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## **FACULTY OF BUSINESS AND MANAGEMENT**

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ÚSTAV MANAGEMENTU

# **FEASIBILITY STUDY FOR ACCREDITED TESTING LABORATORY**

STUDIE PROVEDITELNOSTI PRO AKREDITOVANOU ZKUŠEBNÍ LABORATOŘ

## **BACHELOR'S THESIS**

BAKALÁŘSKÁ PRÁCE

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## Feasibility Study for Accredited Testing Laboratory

### Characteristics of thesis dilemmas:

Introduction  
Goals of the Theses  
Theoretical Foundations  
Current Situation Analysis  
Proposals and Contribution  
Conclusion  
References  
List of Appendices

### Objectives which should be achieve:

The main goal of the bachelor thesis is to conduct a feasibility study for the selected company for the needs of the establishment of an accredited testing laboratory for technical testing in form of a transformation from the already existing testing laboratory. To fulfil the main objective of the bachelor thesis the market potential analysis, external environment analysis, current state analysis in selected company and analysis of financial feasibility related to the transformation of the existing testing laboratory to the accredited testing laboratory will be performed and executed. The work takes into account the basic requirements for the accreditation of the testing laboratory by applicable legislation and international standards as well. The output of the bachelor thesis will be the documents for subsequent processing of the feasibility study which aims to provide the most objective evaluation of the effectiveness of the considered transformation into the accredited testing laboratory in the selected company.

**Basic sources of information:**

ČERVENÝ, Radim, Jiří FICBAUER, Alena HANZELKOVÁ and Miloslav KEŘKOVSKÝ. Business plán – krok za krokem. Praha: C.H.Beck, 2014. ISBN 978-80-7400-511-4.

FOTR, Jiří and Ivan SOUČEK. Podnikatelský záměr a investiční rozhodování. Praha: Grada, 2005. ISBN 80-247-0939-2.

KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. Principles of marketing. Harlow: Pearson, 2018. ISBN 978-1-292-22017-8.

PORTER, Michael Eugene. Competitive Strategy: Techniques for Analyzing Industries and Competitors. New York: Free Press, 1998. ISBN 0-684-84148-7.

ZICH, Robert. Koncepce úspěšuschopnosti: konkurenceschopnost - vítězství, nebo účast v soutěži? Brno: Akademické nakladatelství CERM, 2012. ISBN 978-80-7204-818-2.

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## **ABSTRACT**

Presented bachelor's thesis is focused on the provision of the feasibility study for the purpose of transformation of the already existing testing laboratory into an accredited testing laboratory in a selected company. The feasibility study has been carried out based on the proposed structure of the feasibility study by Jiří Fotr and Ivan Souček. The thesis contains an analysis of the current situation on the market of accredited laboratories, description of needed resources, financial analysis, assessment, and identifies risks connected with the realization of the project of transformation of the current laboratory.

## **ABSTRAKT**

Předložená bakalářská práce je zaměřena na zajištění studie proveditelnosti za účelem transformace již existující zkušební laboratoře na akreditovanou zkušební laboratoř ve vybrané společnosti. Na základě navrhované struktury studie proveditelnosti dle Jiřího Fotra a Ivana Součka je studie proveditelnosti provedena. Práce obsahuje analýzu současné situace na trhu akreditovaných laboratoří, popis potřebných zdrojů, finanční analýzu a posouzení a identifikuje rizika spojená s realizací projektu transformace současné laboratoře.

## **KEYWORDS**

feasibility study, mystery shopping, competition, financial analysis and assessment, accredited testing laboratory

## **KLÍČOVÁ SLOVA**

studie proveditelnosti, mystery shopping, konkurence, finanční analýza a zhodnocení, akreditované zkušební laboratorium

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## **DECLARATION OF ORIGINALITY**

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Brno, 14 May 2021

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Martin Očko

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## **INTRODUCTION**

The establishment of an accredited testing laboratory for the purpose of testing of explosives is a rare event in the Slovak and Czech Republic. The company ZVS Holding a.s. is considering this option because of the fact that it has been able to establish a testing laboratory without accreditation for its own purposes.

The general industry of explosives and ammunition production and their storage is a very specific industry possessing many regulations and proportions differentiating the industry from other industries. Due to the national regulations and limited amount of final customers, there are not many companies on the market. As the defense industry is considered as a part of the critical infrastructure of the state, the state is keen on keeping its share in the companies operating on the field, which is the case of ZVS Holding a.s. as well.

The market and its size narrow even more if we are focusing just on the accredited testing laboratories which have accredited tests for explosives. There are only 4 in the territory of the former Czechoslovakia 2 are under the control of the Ministries of Defence of the Slovak, respectively, the Czech Republic. The laboratories differ in the offered portfolio of the tests as the individual tests are often selected according to the production portfolio of the company or the need of the army of a specific country.

The new accredited testing laboratory established within ZVS Holding a.s. is building its portfolio on previously inspected demanded tests that were purchased by the companies from MSM Group. Therefore, the primary objective of the new accredited laboratory is to serve the demand of the companies of MSM Group. The laboratory is defined as an intrapreneurship project within ZVS Holding a.s..

Thanks to the fact that the portfolio of tests exceeds the portfolio offered by 2 privately-owned competing laboratories, the new laboratory aims to supply the demand from the external companies as well.

To succeed, the new accredited laboratory would have to first communicate towards its customers and afterwards deliver. However, the new laboratory can build up its reputation on the fact that it has a strong background, meaning not only ZVS Holding a.s. but as well MSM Group and the Czechoslovak Group.

Analysis of the current situation on the market, description of the resources needed in order to perform designed portfolio of tests accompanied with financial analysis and assessment of the past and needed investment with identification of risks connected with the transformation from the already existing testing laboratory into the accredited testing laboratory were conducted to execute feasibility study according to the methodology designed by Jiří Fotr and Ivan Souček. The feasibility study has become the main objective of the thesis. It aims to provide information to the top management of ZVS Holding a.s. on whether to realize the transformation of the already existing testing laboratory into an accredited testing laboratory.

# **GOALS OF THE THESES**

## **Problem definition**

The company ZVS Holding a.s. faces the decision of whether to apply for the accreditation of the already existing laboratory within the company which will result in the transformation of the current testing laboratory into an accredited testing laboratory. ZVS Holding a.s. has already invested in the equipment of the laboratory and the laboratory is taking tests just based on the demand of the sister companies ZVS Holding a.s. and ZVS Impex a.s.. The company wants to find out if it would be economically feasible and beneficial to apply for the accreditation of the current laboratory as the company wants to contribute to the strategic goal of strengthening the market position of MSM Group, to which ZVS Holding belongs, and to find another source of financing of the operations of ZVS Holding a.s..

The feasibility study, presented in this thesis, aims to help the company to solve the above-stated problem and decide about the realization of the project of transformation of the current testing laboratory into the accredited testing laboratory.

## **Goals of the thesis**

The main goal of the bachelor's thesis is to conduct a feasibility study for the selected company for the needs of the establishment of an accredited testing laboratory for the technical testing in the form of a transformation from the already existing testing laboratory. To fulfill the main objective of the bachelor's thesis, the market potential analysis, external environment analysis, current state analysis in the selected company, and analysis of financial feasibility related to the transformation of the existing testing laboratory to the accredited testing laboratory will be performed and executed. The work takes into account the basic requirements for the accreditation of the testing laboratory laid down by applicable legislation and international standards as well. To achieve the main goal of the thesis, the author will focus on the fulfillment of sub-objectives which include:

- analysis of the competitors of the new accredited laboratory and their behavior based the on selected criteria;

- analysis of the current situation within the already existing laboratory to identify needs and tasks needed to be performed to execute the transformation of the current testing laboratory;
- financial analysis and evaluation of the potential investment with the calculation of the selected economic indicators.

The output of the bachelor's thesis will be documents to be used for subsequent processing of the feasibility study to provide the most objective evaluation of the effectiveness of the considered transformation into the accredited testing laboratory in the selected company.

### **Methodology of the thesis**

The presented bachelor's thesis is divided into three parts. Theoretical foundations are based on the literature research; the first part is composed of the theoretical foundations for the strategy of the company, company goals formulation, business to business market, conduction of the feasibility study and its parts, frameworks used for the description of the external and internal environment of the given problem and specific characteristics of the accredited testing laboratories. Moreover, the theoretical foundations define terms such as return on assets and payback period which are later used in the proposals and contribution part.

For the purposes of this thesis, the feasibility study is divided between chapters 2 and 3 based on its subject-matter.

This thesis focuses on qualitative research as the industry of the elaborated subject is narrow and demands expertise. For the purposes of the current situation, the analysis mystery shopping was conducted to analyze competitors and their behavior on the market of accredited testing laboratories. Research interviews were conducted as well to get better insight into the industry of explosives and ammunition production and their storage. Kraljic model was used to elaborate the input materials needed for the performance of the accredited tests. Information regarding the usage and amounts inserted were retrieved during an interview with the laboratory assistant employed in the current laboratory. All conducted analyses were summarized in the SWOT analysis.

