



VILNIUS GEDIMINAS TECHNICAL UNIVERSITY

FACULTY OF MECHANICS

DEPARTMENT OF MECHANICAL AND MATERIALS ENGINEERING

Guoda Kirjazovaitė

**KEY PERFORMANCE INDICATORS FOR START-UPS IN FURNITURE  
INDUSTRY**

**BALDŲ PRAMONĖS STARTUOLIŲ PAGRINDINIAI SĖKMĖS RODIKLIAI**

Master's Degree Thesis

Industrial engineering and innovation management, programme code 6211EX056

Production and Manufacturing Engineering study field

Vilnius, 2022

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APPROVED BY  
Head of Department

\_\_\_\_\_  
(Signature)  
Assoc. Prof. Dr. Ina Tetsman  
(Name, Surname)  
\_\_\_\_\_  
2022-05-27  
(Date)

Guoda Kirjazovaitė

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**Supervisor** \_Assoc. prof. dr. Rūta Banelienė\_ 2022-05-27  
(Title, Name, Surname) (Signature) (Date)

**Consultant** \_\_\_\_\_  
(Title, Name, Surname) (Signature) (Date)

**Consultant** \_\_\_\_\_  
(Title, Name, Surname) (Signature) (Date)

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(Date)

**OBJECTIVES FOR MASTER THESIS**

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(Name, Surname)

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**THE OBJECTIVES:**

The aim of the thesis. The aim of the master's thesis is to find out the main success indicators for startups in furniture industry.

Objectives:

1. Perform an analysis of the scientific literature and determine the theoretical foundations of KPI;
2. Carry out a survey based on questionnaire and find out the formula for the success in furniture industry;
3. Develop a KPI model for start-ups in furniture industry on the basis of theoretical foundation and empirical evidence.

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.....

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(Signature) (Title, Name, Surname)

Objectives accepted as a guidance for my Master Thesis

.....  
(Student's signature)  
.....Guoda Kirjazovaitė.....  
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**Thesis language:** English

## Annotation

It is not uncommon to see start-ups suddenly fail. Often, startups try to follow the example of other, successful companies, but they don't always succeed, so this article looks at KPIs for startups in the furniture industry. The furniture industry in the Baltic States is reviewed and their development at different stages of the company's growth is analyzed. The product factors and interrelationships of a successful furniture company have been identified. The article presents research data of the surveyed companies engaged in the development of products for the furniture industry. The success factors of the company are given. According to research data, a model for the development of KPIs for start-ups in the furniture industry is formed and provided; conclusions are presented.

The work consists of 7 parts: introduction, theoretical aspects analysis in key performance indicators for start-ups in furniture industry, empirical research results in key performance indicators for start-ups in furniture industry, model, conclusions and recommendations, references.

Thesis consists of 64 p. text without appendixes, 13 images, 3 tables and 33 references. Work appendixes are attached separately.

**Keywords:** Key performance indicators, Furniture industry, Start-ups, Manufacture, success.

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Pavadinimas **Baldų pramonės startuolių pagrindiniai sėkmės rodikliai**

Autorius **Guoda Kirjazovaitė**

Vadovas **Rūta Banelienė**

**Kalba:** anglų

#### **Anotacija**

Neretai pastebima, kad naujos įmonės staiga žlunga. Dažnai startuoliai bando sekti kitų, sėkmingų įmonių pavyzdžiu, tačiau ne visada pavyksta. Baigiamajame magistro darbe apžvelgiami ir nagrinėjami baldų pramonės startuolių KPI. Apžvelgiama baldų pramonė Baltijos šalyse ir analizuojama jų raida skirtinguose įmonės augimo etapuose. Nustatyti sėkmingos baldų įmonės gaminių veiksniai ir tarpusavio ryšiai. Straipsnyje pateikiami apklaustų įmonių, užsiimančių gaminių baldų pramonei kūrimu, rezultatai. Pateikiamos priežastys ir pagrindiniai veiksniai, įtakojantys įmonės sėkmę. Remiantis tyrimo rezultatais, pateikiamas baldų pramonės startuolių KPI kūrimo modelis ir pateikiamos išvados bei pasiūlymai.

Darbą sudaro 7 dalys: įvadas, baldų pramonės startuoliams sėkmės rodiklių teorinė analizė, empirinio tyrimo analizė, Baltijos šalių baldų pramonės startuolių empirinis tyrimas, siūlomas modelis, išvados ir pasiūlymai, literatūros sąrašas.

Darbo apimtis - 64 p. teksto be priedų, 13 iliustracijų, 3 lentelės, 33 literatūros šaltiniai. Atskirai pridedami darbo priedai.

**Prasminiai žodžiai:** KPI, baldų pramonė, startuolis, gamyba, sėkmės rodikliai.

# CONTENTS

LIST OF TABLES .....	8
LIST OF FIGURES .....	8
INTRODUCTION .....	10
1. THEORETICAL ASPECTS ANALYSIS IN KEY PERFORMANCE INDICATORS FOR START-UPS IN FURNITURE INDUSTRY .....	12
1.1. Key performance indicators .....	12
1.2. Key performance indicator types .....	13
1.3. Key performance indicators creation .....	21
1.4. Key performance indicators' importance.....	23
1.5. Key performance indicators for manufacture companies .....	25
It's important to remember that there are some basic KPIs utilized in the manufacturing industry, and that all companies should modify their KPIs after gaining information. ....	27
1.6. Start-up.....	27
1.7. Start-up success and fail indicators .....	29
2. EMPIRICAL RESEARCH IN KEY PERFORMANCE INDICATORS FOR START-UPS IN FURNITURE INDUSTRY .....	31
2.1. Empirical research structure.....	31
2.2. Empirical research information.....	31
2.2.1. Research type and data gathering process.....	31
2.2.2. Research sample.....	32
2.2.3. Data collection method .....	32
2.2.4. Data analysis process .....	35
2.3. Research process .....	36
3. EMPIRICAL RESEARCH RESULTS IN KEY PERFORMANCE INDICATORS FOR START-UPS IN FURNITURE INDUSTRY .....	37
3.1. Description of the sampling .....	37
3.2. Research results.....	38
3.2.1. Start-up success and fail factors.....	38
3.2.2. Inbound and outbound logistics, marketing & sales and procurement .....	40
3.2.3. Operations and service .....	43
3.2.4. Human resource management.....	45
3.2.5. Technology development.....	46
3.2.6. Sustainability.....	48
3.2.7. Respondents' suggestions .....	49
3.3. Research model .....	50
4. MODEL FOR KEY PERFORMANCE INDICATORS FOR START-UPS IN FURNITURE INDUSTRY .....	53

4.1. Model decomposition.....	53
4.1.1. Stage from 1-9 employees.....	54
4.1.2. Stage from 10-49 employees.....	55
4.1.3. Stage from 50-99 employees.....	56
4.1.4. Stage from 100-249 employees.....	57
4.1.5. Stage with more than 250 employees .....	58
4.2. Focus group.....	58
CONCLUSIONS AND RECOMMENDATIONS .....	60
LITERATURE .....	62
APPENDIX A .....	65
APPENDIX B .....	75
APPENDIX C .....	76

## LIST OF TABLES

<b>Table 1.1.</b> KPI types .....	14
<b>Table 1.2.</b> KPI by departments .....	19
<b>Table 2.1.</b> Questionnaire structure .....	33

## LIST OF FIGURES

<b>Fig. 1.1.</b> SMART Criteria .....	22
<b>Fig. 1.2.</b> 5 reasons why KPIs is important .....	24
<b>Fig. 1.3.</b> KPI into organizational structure.....	25
<b>Fig. 3.1.</b> Startup success and fail factors results .....	38
<b>Fig. 3.2.</b> Inbound and outbound logistics, marketing & sales and procurement results .....	41
<b>Fig. 3.3.</b> Operations and service results .....	43
<b>Fig. 3.4.</b> HRM results.....	45
<b>Fig. 3.5.</b> Technology development results .....	46
<b>Fig. 3.6.</b> Sustainability results.....	48
<b>Fig. 3.7.</b> EvIEWS model .....	51
<b>Fig. 3.8.</b> Final equation .....	52
<b>Fig. 3.9.</b> Actual, fitted and residual graph .....	52
<b>Fig. 4.1.</b> Model for KPI for start-ups in furniture industry .....	53



## **ABBREVIATION**

**CFS** - Critical success factors

**CUR** – Capacity utilisation rate

**EVA** – Economic value added

**HTCV** – Human capital value added

**ISR** – Inventory shrinkage rate

**KPI** – Key performance indicators

**KRI** – Key result indicators

**NPS** – Net promoter score

**OEE** – Overall equipment effectiveness

**OFCT** – Order fulfilment cycle time

**PVS** – Project schedule variance

**ROA** – Return on assets

**ROI** – Return on investment

**RPE** – Revenue per employee

**TSR** – Total shareholder return

## INTRODUCTION

The furniture sector is labor-intensive and productive industry lead by small and medium-sized companies and micro firms. Due to their innovative potential to create newer heard ideas and ability to adapt to always changing market and customers needs, EU furniture manufacturers have a strong reputation and position worldwide. This sector manages to merge new innovation and technologies with cultural legacy, design and creates job opportunities for skilled and knowledgeable workers (Enterprise Lithuania, 2020).

The increased demand for furniture manufacturing is noticeable due to the rising number of clients who prefer new goods rather than old ones and the amount of new building projects being implemented. This is why furniture industry sector is growing by new companies and market players entering the market. Seeing that the current furniture monopolists do not manage to manufacture necessary amount of furniture and supply the entire market - many start-ups try to enter the market, create a business and establish themselves, but not everyone succeeds. Taking into consideration an approach that management mistakes can be avoided by using the opposite behaviors and making the more current and valuable data driven decisions compared to those made before an organization which failed, business consultants and researchers offer navigation believing that this will lead to an effective management of organization and the successful results. Because startup companies still are implementing and creating their structures, procedures and organization, they have a great advantage to learn from the mistakes and fails of other companies, to dismiss major issues in advance and establishes in the market.

In my master's thesis I chose to analyze key performance indicators of startups and already existing successful companies in the furniture sector and the results they show. Also, it is important to pay attention not only to successful examples, but also to companies that have failed to avoid repeating mistakes that prevented them from gaining a foothold in the field.

**Research problem.** What are the main key performance indicators for start-ups in the furniture industry.

**The goal of the thesis.** To find out the main success indicators for startups in furniture industry.

**Objectives.** In particular, before writing, it is important to formulate and set out the objectives of the paper:

1. Perform an analysis of the scientific literature and determine the theoretical foundations of KPI;

2. Carry out a survey based on questionnaire and find out the formula for the success in furniture industry
3. Develop a KPI model for start-ups in furniture industry on the basis of theoretical foundation and empirical evidence.

**Methodology of investigation.** For the best insights on the situation of the furniture industry in the market, the qualitative empirical research was used for the analysis of the situation, the data was obtained in standardized questionnaire. The study plans to get answers from 10-15 people who hold management positions in different furniture industry companies. The analysis of the collected data was performed on the basis of a qualitative data analysis model.

**Structure of the Master's thesis.** Thesis consists of four main parts: theoretical analysis, empirical research, empirical research results and model.

In theoretical analysis part, a variety of journals, books, websites and etc were reviewed to conceive information on KPI and startup nowadays. Firstly, key performance indicators, their types and how they were created. Then, startup, their types, where are they orientated, why some of them are successful and why others fail.

In the empirical research part, research type and data gathering process is described. It is introduced and explained what research and data collection methods are being used. Also, sampling procedure, data collection tool and the process of data analyzation are described. This part also includes research process description and what difficulties were faced.

Empirical results part provides all the data gathered. In particular, respondents are described. Later, different respondent opinions on all KPI blocks are presented and compared. Their choices are analyzed, and respondents' suggestions for important KPIs that were not mentioned in the survey are presented. The simulation performed by EvIEWS is presented.

The last part presents the consists of a solution represented and implemented in a forementioned case study in which the enhanced innovation model was used. The model was developed based on the results of the study and the aspects reviewed in theory. The model is presented according to the number of employees in the company.

The thesis is finished by providing main conclusions, indicating references used to prepare this thesis, and all additional appendices are presented.

**Validation.** 29<sup>th</sup> of April, 2022, at the 25th Lithuanian Young Scientists Conference “Science - the Future of Lithuania”, a report on “Key performance indicators for start-ups in the furniture industry” was given (Appendix C).

# **1. THEORETICAL ASPECTS ANALYSIS IN KEY PERFORMANCE INDICATORS FOR START-UPS IN FURNITURE INDUSTRY**

## **1.1. Key performance indicators**

During theoretical part and scientific literature analysis, in the information found it can be seen that almost all authors understand key performance indicators (KPIs) definitions a bit differently. According to D. Parmenter, KPIs are indicators which concentrate on the form of organizational performance most important and demanding for the current and future success of the company (Parmenter, 2015). Those indicators are designed to bluntly provide as much data and information as possible. KPIs have to be well and clearly defined, provided, create expectations for the team and be a call-to-action (Peterson, 2005).

Managers use and operate KPIs as important navigations tools to figure out if their enterprise is on a right and successful track or not. The right group of these indicators will put a spotlight on companies or teams' performance and show areas that need have problems or need additional attention (Marr, 2012). KPIs are rarely new to the company, because it is not a new concept. It can be that they have not been recognized or they were just not being used by the management (Parmenter, 2015). It can happen because the management team does not understand the concept or key metrics, it creates stress for them and can be in a way of improvement and not moving forward. Issue is that most staff struggle to figure out and determine the significant managements concepts and matrices and to this reason they choose to gather and report a huge amount of all possible information that is easy to measure and evaluate. This leads to them drowning in data which is not useful for them. Effective and good managers and people, making the decisions in the company, understand how their business operates, what are all key performance aspects concentrating them into KPIs. This helps them to measure, keep track and achieve the desire effect (Marr, 2012).

Concentrating to the furniture industry, group of scientists mention that this sector has diverse types of equipment and processes that create challenges in controlling and maintaining of it for the company to achieve effective and efficient results for the plant. In these situations, KPIs are central and probably the main tools to measure the work and its movement. They can give data and of the achievements and results in various companies' operations areas such inventory, product and productions quality and other (Lindberg, 2015) which would allow to successfully manage plant's operations and processes.

According to M. Schumacher, the top four key performance indicators that a furniture retailer should focus on are sales, inventory, growth, and customer satisfaction. These critical metrics will tell you if you are meeting your goals and objectives and help determine how you make strategic decisions for your business (Schumacher, 2021).

## **1.2. Key performance indicator types**

KPIs can be divided by different types based on the companies' business profile and type, the perspective of the interest group it matters and represents or companies' processes. Eric T. Peterson divided KPIs by business types:

- KPI for Online Retailers;
- KPI for Content Sites;
- KPI for Marketing Sites;
- KPI for Customer Support Sites (Peterson, 2006);

He mainly focuses on businesses that operate all or some of their business processes online as e-shops, e-commercials or customers support sites. As online businesses and internet innovations are booming in the 21st century, these KPIs become quite important for all companies in different industries as some of their operations or at least information, communication and marketing actions will probably be provided to their customers through online solutions or sites.

Talking about perspective of the interest group, Bernard Marr says that there are six main groups, which describes KPI:

- Financial perspective (ROI, Revenue growth rate, Net profit, ROA, Operating profit margin, Gross profit margin, TSR, EBITDA, EVA, and other)
- Customer perspective (retention rate, NPS, satisfaction index, Customer lifetime value, other)
- Marketing and sales perspective (growth rate, market share, Cost per lead, Conversion rate and other)
- Operation processes and supply chain (six Sigma level, CUR, Process waste level, OFCT, PSV and other)
- Staff perspective (HCVA, satisfaction index, RPE, engagement level, advocacy score and other)
- Corporate social responsibility (water and carbon footprint, supply chain miles, resource consumption and other)

In total there are 72 KPIs which author divided into those six groups. As it is indicated those groups represent different views of different interest groups that are important for the company. It allows to measure and follow all organization activities and processes. Off course, to follow all 72 indicators can be challenging to a smaller business and also not all indicators can be applied to all companies. Each of them should self-assess the criteria, their availability to gather necessary data and decide if all the groups are suitable for them and what exact KPIs from that group the management team should evaluate and measure in their daily activities.

The last view focuses on performance. Many industries still lack adequate rules for measuring and improving performance, thus they propose various forms of KPIs that may measure and track various sorts of performance (Lindberg, 2015):

- Energy KPIs (energy types: gas, electricity, oil, biomass and etc.);
- Raw-material KPIs (plant, water, chemical and etc.);
- Operation KPIs (OEE, schedule time, over a time period and etc.);
- Control performance KPIs (product quality, production speed, equipment wears);
- Maintenance KPIs;
- Planning KPI;
- Inventory and buffer utilization KPIs;
- Equipment KPIs.

These authors provide more focused approach towards manufacturing and engineering industry. These indicators measure the processes which happen during production and manufacturing phases and everything around this - equipment, materials, operations, products quality and inventory management in the plant and warehouse.

This approach can be essential for this type of companies – they can measure only these performance KPIs or can use mix of different approaches. By combining different approaches and having for example the department responsible for manufacturing keeping up the performance KPIs and other departments measure indicators from their perspective (marketing and sales, customers, HR for employee perspective, etc.) would allow company to have full view of organizational performance that is the most critical for the current and future success of the organization.

According to the Laura Lake, the three characteristics of KPIs are as follows. They are quantitative, practical and actionable. However, other authors identify much more types and describes them into their articles, and we can find much more types of KPI. Different authors opinion let us to assume and identify the main types of the KPI (Table 1.1):

**Table 1.1.** KPI types

<b>KPI type</b>	<b>Description</b>	<b>Example</b>
Quantitative indicators	Really anything that involves numbers. There are two kinds of quotative indicators: discrete and continuous. During time, continuous quantitative indicators can take any meaning (even decimals). Complaints and rating scales are discrete quantitative metrics examples. Indicators should provide the most important performance data to help organizations indicate if they are on the right path to reach their strategic objectives. This is the most prevalent sort of KPI, and it encompasses a wide range of topics.	<ul style="list-style-type: none"> <li>• Number of sales;</li> <li>• Time;</li> <li>• Consulting days delivered;</li> <li>• Money;</li> <li>• Weight;</li> <li>• Waste;</li> <li>• Number of customers;</li> <li>• Inventory;</li> <li>• Resources spent on one paying customer and etc.</li> </ul>
Qualitative indicators	Numbers aren't used for measurement. A qualitative KPI usually shows process or a organizations decision. Properties, opinions and qualities are this type KPIs examples. F.e. Staff satisfaction survey is often used by firms on a regular basis. Some survey data is quantitative, but the measurement is based on an subjective person's assessment. Qualitative research main focus is on "why" instead of "how."	<ul style="list-style-type: none"> <li>• Opinion of the person in various questions.</li> </ul>
Leading indicators	A leading KPI is a measurable variable that changes before the organization begins to follow a specific pattern or trend. These indicators are formulated to forecast the result of a process	<ul style="list-style-type: none"> <li>• Number of new patents;</li> <li>• % Growth in sales pipeline;</li> <li>• The number of new website trials;</li> </ul>

	modification and corroborate long-period data patterns. Leading KPIs are used to forecast company changes, however they are not always reliable.	<ul style="list-style-type: none"> <li>• % Growth in new markets;</li> <li>•</li> </ul>
Lagging indicators	A lagging KPI is a measurable fact that records an organization's actual performance. Lagging indicators are formulated to assess the success or fail of a program by comparing results at the conclusion of a specific period. They're frequently used to measure past performance. Total client encounters or total occurrences are two examples of lagging. Lagging indicators allow firms to measure the result of their companies decisions and determine if they helped them reach the desired goal.	<ul style="list-style-type: none"> <li>• Growth in annual sales;</li> <li>• EBITDA;</li> <li>• Annual sales;</li> <li>• Annual net income;</li> <li>• Gross margin.</li> </ul>
Input indicators	They are used to track how much of a company's resources are consumed throughout a certain companies' process. They are essential for tracking efficiency of resource in big scale projects with many different components, but they are too valuable in smaller projects.	<ul style="list-style-type: none"> <li>• Cash on hand;</li> <li>• Staff time;</li> <li>• Equipment.</li> </ul>
Process indicators	They are indicators that are used to determine whether or not scheduled actions were carried out. Process indicators are used to assess a process's efficiency and promote beneficial modifications. KPIs focusing on customer support tickets are a frequent process indicator for support teams.	<ul style="list-style-type: none"> <li>• Holding of meetings;</li> <li>• Conduction of training courses;</li> <li>• Development and testing;</li> <li>• Customer support tickets;</li> </ul>



		<ul style="list-style-type: none"> <li>• Percentage of product defect;</li> <li>• LOB efficiency measure.</li> </ul>
Output indicators	The process or commercial activity success or fail is measured by output indicators. Frequent KPI kinds is output indicators. There are KPIs that are related to the products that have been generated (goods and services). They can be assessed in terms of quantity, quality, or a combination of the two.	<ul style="list-style-type: none"> <li>• Profits;</li> <li>• Revenues;</li> <li>• New customer acquired.</li> </ul>
Practical indicators	They take existing company processes into consideration and investigate the consequences of those activities on the business. As a result, many practical indications may be specific to a particular organization or set of work processes.	<ul style="list-style-type: none"> <li>• Unique indicators to work or the company processes.</li> </ul>
Directional indicators	Directional indicators assess a company's distinctive patterns. What is the current state of the metrics? Are they getting better, becoming worse, or staying the same? Example of Time on Site is for directional statistic that many service providers utilize. This indicator is used to track how much time technicians spend on-site troubleshooting and correcting issues. Most businesses would prefer to reduce their time on site because it indicates a speedier, more efficient service. Vide indicators can be used to assess your	<ul style="list-style-type: none"> <li>• Amount sold month-over-month.</li> </ul>

	company's place in relation to competitors in your industry.	
Actionable indicators	They assess and represent a company's willingness and ability to adopt organizations improvements. These changes can be in business operations, culture, or other action. These measurements are adopted to assess a organizations ability to implement wished changes during a given time frame.	<ul style="list-style-type: none"> <li>• Review business objectives;</li> <li>• Analyze current performance;</li> <li>• Review targets;</li> <li>• Review progress and readjust.</li> </ul>
Financial indicators	A monetary KPI or metric is a quantitative value that represent a firm's financial results and performance, as well as data regarding expenses, sales, money flow and profit to optimize and meet the financial results and organization objectives.	<ul style="list-style-type: none"> <li>• Monthly recurring revenue (MRR);</li> <li>• Revenue growth rate;</li> <li>• Net profit margin;</li> <li>• Revenue per FTE;</li> <li>• Current ratio;</li> <li>• Revenue per customer;</li> <li>• Return on equity (ROE).</li> </ul>

Choosing the correct indicators is crucial for assessing financial, operational effectiveness. While most business owners are aware of the necessity of selecting the right KPIs, they are often unaware of the differences between the many types of KPIs.

