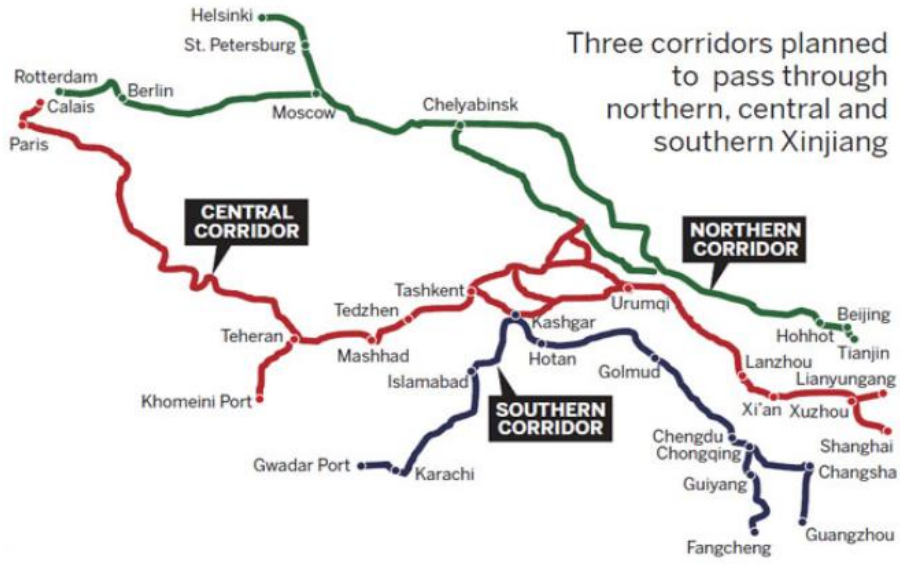


Figure 30. Three planned corridors of "New Silk Way"

That was the last question in the survey. The summary of all given answers is presented in table 19.

Table 19. Survey summary table

Name of company	Finland as a trade partner	Advantages of Finland in trade	Finland as a logistics gateway to Europe	Why Russia does is important for Finland in logistics?	What stops from operations in Northern Finland	Trends in logistics
The Urals Automotive Plant	A viable option	Price, speed of delivery	Yes, but it is unlikely to use	Trucks, railway trains	Lack of consumers in this region	More active usage of 3PL companies` services by Russian companies
Furniture company "Force"	Currently searching for this opportunity	Price	Like an additional option to other gateway (Belarus)	Large market opportunities	The fear of sanctions	Try to benefit from emerging new "Silk Way" by reducing time of delivery
Individual entrepreneur	Unlikely	Price	Never used	Goods from China comes to Finland through Russia	incomprehensibility in customs procedures	Cooperation with Yuzhnouralsky logistics center
Transportation and logistics company "ECOS"	Crucial for the work of the company	Speed of delivery, high responsibility	YES, and even try to use	New logistics route "West Europe-West Asia" comes through Russia to Finland	Lack of knowledge of the market	New emerging routes "West Europe-West Asia" and "New Silk Way"

7.4 Interpretation of the results

The responses to the survey have satisfied. As it was already mentioned, most of Russian companies are reluctant to research projects, which was the reason of low number of responders. The results of the interviews are good and satisfied author as a researcher. Some questions were very controversial and answers of different companies were opposite.

We may say that partnerships between Finland and regions of Russia should be implemented in order to develop Finnish competitiveness in logistics and trade. The collaboration at B2B level, when Russian companies export to Finland raw materials can be very interesting.

According to the responders, Russian companies do not see obvious advantages of Finland in the field of the logistics. What is worse, Finnish logistics services are more expensive than in the Baltic countries and Belarus. Of course infrastructure and quality of logistics services are better in Finland, but high price diminish these advantages.

In addition, Finland perceived as an important transit route to the Nordic region, but even here exist competitors with lower prices for cervices.

All the companies, directly or indirectly, talked about new logistics routes. "New Silk Way" and international transit corridor "West Europe- West China" were mentioned several times by the responders' .In this context, the growing role of Chelyabinsk region as a large logistics center was pointed out. In particular, new Yuzhnouralsky logistics center (located in Chelyabinsk) starting May 2015 plays an extremely important role in Chinese "New Silk Way". All companies show theirs foresight and think about the prospects of using the services of this logistics center.