The proposals and contribution part deal with the role of the new accredited laboratory and its contribution to the vision, mission, and goals of MSM Group. It contains the economic calculation as well the feasibility of the project of transformation. The information regarding the internal formulas was retrieved from the economic director of ZVS Holding a.s..

# 1 THEORETICAL FOUNDATIONS

## 1.1 Company Strategy

Each company operating on the market has at least some strategy outlining what the company wants to achieve and how the company is going to achieve it. When it comes to the definition of strategy, it is important to state the following:

- “Strategy has its origins in the military.
- Strategy is usually connected with the long-term operation of organizations or whatever subject for which it is made.
- The strategy should be connected with achieving concrete goals.
- Strategy intervenes and draws from different fields.
- Accepting the concrete strategy is the most often crucial decision, influencing an important part or the whole company.
- Strategy needs to take into account the environment, in which it is realized as well as resources that are available.
- Strategy should be connected with the development of competitiveness of the company because the environment in which the company is operating is most probably competitive.”<sup>1</sup>

“The formulation of a strategy is usually based on a hierarchical structure including vision and mission, company’s strategy, business and functional strategy as it is shown in Figure 1. In certain simplification, we can understand each part as follows:

- Vision – state to which the company is going in the long-term. Usually, the vision is formally expressed quite generally, which may not be a problem if the next levels of strategy are further developed.
- Mission – can be understood as a certain framework delimiting the way of behavior of the company on the way to its vision. The mission formulates in which manner the strategy fulfills the ideas of the owner of the company, in which ways

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<sup>1</sup> ZICH, Robert. Koncepce úspěchuschopnosti: konkurenceschopnost - vítězství, nebo účast v soutěži?. Brno: Akademické nakladatelství CERM, 2012. p. 12. ISBN 978-80-7204-818-2.

it is profiling towards its surroundings, and last but not least, takes into consideration internal factors.

- Company's strategy – basically defines the behavior and intentions of the company as a whole. It creates space for further definition of fields of entrepreneurship and connected business units and their mutual coordination.
- Business strategies – are formulated for individual strategic business units and define their behavior on a certain market.
- Functional strategy – deals with strategic security of certain functional areas such as production, marketing, research and development, human resources management, financial management, etc. for individual strategic business units.”

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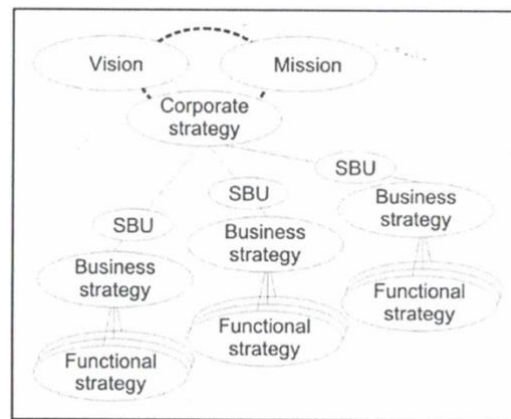


Figure 1: Traditionally Conceived Hierarchy of Corporate Strategy <sup>3</sup>

## 1.2 Goals of the Project

“Definition of goals should come from the general imagination of the development of the company. The form of explanation of this imagination can be different. Generally, it is possible to consider the continuity of all goals to vision and mission. Their problem is, in most cases, considerable generality. If they should fulfill their function, the relation of the highest level and operational level or goals on the level of functional strategies must

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<sup>2</sup> ZICH, Robert. Koncepce úspěchuschopnosti: konkurenceschopnost - vítězství, nebo účast v soutěži?. Brno: Akademické nakladatelství CERM, 2012. p. 14 - 15. ISBN 978-80-7204-818-2.

<sup>3</sup> ZICH, Robert. Koncepce úspěchuschopnosti: konkurenceschopnost - vítězství, nebo účast v soutěži?. Brno: Akademické nakladatelství CERM, 2012. p. 15. ISBN 978-80-7204-818-2.

be clear. At the moment when vision and mission fulfill just marketing role and, in principle, just explain that the company wants to profit in customer attractive way, their usefulness as a basis for goals is problematic.”<sup>4</sup>

Each company is at least trying to compete in the market. There is a great saying: “*The most important thing is not to win, but to take part*”. Unfortunately, the business environment seems to be more straightforward. For example, being the company, which is the part of the market which sells TVs. The company has set the goal to reach some turnover. At the end of the year, the company finds out that it is still operating on the market, but it has reached only 10% of its planned turnover. Is that a success or not a success?

It does not count just to be a participant in the competition. The win is to fulfill your goals at the maximum possible level and, most importantly, to grow as a company. Therefore, the goal should be a direction.<sup>5</sup>



**Picture 1: The target**<sup>6</sup>

In Picture 1, we can see a target. What can be the goal of the archer? To hit the target or to hit the center of the target? Which probability is higher, the one that the archer hits the target or the one that archer hits the specific point in the center of the target? Can we consider it as a failure if the archer hits the target, but not the center?

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<sup>4</sup> ZICH, Robert. Koncepce úspěšuschopnosti: konkurenceschopnost - vítězství, nebo účast v soutěži?. Brno: Akademické nakladatelství CERM, 2012. p. 24. ISBN 978-80-7204-818-2.

<sup>5</sup> ZICH, Robert. Koncepce úspěšuschopnosti: konkurenceschopnost - vítězství, nebo účast v soutěži?. Brno: Akademické nakladatelství CERM, 2012. p. 24 - 28. ISBN 978-80-7204-818-2.

<sup>6</sup> The Target Accessible from: <https://www.colosus.sk/terc-jvd-fita-60cm-1ks-x142018>.

The answers can be variable, but the goal of the company should not be a specific point, but rather it should be the direction towards that point. Of course, if the company has the right direction, it has no guarantee of hitting the exact point, but it knows that it is on the right way to get closer to that point it has chosen.<sup>7</sup>

“Truth is that every miss from hitting that central point should catch the attention of competent people. But what caused that? If the cause is in an unexpected economic crisis, natural or another disaster, it doesn’t necessarily mean that the strategy is bad. Fulfillment of 100% of goals in the wrong direction is far more dangerous for the company than explained problems with fulfillment of goals in the right direction.”<sup>8</sup>

### **1.3 3D Approach**

Practically every goal of any organization can be put into one of the three dimensions: Economical, External, and Internal.

The economic dimension usually consists of goals that come from the perspective of shareholders, the organization, its management, or certain stakeholders such as rating agencies. Goals from this dimension are usually following metrics such as revenues, EBIT, margin, or market share.

The external dimension, on the other hand, focuses more on the environment in which the goals especially from the economic dimension are to be achieved. Goals set within the external dimension should be based on the long-term strategy of the organization and, ideally, would focus on influencing the crucial factors on which the chance of reaching the goals from the economic dimension usually depend.

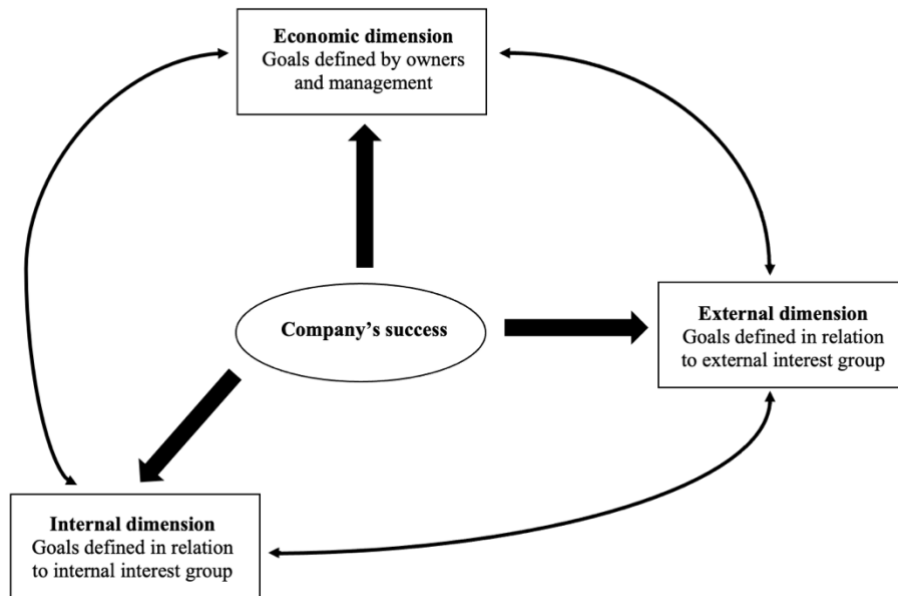
When it comes to the internal dimension, it represents goals that are linked with the situation inside the organization. To reach goals from the external dimension and the economical one, the organization must “work inside”. This can mean not only employee

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<sup>7</sup> ZICH, Robert. Koncepce úspěšuschopnosti: konkurenceschopnost - vítězství, nebo účast v soutěži?. Brno: Akademické nakladatelství CERM, 2012. p. 27 - 28. ISBN 978-80-7204-818-2.