Knowing the different sorts of KPIs can assist you guarantee that you've covered all of your bases. It offers a comprehensive strategy which provides you the ability to measure the past, present, and future of all aspects of your company. Using the wright knowledge to make the KPIs classification will provide you the ability to go beyond tracking individual measures and gain a more in-depth understanding of your company's success.

Continuing our look at the KPIs that might be used by different departments (table 1.2.). KPIs are specific to each organization and department because each has its own set of goals. However, there are enough commonalities between departments within a corporation that their KPIs can be stated similarly.

**Table 1.2.** KPI by departments

<b>Department</b>	<b>Description</b>	<b>Example</b>
Management	Management KPIs provide a strategic perspective of the performance of specific aspects of the business to executive managers and the CEO level, allowing them to make data-driven choices as quickly as possible.	<ol style="list-style-type: none"> <li>1. Customer lifetime value;</li> <li>2. Return on equity;</li> <li>3. Customer acquisition costs;</li> <li>4. Net profit margin;</li> <li>5. Return on assets;</li> <li>6. Sales target;</li> <li>7. P/E ratio.</li> </ol>
Finance	Financial KPIs measure how well a company manages its cash, sales, expenses, and profits. They assist in staying on track with financial goals.	<ol style="list-style-type: none"> <li>1. Percentage of gross profit margin;</li> <li>2. Current Ratio;</li> <li>3. Working Capital;</li> <li>4. Acid Test / Quick Ratio;</li> <li>5. Operating Profit Margin Percentage;</li> <li>6. Berry Ratio and etc.</li> </ol>
Sales	Sales KPIs give you information on process and representatives. They are critical to driving sales forward by tracking pipeline lead generation, health, productivity and general activity.	<ol style="list-style-type: none"> <li>1. ARPU;</li> <li>2. Sales growth;</li> <li>3. Sales target;</li> <li>4. CLVT;</li> <li>5. Customer acquisition cost;</li> <li>6. Customer churn rate.</li> </ol>
Marketing	Marketing KPIs helps in the tracking of overall web performance as well as the launch of all online initiatives. They are necessary in order to provide a comprehensive picture of all online activity and to	<ol style="list-style-type: none"> <li>1. Engagement rate;</li> <li>2. Acquisition cost;</li> <li>3. ROI;</li> <li>4. Target of sales and its growth;</li> <li>5. Value of average order;</li> <li>6. Cost per lead;</li> <li>7. Click-per-click.</li> </ol>

	calculate an accurate marketing ROI.	
Human resources	Human resources KPIs are critical for a well-functioning human resources department that wants to improve its recruitment procedures, workplace happiness, and employee performance.	<ol style="list-style-type: none"> <li>1. Time to fill;</li> <li>2. Absenteeism rate;</li> <li>3. Cost per hire;</li> <li>4. Overtime hours;</li> <li>5. Employee productivity;</li> <li>6. Training costs;</li> </ol>
Service & Support	Customer service is important. KPIs are useful for gaining a comprehensive perspective of the support department, agents, and a 360-degree view of the consumer. They play a critical role in boosting consumer satisfaction.	<ol style="list-style-type: none"> <li>1. Average of the response time;</li> <li>2. Top agents;</li> <li>3. First Call resolution;</li> <li>4. Service level;</li> <li>5. Issue number;</li> <li>6. Revenue churn and etc.</li> </ol>
Procurement	Procurement KPIs aid in overall procurement department management, resulting in more improving and sustainable procedures. Control costs, purchases, savings, and so on.	<ol style="list-style-type: none"> <li>1. Compliance rate;</li> <li>2. Supplier quality rating;</li> <li>3. Number of suppliers;</li> <li>4. Lead time;</li> <li>5. Purchases in time &amp; budget and etc.</li> </ol>
IT	IT KPIs measure all the projects on the wright path with their results. Managing a steady flow of problem tickets while keeping information of IT expenses	<ol style="list-style-type: none"> <li>1. Server downtime;</li> <li>2. Mean time to repair;</li> <li>3. Estimates accuracy;</li> <li>4. IT costs;</li> <li>5. IT ROI;</li> <li>6. Team attrition rate.</li> </ol>

	is the foundation of a well-functioning department.	
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Off course, there are a lot different kinds of KPIs, regarding on the individual goals and the most successful way to calculate them. Only organizations' owner can decide which indicators are the most important for his/her company and decide which type to use to get the best results in the future.

### 1.3. Key performance indicators creation

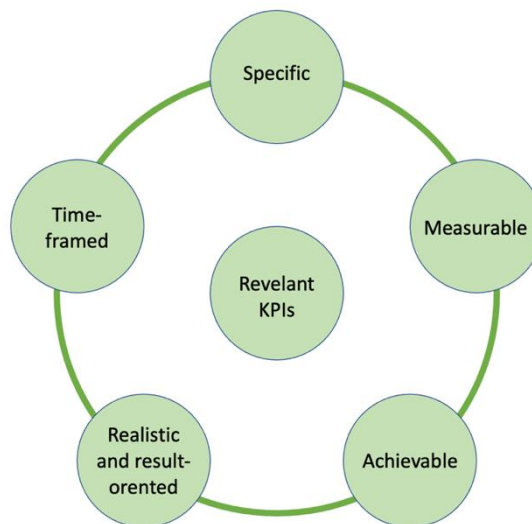
Important to understand how to form KPIs. Key performance indicators can be defined by different characteristics. After all analysis and discussions with over 3000 participants during his study, David Parmenter managed to determine what seven different characteristics of KPIs are:

- Financial and non-financial (not necessary meaning in dollars, Euros, Pounds and other).  
When a currency sign is added to a KPI it converts it mainly into a profit or income result indicator, but not always this is what is wanted to be measured. KPIs can measure the number of new customers, meetings, marketing post or etc., which implemented and reached can also lead and effect the positive financial results of the company.;
- Timely (24/7, daily, or weekly). KPI should be monitored constantly based by the organizations set time schedule. Also, they cannot be measure only once or few times per year, because it will not provide necessary insights at the necessary time when management actions can still be taken.;
- CEO focus (acted upon by the C-level and top management). All KPIs can have an impact; they keep the CEO's or senior management team's attention since they require daily calls to relevant workers to monitor progress.;
- Simple (KPIs should influence you what action need to be taken).;
- Individual or team (duty can be assigned to a person, a team, or a group of teams that collaborate often).;
- Significant impact (huge impact on the company). A KPI are able to impact one or even a lot of the important factors of the company. It should align to a company's strategy and vision for the future and help to reach it.;

- Limited grey zone (need appropriate and impactful action). A performance metric must be checked before becoming a KPI to guarantee that it produces the desired behavioral effect and has few or no negative consequences.

These characteristics review the main aspects and ideology of indicators structure and its management. To add, there are additional recommendations which provide insights into how to form a KPI. It is recommended for each company goal to define at least one KPI that would allow to monitor and measure success. According to Harvey Maylor, SMART (fig 1.1.) criteria can not only be applied to setting goals and targets, but also can be considered and used to create measurable indicators in order to reach those goals and targets. SMART is defined as:

- Specific and written down. It has to be clear what action the KPI is asking and what has to be done.
- Measurable. How it will be measured and decided whether it is achieved/maintained or failed/unreached.
- Achievable. Must be physically possible.
- Realistic and result-oriented. Asking for some sort of result or outcome that would be realistic but also create expectations for improvement.
- Time-framed. Is there a defined deadline, time frame in which it is measured or it is constant (has to be this way always).



**Fig. 1.1. SMART Criteria**

*Source: prepared by author, based on Harvey Maylor, 2010*

With the additions of evaluate and reevaluate, the SMART criterion can be made SMARTER. These two processes are important because they ensure that the management team is constantly evaluating the specified KPIs and their business relevance (Maylor, 2010).

It is also important include several key elements into consideration:

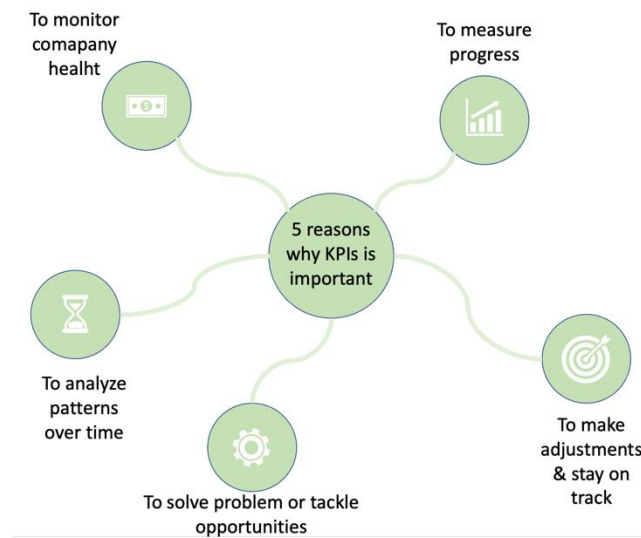
- Measure output: what is being tracked;
- Source of data: what is going to be utilized to measure KPI results, and who and where are the best areas to place it;
- Decided frequency to measure data: the period frame used to evaluate progress;
- System rating: what criteria might be used to evaluate performance; this could be a pass/fail test or a rating system.

All in all, company management team has to understand what action it wants to achieve and based on that to form corresponding KPIs. There are different things that need to be considered when forming the KPI, but mainly it relies on the available data, ability to measure and manage teams' actions accordingly to the organizational performance that is most important for the organization's current and future success (Parmenter, 2015).

#### **1.4. Key performance indicators' importance**

KPIs' help to evaluate systems' performance (Moktadir, 2021). They provide a significant portion of the data needed to establish and explain how the organization will achieve its marketing and business objectives (How Do Key Performance Indicators Affect Company Success? ( 2019, June 25)). For the manufacturing process, KPIs can be a significant decision-making tool. These indicators aid decision-makers in industry in reaching more progressive and efficient decisions by determining whether the organization is heading in the correct path and if they are not, where staff has to focus its thinking. KPIs can help a company set its objective goals and boost its performance significantly. They can also assist in identifying and resolving the fundamental causes of problems in various businesses. The main task of a performance evaluation system is to identify the key performance indicators that can be used to assess its effectiveness. A collection of KPIs can be identified to assist an organization in becoming more sustainable and efficient (Moktadir, 2021). The main KPI's goal is to help improve companies' health (How Do Key Performance Indicators Affect Company Success? ( 2019, June 25)). In addition, a KPI is a numerical figure which shows how effectively an organization is achieving its goals. A collection of KPIs aids a supply chain manager in taking more relevant calculations by measuring the effectiveness and cost of the supply chain. Key performance indicators are also useful for determining whether or not a company is improving. Measurements make it simple to use indicators to undertake continuous monitoring of a business process (Velimirović, in press). The purpose of incorporating KPIs into the manufacturing is to provide assistance for the production process and plant managers, allowing them to respond clearly

and quickly while also having comprehensive control over the situation of the manufacturing process in all of its components (Md. Moktadir, 2021).



**Fig. 1.2.** 5 reasons why KPIs is important

*Source: prepared by author, based on Md. Moktadir A. et al., 2021*

Authors identify main reasons (fig. 1.2.) why KPI is important and why all business owners need to pay a huge attention to the data which they gave from the KPI:

1. Company health examination. Key performance indicators show the company's health state. Only measure what you want to alter so you can put your energy where you want it. Developers have identified the need to evaluate multiple KPIs in each of four stages: Customers, Employees, Revenue and Processes. These go under the responsibilities of HR, CL - consumer loyalty, companies' measures, organizational system and other. Choose the correct KPIs for the company, and then then think who is responsible for them.
2. Progress change examination during a time period. Keep track of critical key performance indicators such as income, margin, number of subdivision, staff, etc. Set goals at the start of each calendar year and quarter and utilize KPIs week by week to track progress toward those objectives. Setting the correct KPIs helps to achieve long-term objectives and organizations methodology.
3. Alteration implementation to move according to a plan. KPIs helps to see what will occur in the near future and the possible performance of companies. In addition to results, managers and companies also need the managerial metrics to acknowledge when a company might enter the zone of failing to meet those set goals before it becomes too late. They indicate whether the organization is working to achieve the expected results the owner needs. Most important KPIs have two features: they are quantifiable and they can be influenced directly. These indicators are acceptable in the dashboard for target projects.



4. Problems solving and the usage of new opportunities. Use a combination/group of KPIs to easily access the data you need to troubleshoot or resolve issues.
5. Patterns indication and analyzation during a time period. If you measure the same KPIs on a quarterly basis, you can start detecting number patterns. There are many ways these models can help a business.

Individual activity and organizational vision are linked through KPIs. Indicators which move from one zone to the next one in a company are great to use. You might visualize this by visualizing your company in a form of a pyramid, as shown in Fig. 1.3. below.



**Fig. 1.3.** KPI into organizational structure

*Source: prepared by author, based on Velimirović et al., 2011*

Starting from the bottom you have concrete actions, KPIs serve in the middle as they descend from the upper levels and manage the actions in the organization. The upper levels which form the KPIs are critical success factors (CSFs), objectives, organization's strategy. In the top you have the companies vision which shows direction.

CFSa are areas of movement where the association should function as well-oiled machine to be effective and by using KPIs it can be assessed. Activities under the KPIS are the commitments that are performed to implement the KPI.

Well-used KPIs provide pillars for organization's strategy and objectives. They concentrate the management on most important things and help measure progress.

## **1.5. Key performance indicators for manufacture companies**

First, it is important to understand that furniture industry is a huge and are related with manufacture and sells. There are many existing companies which are only selling furniture without any production and there are a lot of companies which do both – produce and sells. However, both type of companies does not avoid KPIs. When a company first begins to use KPIs, the concept can seem confusing. Everything can be divided into smaller, more manageable chunks of information. According to the authors, there are 10 basic KPS in manufacturing that organization should consider implementing:

1. Throughput – this KPI measure the production machine, line or factory capabilities; otherwise known as the amount they might deliver within a pre-determined time-slot.

$$\text{Throughput} = \frac{\# \text{ of units produced}}{\text{Time (hour or day)}}$$

2. Cycle time – it is the amount of time it takes to generate a result in the manufacturing industry. It can also be used to calculate the amount of time it might take to make a finished product, as well as the time it takes to deliver the final product to the consumer.

$$\text{Cycle time} = \text{Process end time} - \text{Process start time}$$

3. Demand forecasting – organizations use this production indicator to estimate how much raw material they will require to meet future client demand.

$$\text{Projected customer demand} = \text{Raw materials} \times \text{Production rate}$$

4. Inventory turns – it calculates the number of times stocks are sold over a given period of time and helps to demonstrate resource efficiency. Low proportions suggest feeble transactions and irregular stockpiles, whereas high proportions indicate solid transactions and inventory shortages.

$$\text{Inventory turns} = \frac{\text{Cost of goods sold}}{\text{Avg. inventory}}$$

5. Production attainment – This production productivity indicator determines the percentage of time that the desired level of output is reached after measuring the level of production over a period of time.

$$\text{Production attainment}$$

$$= \frac{\# \text{ of periods production target met}}{\text{total time periods}}$$

6. Cash to cash cycle time – It is the amount of time that elapses between the original cash cost of raw materials, inventories, or an assembly facility and when an organization receives payment from its clients for its items.

$$\text{Cash to cash cycle time} = \text{Inventory sales date} - \text{Inventory purchase date}$$

7. Avoided cost – Metrics for avoiding production costs provide an estimate of how much money can be saved by spending money.

***Avoided cost***

$$= \text{Assumed repair cost} + \text{Production losses} \\ - \text{Preventative maintenance cost}$$

8. Changeover time – The time it takes to switch tasks, starting with one and then moving on to another, is referred to as change time. It shows the time spent moving a production line from one to another in production.

***Changeover time = Net available time – Production time***

9. Takt time – Takt time is the maximum length of time that a product can be manufactured while still reaching a client's deadline.

***Takt time = Net available time / Customer's daily demand***

10. Return on assets (ROA) – This metric measures how your business uses its assets (money).

$$\text{ROA} = \text{Net income} / \text{Avg. total assets}$$

It's important to remember that there are some basic KPIs utilized in the manufacturing industry, and that all companies should modify their KPIs after gaining information.

## **1.6. Start-up**

The creation of new businesses not only makes a strong contribution to job creation (Decker, 2014), but is important for the country's economic growth (Gries, 2009). A large number of companies make little or no contribution to this growth. However, the greatest economic benefits are possible expect only from companies that rely on established-breaking innovations because they open new markets or creates new business models (University of Puerto Rico, 2015). Such changes in the economy are usually compared to the concept of a start-up – a start-up venture (Salamzadeh, 2017). This concept first time was mentioned in 1976. Forbes magazine as a reference to risky entrepreneurship. A coincidentally used term that originally means from several venture with limited capital (Egan-Wyer, 2017) was increasingly used at the beginning of the internet era until it finally took root at this time in the evolving era of the Internet economy.

Other author, Eric Ries identifies a young company as an organization which are able to create something innovative under the extreme uncertainty conditions (Ries, 2011). Often, startup refers to the first stage of a company's development of novel business products and models (Rocha, 2019). Stated in other words, startups are temporal organizations or stages of organization life cycle

that are always experimenting to find a scalable and repeatable business strategy, and then achieve higher levels of growth and returns (Gupta, 2020). Author C. Rocha agree, that startups are characterized by a experimentation period during which managers seek out a service or product that has the potential to generate large returns. While established businesses use well-known business management models and concentrate on optimization and efficiency, young companies are looking for a viable proposition of value and a scalable, repeatable business strategy. (Rocha, 2019).

Whatever the purpose of the activity, in terms of starting creations and with already changing the established business model, startups are based by innovation. For a company, innovation provides a big advantage in their ability to compete. An innovation is defined as "the introduction of a new or significantly enhanced product (good or service), procedure, a new marketing approach, or a new organizational method in company processes, workplace organization, or external interactions." The Oslo Manual grouped innovation into four different categories: product, process, marketing, and organizational. (Karabulut, 2015):

- A product innovation can be immediately identified by the stakeholders of a company's. To have a competitive advantage in the field, it's usually mandatory to always invest in research and development.
- A process innovation is a way for moving up the efficiency of an organization. To make a process innovation, an organization may need to invest in new technology, train the staff, and make changes in their processes.
- When compared to product innovation, market innovation might be simpler and less expensive to a company. It could probably help to renew its' standing in an industry. An enterprise can expand its coverage and boost its sales by penetrating it.
- Organizational innovation broadens a organizations vision and capabilities, promotes employee joy, and moves to change.