The Individual entrepreneur, who has participated in the survey believe that through the Chelyabinsk region will be built a new logistics chain, which will lead from China to Europe with new time record- less than 20 days. That is why the integration in this logistics chain is supposed to be the main challenge for the companies now.

Difficult economic phenomenon in the euro zone and the slowdown in economic growth of the Russian Federation during 2014-2015 could have a negative impact on the forms and methods of Russian-Finnish cooperation.

Russian investments in Finland, even relatively small volumes of investments, could give Russian companies a wide range of opportunities for entering the highly intensive goods and services markets abroad.

From the Russian services in the Finnish market largely can be claimed services for the development and implementation of mathematical software for various sectors of Finnish industry

and the Internet, as well as tourism and consulting services. It deserves special attention is the sector of "other business services" associated with the high-tech sectors of the economy.

Russia may also be reluctant to pursue broader regional transit integration, with accompanying single tariffs and simplified customs procedures, because of concern about its market being flooded with cheap Chinese goods. (Weitz, 2013).

8. DISCUSSION

The name of the chapter speaks for itself. Here are collected the most important findings of the previous chapters that should help to give more clarity on research questions. All the findings from literature review, analysis of secondary and primary data are integrated here.

The research question are:

1. *How to compile an effective portfolio of innovative logistics projects to achieve the strategic goals of the region?*
2. *How to strengthen Imatra`s positions in trading through improvement of logistic system?*

In order, I`ll start with discussion of the 1st research question.

Most of companies, which are searching for commercial success, have to deal with innovations. And sometimes it`s quite difficult to find out the best options among big variety of projects.

This issue was directed to extension of management tools that enable to reduce the risks and costs of enterprises, which they have during implementation of new projects.

Common requirements for managers are to manage innovation, organize business processes and promote innovative products to market in a way that before each subsequent stage were cut off unnecessary dead ends work leading to the identification of unnecessary costs and errors in subsequent stages.

So one of the important tasks of a manager who deal with investment projects, is the problem of early detection of internal contradictions and elimination of unwanted effects in promoting innovation.

In this regard, there is an increased interest of entrepreneurs in practical tools, which could improve the business processes of enterprises and organizations, allowing to strengthen the strategic basis for sustainable business development. The reason for this was the large number of problems and, accordingly, errors in dealing with a particular business process.

To solve this problem was created a program “integral-matrix analysis” which advantages are described in this paper. While working with this tool, I also managed to rethink the whole process of selection of innovative project, and the results are presented below in tabular form.