<sup>8</sup> ZICH, Robert. Koncepce úspěšuschopnosti: konkurenceschopnost - vítězství, nebo účast v soutěži?. Brno: Akademické nakladatelství CERM, 2012. p. 27. ISBN 978-80-7204-818-2.

satisfaction but in a wider perspective also safety, technological advancement of tools, or efficiency of processes.<sup>9</sup>



**Figure 2: 3-Dimensional Evaluation of Company's Success<sup>10</sup>**

It seems that the 3 dimensions shown in Figure 2 are a bit extreme to each other. “They should highlight one important element. That element is reaching the balance in 3D approach to the competitiveness of the company.”<sup>11</sup>

## 1.4 Business to Business Market

“B2B market (business-to-business – B2B) consists of all organizations which are acquiring goods and services used for further production of other goods and services which are sold, rented or delivered to others. The main fields of the B2B market are agriculture, forestry, fishery, mining, manufacturing, construction, transport, communications, public services, banking, finance and insurance, distribution, and

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<sup>9</sup> ZICH, Robert. Koncepce úspěšuschopnosti: konkurenceschopnost - vítězství, nebo účast v soutěži?. Brno: Akademické nakladatelství CERM, 2012. p. 28 – 29. ISBN 978-80-7204-818-2.

<sup>10</sup> ZICH, Robert. Koncepce úspěšuschopnosti: konkurenceschopnost - vítězství, nebo účast v soutěži?. Brno: Akademické nakladatelství CERM, 2012. p. 29. ISBN 978-80-7204-818-2.

<sup>11</sup> ZICH, Robert. Koncepce úspěšuschopnosti: konkurenceschopnost - vítězství, nebo účast v soutěži?. Brno: Akademické nakladatelství CERM, 2012. p. 29. ISBN 978-80-7204-818-2.

services. Sales to business customers involve more money and items than sales to consumers.”<sup>12</sup>

B2B markets contrast with B2C markets in the following aspects:

- There is a lower number of customers in B2B markets.
- The relationship between supplier and customer is closer.
- The attitude towards purchase is professional.
- There are many factors influencing the purchase.
- The number of visits before the actual purchase is greater than one.
- The demand on B2B markets is derived from the demand for consumer goods.
- The demand on B2B markets is inelastic, meaning that the demand is not affected by price changes.
- The demand on B2B markets is fluctuating, meaning that if the demand for consumer goods is increased by end customers, it can lead to a fivefold increase in demand for the machinery producing demanded consumer goods.
- The buyers on certain B2B market are usually concentrated on certain geographical area.

Direct sales are happening on B2B markets as buyers tend to buy directly from the producer without the intermediary.<sup>13</sup>

## 1.5 Feasibility Study

A feasibility study is detailed research and analysis of a proposed development project to find out if a certain project is technically and economically feasible.<sup>14</sup> Applying this statement to the presented bachelor thesis, it means that we aim to provide the company with a feasibility study for their new potential accredited laboratory. Therefore, the

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<sup>12</sup> KOTLER, Philip, Kevin LANE KELLER. *Marketing Management*. Praha: Grada Publishing, 2013. p. 221. ISBN 978-80-247-4150-5.

<sup>13</sup> KOTLER, Philip, Kevin LANE KELLER. *Marketing Management*. Praha: Grada Publishing, 2013. p. 222 – 223. ISBN 978-80-247-4150-5.

<sup>14</sup> KORÁB, Vojtěch, Jiří PETERKA and Mária REŽŇÁKOVÁ. *Podnikatelský plán*. Brno: Computer Press, 2007. p.34. ISBN 978-80-251-1605-0.

feasibility study is a document drafted to give relevant data to the company if the company should or should not go for the new project.

The feasibility study can be used in many different industries, for example, armory industry (as is the case of this bachelor's thesis), food industry (feasibility study for the establishment of a new coffee shop), or software industry (feasibility study for software development).

“The goal of the feasibility study is a detailed elaboration of technical, economic, financial, managerial, and other aspects of the project. This study should bring all information which is important for the general evaluation of the project, which leads to the decision about the acceptance of this project or the denial.”<sup>15</sup>

The feasibility study of the project should contain these parts:

- **market analysis and marketing strategy** – which contains the analysis of macroenvironment described in chapter 1.7, further developed in chapter 2.2.2, analysis of microenvironment described in chapter 1.8, executed within chapter 2.2.3 market segmentation described in chapter 1.9, examined in chapter 3.3.3.1, market targeting described in chapter 1.10, further developed in chapter 3.3.3.2, differentiation and positioning described in chapter 1.11 and elaborated in chapter 3.3.3.3,
- **description of the technology and the size of the production unit** – which contains the description of tests which are to be performed in the laboratory and description of the technology needed to perform such tests described in chapter 2.2.4,
- **material inputs and energies** – which contains the information regarding the energy consumption of the technology needed to perform the test and material inputs needed to perform the tests described in chapter 2.2.5,
- **the location of the production unit** – which is described in chapter 2.3.1,

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<sup>15</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p.33. ISBN 80-247-0939-2.

- **work force (human resources)** – which contains the information regarding the work force needed to perform the tests in the laboratory described in chapter 2.3.2,
- **organization and management** – which contains the information regarding the regulation of the laboratory described in chapter 2.3.3,
- **financial analysis and evaluation** – which contains the information supposed to help the top management of the company to decide whether to go or not to go for the project of transformation of the existing laboratory into the accredited laboratory for testing theoretically described in chapter 1.12, further developed in chapter 3.4,
- **risk analysis** – which contains the information regarding the risks connected with the proposed implementation, theoretically explained in chapter 1.14, further developed in chapter 3.6,
- **plan of realization** – which contains the actual plan of transformation of the existing laboratory into the accredited laboratory. The proposed plan is divided into 2 parts – a business plan which aims to suggest the approach of the transformed laboratory towards customers on the market and operational plan which aims to suggest how to manage the laboratory, described in chapters 3.3.1 and 3.3.2.<sup>16</sup>

According to the definition given by the authors, it seems that the whole feasibility study should be a very comprehensive document. Generally, a feasibility study can be divided into 2 parts: the economical part and the technical part.

In accordance with the division, the first important aspect is that the feasibility study should not only reflect the achieved results from the point of view of elements of the study, but it should also state important aspects of the whole optimization process which led to these results as well.<sup>17</sup>

“The second important aspect, which is necessary to point out, is the tight dependence of individual elements (parts) of the feasibility study. It is impossible to decide about the

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<sup>16</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p.33. ISBN 80-247-0939-2.

<sup>17</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p.33. ISBN 80-247-0939-2.

marketing strategy regardless of the size of the production unit, this size can affect the choice of technology and location of the unit, in some cases - on the contrary - the orientation on certain material inputs affects the choice technological process and the location of the production unit.”<sup>18</sup>

Therefore, the feasibility study is logically divided into chapters that are closely connected and reference on one another. It is very important to state that it is crucial to pay attention to each and every aspect of the feasibility study.

The results provided by the feasibility study serve as a basic input for the conduction of a business plan of the project. This business plan usually serves 2 purposes. On one hand, it is an internal document that serves as a basis for the own management of the company. On the other hand, there is significant importance if the company wants to realize the project with an external investor or if the company is asking for some type of non-repayable aid. In this case, it is important to persuade the capital provider that the project is advantageous and promising.<sup>19</sup>

Another reason why to conduct the feasibility study is that the output can be something like pre-business (something which has a great probability of succeeding on the market – usually a product or service). If the feasibility study is conducted after the launch on the market, it can refine the product range. In some cases, it can narrow the number of options, evaluate each option and propose a solution.<sup>20</sup>

## **1.6 Analysis of Macroenvironment - SLEPT Analysis**

“The company and all other actors operate in a larger macroenvironment of forces that shape opportunities and pose threads to the company.”<sup>21</sup>

The major forces influencing a company’s macroenvironment are shown in Figure 3.

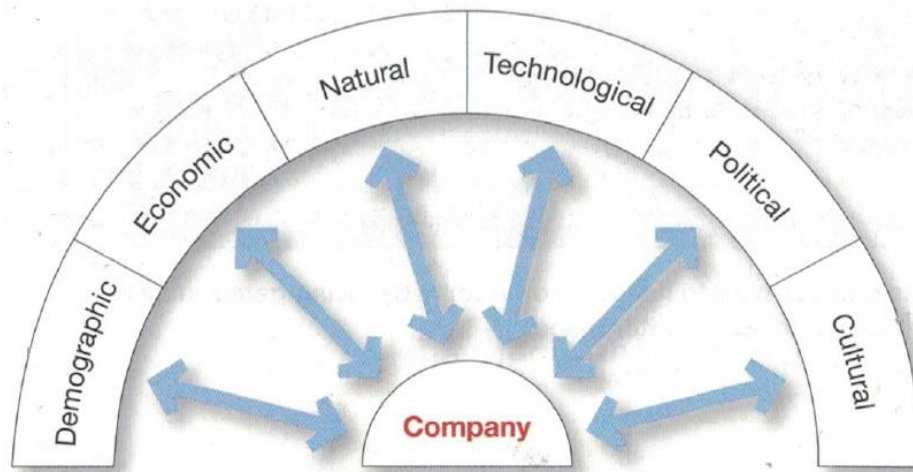
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<sup>18</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p.33. ISBN 80-247-0939-2.