According to the authors, the innovation itself can be of two types – technological and non-technological. Technological innovation is a fundamental source of growth at the firm, sector, and country levels (le Bass, 2014). However, it is important not to underestimate non-technological innovation. Innovation in organization can improve productivity and product quality, improve data and technology usage capacity, and promote information and technology communication among corporate units. New work techniques are an example of organizational innovation. It could be related to knowledge organization, knowledge access, or the creation of new databases. It may also be linked to the creation of an organizational paradigm that encourages employee engagement in decision-making. It has to do with combining R&D and manufacturing, as well as arranging activities of

commerce. Determining that an innovation in companies creates economic benefits and time by overlooking the business functions cooperation (Karabulut, 2015). Regardless of the type of innovation, the ability to solve a sensitive societal or business problem using an existing innovation is assessed in startups.

For the latter reason, in order to solve a sensitive problem, the startup must be oriented to the target audience. Startups can be two types: B2B (Business-to-business) and B2C (Business-to-client). Organizational commerce has existed since the inception of organizations. Of course, this implies that B2B marketing has existed for millennia as well (Hadjikhani, 2013). The rapid expansion of e-commerce in business-to-consumer (B2C) has mostly created value to customers, such as satisfying their product information search and boosting their online purchase decisions quality (Zhou, 2018). For this reason, almost all startups are using both types. It allows to establish itself faster into the market and solve more problems that they can.

### **1.7. Start-up success and fail indicators**

The number of innovative startups increases every year. Significant role in the evolution driven by two factors: rapid rate of technical advancement in scientific fields and the benefits of small startups over large organizations in using innovative ideas due to their ability to adapt and capacity to react to changes in the market. But, only 1/10 startups become successful in the long run. It depends on:

- Companies idea. This is a starting point for every company. Scientific discoveries which have practicality are frequently the source of the best competitive advantage ideas. This paves the way for them to be commercially used. That's why companies say applied science is the leading force of businesses.
- Funds. Any startup's chances of succeeding are slim to none unless it receives some funding which can be enough.
- Staff. It is preferable to have a close and familiar, well-oiled team with whom you introduce your idea to market by the time it is put into production.
- Ground of development. A certain "fertile ground" is necessary for the effective development of a company. On the foundation of a business incubator, startups can grow and flourish. Most higher education institutions offer business incubator on campus which gives access to consultants, office space, etc. (Tomsk Polytechnic University., 2012).

Those four reasons, mentioned before, are just a small but important part of indicators, which allow startup to become successful.

Continuing V. A. Verbovskii idea that only one in ten startups is successful (Tomsk Polytechnic University., 2012), it is important to find out what causes their failure. Fast-growth young companies may collapse if chosen organizational model that served as the foundation for their action plan fails to provide any result. They might become unsuccessful if the industry does not provide a window in the path or at the time they expected. High-risk behavior, which is common with profound innovations, is more likely to fail than succeed. On the other hand, due to entrepreneurial crisis, many firms fail or may not reach their full potential (Davila, 2010).

There are common challenges which effect startups, only the extent to which they affect them differs (Salamzadeh, 2015). The first problem temptation of a good plan, market research and strong strategy. This stuff used to be deciders of potential success in history. The tempting part is to use them to young companies also, but this isn't feasible because young companies operate in an environment of changes and risks (Ries, 2011). The second challenge – finance. The financial part of the young companies' process is crucial. Due to a lot of reasons and at different times, all companies might face financial uncertainty. Different help mechanisms can play a crucial role in the young companies' existence. Business angels, incubators, development parks, organizations' support centers, ventures and other support channels are among in the market. Difficulty to access these support channels increases the failing risk (Salamzadeh, 2015). The third issue appear after seeing traditional, old type of management failing to solve the problems, several executives and 10 Introduction financiers collaborated and adopted the "Just Do It" school of startups. This school believes that if management is the problem, chaos is the solution. Unfortunately, nothing of these options works. It is difficult to believe things as inventive, disruptive as a young company can or must have its management done wright. (Ries, 2011).

These named reasons are only a small part of what can prevent a start-up from becoming successful. Every business and new idea is different from each other, and one reason can bring success to some, failure to others. The human factor and the ability to turn from body position are involved in this place. Only a person who believes in his idea can turn failure into success.

## **2. EMPIRICAL RESEARCH IN KEY PERFORMANCE INDICATORS FOR START-UPS IN FURNITURE INDUSTRY**

### **2.1. Empirical research structure**

In this master's thesis I was used empirical research. In order to gather information that would determine the key success indicators of how to create a competitive and successful furniture industry company, it is necessary to determine what aspects and factors are important for the company, what the company's aspirations are, what the company's services are and what market share the company focuses on. The company should determine what kind of furniture it wants to provide: standard cabinet furniture, non-standard cabinet furniture, upholstered furniture, etc. This section presents empirical research - describes the survey methodology and process.

**The goal of the empirical research** - is to determine the success indicators of existing and potential furniture industry companies, which allowed or would allow for a stable establishment in the market.

#### **Objectives:**

- Introduce research type and data gathering process;
- Sample picking;
- Create data collection method;
- Outline how the data will be analyzed;
- Implement empirical research;
- Data analyzation and results presentation.

### **2.2. Empirical research information**

#### **2.2.1. Research type and data gathering process**

The goal of this study is to determine key indicators of success. To do this, exploratory studies were performed and a qualitative research type was chosen for this study, because the goal of this study is to determine the success factors which can impact furniture industry start-up and his success. The biggest advantage of choosing qualitative research is that it mainly focuses on words, emotions, people thoughts on specific topics or questions, their insights and not on the numbers or big group preferences (Maxwell, 2005).

Qualitative studies typically cover smaller sample of respondents (Rubin, 2011), but provides more in depth information. Researcher can find out what are companies' needs, processes and preferences, delves into their way of thinking and making the choices in different situations or scenarios (Myers, 2013), what are their expectations for results and for success (Rubin, 2011).

To collect the data, a questionnaire that is structured was created to collect information from the respondent - start-up companies. Structured questionnaires are commonly used in management field, pre-defined questions provide direction for respondents and allow to gather the information for the same questions from different companies (Myers, 2013; Oishi, 2002).

### **2.2.2. Research sample**

The target group is managers of companies located in Baltic countries as Lithuania, Latvia, and Estonia. The start-up company should not last more than 2 years independently how much employees it has or what an annual turnover of the company is.

Companies specialize in the furniture industry and managers have different experience but are similar in their responsibilities. This target group was selected based on the current market situation.

The managers from start-up companies located in all Baltic countries are more or less known for the researcher or can be found using different contacts in the industry or the internet. The research is done until no new respondents are reached or it is not manageable to deal with the amount of data, respondents, no different responses are gathered (Saunders, 2009). This way the determination of the sample size is done.

Big sample for this study is unlikely. It is because of the many limitations of the study, it was difficult to find suitable companies that could and would like to participate in the study.

Also, an expert evaluation was performed after the model was prepared through a focus group, a meeting was held and the opinion of an experienced employee about the model was heard.

### **2.2.3. Data collection method**

A block of questions was prepared for a group of respondents (representative of the start-ups). The structure and questions were developed by the researcher based on the theory found and described in the first part of this paper.



The questions were formed in English as respondents are international, google forms were used as a tool. As it was indicated (Table 2.1.), information about the company, their success and fail factors and KPIs for different groups had to be researched. It was aimed to determine respondents thinking and important KPIs for them.

**Table 2.1.** Questionnaire structure

<b>Elements</b>	<b>Questions numbers</b>	<b>Aim to identify</b>
Demographics	5	The profiles of companies. It is important to know, where company are located, what is the size of the company (how many employees works in the company), what they are produce and for which sector their goods are intended. Are the company exporting their production and if yes, where?
Startup success factors	4	This question block shows which aspects are mostly important during startup creation phase. Asked to rate from very likely to very unlikely. <ul style="list-style-type: none"> <li>• Idea;</li> <li>• Funding;</li> <li>• Team;</li> <li>• Ground of development.</li> </ul>
Startup fail factors	3	The aim of this question is to find out the opinion of the respondents, which is why startups usually fail. Asked to rate from very likely to very unlikely. <ul style="list-style-type: none"> <li>• Finance;</li> <li>• Temptation of a good plan, market research and strong strategy;</li> <li>• Failed solving the problem.</li> </ul>
Inbound logistics	2	The aim of inbound logistics shows to which component company needs to take all attention. To rate criteria could help customers reviews. Also was asked to rate from very likely to very unlikely. <ul style="list-style-type: none"> <li>• Delivered goods quality;</li> <li>• Delivery of goods timing.</li> </ul>

Operations	3	<p>In this regard, the aim was to find out how the employee of the company positions the production processes and the results it provides. Asked to rate from very likely to very unlikely.</p> <ul style="list-style-type: none"> <li>• Quality ratio;</li> <li>• Overall equipment effectiveness;</li> <li>• Employees labor productivity.</li> </ul>
Outbound logistic	1	<p>Main objective of this question is to figure out how important touring is. Are there possible errors for unforeseen reasons?</p> <ul style="list-style-type: none"> <li>• Late deliveries to key customers.</li> </ul>
Marketing & Sales	3	<p>What makes a bigger impact on a company in sales? What are the goals? To occupy a large part of the market or to work in a concentrated but large manner?</p> <ul style="list-style-type: none"> <li>• Sales (units) and revenue;</li> <li>• Market share;</li> <li>• Export sales growth rate.</li> </ul>
Service	3	<p>How important is quick response to customer queries? dissatisfaction? does it affect business growth?</p> <ul style="list-style-type: none"> <li>• Damage return rate;</li> <li>• Complaints from key customers not resolved within two h;</li> <li>• Key customer queries not responded to for over twenty-four h.</li> </ul>
HRM	5	<p>How important is the atmosphere in the company? can the company be affected by employee complaints or changes? how important is it to provide employees with suitable and motivated jobs?</p> <ul style="list-style-type: none"> <li>• Initiatives number fulfilled after staff-satisfaction survey;</li> <li>• Staff in important positions who provided their notices in the last hour;</li> <li>• Key position job offers given to candidates, outstanding for more than three days;</li> <li>• Number of deserted roles at a critical in-house course;</li> </ul>

		<ul style="list-style-type: none"> <li>Number of abandonments to be forced in the next thirty, sixty or ninety days.</li> </ul>
Technology development	4	<p>How important is the introduction of new technologies? devices? how can they affect product diversity? how do innovations change production processes?</p> <ul style="list-style-type: none"> <li>Amount of newly developed products;</li> <li>Amount of completed process innovation projects;</li> <li>Amount of technical development projects for learning and growth in process;</li> <li>Amount of implementation innovations planned for the next thirty, sixty or ninety days.</li> </ul>
Procurement	1	<p>How important is it to have the right raw materials? is it affected by rising material prices?</p> <ul style="list-style-type: none"> <li>Stock level.</li> </ul>
Sustainability	5	<p>This question block was aim to identify respondent and company position regarding:</p> <ul style="list-style-type: none"> <li>Reduce energy cost;</li> <li>Renewables usage;</li> <li>Products and services designed for circularity versus products and services by value ratio;</li> <li>Products and services designed for circularity versus products and services by the mass of materials ratio;</li> <li>Inputs recycled.</li> </ul>

#### 2.2.4. Data analysis process

The data collected was consist of an evaluation of the respondents and was be needed for analysis. The data were coded and compiled into an excel program, which made it possible to make a correlation matrix (Appendix B). Quantitative data research consisted of three stages: data aggregation, data representation, conclusions, and verification (Malhotra, 2007). The collected data were filtered, and the most important insights related to the purpose of the study were highlighted. The filtered data were summarized by category, repetition was measured, and matrices showing the patterns and interrelationships were presented and described, interpreted.

### **2.3. Research process**

At the beginnings of the research, 37 managers from different companies were contacted, but only 13 managers from different companies replied: 10 from Lithuanian startup companies, 2 from Estonian companies and 1 Latvian. It is important to mention, that survey was decided to make only into Baltic countries. The final sample was smaller than expected because the request for the research was ignored by the contacted companies.

Research was done by sending an e-mail with a link to the survey. As mentioned previously the survey was made using google forms. It is also important to mention, that the survey was anonymous, and no respondents wanted to receive the survey results.

Data was gathered from 11<sup>th</sup> of October, 2021 until 27<sup>th</sup> of October, 2021.

It was difficult to find furniture industry contacts of few reasons: young companies do not advertise so much about themselves; it was difficult to find reliable sources that publish up-to-date information about companies; it was difficult to find foreign start-ups. Because of these reasons instead as it was planned to gather more than 50 contacts, only 37 were found.

After sending the request to the respondents by mail, there was not much interest. Only one answer was received from the Lithuanian company during the week. A repeated letter was sent with polite requests to answer the questions asked and it gathered more replies. It was possible to get probably more answers by choosing different time frame for the research - the furniture industry in October is always very stressful as all customers want to get their goods before Christmas. Production takes place a couple of months before departure, so I think it was the busy production period that could have been the main obstacle to reaching your target audience easily.

### **3. EMPIRICAL RESEARCH RESULTS IN KEY PERFORMANCE INDICATORS FOR START-UPS IN FURNITURE INDUSTRY**

#### **3.1. Description of the sampling**

The sampling size was 13 respondents. The respondents were from the Baltic countries: 10 executives were from Lithuania (76,9%), 2 executives were from Estonia (15,4%) and 1 executive was from Latvia (7,7%). The size of the companies where the respondents are working also differed: there were 4 respondents who worked in companies which have 1-9 employees (30,8%), 5 executives were from companies which have 10-49 employees (38,5%), 1 respondent works in companies which have 50-99 employees (7,7%), 2 executives were from companies which have 100-249 employees (15,4%) and 1 respondent works in a company with more than 250 employees (7,7%).

Mostly companies produce non-standard furniture (53,8%). This was the answer of 7 respondents. 5 executives work in companies which produce standard furniture (38,5%). 2 respondents work in company which produce hull furniture (15,4%) and only 1 executive works with soft furniture (7,7%).

Also, it was clarified for which sectors the furniture is produced. From the answers we can see that we reached various companies in Baltic country: 7 respondents answer, that their company produces office furniture (53,8%), 4 executives sell and produce retail furniture (30,8%). 4 respondents work in companies which produce kitchen furniture (30,8%), 3 executives work with hotel furniture (23,1%). 3 companies produce bath furniture (23,1%), and only 1 company produces home furniture (7,7%) and pet furniture (7,7%). It is important to mention, that from the answer we can see, that one company can produce not only one sector furniture, but few of them. So in this survey we can see, that mostly companies produce furniture for offices and something else (retail furniture, bath furniture, kitchens or hotel furniture).

According to respondents, the biggest scope of the productions stays into Baltic countries: Lithuania (61,5 %), Latvia (61,5%) and Estonia (38,5%). 6-8 companies identify that the production is staying in the Baltic region. However, a large part of the finished product is exported into the Nordic regions: Norway (46,2%), Sweden (38,5%) and Finland (15,4%). From 2-6 companies exports their production to the neighbours in Scandinavia. Also, a huge part of goods gets Poland (30,8%), United Kingdom (30,8%), Denmark (30,8%). Interesting, that companies who are start-ups in furniture industry exports even into Mexico (7,7%), South Korea (7,7%) and Australia (7,7%). It

is show us, that companies have recommendations and are able to suggest customers good quality and transportations terms.

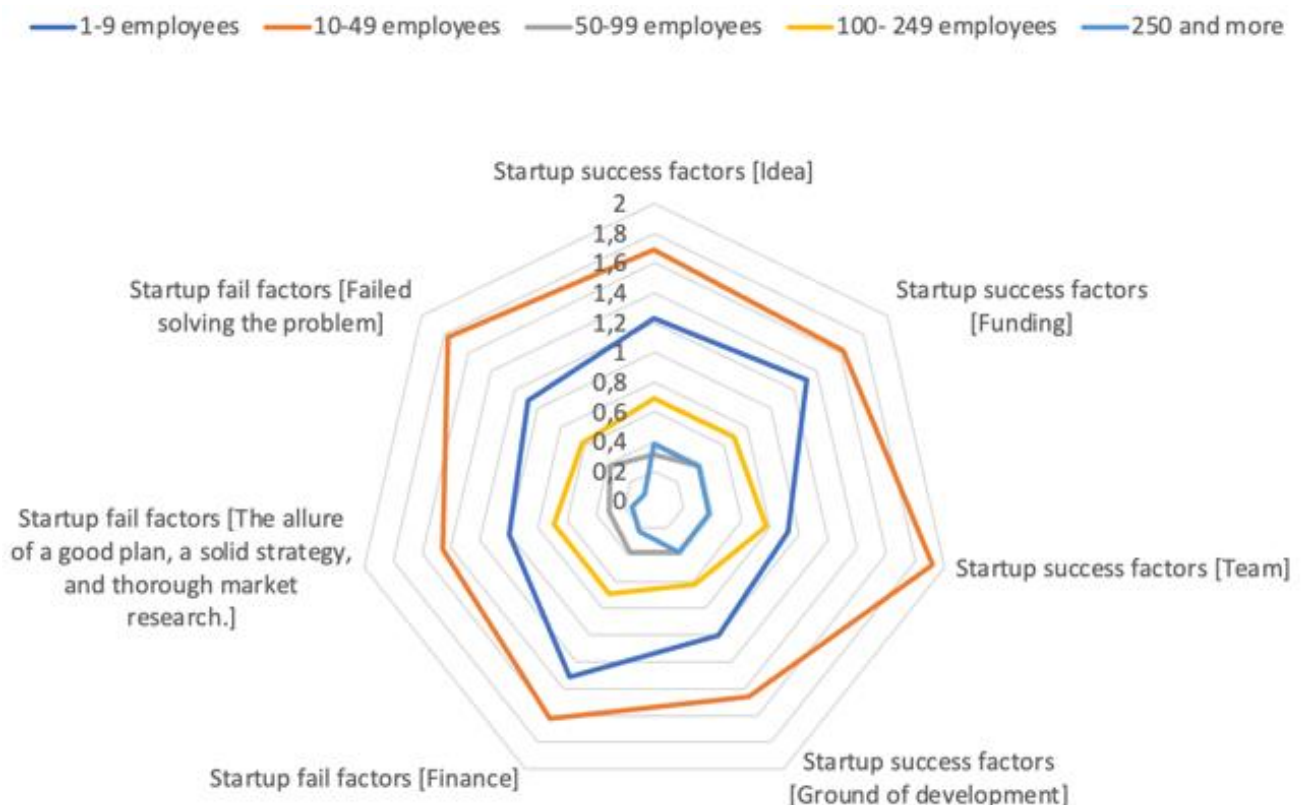
### 3.2. Research results

This part will take research results. All results were coded and written into excel file. Every answer has this own code: 5-very likely; 4-likely; 3– undecided; 2–unlikely; 1–very unlikely.

After coding, a correlation matrix was made, from which we can see the relationships between answers.

#### 3.2.1. Start-up success and fail factors

Respondents were asked to identify which criteria of the startup factors are most important (Fig. 3.1.). They were able to choose between: idea, funding, team and ground of development.



**Fig. 3.1.** Startup success and fail factors results

Results were divided regarding company size. What we can see from the chart, that companies smaller that 250 employees think similar regarding all points. The shape of chart shows,

that company which have from 1-9 employees takes a huge important for a funding and idea, they also think, that at the start-up phase team and ground of development is important, but not so much as other criteria. Strange, but small companies do not take a huge focus on a team into the beginning. They believe that team cannot impact companies' success at the first stage. However, growing employees number shows (companies from 10-49), that at this point, most important criteria became a team. Results shows that company owner are looking into good specialist to employ and invests into them, because without good team company can fail and all work which has been done with be eliminated. Companies from 50-99 and 100-249 shows the same or very similar results, we cannot see any changes at this stage of company size. Companies are focused into all criteria and try to work without any interruptions. All four criteria take the same part of the company success. At the last point, we can see some changes with huge startups. They are coming back to the idea criteria because they already have good team, funding, and ground of development. Company is trying to exploit having resources and create a new good idea to grow up more.

The same as success factors (Fig. 3.1.), respondents were asked to identify startups fails reasons and rate them from very likely to very unlikely. They we able to choose between: finance, temptation of a good plan, market research, and strong strategy the allure and failed solving the problem.

Regarding results, we can see, that it is quite similar to the success results. Small companies from 1-9 and 1-49 agreed, that most dangerous criteria for the young company are finance and failed solving the problem. They truly think, that without finance company can bankrupt. Also, if customer is not satisfied with the final product, bad recommendation can affect and impact companies' reputation and sales. Companies who have 50-99 employees starts to focus at temptation of a good plan, market research, and strong strategy. Having bigger team, companies' owners must start planning and see where company are able to come. If plans fail, it will affect everyone who works there. Similar results show companies with 100-249 employees too. Bigger company's which have more than 250 employees do not take any care regarding problems solving, because they think, that they are big enough to find a new market and occupy it. As a cause, they see more the solid plan. Big start-up a focusing into planning and new goals, because only them can help to growth more and take a good place into the market.

All in all, we are able to make an assumption, that regarding all answers most important success criteria are team. It is important what people and specialists work in the company. They are able to create a good final product independently of what was the funding size or what was the primary business idea.