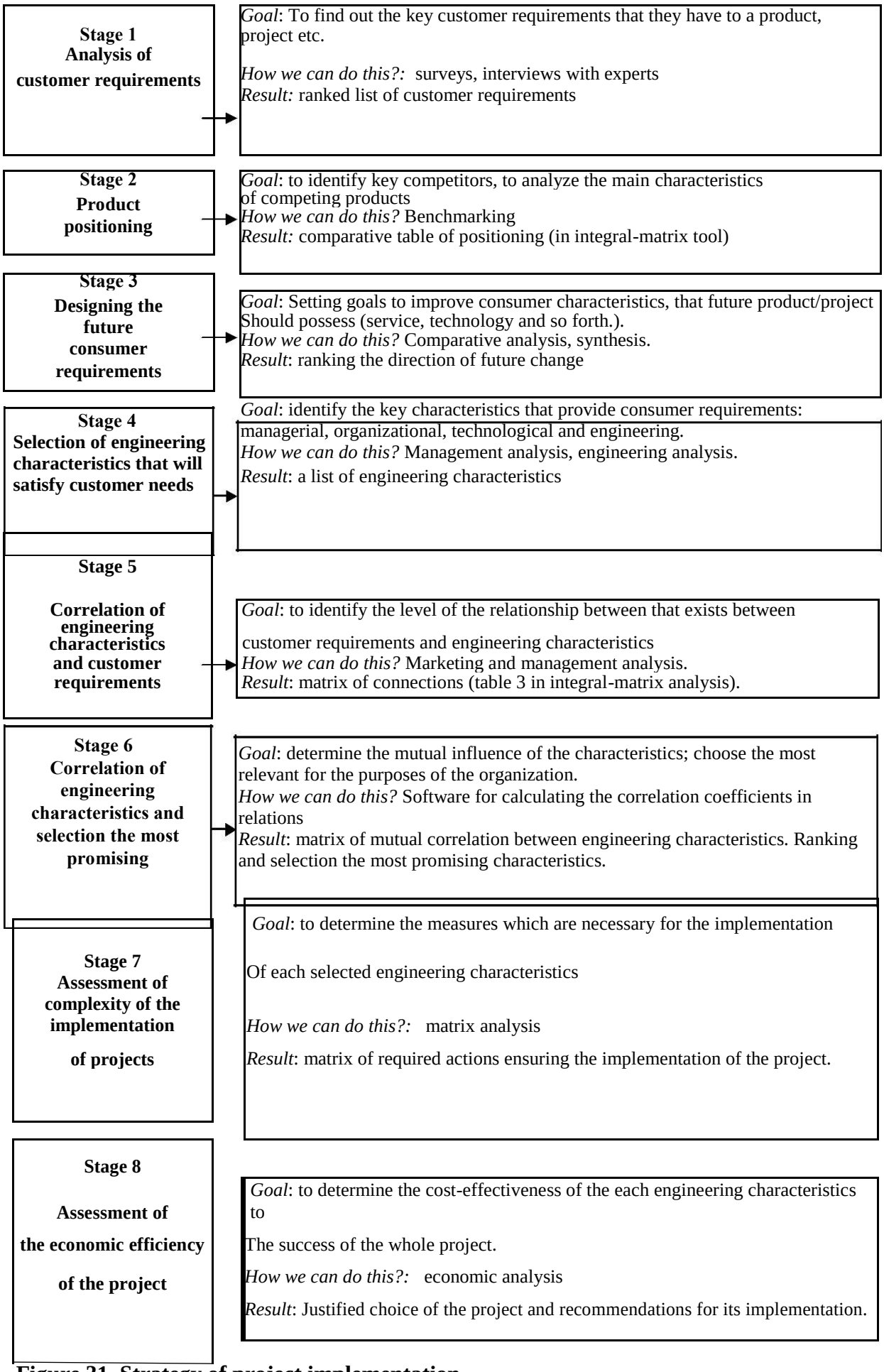


Figure 31. Strategy of project implementation

From my point of view, this is the best sequence of steps for project implementation while each previous stage cuts off all unnecessary and ineffective action and remains only the most valuable for further steps. Such an approach in the implementation of projects (including logistics projects) can reduce the costs in time and finances and bring the work of managers at a new level.

Matrix Analysis - a tool to identify the logical connections between the given parameters. The purpose of this process is to develop a set of alternatives for product development and selection of the most cost-effective projects based on the integration of innovative customer requirements and specifications of the product or a combination of (a competitive advantage of the product), as well as the production capacity of the organization (the baseline for the project).

The second question *How to strengthen Imatra`s positions in trading through improvement of logistic system?*

New opportunities for trade between Finland and different regions of Russia have emerged. According to the results of my market research, Finland could be attached to "New Silk Way" which China is desperately developing right now. A big part of this route comes from Russia. Why not to benefit from opportunities, which this logistics way could bring to Finland? (Increase in speed delivery is one of them).

Many Russian regions that are on the "new Silk Road" produce essential goods for Finland, such as wood products and machinery. Moreover, what is important, because of Russian currency collapse, everything has become much cheaper. The problem is that most of Russian companies are reluctant to international trade and the early stage (and become very aggressive later). It turns out that neither Finns nor Russians do not see the obvious economic advantages, which are generated because of a third party (China). Finland should understand that not only North West Federal District could be very efficient for the economic growth, but also many other regions (like Chelyabinsk or Ufa) are also very attractive for trade. The very first step in establishing economic relations is needed and this is what a wholesale mediator (with the knowledge of Finnish and Russian regional markets) should do.