<sup>19</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p.305. ISBN 80-247-0939-2.

<sup>20</sup> KORÁB, Vojtěch, Jiří PETERKA and Mária REŽŇÁKOVÁ. *Podnikatelský plán*. Brno: Computer Press, 2007. p.34. ISBN 978-80-251-1605-0.

<sup>21</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of marketing*. Harlow: Pearson, 2018. p. 96. ISBN 978-1-292-22017-8.



**Figure 3: Major Forces in the Company's Macroenvironment** <sup>22</sup>

“Even the most dominant companies can be vulnerable to the often turbulent and changing forces in the marketing environment. Some of these forces are unforeseeable and uncontrollable. Others can be predicted and handled through skillful management. Companies that understand and adapt well to their environments can thrive. Those that don’t can face difficult times.” <sup>23</sup>

For the purposes of the analysis of the macroenvironment, we will employ SLEPT analysis. SLEPT analysis should primarily focus on the detection of future development of the macroenvironment of the company or strategic business unit, existing trends of development which can be perceived as threads or opportunities for the company or strategic business unit. According to the focus on the wider environment of the company, SLEPT analysis is also called the analysis of the wider external environment. <sup>24</sup>

“The acronym SLEPT is formed from the first letters of English words indicating 5 areas of the surrounding of the company/strategic business unit to which should be paid attention during the analysis:

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<sup>22</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of marketing*. Harlow: Pearson, 2018. p. 96. ISBN 978-1-292-22017-8.

<sup>23</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of marketing*. Harlow: Pearson, 2018. p. 96. ISBN 978-1-292-22017-8.

<sup>24</sup> ČERVENÝ, Radim, Jiří FICBAUER, Alena HANZELKOVÁ and Miloslav KEŘKOVSKÝ. *Business plán – krok za krokem*. Praha: C.H.Beck, 2014. p. 54. ISBN 978-80-7400-511-4.

- **S** (Social) – social and demographical factors,
- **L** (Legal) – legal factors,
- **E** (Economic) – (macro)economic factors,
- **P** (Political) – political factors,
- **T** (Technological) – technological factors.”<sup>25</sup>

**Social factors** which can be analyzed are, for example: division of incomes, demographical factors (age structure of the population, genders, size of family, jobs or population aging), mobility of the workforce, work-life balance, education, or regional differences.

Among **legal factors**, we can include the legislation which regulates entrepreneurship, legislation about taxation, standards for international trade, labor law, regulations and rules about competitive environment and monopolies.

**Economic factors** are, for example: GDP growth (general or of a certain field), monetary policy, government expenses, antiunemployment policy (minimum wage, unemployment benefits), taxation of incomes, exchange rates, or inflation.

**Political factors** can be government decisions and regulations.

**Technological factors** which can be analyzed are, for example: government expenses on research and development, industry focus on technology improvement, new findings, patents and development of new technologies, degree of technical wear and tear, energy consumption and connected expenses, or the influence of changes in informational technologies.<sup>26</sup>

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<sup>25</sup> ČERVENÝ, Radim, Jiří FICBAUER, Alena HANZELKOVÁ and Miloslav KEŘKOVSKÝ. *Business plán – krok za krokem*. Praha: C.H.Beck, 2014. p. 54. ISBN 978-80-7400-511-4.

<sup>26</sup> BLAŽKOVÁ, Martina. *Marketingové řízení a plánování pro malé a střední firmy*. Praha: Grada, 2007. p. 53-54. ISBN 978-80-247-1535-3.

## 1.7 Analysis of Microenvironment – Porter’s Model of 5 Forces

“The microenvironment consists of the actors close to the company that affect its ability to engage and serve its customers – the company, suppliers, marketing intermediaries, customers markets, competitors and public.”<sup>27</sup>

“The goal of the analysis of the microenvironment is to identify the basic driving forces operating in the sector and are influencing the activity of the company. The behavior of the company is not determined just by the competition, but as well by the behavior of consumers and suppliers, substitutional goods, and potential new competitors. These 5 five competition factors are depicted in Porter’s model of 5 forces.”<sup>28</sup>

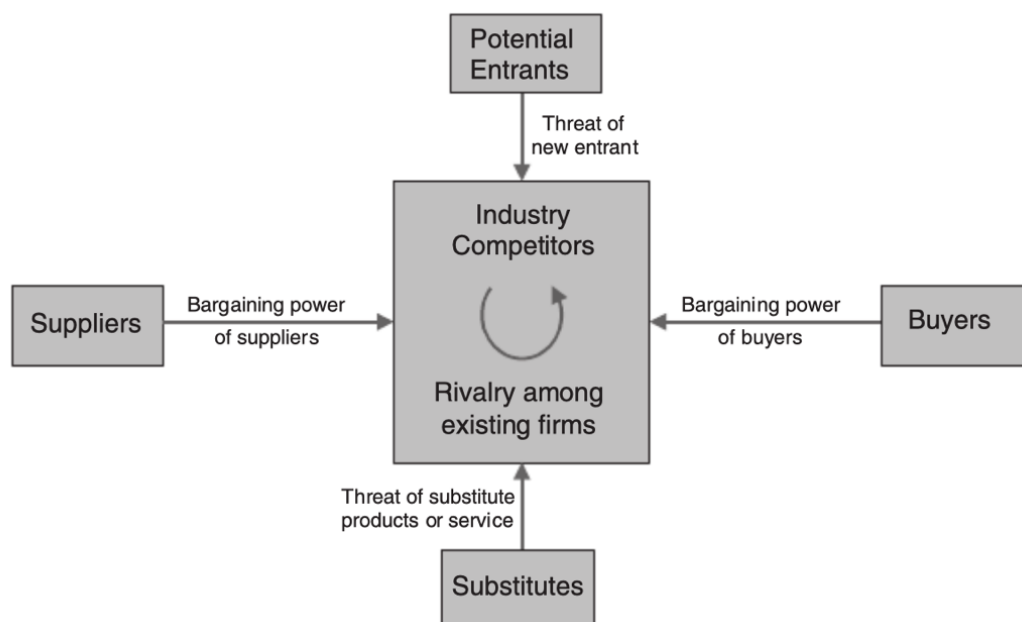


Figure 4: Porter’s Model of 5 Forces<sup>29</sup>

### Threat of new entrant

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<sup>27</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of marketing*. Harlow: Pearson, 2018. p. 92. ISBN 978-1-292-22017-8.

<sup>28</sup> JAKUBÍKOVÁ, Dagmar. *Strategický marketing: strategie a trendy*. Praha: Grada, 2013. p. 103. ISBN 978-80-247-4670-8.

<sup>29</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p. 4. ISBN 0-684-84148-7

“New entrants to an industry bring new capacity, the desire to gain market share, and often substantial resources. Prices can be bid down or incumbents’ costs inflated as a result, reducing profitability.”<sup>30</sup>

“The threat of entry into an industry depends on the barriers to entry that are present, coupled with the reaction from existing competitors that the entrant can expect. If barriers are high and/or the newcomer can expect sharp retaliation from entrenched competitors, the threat of entry is low.”<sup>31</sup>

Michael Porter recognizes 6 major sources of barriers to entry:

- Economies of scale – which refer to declines in unit costs of a product as the absolute volume per period increases.
- Product differentiation – refers to the fact that some companies have strong brand identification and loyal customers.
- Capital requirements – if there is a significant amount of money needed to be invested in order to enter the market.
- Switching costs – are one-time costs facing the buyer of switching from one supplier’s product to another. For example, employee retraining.
- Access to distribution channels – this barrier can occur while the new entrant needs to secure the distribution for its product.
- Cost disadvantages independent of scale – established companies can have some cost advantages not replicable by new entrants regardless of their size.<sup>32</sup>

### **Rivalry among existing firms**

“Rivalry occurs because one or more competitors either feels the pressure or sees the opportunity to improve position. In most industries, competitive moves by one firm have

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<sup>30</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p. 7. ISBN 0-684-84148-7

<sup>31</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p. 7. ISBN 0-684-84148-7

<sup>32</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p. 9 - 12. ISBN 0-684-84148-7

noticeable effects on its competitors and thus may incite retaliation or efforts to counter the move; that is, firms are mutually dependent.”<sup>33</sup>

For example, price competition is highly unstable and can have negative effects on the industry. If one competitor decreases prices, the others are trying to match the price which can have an effect on price elasticity and other factors such as the quality of the product. Rivalry can be characterized by phrases like “warlike,” “bitter,” or “cutthroat,” or, on the other hand, it can be termed as “polite” or “gentlemanly” depending on the industry.<sup>34</sup>

Rivalry occurs when the following factors are interacting:

- Numerous or equally balanced competitors – there is competition between companies when there are numerous firms on the market as well as when there are just a few. In both cases, the competitors tend to fight for the resources.
- Slow industry growth – this turns the competition into the game of market share between the competitors where each of them can be aiming to extend their share on the market.
- High fixed or storage costs – this factor puts pressure on the companies to fill the capacity which can cause a rapid rise in prices. For example, materials such as paper or aluminum suffer from this problem. This factor can be significant for companies producing products that have high fixed costs in the sense of needed materials from suppliers in order to produce.
- Lack of differentiation or switching costs – if the product or service is perceived as a commodity, buyers are very price sensitive. Differentiation creates space for the buyer to compare the specific product with other products not just by price.
- Capacity augmented in large increments – this factor relates to the economy of scale which sometimes can dictate that the capacity must be added in large increments which can disrupt the supply/demand balance. For example, this can be the cause of chlorine, vinyl chloride, and ammonium fertilizer production.