Regarding company fail, additional insight was noticed from the answers of the respondents. There may be more than one reason for failure. It depends on many components, the company's performance and attitude, the relationship with the customer or the product offered. Finances and problem solving may be only part of the cause of failure, but one cause does not figure, they must be the whole.

### **3.2.2. Inbound and outbound logistics, marketing & sales and procurement**

Inbound and outbound logistics is more key result indicator (KRIs) than KPI. Regarding this question the main aim was to understand, how much the final product can influence company works and success. Outbound logistics concentrates on the supply aspect of the supply and demand. The process entails transporting and storing items to the final user or client. Order implementation, packing, shipping, and customer support linked to delivery fall among the procedures involved. If one procedure late – all order will not be delivered on time to the customer. (Fig. 3.2.).

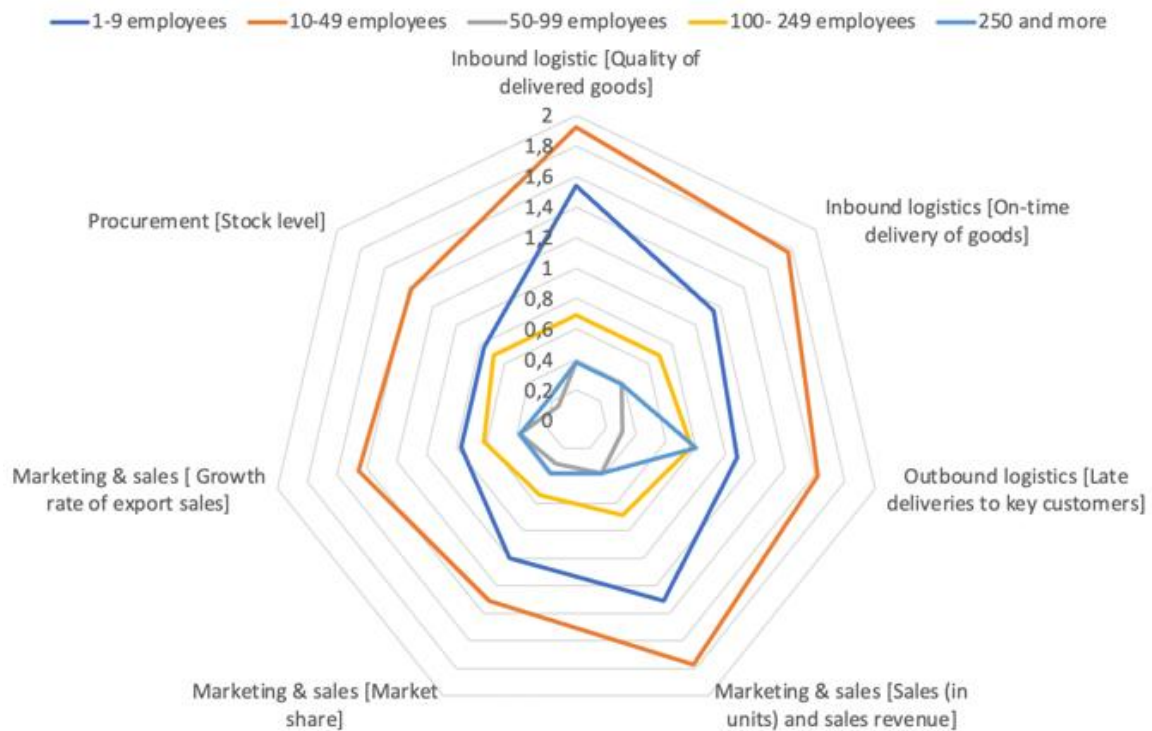
Firstly, it was important to understand how important for the company is quality of delivered goods. The answers did not surprise, and it was expected. All size companies as a priority take quality. Especially, huge note takes small companies which have 1-9 employees. They are focus on the products quality because everything based on the customers reviews. Make sense, that all customers pay for the quality and if they did not get that – review about company could be not so good as the owner wished and it could affect sales.

Second part of the question was on-time delivery of goods. Regarding all answers, we can see, that companies are trying to do their best and delivery all goods on time. However, not always everything goes to the plan and might be some delays which can be influenced by suppliers or other companies' partners. In this way, companies are trying get an argument and made as short delays as possible. In this way, companies' owner will avoid some misunderstandings and conflicts with the customers.

We can make an assumption, that in the first place is quality of goods. It is better to have good quality and took longer production time, than produce furniture on time with some damages or misunderstanding. This would let manufacture to avoid reclamations or snagging. It is better to explain customer about few days or week delay, that delivery furniture with reject.



Outbound logistic question was asked about what our respondent think about late deliveries to key customer. Do they effect companies work or no. From the answer we can assume, that almost all size companies' executives think that late deliveries to key customers identify as a huge problem and think that it can make bad impact to company. Only companies where work 50-99 employees do not take a huge effort to the deliveries on time to key customers. The reasons could be various, but probably they already have close relationships with their mane customers and are able to variate into delivery time.



**Fig. 3.2.** Inbound and outbound logistics, marketing & sales and procurement results

Marketing and sales are two corporate disciplines that have an impact on lead creation and revenue production. Without marketing there will not be any good results. It helps a company to grow. In this question section were 3 question blocks: sales (units) and revenue, market share and export sales growth rate (Fig. 3.2).

First question in this marketing & sales section was regarding sales (in units) and sales revenue. According to respondents, almost that sales make huge impact for companies' behavior. They think that sales take an important part of companies work. Only big companies' owners think and do not put huge afford to impact sales. They think that sales need to flow naturally without any impact. They already have their loyal clients and are sure, that they will get them new orders. Sometimes not order number can impact company work. It can be enough to get one huge project from one customer than get a lot from different ones.

However, we can see different opinion about market share question. Regarding chart, we can see, that companies do not take a big impact to take a huge part of market share. All companies have their own client and reach the with their production. As companies said, they are not trying to force their production and do not trying to sale what they are not producing. Also, some of companies are just not ready or are not big enough to produce bigger scopes of production and are satisfied with already taken market share. However, they are not ejecting option to improve their performance and take bigger part of market into the future.

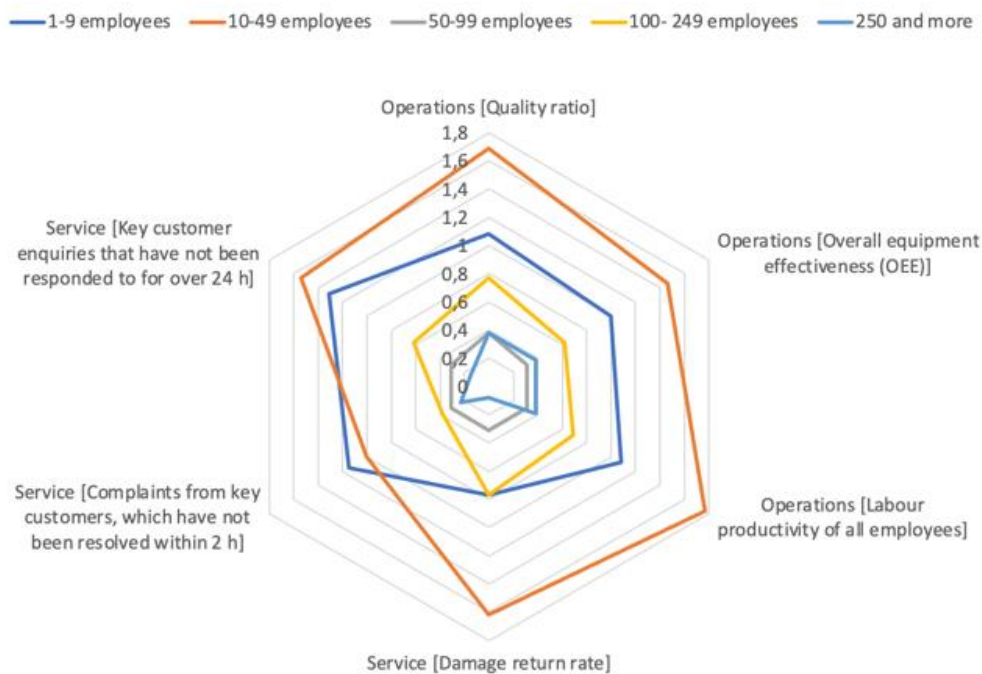
Last question block from marketing & sales was about growth rate of export sales. This indicator shows how quickly a company can establish itself not only in its own country. But also, be widely known to foreign consumers. According to the answers, companies which have more than 10 employees agreed, that it is important for those companies to have sales abroad. Such answers may suggest that these companies are interested in the foreign market and that the growth in sales affects the company's operations. However, respondents believe that sales growth in the company is a fairly important criterion, but also are focused on local sales. Only small companies think that sales growth abroad is not an important criterion and they do not pay attention to it. It can be assumed that at the time of the survey, the size of the company was not yet able to operate abroad.

Procurement process allows location and aggregation on terms for an external source to obtain services, goods, usually using a tender or competitive linking procedure. Regarding this question block the main aim of the question was to get respondent opinion regarding stock level (Fig. 3.2.).

Respondents shared their views and different opinions. Companies who have 1-9, 50-99 and more then 250 workers agreed, than they are not holding materials on stock. Reason can be various: smaller companies do not have enough money and space to keep it in the warehouse, they are not sure if they will need exactly this material. Biggest companies think that it is better to not store any materials and by everything by the project. However, there are possibility that needed material is out of stock for a while. In this case it is needed to suggest some alternative material with the similar look and properties. Other possibility is that there is no needed to have stock level and buy all materials on time during the project. In this case project will have long production time and customers will be forced to wait their goods. Left companies believe, that most of the raw materials must be stored on the production premises or in a warehouse. In this case a huge amount of money might be not moved for years, but you will always have all materials for the production. Other option is, that it is better to work with stored materials, but in suppliers' warehouses. In this case leads time is short and company's owner do not need invest money to the materials which is not needed to the project.

### 3.2.3. Operations and service

This question block was made combined two questions: operation and service. Operations is about company's quality ratio, overall equipment effectiveness and employees labor productivity. It is important to understand where production puts all capacity (Fig. 3.3.). This affects the speed of production and the quality of products, which also determines the success of the company. Every company which produces furniture, supplies additional services such as installation, dismantling, delivery and etc. The purpose of this block of questions (Fig. 3.3.) was to find out how company managers evaluate the damage return rate, complaints from key customers, not resolved within two hours and key customer inquiries that have not been responded to for over twenty-four hours.



**Fig. 3.3.** Operations and service results

As in the first question block, companies were divided regarding company size. What we can see from the results, that all companies' sizes take a huge look into quality ratio. The quality ratio is a quantitative factor that determines how efficiently companies use their assets to generate high gross margin sales. It means, that no matter what size company are, it has to efficiently use production and established good results for the sales. Taking a look into overall equipment effectiveness (OEE) we can see that it is also important for all size companies. The overall efficiency index is the highest achievement for gauging productivity of the manufacturing. Simply explained, it describes the number of time spent producing that is productive. From the results see, that as much as big company are, this criterion became more important. The main reason why it is happening,

orders number. The larger the company, the higher the productivity must be for all orders to be fulfilled on time. Looking into next question labour productivity of all employees we can see, that for companies with 10-49 employees takes the most important part. Less focus into this criterion puts companies with 50-99 employees. There is no explanation why we have got such a result because all companies owners are interested to pay and employ only those workers, to brings some benefits to the company.

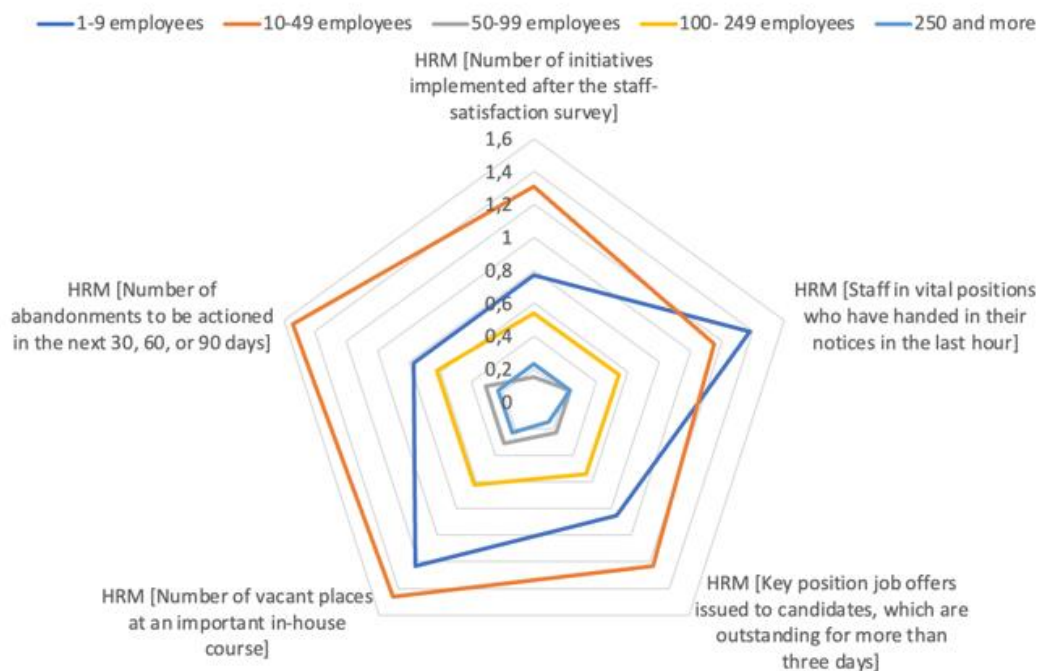
Other question part was regarding services. As we can see from the chart, that almost all size companies, expect those, who has more than 250 employees think, that key customer enquiries that have not been responded to for over twenty-four hours can affect companies work hard. Companies' owners think, that if they will not respond to the request fast, they can lose this deal and potential client. However, huge companied do not complains about that, because they get much more leads and sometimes, they choose with who work, not as it usual for smaller companies. Next question related with complaints from key customers, not resolved within two hours. here we can see different situation as we saw in previously question. The biggest efforts put companies with 1-9 employees and those who have more than 250 employees. This is since companies with few employees try to take care of their customers and solve any problems quickly as soon as possible, so that bad opinions do not spread about them, which would lead to new customers not leaving. Large companies take care of their biggest customers and don't want to ruin their relationship with them because all the big deals would fail. Medium size companies are still trying to figure out which clients are more important than others and because of this reason they are not reacting so quickly as a small or big companies. The last part regarding service was about damage return rate. Damage return rate is important factor in correcting a mistake made by company and leaving a good impression on customers. Chart shows, that mostly damage return medium size companies. These companies have enough money to fix made mistake and return damages. In this case, they are saving good reputation with customers. Companies with less than 10 employees sometime do not get as much profit as they want and can not return all claims what they get from the client. Companies with more than 250 employees have their partners as a transport company, installation teams, suppliers and other, and those mistakes might can be made by them. So, it takes a lot of time to surveyor identify which chain has to take a responsibility. That why they are not taking this criterion as a priority.

After research, we can assume that from operation block as the most important KPIs respondents named quality ration. All sizes companies identify it as important criteria and put a lot of effort to make a good result. Talking about service block, here we can see that dominated key customer enquiries that have not been responded to for over twenty-four hours. All employees need

to give an answer as soon as possible for the client and try not to lose them, because they did not respond at the time.

### 3.2.4. Human resource management

Human resource management is a strategic way to the effective and efficient staff management in an organization or enterprise so they can help the company to reach competitive advantage and benefit. It is dedicated to maximize companies' staff performance to support company's strategic wishes and goals.(Fig. 3.4.).



**Fig. 3.4.** HRM results

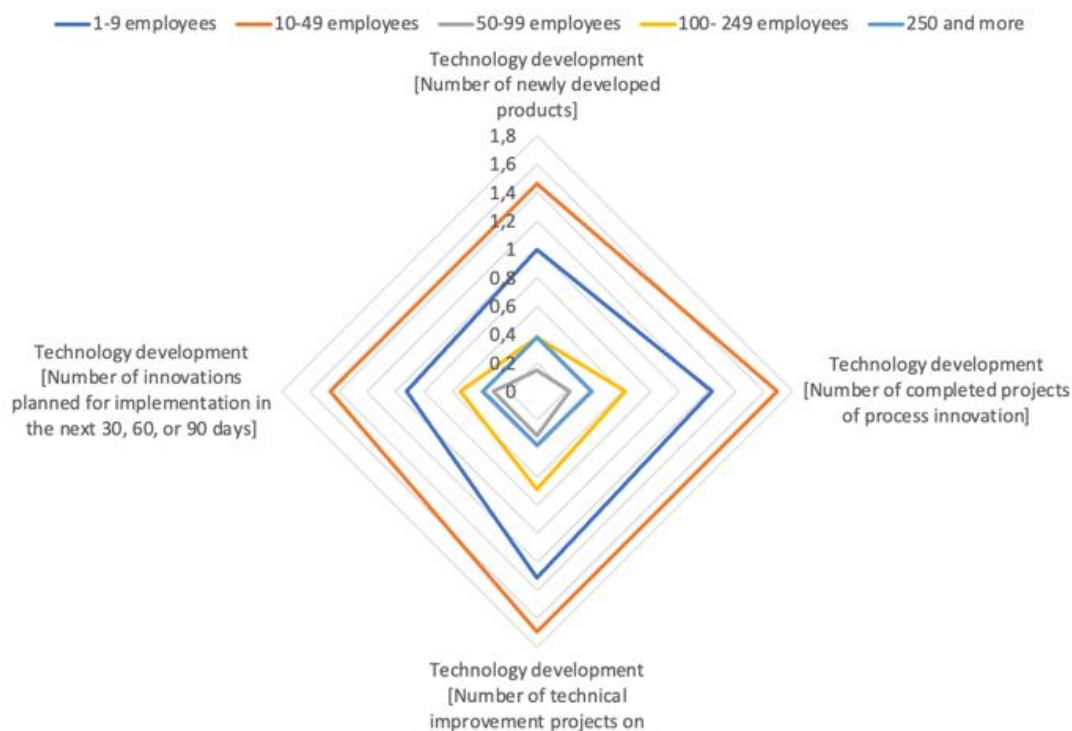
The first impression looking into the chart that for companies who has more than 10 employees all criteria are equally important. We cannot see any major deviations into the chart. This is due to the fact that the company has established work norms and ethics that allow the company to operate in the right direction. However, more interesting answers were gotten from smaller companies.

Companies where work 1-9 employees identify that most important criterions for them are staff in important positions who provided their notices in the last hour. This is because every employee in a small company performs a large part of the functions, and his / her sudden exit can ruin a large part or even the whole process. The goal of small businesses is to retain employees and try to avoid sudden retirements. Another sudden deviation is seen regarding number of deserted roles at a critical in-house course. For a small company to have a vacancy for a long time is painful enough.

This means that other workers have to cover vacancies and the workload of existing workers increases very sharply. Also, with a small number of employees, the employer is not assured that the vacancy can be covered by existing employees due to their competence. Most often, small businesses have employees from different fields and there are no people working in the same field. Also, an employer may have trouble quickly finding a competent employee who would accept a high workload and a sufficiently low salary to work as a start-up. The other reason, why other question is not so important for such a small company is because they do not have such a huge number of employees. As a result, all other decisions are made much faster because of the need for consultation and decision-making with a smaller group of people.

### 3.2.5. Technology development

The total process of technology or process invention, innovation, and diffusion is known as technological development. In a nutshell, technological progress is based on both improved and increased technology. This question block was made from amount of newly developed products, amount of completed process innovation projects, amount of technical development projects for learning and growth in process and amount of implementation innovations planned for the next thirty, sixty or ninety days question (Fig. 3.5.).



**Fig. 3.5.** Technology development results

First question was about number of newly developed products. What we can see from the chart, that small companies (1-9 and 10-49 employees) are more interesting into newly developed products, that medium or big. Probably because small companies do not already have a huge variation between products and trying to find as much as possible ways to find their customer. New products help to do that and reach much more bigger market share. Also, from the company size depends on their possibilities to produce number of products. So, what is a lot for small company, for big is just a normal batch of production. Also, bigger companies already have found their customer and are focus on some type of goods and do not produce anything what is outside of their profile. They are trying to find much easier ways, for example order some production from the supplier and sell as their own. In this case, there are not making a plug into their production and do not increase number of new products, but find a solution how to make customer happy with all production what he is needed.

Second part was regarding number of completed projects of process innovation. this indicator shows how well a company has adapted to innovate and adapt quickly. The chart shows that no matter what size of the company are it is important how company are able to complete projects of process innovation. Every new established innovation needs somehow to help for the process. For example: it could be new machines implemented, o new KANBAN system. Every change need to bring some benefits for the company and save time and resources into production and all other process.