The region of South Karelia has a great potential for the development of transport and logistics services. This requires the development of new logistics routes, as well as establishing of agreements with new economic actors - a necessary step to overcome the inefficient transit role of the region and the beginning of large-scale cooperation with Russia.

Personally, I can help only indirectly with the development of the logistics network of South Karelia by attracting new economic agents from various regions of Russia.

Customers (in this case companies that work in B2B market) will get rid of the following functions:

a) Search for foreign counterparty;

b) Preparation and transaction implementation of freight-forwarding operation;

c) Insurance of goods in transit;

d) Attendance to customs formalities;

e) Promotional activities in foreign markets.

What was done by me to strengthen Imatra`s logistics position?

1) Primary (with interviews) and secondary marketing research on Russia - which regions Finland can benefit the most in logistics and freight. Simply speaking, I have found out what regions could propose to Finland.

2) I have developed a portfolio of companies whose products may be interesting to the region of South Karelia (almost all companies are engaged in wood products).

3) I made a search on Finnish companies (metal producers) whose products can be purchased in the Russian regions.

9. CONCLUSION

9.1 General conclusion

Why does Imatra need a developed logistics center based on strong collaboration with partners from neighboring countries?

The Imatra region do need a well-developed logistics infrastructure, especially during current economic instability in Finland, which starting 2015 becoming more and more apparent.

A high level of development of logistics in Imatra carries the following positive effects:

1) Further reduction of the cost of goods and services. The costs of logistics in the total cost of goods and services in countries with high levels of logistics (such as Finland) are estimated at 10% of GDP, while in countries with undeveloped logistics, this figure could reach 20% and above.

2) Creation of new jobs. Large transport and warehouses centers may be a source of employment for thousands of people. For example, the total number of employees of the logistics center "Air-Policy" in the city of Vantaa is 35 thousand people. Imatra can also use such advantages.

3) Increase in wholesale and retail trade and the service of customer service. International chain retailers tend to occupy a niche in areas with developed logistics infrastructure, thereby enhancing the quality of public services, leading to an increase in turnover.

4) Further logistics development could increase the investment attractiveness of Imatra. Private investment leads to intensification of economic growth and quality of life.

5) Improvement of the environment is possible by the optimization of the transport infrastructure, including construction of bypass roads and separation of freight and passenger flows.

6) Increase government revenues from realization of transit capacity.

Below is presented a table, in which I tried to point out the main benefits which logistics center in Imatra could bring to different interested parties.

Table 20. Expectations of interested parties on the development of logistics in Imatra

Interested parties (stakeholders)	Expectations of stakeholders on the creation of TLC
The Federal Government	General development of the economy; Development of foreign trade; The harmonious development of different modes of transport; Increase in tax revenues to the federal budget.
The regional authorities, municipal authorities of Imatra	Increasing the investment attractiveness of the region; Creation of new jobs; Increase in tax revenues in the region.
Potential consumers of services (network trading	Development of logistics outsourcing; Improving the quality of service in the field of logistics;

companies, wholesale companies, industrial enterprises)	Reduction of logistics costs.
Logistics intermediaries	Expansion of market services; Creating the conditions for doing business
Investors	Creation of attractive investment projects with low risk and acceptable payback period.
Developers	Creating conditions for the construction of large-scale logistics projects for subsequent lease or sale to logistics operators.
Population of Imatra	Creation of new jobs; Development of transport infrastructure; Improving the quality of services in retail trade; Improving the environmental situation.

When all positive effects and expectations of different stakeholders are mentioned, the questions regarding logistics projects appear. How to compile an effective portfolio of logistics projects under time and resources constraints? Which projects shall we start first? The author of this Thesis has managed to answer these questions with the help of "Integral-matrix analysis", a written program that enables to select projects with the biggest positive effect. Based on the requirements of employer supervisor, the following projects were proposed:

1) Introduction of new technologies in the border logistics (for its acceleration);
2) Market research on key areas of logistics development of Russia;
3) Negotiations about cooperation with the new logistics centers;
4) Carrying out commercial transactions in order to join the new trade routes;
5) Measures to attract new suppliers to the region;

Unfortunately, due to the strict framework of the thesis it is impossible to implement all the projects. That is why it was decided to implement the project with the largest positive effect on logistics of Imatra and project "market research on key areas of logistics development of Russia" was conducted in chapters 6 and 7. Thanks to this market research, we managed to find out the following issues:

1) Russia makes great financial investments in logistics and Finnish development companies have a great potential to participate in these projects;
2) Companies from Russian regions are willing to establish business relations with Finnish companies;
3) Russia participates in 2 big logistics projects ("New Silk Way" and "West Europe-West China") and Finland can be attached to both logistics routes.