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<sup>33</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p.17. ISBN 0-684-84148-7

<sup>34</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p.17 - 18. ISBN 0-684-84148-7

- Diverse competitors – generally, each company is different. The fact that companies are different in strategies, origins, personalities, and relationships encourages competition because of their different goals. It could be hard for the companies to read the intentions of others as well as to reach an agreement on the “rules of the game” for the industry.
- High strategic stakes – this happens when diversified firms such as Bosch, Sony, or Philips establish a goal of expansion and gaining a decent position in a certain market. Companies should be careful because such goals can cause destabilization and they should be aware of the probability of sacrificing their profitability because of the expansion.
- High exit barriers – such barriers can be economic, strategic, or even emotional. They are the reason why companies still keep fighting even though they keep earning low or negative returns on investment. Major sources of the exit barrier according to Porter are:
  - Specialized assets
  - Fixed costs of exit
  - Strategic interrelationships
  - Emotional barriers of management
  - Government and social restrictions <sup>35</sup>

### **Threat of substitute products or service**

“All firms in an industry are competing, in a broad sense, with industries producing substitute products. Substitutes limit the potential returns of an industry by placing a ceiling on the prices firms in the industry can profitably charge. The more attractive the price-performance alternative offered by substitutes, the firmer the lid on industry profits.” <sup>36</sup>

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<sup>35</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p. 18 - 21. ISBN 0-684-84148-7

<sup>36</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p. 23. ISBN 0-684-84148-7

“Identifying substitute products is a matter of searching for other products that can perform the same function as the product of the industry.”<sup>37</sup>

According to Porter, 2 types of substitute products that deserve the most attention are those that:

- are trending to improve their price-performance compared with the industry’s product;
- are made by industries making high profits.<sup>38</sup>

### **Bargaining power of buyers**

“Buyers compete with the industry by forcing down prices, bargaining for higher quality or more services, and playing competitors against each other – all at the expense of industry profitability. The power of each of the industry’s important buyer groups depends on a number of characteristics of its market situation and on the relative importance of its purchases from the industry compared with its overall business.”<sup>39</sup>

Buyer power is significant if the following statements are true:

- It is concentrated or purchases large volumes relative to seller sales – meaning that the power of the buyer increases with the amount of purchases he makes compared to the whole number of sales made by the seller.
- The products the buyer purchases from the industry represent a significant fraction of the buyer’s costs or purchases – buyers are very sensitive to the price because it forms an important part of their overall costs.
- The products it purchases from the industry are standard or undifferentiated – in this case, we can be sure that the buyers will find alternative suppliers and that will increase their power.

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<sup>37</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p.23. ISBN 0-684-84148-7

<sup>38</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p.24. ISBN 0-684-84148-7

<sup>39</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p.24. ISBN 0-684-84148-7

- The buyer faces few switching costs – explained previously, the need to pay one-time costs can transform into the rise of the power of buyers if the costs shift from the buyer to the seller.
- The seller earns low profits – which forms momentum to lower purchasing costs.
- Buyers pose a credible threat of backward integration – can be demonstrated by the case of General Motors and Ford as they are well known for using the threat of self-manufacture as a bargaining lever. The companies produce some of their needs for a given component and purchase the rest from the suppliers. The threat of further integration is particularly credible but the fact that they produce partially on their own gives them detailed knowledge of costs which can help them in negotiations with suppliers.
- The industry’s product is unimportant to the quality of the buyers’ products or services – when the product is unimportant to the quality, buyers tend to be more price-sensitive.
- The buyer has full information – most probably the worst case is when the buyer has all the important information regarding the demand, prices on the market, or information about costs connected with the production; the buyer is in a great position to receive the best price. <sup>40</sup>

### **Bargaining power of suppliers**

“Suppliers can exert bargaining power over participants in an industry by threatening to raise prices or reduce the quality of purchased goods and services. Powerful suppliers can thereby squeeze profitability out of an industry unable to recover cost increases in its own prices. By raising their prices, for example, chemical companies have contributed to the erosion of profitability of contract aerosol packagers because the packagers, facing intense competition from self-manufacture by their buyers, accordingly, have limited freedom to raise their prices.” <sup>41</sup>

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<sup>40</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p.24 - 26. ISBN 0-684-84148-7

<sup>41</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p.27. ISBN 0-684-84148-7

Supplier power is significant if the following statements are true:

- The market is dominated by a few companies and is more concentrated than the industry it sells to – if a few suppliers sell to many small buyers, they are able to have an influence on price, quality, and terms of the deal.
- The product is not obliged to contend with another substitute product for sale to the industry – the power of large suppliers can be seen if they need to compete with others offering their substitute products.
- The industry is not an important customer of the supplier group – if the supplier makes products for many different industries, the supplier can affect pricing.
- The supplier’s product is an important input to the buyer’s business – if the product, which the supplier produces, is important for the production of the buyer the power of the supplier raises.
- The supplier group’s products are differentiated, or the product has built up switching costs – “differentiation or switching costs facing the buyers cut off their options to play one supplier against another. If the supplier faces switching costs, the effect is reversed.”<sup>42</sup>
- The supplier group poses a credible threat of forwarding integration – check on the ability of the industry to improve the terms of purchasing.<sup>43</sup>

The five above-stated competitive forces shown in Figure 2 determine the state of competition in a certain industry.<sup>44</sup>

“The collective strength of these forces determines the ultimate profit potential in the industry, where profit potential is measured in terms of long-run return on invested capital.”<sup>45</sup>

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<sup>42</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p.28. ISBN 0-684-84148-7

<sup>43</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p.27 - 28. ISBN 0-684-84148-7

<sup>44</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p.3. ISBN 0-684-84148-7

<sup>45</sup> PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. p.3. ISBN 0-684-84148-7

## 1.7.1 Market Research

### Mystery shopping

“Mystery shopping, a form of participant observation, uses researchers to act as customers or potential customers to monitor the quality of processes and procedures used in the delivery of a service.”<sup>46</sup>

“If an organization is communicating the expectations of management and customers through setting service standards, there is thought to be a need for measurement of performance relative to these standards. Mystery shopping can provide this measurement as it aims to collect facts rather than perceptions. These facts can relate to basic enquiries, purchases, and transactions covering topics such as:

- How many rings before the phone was answered?
- How long was the queue?
- What form of greeting was used?”<sup>47</sup>

Results from mystery shopping are used for 3 main purposes:

- “to act as a diagnostic tool identifying failings and weak points in an organization’s service delivery,
- to encourage, develop and motivate service personnel by linking with appraisal, training and reward mechanisms and,
- to assess the competitiveness of an organization’s service provision by benchmarking it against the offerings of others in an industry.”<sup>48</sup>

The final step of the mystery shopping is to report results which are often concluded in the form of graphs and figures. “Traditionally, reporting was based on subjective information and open questions. More recently, reporting also covers objective

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<sup>46</sup> WILSON, Alan M. The role of Mystery Shopping in the Measurement of Service Performance. *Managing Service Quality: An International Journal*, 1998. p. 414 ISSN 0960-4529

<sup>47</sup> WILSON, Alan M. The role of Mystery Shopping in the Measurement of Service Performance. *Managing Service Quality: An International Journal*, 1998. p. 414 ISSN 0960-4529

<sup>48</sup> WILSON, Alan M. The role of Mystery Shopping in the Measurement of Service Performance. *Managing Service Quality: An International Journal*, 1998. p. 414 ISSN 0960-4529

measurements based on checklists. The reports should be presented to responsible managers as soon as possible after the visit.”<sup>49</sup>

### **Research interview**

“An interview is a conversation, usually between two people. But it is a conversation where one person – the interviewer – is seeking responses for a particular purpose from the other person: the interviewee.”<sup>50</sup>

The research interview focuses on obtaining the information and finding and understanding the issues connected with the project for which it is conducted.<sup>51</sup>

“The most structured forms of interview (common in market research) are those where the interviewer knows what he or she wants to find out and the interviewee just has to answer the direct questions. Precise buying habits, preferences, and opinions may be unknown, but the interviewer knows exactly what kinds of answers are needed: in the end, he or she needs to be able to put a number to these (61 percent or whatever buy this, prefer that think the other). The specification is achieved but no unexpected discoveries: a high degree of the structure largely excludes them.”<sup>52</sup>

## **1.8 Kraljic Model**

“A company’s need for a supply strategy depends on two factors:

1. The strategic importance of purchasing in terms of the value added by product line, the percentage of raw materials in total costs and their impact on profitability, and so on.
2. The complexity of the supply market gauged by supply scarcity, pace of technology and/or materials substitution, entry barriers, logistics cost or complexity, and monopoly or oligopoly conditions.