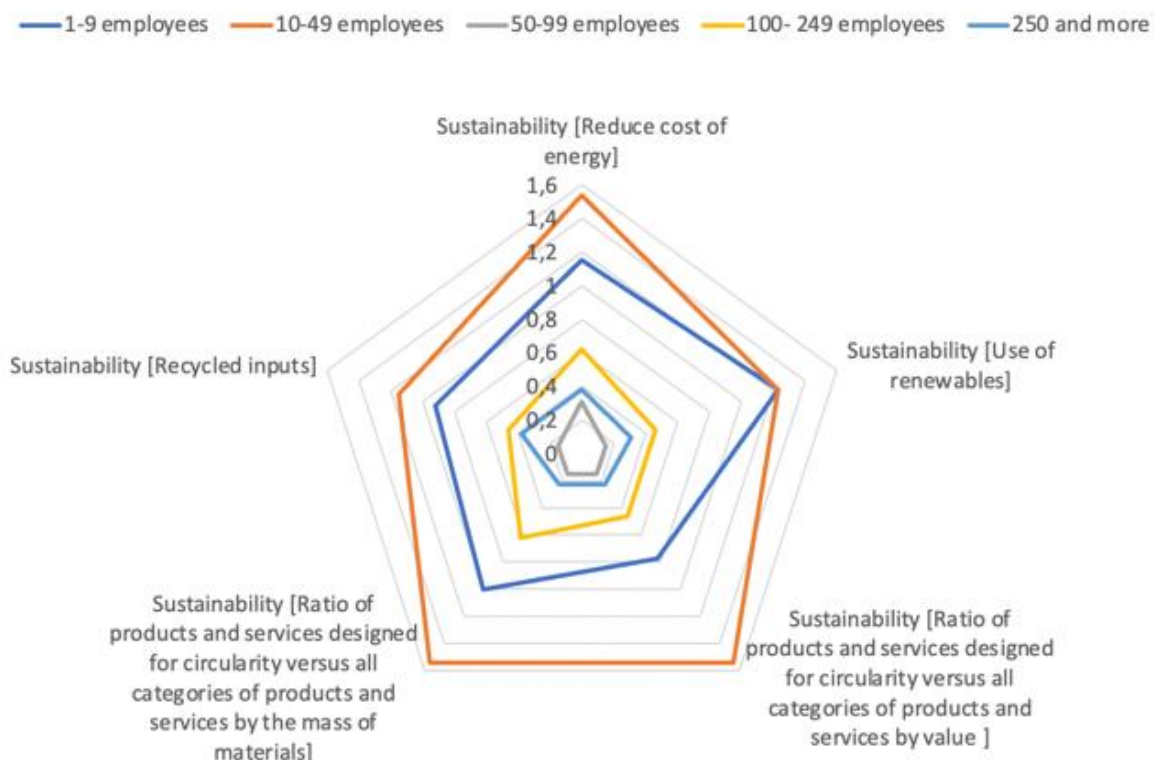
The third part of the question was to get an opinion on the amount of technical improvement projects or during the learning and growth process. The chart shows that this indicator is important for companies of all sizes. The answers suggest that the company invests heavily in technology and employee expertise. Good results can increase and speed up a company's work. This would allow serving a much larger number of customers and bringing higher profits to the company.

The last part of the question is about how many innovations are planned to be implemented in the next 30, 60 or 90 days. This number can show how flexible a company is in innovation. We are seeing a lot of interest in this KPI from companies with fewer employees as they try to compensate people with new technologies that will help them grow faster. Medium and large companies think this number may be important, but it cannot be trusted. In their view, this KPI is not relevant, and this number cannot affect the performance of companies, as it is only a planned innovation and not an implemented innovation.



### 3.2.6. Sustainability

More and more people are thinking about sustainability and eco-friendly company. The main aim of this question was to take a view and understand if it can help for company became successful. This question has 5 blocks: reduce energy cost, renewables usage, products and services designed for circularity versus products and services by value ratio, products and services designed for circularity versus products and services by the mass of materials ratio, inputs recycled. (Fig 3.6.).



**Fig. 3.6.** Sustainability results

The first block of questions was asked about reducing energy costs. Looking at the chart, we can see that all companies have a similar view: to reduce energy costs. As a result, the company becomes more environmentally friendly and can reach an even larger customer audience. Also, with low energy costs, higher financial costs remain, and that money can be invested in new equipment, marketing, or other necessary processes for the company.

The second part of the block was about the use of renewable energy sources. Not all companies have access to renewable energy sources. However, only managers of smaller companies can help a company be more successful and superior to other companies. This could be due to the fact that they serve only a small part of the market and the production volumes allow the use of renewable energy sources without any difficulty. Managers of larger companies have a different



opinion. This can lead to the company using other sources during the survey and introducing new ones that would take a lot of money and cost or not see much substance in introducing it.

Third question part was regarding ration of products and services designed for circularity versus products and services by value ratio. As we can see from the results, opinions differed. The smallest companies with only 1-9 employees say they do not have much opportunity and capacity to spend a lot of money and time on this indicator. However, companies with more than 10 employees take the view that this KPI is important and that they are trying to use as many products and services as possible for circular consumption.

Next block part was about products and services designed for circularity versus products and services by the mass of materials ratio. In this regard, we see that the views of the companies coincided. But here we can see both the pros and cons. Mass use of one material facilitates production, no difference in material processing technology, reduced resources. However, if all companies start using one and the same material, it will simply no longer be possible to find the material and its price will increase inadequately and the customer will overpay for simple products.

Last block question was regarding recycled inputs. We can see from the survey results that this issue has received much less interest than others. This may have been due to the fact that recycled raw materials are not yet as in demand as expected. Demand for these raw materials is not growing due to inadequate prices. Although manufacturers offer this raw material as an alternative to the customer, not all customers are able to pay almost double the money. Choosing a simple material can get the same product much cheaper. In fact, the issue depends more on the customer's choice of what the manufacturer can do most - try to offer the customer and expect him to choose a better option for the environment.

### **3.2.7. Respondents' suggestions**

At the end there was one additional question with respondents' suggestion. We ask them what other areas would be important for them. The vast majority replied that the main and most important directions were discussed in the question blocks, but several respondents also had their own observations.

One of respondent mention cyber security as an important KPI. The use of technology and policies to guard operations, systems, devices, and data from cyber danger is known as cyber security. The main objective is to minimize the cyber-attacks risk and make systems and technology

secure from illegal use. Respondents think that company, which gets huge number of cyber-attacks cannot be successful, because all affords go to stop it, but not for the company growth.

Second respondent speaks about funding programs. He truly believes that all startups need to get some government help regarding finance or equipment investment return rate. In this case, company would be able to have a better finance position and could feel more stable and do not be afraid to make decisions.

Third suggestion was to take a note to the morale and emotional health of employees. Nowadays, Covid -19 mess up people both physically and emotionally. Wanting to have a successful company – team is important. Huge attention must be paid to the team and its well-being.

The last and most important – number of new customers per quarter; new customer inquire conversation rate to actual sale. Number of new customers per quarter can show dissemination of company awareness and marketing. The company's ability to attract new customers increases its turnover and improves results.

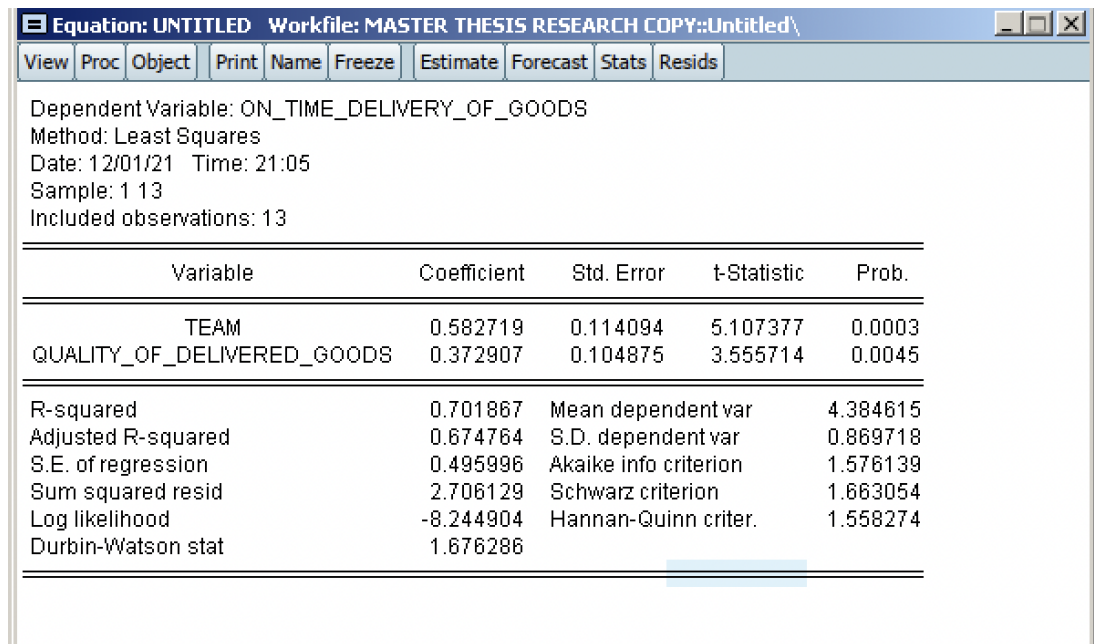
### **3.3. Research model**

After the study and systematized data, modeling was performed with the Eviews program. Regarding this program, we can create a simulation which can help working with the results. EViews can be used for cross-section and panel data analysis, as well as time series estimation and forecasting, as well as conventional statistical and economic analyses.

First of all, all data was organized using excel. As was mentioned before, all answer we coded: 5 – very likely, 4- likely, 3- undecided, 2- unlikely, 1- very unlikely. Using organized answer, correlation matrix was made to. Correlation matrix shows relationships between answers and shows potential models which could work. After correlation matrix analysis, was found 15 possible matches.

Before started working with Eviews program, hypothesis was created: In order to develop, expand, and avoid bankruptcy, every start-up needs delighted consumers. When you have a steady stream of happy clients, you can accomplish this. Customers are pleased when things arrive on schedule and in decent condition. A team that consist of qualified personnel and pre-existing product standards for quality are essential for an organization to be able to create products within the stipulated time period.

After long search, only one model was made, which showed positive results (Fig. 3.7.).



**Fig. 3.7.** Eviews model

From the figure 3.10 we can see that our dependent variable is on time delivered goods, model variable is team and quality of delivered goods. Results shows that their probability is 0,0003 and 0,0045. It is means, that our models works because those probabilities are less than 0,05.

Next important criteria are R-squared. R-squared ( $R^2$ ) is a measure for statistics which quantifies the proportion of the explained variation by an separte variable or variables in a model of regression for a variable that is dependent. The values of R-squared and R-squared changed also shows goodness of the model. It indicates that model created with Eview program works 70%.

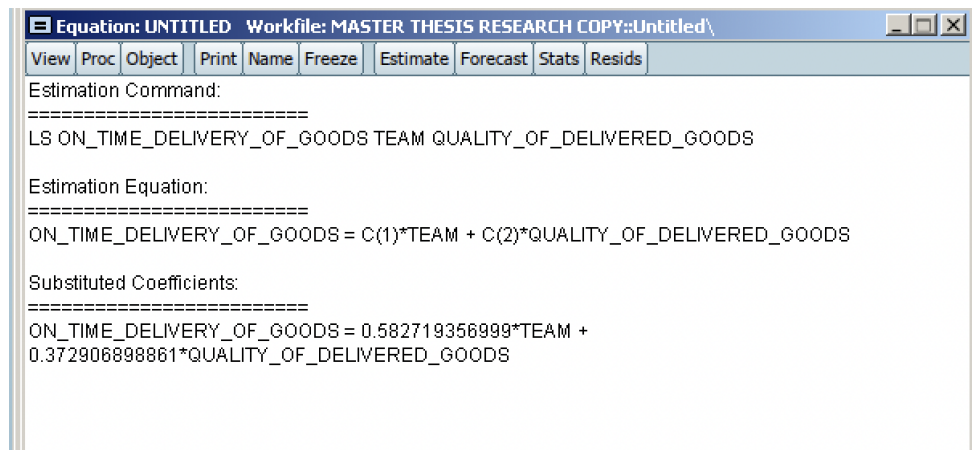
Also, it is important to investigate Durbin-Watson stat rate. A test for autocorrelation in residuals from a statistical model or regression study is the Durbin Watson (DW) statistic. A number between 0 and 4 will always be assigned to the Durbin-Watson statistic. A score of 2.0 implies that the sample contains no autocorrelation. A result of 1.6 in the Durbin-Watson test indicates a small proclivity towards non-autocorrelation. It's pretty near to 2, which is the optimal non-autocorrelation value.

Figure 3.8. shows final equation. On the top of the picture was written estimation command which says that our dependent variable on time delivered good (OTDG) has a relationship with independent variable team (T) and quality of delivered goods (QODG).

Second part of the figure shows estimation equation which is mathematical form of this relationship:

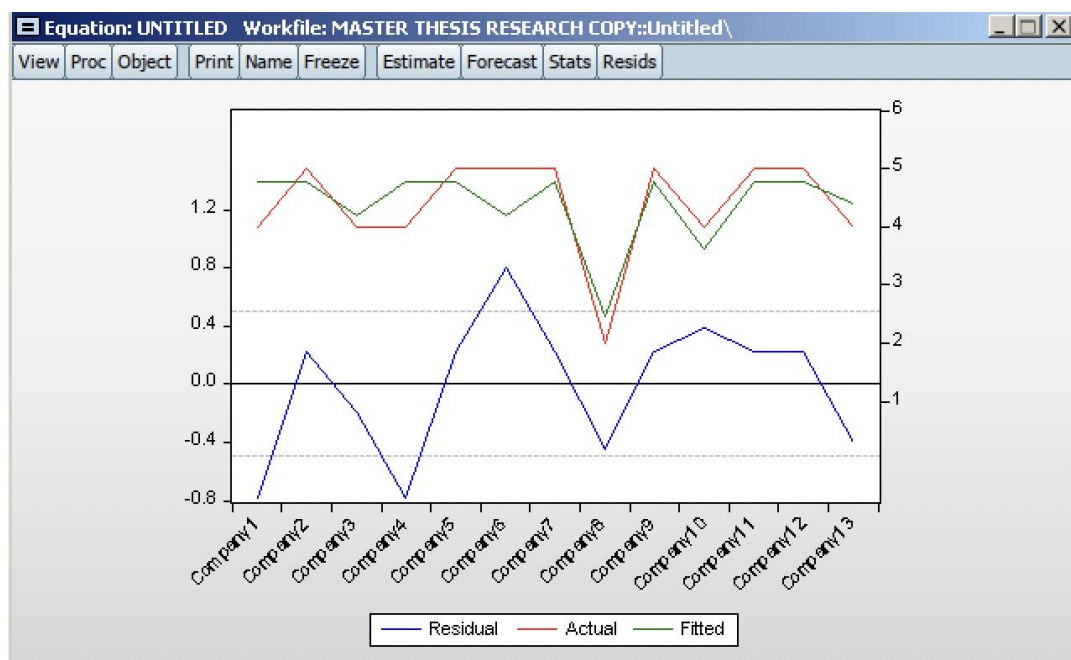
$$OTDG = T + OQDG$$

The last part of the figure 3.8. shows substituted coefficients what is equation with coefficients.



**Fig. 3.8.** Final equation

The last things was made using Ewiev programs was actual, fitted and residual graph (Fig. 3.9.). This picture shows what is relation between residual and actual model. Picture shows, that we can see some differences between company4 and company 10. Those two companies do not agree with the majority opinion, that's why we see some divisions on the graph.



**Fig. 3.9.** Actual, fitted and residual graph

After modeling we can make a conclusion, that our hypothesis is confirmed. Furniture start-ups should pay special attention to product quality, team and delivery schedules. A company's success is usually determined by the outcome rather than the method.

## 4. MODEL FOR KEY PERFORMANCE INDICATORS FOR START-UPS IN FURNITURE INDUSTRY

### 4.1. Model decomposition

Based on the survey data and the results obtained, it is noticeable that a start-up with a different number of employees takes into account different indicators. From this, we can assume that KPIs can be affected by the number of employees and the size of the firm.

A model based on the results of the survey based on the number of employees in the company (Fig. 4.1.) is created and presented. The model is arranged in order of priority. KPIs need to be addressed at each stage of a startup's growth.

STAGES	1-9 employees	10-49 employees	50-99 employees	100-249 employees	250 and more employees
Success factors	1) Idea; 2) Funding.	1) Team; 2) Idea; 3) Funding.	1) Team; 2) Ground of development; 3) Idea; 4) Funding.	1) Team; 2) Ground of development; 3) Idea; 4) Funding.	1) Idea; 2) Team; 3) Funding; 4) Ground of development.
Fail factors	1) Finance.	1) Failed solving the problems; 2) Finance.	1) Failed solving the problems; 2) Finance.	1) The allure of a good plan, a solid strategy, and thorough market research; 2) Finance.	1) The allure of a good plan, a solid strategy, and thorough market research; 2) Finance.
Inbound logistics	1) Quality of delivered goods.	1) Quality of delivered goods; 2) On-time delivery of goods.	1) Quality of delivered goods; 2) On-time delivery of goods.	1) Quality of delivered goods; 2) On-time delivery of goods.	1) Quality of delivered goods; 2) On-time delivery of goods.
Outbound logistics	—	—	—	1) Late deliveries to key customers.	1) Late deliveries to key customers.
Marketing & sales	1) Sales (in units) and sales revenue; 2) Market share.	1) Sales (in units) and sales revenue; 2) Market share.	1) Growth rate of export sales; 2) Sales (in units) and sales revenue.	1) Growth rate of export sales; 2) Sales (in units) and sales revenue.	1) Growth rate of export sales; 2) Market share.
Procurement	—	—	—	1) Stock level.	1) Stock level.
Operation	1) Labour productivity of all employees; 2) Quality ratio.	1) Labour productivity of all employees; 2) Quality ratio.	1) Overall equipment effectiveness (OEE); 2) Labour productivity of all employees; 3) Quality ratio.	1) Quality ratio; 2) Labour productivity of all employees; 3) Overall equipment effectiveness (OEE).	1) Labour productivity of all employees; 2) Overall equipment effectiveness (OEE); 3) Quality ratio.
Service	1) Key customer inquiries that have not been responded to for over 24h; 2) Complaints from key customers, which have not been resolved within 2h.	1) Damage return rate; 2) Key customer inquiries that have not been responded to for over 24h.	1) Key customer inquiries that have not been responded to for over 24h; 2) Complaints from key customers, which have not been resolved within 2h; 3) Damage return rate.	1) Damage return rate; 2) Key customer inquiries that have not been responded to for over 24h.	1) Complaints from key customers, which have not been resolved within 2h.
HRM	1) Staff in vital positions who have handed in their notices in the last hour; 2) Number of vacant places at an important in-house course.	1) Number of abandonments to be actioned in the next 30, 60, or 90 days; 2) Number of vacant places at an important in-house course.	1) Number of abandonments to be actioned in the next 30, 60, or 90 days; 2) Number of vacant places at an important in-house course.	1) Number of abandonments to be actioned in the next 30, 60, or 90 days; 2) Number of vacant places at an important in-house course; 3) Key position job offers issued to candidates, which are outstanding for more than three days; 4) Number of initiatives implemented after the staff-satisfaction survey.	1) Number of initiatives implemented after the staff-satisfaction survey; 2) Number of vacant places at an important in-house course; 3) Number of abandonments to be actioned in the next 30, 60, or 90 days.
Technology development	1) Number of technical improvement projects on learning and growth in process; 2) Number of completed projects of process innovation.	1) Number of technical improvement projects on learning and growth in process; 2) Number of completed projects of process innovation.	1) Number of technical improvement projects on learning and growth in process; 2) Number of innovations planned for implementation in the next 30, 60, or 90 days.	1) Number of technical improvement projects on learning and growth in process; 2) Number of completed projects of process innovation.	1) Number of newly developed products; 2) Number of completed projects of process innovation; 3) Number of technical improvement projects on learning and growth in process; 4) Number of innovations planned for implementation in the next 30, 60, or 90 days.
Sustainability	1) Use of renewables; 2) Reduce cost of energy.	1) Reduce cost of energy; 2) Ratio of products and services designed for circularity versus all categories of products and services by value; 3) Ratio of products and services designed for circularity versus all categories of products and services by mass of material.	1) Reduce cost of energy.	1) Reduce cost of energy; 2) Ratio of products and services designed for circularity versus all categories of products and services by mass of material.	1) Recycled inputs; 2) Reduce cost of energy.