Thanks to the market research, we have managed to find out 2 emerging logistics routes and both could become very beneficial for Finland.

The Western Europe-Western China international transit corridor is harmonized with the "New Silk Road". The projects will enable goods to exit and enter China much more quickly and cheaply.

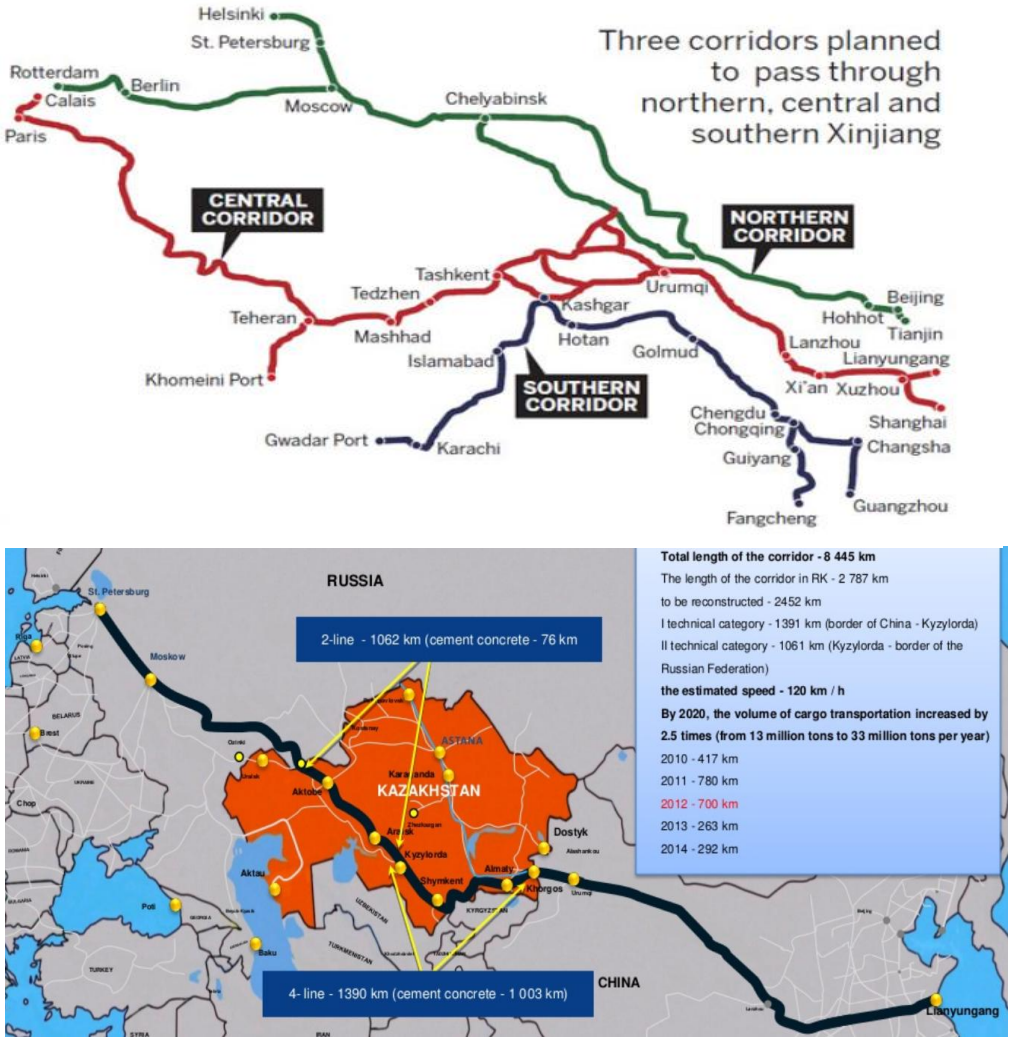


Figure 32. Visual explanation that Finland can benefit from new emerging logistics routes