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<sup>49</sup> WIELE, Ton Van der; HESSELINK, Martin; IWAARDEN, Jos Van. Mystery Shopping: A Tool to Develop Insight into Customer Service Provision. *Total Quality Management & Business Excellence*, 2005, 16.4, p. 535. DOI: 10.1080/14783360500078433

<sup>50</sup> GILLHAM, Bill. *Research Interview*. London: Continuum, 2000. p. 1. ISBN 978-0-826-44797-5

<sup>51</sup> GILLHAM, Bill. *Research Interview*. London: Continuum, 2000. p. 2. ISBN 978-0-826-44797-5

<sup>52</sup> GILLHAM, Bill. *Research Interview*. London: Continuum, 2000. p. 2. ISBN 978-0-826-44797-5

By assessing the company's situation in terms of these two variables, top management, and senior purchasing executives can determine the type of supply strategy the company needs both to exploit its purchasing power vis-à-vis important suppliers and to reduce its risks to an acceptable minimum.”<sup>53</sup>

Peter Kraljic has introduced his 4-phase approach which helps companies with the collection of marketing and corporate data, forecasting future supply scenarios, identifying available purchasing options, and with the development of individual supply strategies for critical items and materials.

### **Phase 1 – Classification**

During this stage, we are determining the *profit impact* of each supply item which we can define in terms of:

- volume purchased,
- percentage of total purchase cost,
- or impact on product quality or business growth.

Secondly, we are evaluating the supply risk. The *supply risk* is evaluated through:

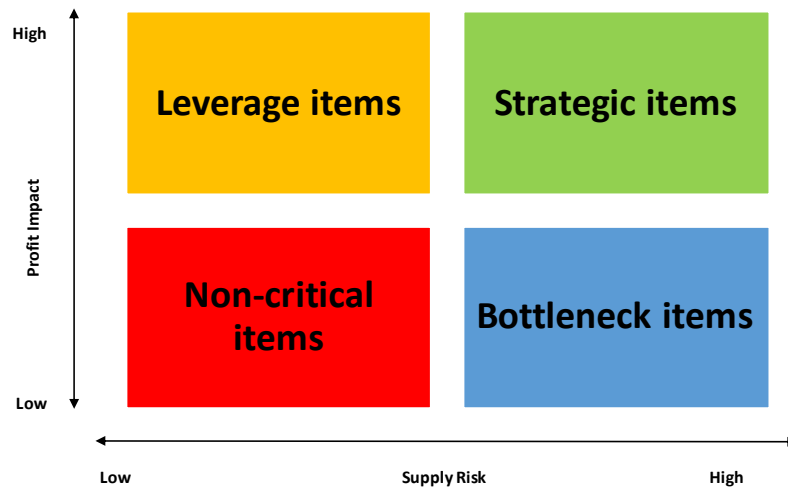
- availability,
- number of suppliers,
- competitive demand,
- make-or-buy opportunities,
- storage risks,
- and substitution possibilities.”<sup>54</sup>

The purchased items can be divided into the following criteria shown in Figure 5.

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<sup>53</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 110. ISSN 0017-8012

<sup>54</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 111. ISSN 0017-8012



**Figure 5: Evaluation of supply items** <sup>55</sup>

Each of the supply items can be placed into one of 4 categories.

- Strategic items (supply items with high supply risk and high-profit impact)
- Leverage items (supply items with low supply risk and high-profit impact)
- Non-critical items (supply items with low supply risk and low-profit impact)
- Bottleneck items (supply items with high supply risk and low-profit impact) <sup>56</sup>

“Each of these four categories requires a distinctive purchasing approach, whose complexity is in proportion to the strategic implications.” <sup>57</sup>

Approaches towards these 4 categories of supply items are summarized in Figure 6.

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<sup>55</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 112. ISSN 0017-8012

<sup>56</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 112. ISSN 0017-8012

<sup>57</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 112. ISSN 0017-8012

<b>Classifying Purchasing Materials Requirements</b>			
<b>Procurement focus</b>	<b>Main tasks</b>	<b>Required information</b>	<b>Decision level</b>
<b>Strategic items</b>	Accurate demand forecasting. Detailed market research. Development of long-term supply relationships. Make-or-buy decisions. Contract staggering. Risk analysis. Contingency planning. Logistics, inventory, and vendor control.	Highly detailed market data. Long-term supply and demand trend information. Good competitive intelligence. Industry cost curves.	Top level (e.g., vice president, purchasing).
<b>Bottleneck items</b>	Volume insurance (at cost premium if necessary). Control of vendors. Security of inventories. Backup plans.	Medium-term supply/demand forecasts. Very good market data. Inventory costs. Maintenance plans.	Higher level (e.g., department heads).
<b>Leverage items</b>	Exploitation of full purchasing power. Vendor selection. Product substitution. Targeted pricing strategies/negotiations. Contract/spot purchasing mix. Order volume optimization.	Good market data. Short- to medium-term demand planning. Accurate vendor data. Price/transport rate forecasts.	Medium level (e.g., chief buyer).
<b>Noncritical items</b>	Product standardization. Order volume monitoring/optimization. Efficient processing. Inventory optimization.	Good market overview. Short-term demand forecast. Economic order quantity inventory levels.	Lower levels (e.g., buyers).

Figure 6: Classification of Purchasing Materials Requirements <sup>58</sup>

## Phase 2 – Market analysis

“Next the company weights the bargaining power of its suppliers against its own strength as a customer. It systematically reviews the supply market, assessing the availability of

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<sup>58</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 112. ISSN 0017-8012

strategic materials in terms of both quality and quantity, and the relative strength of existing vendors. The company then analyses its own needs and supply lines to gauge its ability to get the kind of supply terms it wants.”<sup>59</sup>

Some of the criteria for evaluation of the supplier strength and the company strength according to Kraljic are listed in Table 1.

**Table 1: Criteria for Evaluation of the Supplier Strength and the Company Strength**<sup>60</sup>

<b>Supplier strength</b>	<b>Company strength</b>
Market size versus supplier capacity	Purchasing volume versus capacity of main units
Market growth versus capacity growth	Demand growth versus capacity growth
Capacity utilization or bottleneck risk	Capacity utilization of main units
Competitive structure	Market share vis-à-vis main competition
Return on investment and/or Return on costs	Profitability of main end products
Cost and price structure	Cost and price structure
Break-even stability	Cost of nondelivery
Uniqueness of product and technological stability	Own production capability or integration depth
Entry barrier (capital and know-how requirements)	Entry cost for new sources versus cost for own production

<sup>59</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 112. ISSN 0017-8012

<sup>60</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 114. ISSN 0017-8012

Logistics situation	Logistics
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### Phase 3 – Strategic positioning

“Next the company positions the materials identified in Phase 1 as strategic in the purchasing portfolio matrix. It can then identify areas of opportunity or vulnerability, assess supply risks, and derive basic strategic thrusts for these items. The purchasing portfolio matrix plots company buying strength against the strengths of the supply market and can be used to develop counterstrategies vis-à-vis key suppliers—an approach sometimes called reverse marketing.”<sup>61</sup>

Peter Krajlic identifies 3 different types of cells corresponding with 3 basic risk categories. **Exploit strategy** is applied on items where the company plays a dominant market role and suppliers’ strength is rated medium or low. The recommended strategy for the company is to be aggressive because the supply risk is low and the company has better chances to get favorable prices and better contract conditions.

**Diversify strategy** is applied on items where the company plays a secondary role on the market and suppliers have a strong position. The company should start in a defensive position and should increase expenditure on the market research to find another supplier, invest in supplier relations or even consider investing in its own research and development.