**Fig. 4.1.** Model for KPI for start-ups in furniture industry

#### **4.1.1. Stage from 1-9 employees**

Companies with 1-9 employees should pay close attention to the idea and funding. Without these two criteria, a good start is not very possible. In terms of funding, there are many to get it: Business angel fund II (New companies age should be more than 1.5 years), reward-based crowdfunding, Horizon Europe (2021 - 2027 years), EU investments measures and ect. The most important thing is to choose the right funding fund and meet the criteria required everywhere. The idea and the design of the company are one of the most important criteria for starting a company. Usually, the founder of a company only has an idea that he believes in, not only does he undertake the establishment of the company. However, it is important to keep in mind that the most important criteria in order to avoid failure in the initial stage of a business should be money and its distribution. Even if you have a good idea and a sufficient amount of money, if you don't manage it wisely, the company can go bankrupt very quickly. To avoid this, you should have a competent employee to handle the company's financial affairs. When it comes to inbound logistic, great attention must be paid to the quality of the goods delivered. Priority must be given to product quality to avoid negative comments and feedback. Proper product quality will allow you to get word-of-mouth recommendations and expand your customer base. Also, it would be advisable to have a person in the company who would be responsible for quality control. Outbound logistic for such a micro company should not be a priority KPI, so the offer would not focus on it. In the field of marketing & sales, priority should be given to sales (units) and revenue and market share. A company with a small number of employees should pay close attention to sales volume and increase that volume. Only a growing number of sales will allow the company to establish itself in the market and occupy a strong position and a large market share. The procurement block does not offer the company to store materials. In this way, the company does not freeze money and can invest it in much more relevant activities. Operation KPIs must concentrate on labour productivity of all employees, as the number of employees is not high and there can be no downtime. Insufficient employee productivity makes the company inefficient, which means that it does not make enough profit to sustain the company and faces bankruptcy. Also, great attention must be paid to the quality ratio. For service KPIs, priority should be given to key customer queries that have not been answered for over 24h and complaints for key customers that have not been resolved within 2h. In order not to lose customers, there must be a quick look, so that the customer feels important and does not run away from competitors. In order to have a successful business, great attention must be paid to the customer. In terms of internal company and HRM, priority should be given to staff in important positions who have provided in their notices

in the last hour and number of deserted roles at an important in-house course. In a young and small business, it is important that employees do not run away from the workplace, as the loss of one employee can lead to many processes being lost. Typically, a young company employs an employee who can perform more than one function but knows a wide range of processes, so losing it can be very costly for the company. If there is or will be a vacancy, it should be filled as soon as possible and not be kept vacant for a long time. Also, it is important to keep in mind technology development. At this stage, the focus must be on the amount of technical development projects on learning and growth in the process and the amount of completed process innovation projects. The last block of KPI that is important for the company is sustainability. In this area, priority should be given to the use of renewables and reduce the cost of energy. This would save money and be used for the development and growth of the company.

#### **4.1.2. Stage from 10-49 employees**

As a company grows, so do KPIs, and companies with 10-49 employees should prioritize the team. As the number of employees increases, employees should be recruited responsibly. Employees should be competent and bring visible benefits to the company. Problem solving and finances should be the most important criteria to avoid failures in the initial stages. All problems must be solved and addressed. With sufficient staff resources, there should be no congestion or unresolved trouble. When it comes to inbound logistics, great attention must be paid to the quality of the delivered goods and the timely delivery of the goods. It is necessary to balance these two indicators so that the goods do not have a long delivery time, but faster production times can not affect the quality of the product. In the area of marketing & sales, priority should be given to sales (units) and revenue and market share. These criteria should be tested from the initial stage of the company, when it had up to 9 employees. Operation KPIs must prioritize labor productivity of all employees and quality ratio. These indicators must also have continuity and ongoing monitoring. For service KPIs, priority should be given to damage return rates and key customer inquiries that have not been answered for over 24h. A company of this size should already be able to compensate customers for the damage done and correct its mistakes if there has been a mistake in the quality of the product. If we are talking about in-house and HRM, prioritize the number of abandonments to be actioned in the next thirty, sixty, or ninety days and the number of deserted roles at an important in-house course. As this stage of the company is growing, a lot of attention needs to be paid to the number of employees and finding out why employees are leaving (if any). Also, in technology

development, the focus must be on the amount of technical development projects on learning and growth in the process and the amount of implemented innovation process projects. The last block of KPI that is important for the company is sustainability. In this area, priority should be given to reducing the cost of energy and the products and services designed for circularity versus products and services by value ratio and the products and services designed for circularity versus products and services by the mass of materials ratio. The further away, the more customers choose more sustainable companies, or at least those that support the idea of sustainability. It can also be a great criterion that will attract a large number of new customers or even employees.

#### **4.1.3. Stage from 50-99 employees**

A medium-sized start-up with 50-99 employees should pay close attention to the team and the ground of development. The development of the company is also important for a company that already has a large number of employees. The expansion of the company allows us to be noticeable to a wider group of users and thus get even more orders from new customers. However, it should be borne in mind that problem solving and finances should be the most important criteria to avoid failure in the initial stages. Although the company has enough money, as the number of customers grows, so do the problems that can be solved with large amounts of profit. In terms of inbound logistic, great attention must be paid to the quality of delivered goods and on-time delivery of goods. The larger the company, the faster customers expect to receive their order, not to mention its quality. This criterion is already running by default. In the field of marketing & sales, the growth rate of export sales should be a priority and sales (in units) and sales revenue. The company should start looking for opportunities to expand in the foreign market. In this way, the number of sales would grow as well as the company itself. Gaining international recognition would make the company widely known. Priority must be given to overall equipment effectiveness, staff productivity and quality ratio. As I mentioned earlier, as the number of customers increases, so does the number of orders, so it is very important that the equipment and staff in the factory work efficiently. For service KPIs, priority should be given to key customer inquiries that have not been answered for over twenty-four hours, complaints from key customers, which have not been resolved within two hours and damage return rate. These two criteria would prevent the loss of existing and new customers. If we are talking about in-house and HRM, prioritize the number of abandonments to be actioned in the next thirty, sixty, or ninety days and the number of vacant places at an important in-house course. It should be in the company's interest to maintain a constant number of employees and, if a job becomes



available, to fill it quickly with a new and competent employee. Also, it is important to keep in mind technology development. At this stage of the company, the focus should be on the number of technical improvement projects on learning and growth in the process and the number of innovations planned for implementation in the next thirty, sixty or ninety days. The last block of KPI that is important for the company is sustainability. In this area, priority should be given to reducing the cost of energy. This would save the company the amount of money it could spend on developing the company.

#### **4.1.4. Stage from 100-249 employees**

As a company grows from a medium to a large company, the focus should be the same: team and the ground of development. Companies should stay focused regarding those two criteria's and put all effort to keep a high level of employees' competence. To avoid setbacks in the primary stages, the most important criteria should be the temptation of a good plan, market research and strong strategy, and also finance. Only by analyzing your company and the market together can you achieve really high results. In terms of inbound logistic, great attention must continue to be paid to the quality of delivered goods and on-time delivery of goods. Also, the company is already large enough to have a relevant and outbound logistic KPI for late deliveries to key customers. In other words, one of the key KPIs should be to avoid significant delays. In the area of marketing & sales, priority should be given to the growth rate of export sales and sales (in units) and sales revenue. The core proposition is to increase and accelerate export sales. At this stage of the company, the focus should again be on the stock level. Quick visibility is needed in order to serve customers who have short deadlines and have performed from other businesses. In other words, the storage of materials, while freezing some of the money, allows you to accept fast customers, which would allow the company to grow without much effort - just by accepting their urgent order. Clearly, the most current material positions should be stored to suit the widest possible range of clients. Priority for Operation KPIs must be continue to be given to quality ratio, labor productivity of all employees and overall equipment effectiveness. For service KPIs, priority should be given to damage return rates and key customer inquiries that have not been answered for over twenty-four hours. If we talk about the company's internal and HRM, the number of abandonments should be prioritized in the next thirty, sixty, or ninety days, the number of deserted roles at an important in-house course, key position job offers given to candidate, outstanding for more than three days and number of initiatives implemented after the staff-satisfaction survey. As the number of employees in a company is high, the employer should have an interest in improving the well-being of the company. This would retain existing employees and increase the willingness to

come to the company to hire new employees. It is also important to keep in mind technological developments. Also, it is important to keep in mind technology development. At this stage of the company, the focus must be on the amount of technical development projects on learning and growth in the process and the number of completed projects on the process of innovation. The more technologically innovative and innovative a company is, the better its results will be. The last block of KPI that is important for the company is sustainability. In this area, priority should be given to reducing the cost of energy and the products and services designed for circularity versus products and services by the mass of materials ratio.

#### **4.1.5. Stage with more than 250 employees**

As a giant startup, the company should not abandon any of the KPIs previously examined and implemented. To avoid unexpected setbacks, the focus remains on the temptation of a good plan, market research, strong strategy and finance. In terms of inbound logistic, great attention must be continue to be paid to the quality of delivered goods and on-time delivery of goods. Also, ongoing work and an outbound logistic KPI indicator of late deliveries to key customers continue. In the field of marketing & sales, the growth rate of export sales and market share should be a priority as well. Priority should be given to the same indicators as in enterprises with 100-249 employees. For service KPIs, priority should be given to complaints from key customers, not resolved within two hours. If we talk about the company's internal and HRM prioritization should continue to be the same criteria except for the key position job offers given to candidate, which are outstanding for more than three days. Also, it is important to keep in mind technology development. At this stage of the company, the focus should be on the amount of newly developed products, the amount of completed projects of process innovation, the number of technical improvement projects on learning and growth in process and the number of innovations planned for implementation in the next thirty, sixty and ninety days. The last block of KPIs is sustainability. In this area, priority should be given to recycled inputs and reduce the cost of energy.

#### **4.2. Focus group**

The last step regarding the model was focus group analysis. The focus group was attended by 4 employees working for UAB FITSOUT, which currently has more than 250 employees and specializes in production of non-standard furniture. The surveyed group consisted of employees

responsible for team management, project management, manufacturing processes and procurement. Their insights are provided below:

1. The model can be applicable for a very wide range of companies that specialize in the furniture market (can be a manufacturer, supplier, reseller, etc.). Based on these criteria, companies can select areas of KPI that are relevant to them and focus on them. The model is sufficiently detailed and clear, presented in a clear and structured manner, and is easy to understand. All key areas of the company processes are reviewed and discussed.

2. Seeing this model and KPIs by area raises two key questions for the company:

- If the company is smaller, who should be responsible for tracking KPIs and should they track all of them in every group? Because, in many cases, small start-ups have not developed a detailed strategy that is broken down into the company's areas of activity, they are not that structured and corporate, it is not clear and detailed who should follow what indicators.

- How the KPI tracking process should look like: how often it should be measured, who should be responsible for collecting the information, how that data should move within the company to keep the data relevant, how the information should be captured, and where (in what systems, etc.).

At the end of the interview, the company stated that the theoretical model is good and relevant for companies. However, for companies which are actually operating in the market the practical application of the model becomes important, i.e. how to put processes into practice and evaluate the KPIs so that the company could effectively and efficiently achieve its strategic goals and organize company's operations.

## CONCLUSIONS AND RECOMMENDATIONS

The goal of this research was to determine the success indicators of existing and potential furniture industry companies, which allowed or would allow for a stable establishment in the market. After the analysis of literature sources and the analysis of the furniture industry market, the following conclusions and recommendations are presented:

1. It was indicated, that KPI stands for key performance indicator, a numerical measure of performance over a time frame for a specific topic. Key performance indicators show values that help to measure the performance and results of a system. Indicators give teams goals and objectives to strive for, milestones track the movement of the process, and insights to help individuals make better decisions. KPIs enable every element of the company to move forward (from sales to marketing, etc). In total there are 72 KPIs which author divided into six groups. Also, it is noticed that KPI have a strong relationship with SMART or SMARTER.
2. According to theoretical part, were created research which helped to identify opinion and experience of start-ups in furniture sectors. Research was quotative and anonymous. The size of the research were 7 questions regarding demographic aspects and 10 questions blocks which related with KPIs. The sampling size for this research was 13 respondents. The respondents were from the Baltic countries. 10 executives were from Lithuania (76,9%), 2 executives were from Estonia (15,4%) and 1 executive was from Latvia (7,7%). The size of the companies where the respondents are working also differed: there were 4 respondents who worked in companies which have 1-9 employees (30,8%), 5 executives were from companies which have 10-49 employees (38,5%), 1 respondent works in companies which have 50-99 employees (7,7%), 2 executives were from companies which have 100-249 employees (15,4%) and 1 respondent works in a company with more than 250 employees (7,7%). The results obtained provided insights on how different size start-ups concentrate on different aspects in different topics, so based on that, a model of key performance indicators was made by the number of employees and the size of the firm.
3. The model consisted of 10 different spheres (success factors, fail factors, inbound logistics, outbound logistics, marketing & sales, procurement, operation, service, HRM, technology development, sustainability) for 5 different companies size (1-9

employees, 10-49 employees, 50-99 employees, 100-249 employees and 250 and more employees). In the model were overviewed main KPIs blocks and suggested considerate of the companies size. KPIs were proposed in order of priority that the company should pay attention to. However, during the survey limitation were experienced. It was chosen very specific industry, which do not have a huge number of participants. Also, target group were chosen Baltic country furniture industry start-ups which has no longer than 2 year's experience. Also, model was presented to the focus group. They evaluated model as a good and understandable, however they are more interested in the practical model used.

To conclude, in order for start-ups to succeed they have to follow and prioritize different KPIs in all spheres in different companies' growth stages. It is important to mention, that as the company grows and new KPIs are introduced and prioritized, new procedures are being created and implemented in the company in order to follow up with those KPIs and necessary processes, previously prioritized KPIs still have to be measured, checked and maintained on a daily basis. This way, moving through different stages of the start-up and growing it, companies' management team will cover all the most important aspects in different business spheres and will manage to do the establishment in the market effectively, constantly and sustainably in the long run.

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## APPENDIX A

### Survey

Hello. My name is Guoda Kirjazovaitė and I am Vilniustech university, Industrial engineering and innovation management master student. I am doing my master thesis research about KPIs and KRIs for startups in furniture industry. This survey is anonymous. If you would like to get results of this survey - I would lovely share it with you.

Where is your company located? \*

- ☐ Lithuania
- ☐ Latvia
- ☐ Estonia
- ☐ Other: \_\_\_\_\_

How many employees your company has? \*

- ☐ 1-9 employees
- ☐ 10-49 employees
- ☐ 50-99 employees
- ☐ 100- 249 employees
- ☐ 250 and more

What do you produce? \*

- ☐ Standard furniture
- ☐ Non-standard furniture
- ☐ Soft furniture
- ☐ Hull furniture
- ☐ Other: \_\_\_\_\_

For what sector your furniture is intended? \*

☐ Hotel furniture

☐ Retail furniture

☐ Office furniture

☐ Kitchen furniture

☐ Bath furniture

☐ Other: \_\_\_\_\_

Where are you exporting your production? \*

☐ Australia

☐ Austria

☐ Belarus

☐ Belgium

☐ Bulgaria

☐ Canada

☐ Chile

☐ China

☐ Columbia

☐ Costa Rica

☐ Croatia

☐ Cyprus

☐ Czech Republic

☐ Denmark

☐ Estonia

☐ Finland

☐ France

☐ Germany

☐ Greece

☐ Hungary

- 
- ☐ Iceland
  - ☐ Ireland
  - ☐ Israel
  - ☐ Italy
  - ☐ Japan
  - ☐ South Korea
  - ☐ Latvia
  - ☐ Lithuania
  - ☐ Luxembourg
  - ☐ Malta
  - ☐ Mexico
  - ☐ Netherlands
  - ☐ New Zealand
  - ☐ Norway
  - ☐ Poland
  - ☐ Portugal
  - ☐ Romania
  - ☐ Russian Federation
  - ☐ Slovakia
  - ☐ Slovenia
  - ☐ Spain
  - ☐ Sweden
  - ☐ Switzerland
  - ☐ Turkey
  - ☐ United Kingdom
  - ☐ United States
  - ☐ Other: \_\_\_\_\_

## Which factors your company would choose as success factors and fail factors?

### Startup success factors \*

	Very unlikely	Unlikely	Undecided	Likely	Very likely
Idea	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Funding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Team	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ground of development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Startup fail factors \*

	Very unlikely	Unlikely	Undecided	Likely	Very likely
Finance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The allure of a good plan, a solid strategy, and thorough market research.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Failed solving the problem	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Which indicators your company would choose as key performance indicators (KPIs) and key result indicators (KRIs)?

### Inbound logistics \*

	Very unlikely	Unlikely	Undecided	Likely	Very likely
Quality of delivered goods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On-time delivery of goods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Operations \*

	Very unlikely	Unlikely	Undecided	Likely	Very likely
Quality ratio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall equipment effectiveness (OEE)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Labour productivity of all employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Outbound logistics \*

	Very unlikely	Unlikely	Undecided	Likely	Very likely
Late deliveries to key customers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Marketing & sales \*

	Very unlikely	Unlikely	Undecided	Likely	Very likely
Sales (in units) and sales revenue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Market share	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Growth rate of export sales	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Service \*

	Very unlikely	Unlikely	Undecided	Likely	Very likely
Damage return rate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Complaints from key customers, which have not been resolved within 2 h	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Key customer enquiries that have not been responded to for over 24 h	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## HRM \*

	Very unlikely	Unlikely	Undecided	Likely	Very likely
Number of initiatives implemented after the staff-satisfaction survey	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staff in vital positions who have handed in their notices in the last hour	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Key position job offers issued to candidates, which are outstanding for more than three days	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Number of vacant places at an important in-house course	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Number of abandonments to be actioned in the next 30, 60, or 90 days	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Technology development \*

	Very unlikely	Unlikely	Undecided	Likely	Very likely
Number of newly developed products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Number of completed projects of process innovation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Number of technical improvement projects on learning and growth in process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Number of innovations planned for implementation in the next 30, 60, or 90 days	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Procurement \*

	Very unlikely	Unlikely	Undecided	Likely	Very likely
Stock level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## Sustainability \*

	Very unlikely	Unlikely	Undecided	Likely	Very likely
Reduce cost of energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of renewables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ratio of products and services designed for circularity versus all categories of products and services by value	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ratio of products and services designed for circularity versus all categories of products and services by the mass of materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recycled inputs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What other areas would be important for you? \*

Your answer

**Thank you for your answer.**

If you would like to get survey results, please leave your email below:

Your answer

APPENDIX B

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
1	1.00																																	
2	0.63	1.00																																
3	0.66	0.37	1.00																															
4	0.35	0.30	0.48	1.00																														
5	0.01	0.33	-0.02	-0.36	1.00																													
6	0.18	0.20	0.26	0.26	0.29	1.00																												
7	-0.42	-0.36	-0.13	-0.38	0.53	0.32	1.00																											
8	0.08	0.15	-0.15	-0.05	0.12	-0.11	-0.02	1.00																										
9	0.73	0.51	0.81	0.37	0.14	-0.10	-0.32	0.13	1.00																									
10	0.68	0.23	0.80	0.26	0.01	0.10	-0.19	-0.18	0.69	1.00																								
11	0.70	0.29	0.73	0.62	-0.39	0.13	-0.63	-0.06	0.67	0.72	1.00																							
12	0.76	0.48	0.82	0.27	-0.09	0.08	-0.37	-0.21	0.78	0.65	0.70	1.00																						
13	0.04	-0.13	0.25	-0.26	0.58	0.62	0.61	-0.32	0.07	0.17	-0.10	0.18	1.00																					
14	0.41	0.27	0.45	0.66	-0.16	0.41	-0.17	0.31	0.43	0.25	0.50	0.35	0.01	1.00																				
15	-0.21	0.04	0.12	0.55	-0.65	-0.03	-0.42	-0.18	-0.09	-0.10	0.33	0.04	-0.49	0.25	1.00																			
16	0.33	0.51	0.73	0.67	-0.11	0.08	-0.25	-0.11	0.64	0.37	0.54	0.52	-0.13	0.41	0.59	1.00																		
17	0.29	0.02	0.52	-0.11	0.59	0.35	0.50	-0.29	0.40	0.51	0.03	0.37	0.78	0.02	-0.62	0.04	1.00																	
18	0.27	0.52	-0.31	0.13	0.32	-0.06	-0.31	0.43	0.08	-0.12	0.02	-0.12	-0.29	0.10	-0.22	-0.17	-0.26	1.00																
19	0.03	0.05	-0.15	-0.24	0.59	0.59	0.31	0.37	-0.08	-0.16	-0.12	-0.18	0.60	0.11	-0.49	-0.36	0.26	0.30	1.00															
20	0.28	-0.27	0.51	0.00	-0.17	-0.10	-0.07	0.00	0.47	0.52	0.44	0.28	0.19	0.00	-0.13	0.20	0.34	-0.54	0.00	1.00														
21	0.13	0.24	-0.38	0.01	0.05	0.20	-0.31	0.15	-0.34	-0.14	0.04	-0.34	-0.22	-0.27	-0.08	-0.33	-0.36	0.57	0.37	-0.19	1.00													
22	0.08	0.22	0.14	0.34	0.28	0.24	0.06	0.00	0.10	-0.07	0.00	-0.15	0.08	-0.16	-0.11	0.24	0.22	0.11	0.22	0.20	0.40	1.00												
23	0.06	-0.03	-0.02	0.18	0.25	0.52	-0.01	0.32	-0.03	0.05	0.14	-0.15	0.26	0.42	-0.26	-0.28	0.21	0.30	0.66	0.00	0.30	0.21	1.00											
24	0.58	0.38	0.84	0.40	0.21	0.56	-0.03	0.13	0.70	0.61	0.64	0.63	0.44	0.58	-0.02	0.56	0.51	-0.15	0.36	0.49	-0.17	0.24	0.39	1.00										
25	0.39	0.01	0.34	0.06	-0.55	-0.46	-0.56	0.11	0.47	0.23	0.49	0.65	-0.32	0.20	0.13	0.15	-0.14	-0.15	-0.38	0.29	-0.36	-0.40	-0.22	0.13	1.00									
26	0.28	0.15	0.10	0.22	-0.23	0.25	-0.19	0.39	0.13	-0.13	0.12	0.22	-0.06	0.70	-0.01	-0.02	-0.07	-0.02	0.14	0.00	-0.18	-0.19	0.38	0.27	0.38	1.00								
27	-0.08	0.02	-0.13	0.46	-0.32	0.15	-0.07	0.23	-0.17	-0.35	-0.12	-0.32	-0.34	0.41	0.28	0.15	-0.29	-0.08	-0.13	0.00	0.05	0.33	0.16	-0.05	-0.15	0.59	1.00							
28	-0.09	-0.19	0.24	0.62	-0.38	-0.03	0.03	0.17	0.13	0.06	0.12	-0.13	-0.32	0.54	0.36	0.39	-0.04	-0.29	-0.39	0.21	-0.39	0.17	0.12	0.15	0.03	0.38	0.73	1.00						
29	0.25	-0.28	0.50	0.24	-0.30	0.46	-0.09	-0.19	0.22	0.46	0.56	0.33	0.41	0.44	0.12	0.14	0.29	-0.55	0.20	0.66	-0.17	-0.07	0.38	0.62	0.18	0.34	0.11	0.24	1.00					
30	0.00	-0.27	0.26	0.52	-0.51	-0.10	-0.44	0.00	0.12	0.35	0.53	0.00	-0.38	0.20	0.39	0.20	-0.14	-0.13	-0.27	0.38	0.10	0.20	0.38	0.19	0.20	0.00	0.20	0.53	0.41	1.00				
31	0.03	-0.20	-0.20	0.22	-0.69	-0.08	-0.61	0.11	-0.18	-0.17	0.42	-0.08	-0.39	0.05	0.44	-0.08	-0.67	0.06	0.04	0.20	0.48	0.00	0.08	-0.10	0.31	0.11	0.17	-0.06	0.31	0.39	1.00			
32	0.52	0.11	0.59	0.30	-0.17	-0.08	-0.19	0.04	0.57	0.37	0.50	0.47	0.02	-0.01	-0.10	0.38	0.27	-0.19	-0.08	0.67	-0.01	0.55	-0.15	0.46	0.41	-0.02	0.03	0.14	0.25	0.25	0.21	1.00		
33	0.22	-0.19	0.31	0.27	-0.23	0.14	-0.15	-0.14	0.13	0.21	0.34	0.11	0.09	-0.13	-0.09	0.06	0.24	-0.29	0.06	0.63	0.27	0.69	0.22	0.31	0.11	-0.01	0.22	0.20	0.45	0.53	0.36	0.77	1.00	
34	0.12	-0.25	0.11	0.26	-0.70	-0.51	-0.52	0.02	0.15	0.25	0.43	-0.02	-0.59	-0.08	0.36	0.18	-0.40	-0.22	-0.52	0.59	0.11	0.08	-0.29	-0.11	0.36	-0.10	0.26	0.37	0.25	0.59	0.59	0.45	0.45	1.00

- 1 Idea

2 Funding

3 Team

4 Ground of development

5 Finance

6 The allure of good plan, a solid strategy, and thorought market rese

7 Failed solving the problem

8 Quality of delivered goods

9 On-time delivery of goods

10 Quality ratio

11 Overall equipment effectiveness (OEE)

12 Labour productivity of all employees

13 Late deliveries to key customers

14 Sales (in units) and sales revenue

15 Market share

16 Growth rate of export sales

17 Damage return rate
- 18 Complaints from key customers, which have not been resolved within 2 h

19 Key customer enquiries that have not been responded to for over 24 h

20 Number of initiatives implemented after the staff-satisfaction survey

21 Staff in vital positions who have handed in their notices in the last hour

22 Key position job offers issued to candidates, which are outstanding for more than three days

23 Number of vacant places at an important in-house course

24 Number of abandonments to be actioned in the next 30, 60, or 90 days

25 Number of newly developed products

26 Number of completed projects of process innovation

27 Number of technical improvement projects on learning and growth in process

28 Number of innovations planned for implementation in the next 30, 60, or 90 days

29 Stock level

30 Reduce cost of energy

31 Use of renewables

32 Ratio of products and services designed for circularity versus all categories of products and services by value

33 Ratio of products and services designed for circularity versus all categories of products and services by the mass of materials

34 Recycled inputs

## APPENDIX C

Mechanics, material science, industrial engineering and management  
Mechanika, medžiagų inžinerija, pramonės inžinerija ir vadyba

### KEY PERFORMANCE INDICATORS FOR START-UPS IN FURNITURE INDUSTRY

*Vilnius Tech, Vilnius, Lithuania*

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**Abstract.** It is not uncommon to see start-ups suddenly fail. Often, startups try to follow the example of other, successful companies, but they don't always succeed, so this article looks at KPIs for startups in the furniture industry. The furniture industry in the Baltic States is reviewed and their development at different stages of the company's growth is analyzed. The product factors and interrelationships of a successful furniture company have been identified. The article presents the results of the surveyed companies engaged in the development of products for the furniture industry. The reasons and the main factors influencing the success of the company are given. Based on the results of the study, a model for the development of KPIs for start-ups in the furniture industry is presented and conclusions and suggestions are presented.

**Keywords:** Key performance indicators, Furniture industry, Start-ups, Manufacture, success.

## INTRODUCTION

The furniture industry is a labor-intensive and dynamic sector dominated by small and medium-sized enterprises and micro firms. Thanks to their innovative potential for new ideas and responsiveness to new demand, EU furniture manufacturers have a strong reputation and position worldwide. The industry is able to combine new technologies and innovation with cultural heritage and style and provides jobs for highly skilled workers (Furniture Industry, 2020).

These days, it is noticeable that the furniture industry sector is growing. The need for furniture production is visible due to the increased number of customers who choose new furniture rather than used ones. Seeing that the current giants of the furniture industry do not manage to supply the entire market - there are many start-ups who try to establish themselves, but not everyone succeeds. Based on the view that management mistakes these days would be avoided by fundamentally opposite behaviors and decisions compared to those made before an organization, department, or team fails, researchers and business consultants offer guidance in the belief that they will be the key to effective organizational management. There is a great advantage for start-ups to learn from the mistakes of strangers and to avoid major problems before hand, at least until they are established in the market.

The main problem is as following – what are the main key performance indicators for start-ups in furniture industry.

## 1. KEY PERFORMANCE INDICATORS; THEORETICAL FRAMEWORK

In different literature sources it can be seen that almost all authors understand key performance indicators (KPIs) definitions a bit differently. According to D. Parmenter, KPIs are those indicators that focus on the aspects of organizational performance that are the most critical for the current and future success of the organization (Parmenter D., 2015). Those indicators are numbers designed to succinctly convey as much information as possible. Good KPIs are well defined, well presented, create expectations and drive actions (Peterson E.T., 2006).

KPIs are the vital navigations instruments used by managers to understand whether their business is on a successful voyage or whether it is very off the prosperous path. The right set of indicators will shine light on performance and highlight areas that need attentions (Marr B, 2012). KPIs are rarely new to the organization. Either they have not been recognized or they were gathering dust somewhere unknown to the current management team (Parmenter D., 2015). Often, not understanding key metrics can cause anxiety to management team and can hold people back. The problem is that most managers are struggling to

understand and identify the vital few managements metrics and instead collect and report a vast amount of everything that is easy to measure. As a consequence, they end up drowning in data while thirsting for information. Effective managers and decision makers understand the performance of all key dimensions of their business by distilling them down into the critical KPIs which allow them to measure, keep track and achieve the desire effect (Marr B., 2012).

Concentrating to the furniture industry, group of scientists mention that this industry contains numerous types of equipment and processes that are a challenge to control and maintain in order to achieve highest performance and profit results for the plant. In these situations, KPIs are fundamental in measuring the performance and its progress. KPIs can provide information about the performance in different areas such as energy, raw-material, control & operation, maintenance, planning & scheduling, product quality, inventory, safety, etc. (Lindberg C.F & others, 2015) which would allow to successfully manage plant's operations and processes.

According to M. Schumacher, the top four key performance indicators that a furniture retailer should focus on are sales, inventory, growth, and customer satisfaction. These critical metrics will tell you if you are meeting your goals and objectives and help determine how you make strategic decisions for your business (M. Schumacher, 2021).

### **1.1.KEY PERFORMANCE INDICATOR TYPES**

KPIs can be divided by different types based on the companies' business profile and type, the perspective of the interest group it matters and represents or companies' processes.

Eric T. Peterson divided KPIs by business types:

- KPI for Online Retailers;
- KPI for Content Sites;
- KPI for Marketing Sites;
- KPI for Customer Support Sites (Peterson E.T., 2006);

He mainly focuses on businesses that operate all or some of their business processes online as e-shops, e-commercials or customers support sites. As online businesses and internet innovations are booming in the 21st century, these KPIs become quite important for all companies in different industries as some of their operations or at least information, communication and marketing actions will probably be provided to their customers through online solutions or sites.

Talking about perspective of the interest group, Bernard Marr says that there are six mains groups, which describes KPI:

- Financial perspective (Net profit, Gross profit margin, EBITDA, Revenue growth rate and etc.)

- Customer perspective (NPS, Customer retention rate, Customer satisfaction index and etc.)
- Marketing and sales perspective (market growth rate, Relative market share, Conversion rate and etc.)
- Operation processes and supply chain perspective (six Sigma level, Process waste level and etc.)
- Employee perspective (Employee satisfaction index, Employee engagement level and etc.)
- Corporate social responsibility perspective (carbon footprint, water footprint, supply chain miles and etc.)

In total there are 72 KPIs which author divided into those six groups. As it is indicated those groups represent different views of different interest groups that are important for the company. It allows to measure and follow all organization activities and processes. Off course, to follow all 72 indicators can be challenging to a smaller business and also not all indicators can be applied to all companies. Each of them should self-assess the criteria, their availability to gather necessary data and decide if all the groups are suitable for them and what exact KPIs from that group the management team should evaluate and measure in their daily activities.

### **1.2. KEY PERFORMANCE INDICATOR CREATION**

Key performance indicators can be defined by different characteristics. After all analysis and discussions, David Parmenter has been able to define what seven characteristics of KPIs are:

- Financial and non-financial (not expressed in dollars, Euros, Pounds and etc.). When a currency sign is added to a KPI it converts it mainly into a profit or income result indicator, but not always this is what is wanted to be measured. KPIs can measure the number of new customers, meetings, marketing post or etc., which implemented and reached can also lead and effect the positive financial results of the company.;
- Timely (24/7, daily, or weekly). KPI should be monitored constantly based by the organizations set time schedule. Also, they cannot be measure only once or few times per year, because it will not provide necessary insights at the necessary time when management actions can still be taken.;
- CEO focus (acted upon by the CEO and senior management team). All KPIs make a difference; they have the CEO's or senior management team constant attention due to daily calls to the relevant staff to review the progress.;

- Simple (KPIs should tell you what action need to be taken).;
- Individual or team based (responsibility can be tied down to a position, to a team or a cluster of the teams who work closely together).;
- Significant impact (major impact on the organization). A KPI will affect one or more of the critical success factors of the company. It should align to a company's strategy and vision for the future and help to reach it.;
- Limited dark side (they encourage appropriate action). Before becoming a KPI, a performance measure needs to be tested to ensure that it creates the desired behavioral outcome and have limited or no negative result.

These characteristics review the main aspects and ideology of indicators structure and its management. To add, there are additional recommendations which provide insights into how to form a KPI. It is recommended for each company goal to define at least one KPI that would allow to monitor and measure success. According to Harvey Maylor, SMART (Figure 1.) criteria can not only be applied to setting goals and targets, but also can be considered and used to create measurable indicators in order to reach those goals and targets. SMART is defined as:

- Specific and written down. It has to be clear what action the KPI is asking and what has to be done.
- Measurable. How it will be measured and decided whether it is achieved/maintained or failed/unreached.
- Achievable. Must be physically possible.
- Realistic and result-oriented. Asking for some sort of result or outcome that would be realistic but also create expectations for improvement.
- Time-framed. Is there a defined deadline, time frame in which it is measured or it is constant (has to be this way always).

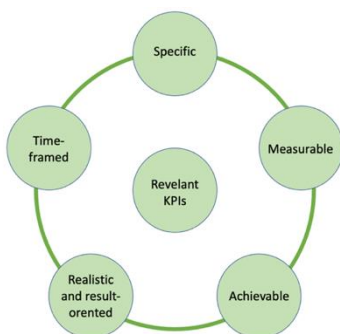


Figure 1. SMART Criteria

### 1.3.START-UP; SUCCESS AND FAIL INDICATORS

The creation of new businesses not only makes a strong contribution to job creation (Decker R. et. al., 2014), but is important for the country's economic growth (Gries T. & Naude W., 2009). A large number of companies make little or no contribution to this growth. However, the greatest economic benefits are possible expect only from companies that rely on established-breaking innovations because they open new markets or creates new business models (Robles E., 2015). Such changes in the economy are usually compared to the concept of a start-up – a start-up venture (Salamzadeh A. & Kesim H.K., 2017).

The number of ground-breaking startups is growing year by year, and their major part in the evolving of modern society is conditioned by, first, growing pace of technological development in all scientific spheres, second, the advantage of small companies-startups in comparison with huge corporations in implementing new ideas because of their flexibility and ability to respond faster to market changes. According to the statistics, only one of ten startups becomes successful in the end. It depends on:

- Idea. Idea is what any startup begins from. Ideas, having best competitive advantage, are usually the result of scientific discoveries, but ones that have practical application.
- Funding. It is very unlikely that any startup can budge without investing in it some funds, and sometimes it is very significant funds.
- Team. By the time of the putting product into production it is better have a close-knit team of people with whom you launch your design to market.
- Ground of development. The successful development of startup requires a certain "fertile ground". Startup can be grown on the basis of business incubator (Verbovskii V.A. et. al, 2012).

Continuing V. A. Verbovskii idea that only one in ten startups is successful (Verbovskii V. A. et. al, 2012), it is important to find out what causes their failure. High-growth startup companies may fail because the business model that was the basis of their strategy does not materialize. They may also fail because the market does not "open up" in the way and time anticipated. High risk taking, often with radical innovations, is more often rewarded with failure than success. However, startups often fail or do not achieve their full potential because they get stuck in this entrepreneurial crisis. (Davila A. et. al., 2010).

There are common challenges which effect startups, only the extent to which they affect them differs (Salamzadeh A. & Kesim K. H., 2015). The first problem is the allure of a good plan, a solid strategy, and thorough market research. In earlier eras, these things were indicators of likely success. The overwhelming temptation is to apply them to startups too, but this doesn't work, because startups operate

with too much uncertainty (Ries E., 2011). The second challenge – finance. Finance is an integral part of the startup process. Any startup would face financial issues

## **2. RESEARCH METHODOLOGY**

The aim of the empirical research was to determine the success indicators of existing and potential furniture industry companies, which allowed or would allow for a stable establishment in the market.

The target group was managers of companies located in Baltic countries as Lithuania, Latvia, and Estonia. The start-up company should not last more than 2 years independently how much employees it has or what an annual turnover of the company is. The selection framework was familiar to researcher - managers from start-up companies located in all Baltic countries. This selection frame was chosen because the respondents are familiar to the researcher through work or can be approached through different contacts. The sample size was determined by gathering data until either no new meanings were identified, or the sample was as large as was manageable and reachable (Saunders, Lewis & Thornhill, 2009).

As the chosen data collection method was a standardized, semi-structured questionnaire, a block of questions was prepared for a group of respondents (representative of the start-ups). The structure and questions of the interview were developed by the researcher taking into account the theoretical aspects and situation analysis results.

The questions were conducted in English. To prepare and execute the questionnaire google forms were used. As it was indicated information about the company, companies position into the market and KPI using had to be reached. These elements aimed to identify respondents thinking and KPI positioning. The survey consisted of 12 question blocks related to demographics, success and fail factors, inbound and outbound logistics, operations, marketing & sales, services, HRM, technology development, procurement and sustainability questionnaire. Every answer had this own code: 1 – very unlikely, 2 – unlikely, 3 – undecided, 4 – likely, 5 – very likely.

After this empirical research, conclusions and findings were used to develop a new model.

The next section will present the empirical part which was made according to this methodology

## **3. ANALYSIS OF EMPIRICAL RESEARCH**

The sampling size was 13 respondents. The respondents were from the Baltic countries: 10 executives were from Lithuania (76,9%), 2 executives were from Estonia (15,4%) and 1 executive was from Latvia (7,7%). The size of the companies where the respondents are working also differed: there were 4 respondents who worked in companies which have 1-9 employees (30,8%), 5 executives were from companies which have 10-49 employees (38,5%), 1 respondent works in a company which has 50-99 employees

and problems for several reasons and in different stages. The third problem is that after seeing traditional man argument fail to solve problem.

(7,7%), 2 executives were from companies which have 100-249 employees (15,4%) and 1 respondent works in a company with more than 250 employees (7,7%).

Mostly companies produce non-standard furniture (53,8%). This was the answer of 7 respondents. 5 executives work in companies which produce standard furniture (38,5%). 2 respondents work in companies which produce hull furniture (15,4%) and only 1 executive works with soft furniture (7,7%).

Also, it was clarified for which sectors the furniture is produced. From the answers we can see that we reached various companies in Baltic country: 7 respondents answer, that their company produces office furniture (53,8%), 4 executives sell and produce retail furniture (30,8%). 4 respondents work in companies which produce kitchen furniture (30,8%), 3 executives work with hotel furniture (23,1%). 3 companies produce bath furniture (23,1%), and only 1 company produces home furniture (7,7%) and pet furniture (7,7%). It is important to mention, that from the answer we can see, that one company can produce not only one sector furniture, but few of them. So in this survey we can see, that mostly companies produce furniture for offices and something else (retail furniture, bath furniture, kitchens or hotel furniture).

According to respondents, the biggest scope of the productions stays into Baltic countries: Lithuania (61,5%), Latvia (61,5%) and Estonia (38,5%).

Respondents were asked to identify which criteria of the startup factors are most important (Figure 2.). They were able to choose between: idea, funding, team and ground of development.

We are able to make an assumption, that regarding all answers most important success criteria is team. It is important what people and specialists work in the company. They are able to create a good final product independently of what was the funding size or what was the primary business idea.

Regarding company fail, additional insight was noticed. There may be more than one reason for failure. It depends on many components, the company's performance and attitude, the relationship with the customer or the product offered. Finances and problem solving may be only part of the cause of failure, but one cause does not figure, they must be the whole.



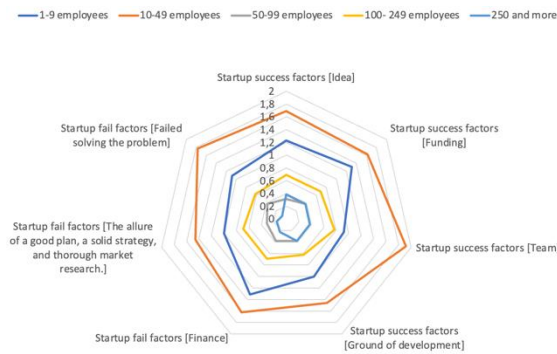


Figure 2. Startup success and fail factors results

Inbound and outbound logistics is more key result indicator (KRIs) than KPI. Outbound logistics focuses on the demand side of the supply-demand equation. The process involves storing and moving goods to the customer or end user (Figure 3.).

In the first place is quality of goods. It is better to have good quality and took longer production time, than produce furniture on time with some damages or misunderstanding. It is better to explain customer about few days or week delay, that delivery furniture with reject.

Marketing and sales are two business functions within an organization – they both impact lead generation and revenue. Without marketing there will not be any good results (Figure 3.).