Yet, Russian enthusiasm for the Europe-China road corridor has been slow to materialize. In March 2013, Russian Minister of Transport Maksim Sokolov announced that the Russian portion would not be built until 2020. (Weitz, 2013). Now, in 2015 the deadline for the start of the corridor is still not precisely defined. Despite its high cost, almost any Russian project in the field of logistics is not performed in time. China aware of this and take all attempts to influence the development of key Russian projects (such as Yuzhnouralsky logistics center in Chelyabinsk). Perhaps, Finland should do the same near its border and try to influence the projects in North-West Federal District of Russia.

In addition, secondary data research (chapter 6.4.1) has revealed, that most of Russian projects are not fulfilled in time. Hence, Finland should be proactive and try to influence on Russian logistics projects.

9.2 Actionable recommendations for further research

Actionable recommendations:

1) Imatra has to establish partnerships with logistics centers of Russia though which will pass new logistics routes.

For example, during the primary collection data, we managed to find out that Yuzhnouralsky logistics center (Chelyabinsk region) should not be regarded as "another one" TLC. Chinese side has established that this TLC is the one of the central hubs in the emerging new "Silk Road". As we all know, previous "Silk Road" did not go directly to Finland and first passed through other logistics centers. Now we cannot miss such opportunity. Of course, Imatra cannot become a major gateway to Europe but it has the potential to become the gateway to Northern Europe. Fast speed of delivery of goods could be a way to convince consumers of logistics services to use the services of Imatra as logistics gate. Now, the main problem is that we do not know the real speed of delivery of goods from Yuzhnouralsky logistics center to Imatra.

This implies the following actionable recommendation

2) We need to measure the time of delivery of goods from Yuzhnouralsky logistics center to Imatra.

If the time of delivery will satisfy us, then we will be able to place on record the importance of Imatra New Silk Road. Consumers from Nordic region deliberately will select Imatra because of speed of delivery.

3) Finland should try to attract Russian investors to the region of Imatra.

Imatra should be focused on finding the big Russian cities, which are on the ways of new logistics routes. It would be more and more difficult for countries to maintain competitiveness in logistics. The custom operations should be eased, while the cost of operation should become lower.

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APPENDICES

APPENDIX 1: The most important projects of Russian transport strategy which supposed to be finished in 2015

1. **High speed line from Moscow to St. Petersburg** – it supposed to be opened in 2015 but has been cancelled in 2011. Reason – On this route already exists “the Sapsan” with a top speed of 250 km/h. Government decided to focus on high-speed line from Moscow to Kazan.

2. **High-speed train from Moscow to Nizhny Novgorod** - a new high-speed train "Strizh" (translated as “Swift”) made its first trip on Moscow – Nizhny Novgorod line. The train’s cars were made at PATENTES TALGO SL (Spain). The journey takes only 3 hours 35 minutes

3. **High-speed highway Moscow - St. Petersburg** (federal highway M11) - is a planned toll road between Moscow and Saint Petersburg. The first sections of the highway was finished in 2014. The road will run parallel to the M10 highway. Its construction has been met with strong protest from environmentalist groups and residents' groups, mainly around the Khimki forest. The total length of highway Moscow - St. Petersburg will be about 700 km. Starting from the borders of Moscow, the new route will take place in the Moscow region (90 km), the Tver region (253 km), the Novgorod region (233 km) and the Leningrad region (75 km). It will be opened no earlier than in 2018.

4. **Central Ring Road** (ЦКАД) is a planned highway to be built in Moscow Oblast.

   The main purpose of CRR - unloading of federal roads, Ring Road through the redistribution of the transit flow of vehicles. The total length of the Ring Road will amount to 525 km. The beginning of construction was scheduled for 2011, and then moved to 2016; Estimated completion of construction - 2022.

5. **The federal highway M-4 "Don" Moscow - Voronezh - Rostov-on-Don - Krasnodar – Novorossiysk**- total length is over 1,500 kilometers. This highway already has a number of high-speed sections of categories IB, IA and IB, and by 2019 will be fully completed.