**Balance strategy** is applied on items where there are no major visible risks or benefits. The defensive position of the company can be costly and, on the other hand, being too aggressive can damage relationship suppliers.<sup>62</sup>

### Phase 4 – Action plans

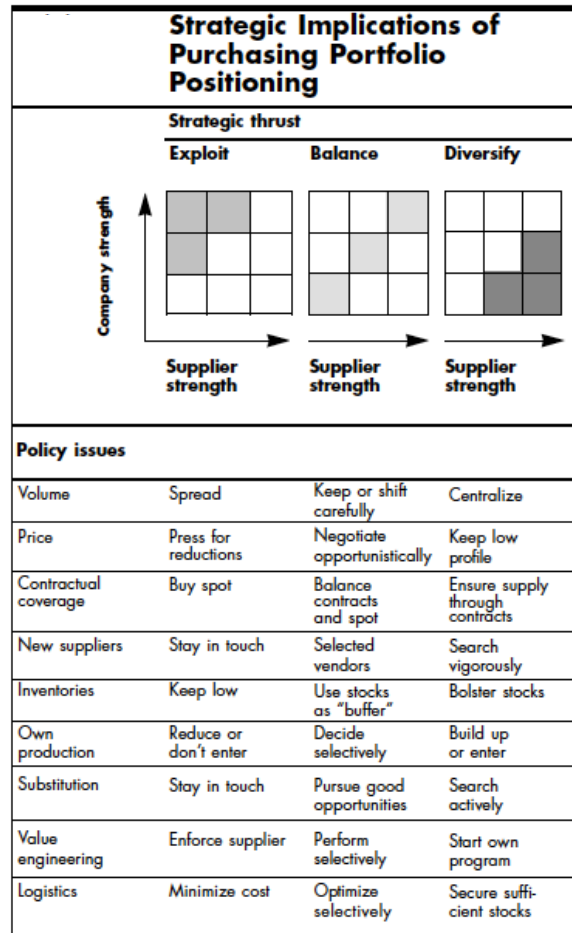
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<sup>61</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 113. ISSN 0017-8012

<sup>62</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 113. ISSN 0017-8012

“Each of the three strategic thrusts has distinctive implications for the individual elements of the purchasing strategy, such as volume, price, supplier selection, material substitution, inventory policy, and so on.”<sup>63</sup>

Figure 7 shows the strategic implications of purchasing portfolio positioning.



**Figure 7: Strategic Implications of Purchasing Portfolio Positioning**<sup>64</sup>

For strategic items where the suppliers’ strength is greater than the company’s strength, the company should respect and accept the conditions of the contract in the short run. In the long run, the company should look for alternative suppliers, materials, or even consider in-house production. If the company has greater power than the suppliers, the

<sup>63</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 114. ISSN 0017-8012

<sup>64</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 115. ISSN 0017-8012

company should take the advantage of its power and try to negotiate better prices, increase purchases and reduce inventory levels. <sup>65</sup>

“In this phase, then, the company should explore a range of supply scenarios in which it lays out its options for securing long-term supply and for exploiting short-term opportunities; clearly define respective risks, costs, returns, and strategic implications; and develop a preferred option with objectives, steps, responsibilities, and contingency measures laid out in detail for top management approval and implementation.” <sup>66</sup>

## **1.9 Market Segmentation**

“Market segmentation involves dividing a market into distinct groups of buyers who have different needs, characteristic, or behavior and who might require separate marketing strategies or mixes. The company identifies different ways to segment the market and develops profiles of the resulting market segments.” <sup>67</sup>

There are different buyers on the market. The company segments the market in order to divide a large market into smaller segments which the company can reach more efficiently and effectively and design the products or services according to the needs of the segment. Unfortunately, each market has a specific way of segmentation. Therefore, it is crucial for the company to understand variables on the market to find the best way to view market structure. Consumer markets are usually segmented by the following segmentations:

- Geographic segmentation – segmenting the market into, for example, nations, regions, states, cities, neighborhoods, or climate.
- Demographic segmentation – segmenting the market into, for example, age, gender, income, education, or religion.
- Psychographic segmentation – segmenting the market into, for example, lifestyle or personality.

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<sup>65</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 114. ISSN 0017-8012

<sup>66</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 114. ISSN 0017-8012

<sup>67</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 212. ISBN 978-1-292-22017-8.

- Behavioral segmentation – segmenting the market into, for example, occasions, benefits, user status, or loyalty status. <sup>68</sup>

### **Business market segmentation**

“Consumer and business marketers use many of the same variables to segment their markets. Business buyers can be segmented geographically, demographically (industry, company size), or by benefits sought, user status, usage rate, and loyalty status. Yet business marketers also use some additional variables, such as customer operating characteristics, purchasing approaches, situational factors, and personal characteristics.”

<sup>69</sup> Table 2 shows the main segmentation variables on the B2B market.

**Table 2: Main Segmentation Variables on B2B Market <sup>70</sup>**

<p><b>Demography</b></p> <ol style="list-style-type: none"> <li>1. Industry – Which industry should we serve?</li> <li>2. The size of the company – How big companies should we serve?</li> <li>3. Location – Which geographical areas should we serve?</li> </ol>
<p><b>Customer operating characteristics</b></p> <ol style="list-style-type: none"> <li>4. Technologies – On which customers’ technologies should we focus?</li> <li>5. User or non-user status – Should we serve frequent users, regular users, occasional users, or non-users?</li> <li>6. Customer’s abilities – Should we serve the customers requiring many or little services?</li> </ol>
<p><b>Purchasing approaches</b></p>

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<sup>68</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 213 - 217. ISBN 978-1-292-22017-8.

<sup>69</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 219 - 220. ISBN 978-1-292-22017-8.

<sup>70</sup> KOTLER, Philip, Kevin LANE KELLER. *Marketing Management*. Praha: Grada Publishing, 2013. p. 268. ISBN 978-80-247-4150-5. from BONOMA, Thomas V., Benson P. SHAPIRO. *Segmenting the Industrial Market*. Lexington Books, 1983. ISBN 978-06-690-9469-5

7. Organization of purchasing functions – Should we serve companies with a highly centralized or decentralized purchasing approach?
8. Power structure – Should we serve companies where the decision-makers are technicians, financials, or others?
9. The nature of existing relationships – Should we serve customers with whom we have strong relationships, or should we go for more attractive customers?
10. General purchasing approaches – Should we serve companies that prefer leasing, service contracts, purchases of integrated systems, or purchase auctions?
11. Purchasing criteria – Should we serve companies searching for quality, services, or price?

**Situational factors**

12. Acuteness – Should we serve companies that need quick and unexpected deliveries or services?
13. Specific usage – Should we rather focus on specific uses of the products than for all their possible uses?
14. Size of order – Should we focus on small or big orders?

**Personal characteristics**

15. Similarity of the buyer and the seller – Should we serve companies whose employees and values are similar to ours?
16. Attitude to risk – Should we serve customers willing to risk or those who are averse to risk?
17. Loyalty – Should we serve companies that are loyal to their suppliers?

“The flexible market offer consists of 2 parts: a bare solution represented by elements of products and services that are appreciated by all members of the segment, and options

that are of value only to certain members of the segment. Each option may require a fee.”

71

It is clear that it is possible to segment the market in many ways. Therefore, it is important for the company to keep in mind that market segments should always be: <sup>72</sup>

- “*Measurable*. The size, purchasing power, and profiles of the segments can be measured.
- *Accessible*. The market segments can be effectively reached and served.
- *Substantial*. The market segments are large or profitable enough to serve. A segment should be the largest possible homogenous group worth pursuing with a tailored marketing program. It would not pay, for example, for an automobile manufacturer to develop cars especially for people whose height is greater than seven feet.
- *Differentiable*. The segments are conceptually distinguishable and respond differently to different marketing mix elements and programs. If men and women respond similarly to marketing efforts for soft drinks, they do not constitute separate segments.
- *Actionable*. Effective programs can be designed for attracting and serving the segments. For example, although one small airline identified seven market segments, its staff was too small to develop separate marketing programs for each segment.” <sup>73</sup>

## 1.10 Market Targeting

After the segmentation is finished, it is time for the company to evaluate market segments. According to Kotler and Armstrong, the company should take a look at 3 factors:

- segment size and growth;

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<sup>71</sup> KOTLER, Philip, Kevin LANE KELLER. *Marketing Management*. Praha: Grada Publishing, 2013. p. 269. ISBN 978-80-247-4150-5.

<sup>72</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 221. ISBN 978-1-292-22017-8.

<sup>73</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 221. ISBN 978-1-292-22017-8.

- segment structural attractiveness;
- company objectives and resources.