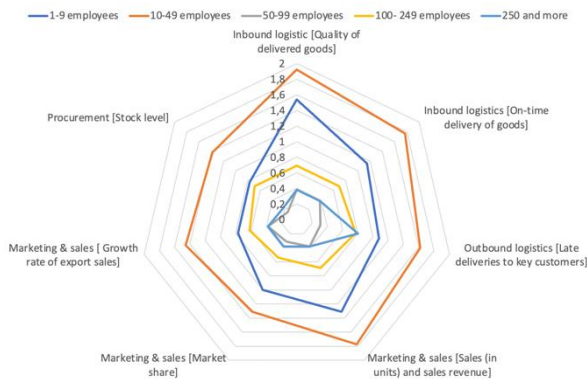


Figure 3. Inbound and outbound logistics, marketing & sales and procurement results

Regarding sales (in units) and sales revenue, almost all respondents identify, that sales make huge impact for companies' behavior. However, we can see different opinion about market share question. Regarding chart, we can see, that companies do not take a big impact to take a huge part of market share. All companies have their own client and reach the with their production. As companies said, they are not trying to force their production and do not trying to sale what they are not producing. Growth rate of export sales indicator shows how quickly a company can establish itself not only in its own country. But also, be widely known to foreign consumers. According to the answers, companies which have more than 10 employees agreed, that it is important for those companies to have sales abroad. Such answers may suggest that these companies are

interested in the foreign market and that the growth in sales affects the company's operations.

Procurement is the process of finding and agreeing to terms, and acquiring goods, services, or works from an external source, often via a tendering or competitive bidding process. Companies who have 1-9, 50-99 and more then 250 workers agreed, than they are not holding materials on stock. Reason can be various: smaller companies do not have enough money and space to keep it in the warehouse, they are not sure if they will need exactly this material. Biggest companies think that it is better to not store any materials and by everything by the project. However, there are possibility that needed material is out of stock for a while.

After research, we can assume that from operation block as the most important KPIs respondents named quality ration. Talking about service block, here we can see that dominated key customer enquiries that have not been responded to for over 24h. All employees need to give an answer as soon as possible for the client and try not to lose them, because they did not respond at the time (Figure 4.).

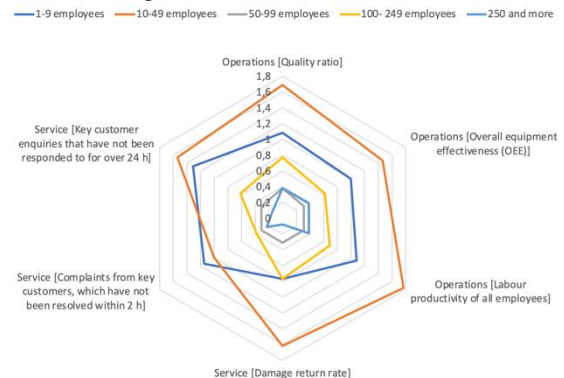


Figure 4. Operations and service results

Human resource management (HRM or HR) is the strategic approach to the effective and efficient management of people in a company or organization such that they help their business gain a competitive advantage. It is designed to maximize employee performance in service of an employer's strategic objectives (Figure 5.).

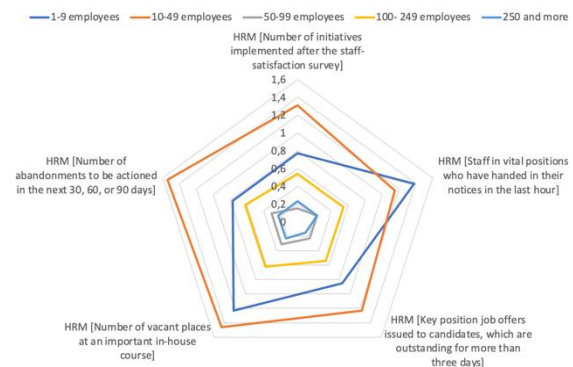


Figure 5. HRM results



Companies where work 1-9 employees identify that most important criterions for them are staff in vital positions who have handed in their notices in the last hour. This is because every employee in a small company performs a large part of functions, and his / her sudden exit can ruin a large part or even the whole process. The goal of small businesses is to retain employees and try to avoid sudden retirements. Another sudden deviation is seen regarding number of vacant places at an important in-house course. For a small company to have a vacancy for a long time is painful enough. This means that other workers have to cover vacancies and the workload of existing workers increases very sharply. Also, with a small number of employees, the employer is not assured that the vacancy can be covered by existing employees due to their competence. Also, an employer may have trouble quickly finding a competent employee who would accept a high workload and a sufficiently low salary to work as a start-up. The other reason, why other question is not so important for such a small company is because they do not have such a huge number of employees. As a result, all other decisions are made much faster because of the need for consultation and decision-making with a smaller group of people.

Technological development is the overall process of invention, innovation and diffusion of technology or processes. In short, technological change is based on both better and more technology. This question block was made from number of newly developed products, number of completed projects of process innovation, number of technical improvement projects or learning and growth in process and number of innovations planned for implementation in the next 30, 60 or 90 days' question (Figure 6.).

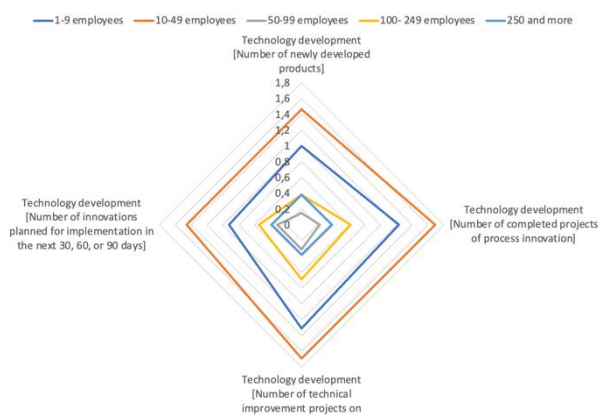


Figure 6. Technology development results

What we can see from the chart, that small companies (1-9 and 10-49 employees) are more interesting into newly developed products, that medium or big. Probably because small companies do not already have a huge variation between products and trying to find as much as possible ways to find their customer. Regarding number of completed projects of process innovation. This indicator shows how well a company has adapted to innovate and adapt quickly. The chart shows that no matter what size of the company are it is

important how company are able to complete projects of process innovation. Every new established innovation needs somehow to help for the process. The chart shows that number of technical improvement projects is important for companies of all sizes. The answers suggest that the company invests heavily in technology and employee expertise. Good results can increase and speed up a company's work. This number of innovations are planned to be implemented in the next 30, 60 or 90 days can show how flexible a company is in innovation. We are seeing a lot of interest in this KPI from companies with fewer employees as they try to compensate people with new technologies that will help them grow faster.

More and more people are thinking about sustainability and eco-friendly company. The main aim of this question was to take a view and understand if it can help for company became successful. This question has 5 blocks: reduce cost of energy, use of renewables, ration of products and services designed for circularity versus all categories of products and services by value, ratio of products and services designed for circularity versus all categories of products and services by the mass materials, recycled inputs (Figure 7.)



Figure 7. Sustainability results

Looking at the chart, we can see that all companies have a similar view: to reduce energy costs. As a result, the company becomes more environmentally friendly and can reach an even larger customer audience. Also, with low energy costs, higher financial costs remain, and that money can be invested in new equipment, marketing, or other necessary processes for the company. Not all companies have access to renewable energy sources. However, only managers of smaller companies can help a company be more successful and superior to other companies. This could be due to the fact that they serve only a small part of the market, and the production volumes allow the use of renewable energy sources without any difficulty. Third question part was regarding ration of products and services designed for circularity versus all categories of products and services by value. As we can see from the results, opinions differed. The smallest companies with only 1-9 employees say they do not have much opportunity and capacity to spend a lot of money and time on this indicator. However, companies with more than 10 employees take the view that this KPI is

important and that they are trying to use as many products and services as possible for circular consumption. Next block part was about ratio of products and services designed for circularity versus all categories of products and services by the mass materials. In this regard, we see that the views of the companies coincided. Mass use of one material facilitates production, no difference in material processing technology, reduced resources. However, if all companies start using one and the same material, it will simply no longer be possible to find the material and its price will increase inadequately and the customer will overpay for simple products. Last block question was regarding recycled inputs. This may have been due to the fact that recycled raw materials are not yet as in demand as expected. Demand for these raw materials is not growing due to inadequate prices.

#### **4. MODEL FOR KEY PERFORMANCE INDICATORS FOR START-UPS IN FURNITURE INDUSTRY**

Based on the survey data and the results obtained, it is noticeable that a start-up with a different number of employees takes into account different indicators. From this, we can assume that KPIs can be affected by the number of employees and the size of the firm.

A model based on the results of the survey based on the number of employees in the company (Appendix A) is created and presented. The model is arranged in order of priority. KPIs need to be addressed at each stage of a startup's growth.

Companies with 1-9 employees should pay close attention to the idea and funding. Without these two criteria, a good start-up is not very possible. To avoid failure in the primary stages, the most important criteria should be money and proper distribution. In terms of inbound logistic, great attention must be paid to the quality of the goods delivered. Priority must be given to product quality to avoid negative comments and feedback. In the field of marketing & sales, priority should be given to sales (in units) and sales revenue and market share. Operation KPIs must concentrate on labor productivity of all employees, as the number of employees is not high and there can be no downtime. Also, great attention must be paid to the quality ratio. For service KPIs, priority should be given to key customer inquiries that have not been answered for over 24h and complaints for key customers that have not been resolved within 2h. In order to have a successful business, great attention must be paid to the customer. In terms of internal company and HRM, priority should be given to staff in vital positions who have handed in their notices in the last hour and number of vacant places at an important in-house course. Also, it is important to keep in mind technology development. At this stage, the focus must be on the number of technical improvement projects on learning and growth in the process and the number of completed projects on the process of innovation. The last block of KPI that is important for the company is sustainability.

In this area, priority should be given to the use of renewables and reduce the cost of energy.

As a company grows, so do KPIs, and companies with 10-49 employees should pay close attention to the team as well. As the number of employees increases, employees should be recruited responsibly. To avoid setbacks in the primary stages, the most important criterion should be problem solving and finance. In terms of inbound logistic, great attention must be paid to the quality of delivered goods and on-time delivery of goods. In the area of marketing & sales, priority should be given to sales (in units) and sales revenue and market share. In the growth stage of a company from a small to a medium-sized company, one of the KPIs should be the stock level. Operation KPIs must prioritize labor productivity of all employees and quality ratio. For service KPIs, priority should be given to damage return rates and key customer inquiries that have not been answered for over 24h. If we are talking about in-house and HRM, prioritize the number of abandonments to be actioned in the next 30, 60, or 90 days and the number of vacant places at an important in-house course. Also, in technology development, the focus must be on the number of technical improvement projects on learning and growth in the process and the number of completed projects on the process of innovation. The last block of KPI that is important for the company is sustainability. In this area, priority should be given to reducing the cost of energy and the ratio of products, services designed for circularity versus all categories of products and services by value and the ratio of products and services designed for circularity versus all categories of products and services by mass material.

A medium-sized start-up with 50-99 employees should pay close attention to the team and the ground of development. The development of the company is also important for a company that already has a large number of employees. To avoid setbacks in the primary stages, the most important criterion should be problem solving and also finance. In terms of inbound logistic, great attention must be paid to the quality of delivered goods and on-time delivery of goods. In the field of marketing & sales, the growth rate of export sales should be a priority and sales (in units) and sales revenue. The company should start looking for opportunities to expand in the foreign market. Priority must be given to overall equipment effectiveness (OEE), labor productivity of all employees and quality ratio. For service KPIs, priority should be given to key customer inquiries that have not been answered for over 24h, complaints from key customers, which have not been resolved within 2h and damage return rate. If we are talking about in-house and HRM, prioritize the number of abandonments to be actioned in the next 30, 60, or 90 days and the number of vacant places at an important in-house course. Also, it is important to keep in mind technology development. At this stage of the company, the focus should be on the number of technical improvement projects on learning and growth

in the process and the number of innovations planned for implementation in the next 30, 60 or 90 days. the last block of KPI that is important for the company is sustainability. In this area, priority should be given to reducing the cost of energy.

As a company grows from a medium to a large company, the focus should be on the team and the ground of development. To avoid setbacks in the primary stages, the most important criteria should be the allure of a good plan, a solid strategy, and thorough market research and also finance. In terms of inbound logistic, great attention must be paid to the quality of delivered goods and on-time delivery of goods. Also, the company is already large enough to have a relevant and outbound logistic KPI for late deliveries to key customers. In the area of marketing & sales, priority should be given to the growth rate of export sales and sales (in units) and sales revenue. At this stage of the company, the focus should again be on the stock level. Priority for Operation KPIs must be given to quality ratio, labor productivity of all employees and overall equipment effectiveness (OEE). For service KPIs, priority should be given to damage return rates and key customer inquiries that have not been answered for over 24h. If we talk about the company's internal and HRM, the number of abandonments should be prioritized in the next 30, 60, or 90 days, the number of vacant places at an important in-house course, key position job offers issued to candidate, which are outstanding for more than three days and number of initiatives implemented after the staff-satisfaction survey. Also, it is important to keep in mind technology development. At this stage of the company, the focus must be on the number of technical improvement projects on learning and growth in the process and the number of completed projects on the process of innovation. The last block of KPI that is important for the company is sustainability. In this area, priority should be given to reducing the cost of energy and the ratio of products and services designed for circularity versus all categories of products and services by mass of material.

As a giant startup, the company should not abandon any of the KPIs previously examined and implemented. To avoid unexpected setbacks, the focus remains on the allure of a good plan, a solid strategy, and thorough market research and also finance. In terms of inbound logistic, great attention must be paid to the quality of delivered goods and on-time delivery of goods. Also, ongoing work and an outbound logistic KPI indicator of late deliveries to key customers continue. In the field of marketing & sales, the growth rate of export sales and market share should be a priority. Priority should be given to the same indicators as in enterprises with 100-249 employees. For service KPIs, priority should be given to complaints from key customers, which have not been resolved within 2h. If we talk about the company's internal and HRM prioritization should continue to be the same criteria except for the key position job offers issued to

candidate, which are outstanding for more than three days. Also, it is important to keep in mind technology development. At this stage of the company, the focus should be on the number of newly developed products, the number of completed projects of process innovation, the number of technical improvement projects on learning and growth in process and the number of innovations planned for implementation in the next 30, 60 and 90 days. The last block of KPIs is sustainability. In this area, priority should be given to recycled inputs and reduce the cost of energy.

## CONCLUSIONS AND RECOMMENDATIONS

As mentioned in the beginning, the aim of this research was to determine the success indicators of existing and potential furniture industry companies, which allowed or would allow for a stable establishment in the market.

It was indicated, that KPI stands for key performance indicator, a quantifiable measure of performance over time for a specific objective. KPIs provide targets for teams to shoot for, milestones to gauge progress, and insights that help people across the organization make better decisions. From finance and HR to marketing and sales, key performance indicators help every area of the business move forward at the strategic level. The sampling size for this research was 13 respondents. The respondents were from the Baltic countries. The results obtained provided insights on how different size start-ups concentrate on different aspects in different topics, so based on that, a model of key performance indicators was made by the number of employees and the size of the firm.

To conclude, in order for start-ups to succeed they have to follow and prioritize different KPIs in all spheres in different companies' growth stages. It is important to mention, that as the company grows and new KPIs are introduced and prioritized, new procedures are being created and implemented in the company in order to follow up with those KPIs and necessary processes, previously prioritized KPIs still have to be measured, checked and maintained on a daily basis. This way, moving through different stages of the start-up and growing it, companies' management team will cover all the most important aspects in different business spheres and will manage to do the establishment in the market effectively, constantly and sustainably in the long run.

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## BALDŲ PRAMONĖS STARTUOLIŲ PAGRINDINIAI SEKMĖS RODIKLIAI

### G. Kirjazovaitė

**Santrauka.** Neretai pastebima, kad naujos įmonės staiga žlunga. Dažnai startuoliai bando sekti kitų, sėkmingų įmonių pavyzdžiu, tačiau ne visada pavyksta, todėl šiame straipsnyje apžvelgiami baldų pramonės startuolių KPI. Apžvelgiama baldų pramonė Baltijos šalyse ir analizuojama jų raida skirtinguose įmonės augimo etapuose. Nustatyti sėkmingos baldų įmonės gaminių veiksniai ir tarpusavio ryšiai. Straipsnyje pateikiami apklaustų įmonių, užsiimančių gaminių baldų pramonei kūrimu, rezultatai. Pateikiamos priežastys ir pagrindiniai veiksniai, įtakoiantys įmonės sėkmę. Remiantis tyrimo rezultatais, pateikiamas baldų pramonės startuolių KPI kūrimo modelis ir pateikiamos išvados bei pasiūlymai.

**Reikšminiai žodžiai.** KPI, baldų pramonė, startuolis, gamyba, sėkmės rodikliai.

# KPIs FOR START-UPS IN FURNITURE INDUSTRY

STAGES	1-9 employees	10-49 employees	50-99 employees	100-249 employees	250 and more employees
Success factors	1) Idea; 2) Funding.	1) Team; 2) Idea; 3) Funding.	1) Team; 2) Ground of development; 3) Idea; 4) Funding.	1) Team; 2) Ground of development; 3) Idea; 4) Funding.	1) Idea; 2) Team; 3) Funding; 4) Ground of development.
Fail factors	1) Finance.	1) Failed solving the problems; 2) Finance.	1) Failed solving the problems; 2) Finance.	1) The allure of a good plan, a solid strategy, and thorough market research; 2) Finance.	1) The allure of a good plan, a solid strategy, and thorough market research; 2) Finance.
Inbound logistics	1) Quality of delivered goods.	1) Quality of delivered goods; 2) On-time delivery of goods.	1) Quality of delivered goods; 2) On-time delivery of goods.	1) Quality of delivered goods; 2) On-time delivery of goods.	1) Quality of delivered goods; 2) On-time delivery of goods;
Outbound logistics	—————	—————	—————	1) Late deliveries to key customers.	1) Late deliveries to key customers.
Marketing & sales	1) Sales (in units) and sales revenue; 2) Market share.	1) Sales (in units) and sales revenue; 2) Market share.	1) Growth rate of export sales; 2) Sales (in units) and sales revenue.	1) Growth rate of export sales; 2) Sales (in units) and sales revenue.	1) Growth rate of export sales; 2) Market share.
Procurement	—————	1) Stock level.	—————	1) Stock level.	—————
Operation	1) Labour productivity of all employees; 2) Quality ratio.	1) Labour productivity of all employees; 2) Quality ratio.	1) Overall equipment effectiveness (OEE); 2) Labour productivity of all employees; 3) Quality ratio.	1) Quality ratio; 2) Labour productivity of all employees; 3) Overall equipment effectiveness (OEE).	1) Labour productivity of all employees; 2) Overall equipment effectiveness (OEE); 3) Quality ratio.
Service	1) Key customer inquiries that have not been responded to for over 24h; 2) Complaints from key customers, which have not been resolved within 2h.	1) Damage return rate; 2) Key customer inquiries that have not been responded to for over 24h.	1) Key customer inquiries that have not been responded to for over 24h; 2) Complaints from key customers, which have not been resolved within 2h; 3) Damage return rate.	1) Damage return rate; 2) Key customer inquiries that have not been responded to for over 24h.	1) Complaints from key customers, which have not been resolved within 2h.
HRM	1) Staff in vital positions who have handed in their notices in the last hour; 2) Number of vacant places at an important in-house course.	1) Number of abandonments to be actioned in the next 30, 60, or 90 days; 2) Number of vacant places at an important in-house course.	1) Number of abandonments to be actioned in the next 30, 60, or 90 days; 2) Number of vacant places at an important in-house course.	1) Number of abandonments to be actioned in the next 30, 60, or 90 days; 2) Number of vacant places at an important in-house course; 3) Key position job offers issued to candidates, which are outstanding for more than three days; 4) Number of initiatives implemented after the staff-satisfaction survey.	1) Number of initiatives implemented after the staff-satisfaction survey; 2) Number of vacant places at an important in-house course; 3) Number of abandonments to be actioned in the next 30, 60, or 90 days.
Technology development	1) Number of technical improvement projects on learning and growth in process; 2) Number of completed projects of process innovation.	1) Number of technical improvement projects on learning and growth in process; 2) Number of completed projects of process innovation.	1) Number of technical improvement projects on learning and growth in process; 2) Number of innovations planned for implementation in the next 30, 60, or 90 days.	1) Number of technical improvement projects on learning and growth in process; 2) Number of completed projects of process innovation.	1) Number of newly developed products; 2) Number of completed projects of process innovation; 3) Number of technical improvement projects on learning and growth in process; 4) Number of innovations planned for implementation in the next 30, 60, or 90 days.
Sustainability	1) Use of renewables; 2) Reduce cost of energy.	1) Reduce cost of energy; 2) Ratio of products and services designed for circularity versus all categories of products and services by value; 3) Ratio of products and services designed for circularity versus all categories of products and services by mass of material.	1) Reduce cost of energy.	1) Reduce cost of energy; 2) Ratio of products and services designed for circularity versus all categories of products and services by mass of material.	1) Recycled inputs; 2) Reduce cost of energy.