6. *The bridge across* the *Nadym River* - is located on the road from Surgut to Salekhard. The length of *the bridge* is 1340m. It has 12x110m span. Current status- completed.

7. Bugrinsky *Bridge across the Ob River – was opened in 2014.*

8. **Start of construction of North-Siberian railway** – a railway project with length approximately 2 thousand kilometers. Will connect the railway network of the Khanty-Mansiysk Autonomous Okrug with the Baikal-Amur Mainline. Presumably designing the North-Siberian railway will begin in 2016.

9. **Reconstruction of Krasnoyarsk dam boatlift** – rreconstruction works have not started yet.

10. **Reconstruction of The Moscow Canal** – a huge corruption scandal with the theft of about 70% of the funds allocated from the budget to the development plan for the reconstruction of infrastructure facilities of the Moscow Canal. According to estimates of the investigation, inflating the cost of the contract, its members stole 457.4 million rubles.

11. **Electrification of railway section "Ulan-Ude – Naushki"** - Electrification of Ulan-Ude - Naushki is included in the strategy of development of railway transport in Russia until 2030, but the time of the implementation has not yet been determined.

12. **Start of construction of speed railway Yekaterinburg – Chelyabinsk -** During summer 2015 this project was only officially approved no data about possible start.

13. **Amur–Yakutsk Mainline –** is a partially completed railway in eastern Russia, linking the Trans-Siberian Railway and Baikal–Amur Mainline. August 30, 2014 was opened for freight trains. In addition, the president of Yakutia Yegor Borisov told reporters that the passenger traffic scheduled to open in 2016.

Interpretation of the results

All these tables give a clear picture of future Russia`s step in implementation of Transport Strategy. Unfortunately, Finland is barely involved even in long-term projects of Russia. The biggest project in which Finland might be involved is "Western Europe-Western China transit corridor".

APPENDIX 2: Interview questions (English version)

Finland as a trade partner

1. What is your involvement in foreign trade?
2. Do you feel that not only Northwest Federal districts, but also other regions of Russia can be involved in trade with North Europe?
3. Do you perceive Northern Europe as a trading partner? (If yes, what caused you think that?)
4. Does Finland have competitive advantages that could attract Russian companies?

Finland as a logistics partner

1. Do you perceive Finland as a logistics gateway to Europe?
2. What Russia can propose to Finland in logistics?
3. The share of export in the total cargo flow of the company. (Including export to Finland).
4. What stops you from operations in Northern Europe?

Trends in logistics and new possibilities for partnership.

1. Forecast of change in cargo traffic in 2020 perspective, and how it can be changed with Finland.
2. What are the trends in logistics that stimulate the development of your business?
3. Do the new logistics routes can be useful for the development of foreign trade, especially with Finland?

APPENDIX 3: Interview questions (Russian version)

Финляндия как торговый партнер

1. Насколько вовлечена Ваша компания в международную торговлю?
2. Не кажется ли Вам, что не только Северо-Западный федеральный округ, но и многие другие регионы нашей страны могут активно участвовать в торговле с Северной Европе (Финляндия, Швеция)?
3. Рассматриваете ли Вы Северную Европу в качестве торгового партнера? (Если да, то каковы причины?)
4. Какими преимуществами обладает Финляндия, благодаря которым она может привлечь различные регионы России к торговле?

Финляндия как логистический партнер

1. Воспринимаете ли Вы Финляндию в качестве логистического моста в Европу?
2. Что Россия может предложить Финляндии в сфере логистики?
3. Какова доля экспорта в вашем обороте (отправляете ли Вы товары в Финляндию)?
4. Что останавливает Вашу компанию от торговли в Северной Европе?

Логистические тренды и новые возможности для партнёрства

1. Можете ли вы предсказать изменения в грузоперевозках до 2020 года? Каким изменениям могут быть подвергнуты грузоперевозки с Финляндией?
2. Какие логистические тренды могут стимулировать рост Вашего бизнеса?

Могут ли новые логистические маршруты положительно повлиять на ваш бизнес?