Ideally, the company would like to have the segment at “right size and growth”. Unfortunately, it is a relative matter. The fastest-growing segment is not always attractive for every company. Due to lack of skills and resources or due to intense competition, small companies may find it difficult to serve such a segment. Such companies may target objectively less attractive segments which can be more profitable for them. <sup>74</sup>

“For example, a segment is less attractive if it already contains many strong and aggressive competitors or if it is easy for new entrants to come into the segment. The existence of many actual or potential substitute products may limit prices and the profits that can be earned in a segment. The relative power of buyers also effects segment attractiveness. Buyers with strong bargaining power relative to sellers will try to force prices down, demand more services, and set competitors against one another – all at the expense of seller profitability. Finally, a segment may be less attractive if it contains powerful suppliers that can control prices or reduce the quality or quantity of ordered goods and services.” <sup>75</sup>

Even if the company is in the position that it has found a segment of the “right size and growth” it still has to reflect the choice of the segment to its own goals and values. For example, the segment of economy cars may be large and growing enough for Mercedes-Benz, but would it make sense for Mercedes-Benz to enter such a segment? Most probably not, because of the perception of the brand. <sup>76</sup>

“A company should only enter segments in which it can create superior customer value and gain advantages over its competitors.” <sup>77</sup>

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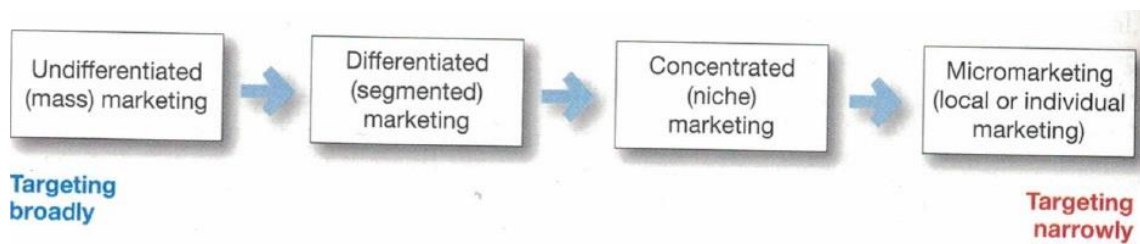
<sup>74</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 221 - 222. ISBN 978-1-292-22017-8.

<sup>75</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 222. ISBN 978-1-292-22017-8.

<sup>76</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 222. ISBN 978-1-292-22017-8.

<sup>77</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 222. ISBN 978-1-292-22017-8.

Figure 8 shows the levels of market targeting.



**Figure 8: Levels of Market Targeting** <sup>78</sup>

When the company uses **undifferentiated marketing**, it ignores market segment differences and targets the market with one offer. The company focuses on what is common in the needs when using the strategy of undifferentiated marketing.

**Differentiated marketing** strategy is adopted when the company decides to target several market segments and designs separate offers for each segment hoping for an increase of sales and development of stronger positions in each segment.

The company uses a **concentrated marketing (or niche marketing)** strategy when the company wants to acquire a large share on one or a few smaller segments. The company benefits from its concentration on a certain niche because it can adjust and react to the needs of concrete segments. Niche marketing is a common strategy for smaller companies that use their limited resources to serve smaller segments which may be unimportant for large corporations. A concentrated marketing strategy can be highly profitable; however, on the other hand, it can involve higher-than-normal risks because the company relies on one or a few segments that can fail, and the company can suffer because of it. This situation can happen when large corporations decide to enter particular small segments by acquiring niche brands. For example, Coca-Cola acquired FUZE (a fusion of tea, fruit, and other flavors), which facilitated Coca-Cola to compete in more niche markets and, finally, to develop strong positions in such markets.

**Micromarketing** strategy is followed when the company decides to tailor its products or services to specific individuals and local customer segments. The strategy perceives the

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<sup>78</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 222. ISBN 978-1-292-22017-8.

individual in every customer. *Local marketing* targets local customers which can increase manufacturing and marketing costs by reducing the economies of scale. It also involves problems in logistics. *Individual marketing* is probably the most extreme form of marketing when companies customize their products or services individually according to the needs of the customer. <sup>79</sup>

“Companies need to consider many factors when choosing a market-targeting strategy. Which strategy is the best depends on:” <sup>80</sup>

- company’s resources;
- type of product;
- product’s life-cycle stage;
- market variability;
- competitor’s marketing strategies. <sup>81</sup>

## **1.11 Differentiation and Positioning**

“Beyond deciding which segments of the market it will target, the company must decide on a value proposition – how it will create differentiated value for targeted segments and what positions it wants to occupy in those segments. A product position is the way a product is defined by customers on important attributes – the place the product occupies in consumers’ minds relative to competing products. Products are made in factories, but brands happen in the minds of consumers.” <sup>82</sup>

Planning differentiation and positioning strategy, companies should prepare positioning maps that show consumer perception of the company’s brand and the consumer perception of competing products on important buying dimensions.

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<sup>79</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 222 - 226. ISBN 978-1-292-22017-8.

<sup>80</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 227. ISBN 978-1-292-22017-8.

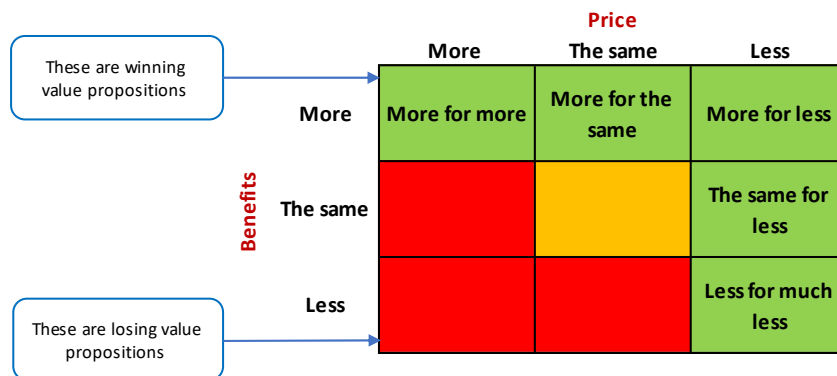
<sup>81</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 227. ISBN 978-1-292-22017-8.

<sup>82</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 228. ISBN 978-1-292-22017-8.

The differentiation and positioning include 3 tasks:

1. **Identifying possible value differences and competitive advantages** – the company has to understand its customer needs and deliver more and better customer value than competitors. The company that can differentiate and gains the position of the provider of superior customer value gains a competitive advantage.
2. **Choosing the right competitive advantages** – after successful identification of value differences and competitive advantages, the company has to decide on:
  - a. how many differences to promote;
  - b. which differences to promote.
3. **Selecting on overall positioning strategy** – the creation of a value proposition, which can be understood as a full mix of benefits on which a brand is differentiated and positioned. The value proposition should answer the customer’s question: *Why should I buy from this company?*<sup>83</sup>

Figure 9 shows possible value propositions.



**Figure 9: Possible Value Propositions**<sup>84</sup>

“In Figure 7, five green cells on the top and right represent winning value propositions – differentiation and positioning that give the company a competitive advantage. The red

<sup>83</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 228 - 232. ISBN 978-1-292-22017-8.

<sup>84</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 232. ISBN 978-1-292-22017-8.

cells at the lower left, however, represent losing value propositions. The center cell represents at best a marginal position.”<sup>85</sup>

## 1.12 Financial Analysis and Assessment

“For any venture to survive and grow, it needs to be financially viable and it needs to have good financial control. This can mean a number of different things. For it to be attractive to an equity investor – and the founder – it needs to be profitable and efficient. For it to survive it needs to be sufficiently liquid to enable it to pay its bills. And all of these things mean that stakeholders are interested in the risk that a new venture faces.”<sup>86</sup>

A three-to-five-year financial prediction should be prepared based on the before performed analysis. It should contain details about probable revenue, expenses, profits, cash-flow, and calculation of criteria determining profitability stated below. The basic calculation should as well the calculation of the breakeven point. The assessment should be addressed to the decision-makers in the company in order to make conclusions out of it.<sup>87</sup>

“Financial analysis and assessment of projects are taking important position within the feasibility study as they are offering basic information for the decision about acceptance or rejection of a project, respectively, information for evaluation of advantages of more options of the project and the decision about the option which should be realized.”<sup>88</sup>

The analysis and assessment lead to 2 decisions:

- investment decision – decision about to which specific assets will the company invest;
- financial decision – decision about the amount of money which will be invested.

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<sup>85</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 232. ISBN 978-1-292-22017-8.

<sup>86</sup> BURNS, Paul. *Entrepreneurship and Small Business: Start-up, Growth and Maturity*. New York: Palgrave Macmillan, 2016. p. 269. ISBN 978-1-137-43035-9.

<sup>87</sup> NYKIEL, Ronald A. *Handbook of Marketing Research Methodologies for Hospitality and Tourism*. New York: Haworth Press, 2007. p. 135-136. ISBN 978-0-7890-3426-7

<sup>88</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p. 63. ISBN 80-247-0939-2.

Stated 2 decisions are closely connected and they have a common basis in the cash flow statement of the project which is true during the whole lifespan of the project. To evaluate investment and financial decisions, there are criteria for the evaluation of economical effectiveness. Such criteria determine the profitability of resources and they are:

- return on capital;
- payback period;
- net present value;
- profitability index.

### **Return on capital**

“These indicators make it possible to measure the return on the capital used to finance the project by measuring the profit of the project to the invested funds.”<sup>89</sup>

The most frequently used indicators include:

- *Return of Equity* - which is determined as the ratio of profit before or after taxation to equity invested in the project by the investor. Through Return of Equity, we can therefore determine the valorization of the investor's investment.
- *Return of Assets* – which is determined as the ratio of earnings before interest and taxes or earnings after interest and taxes and the whole capital invested into the project (own + external) to set the valorization of the whole capital invested into the project.
- *Return of Investment* – slightly differs from Return of Assets as it is the ratio of long-term assets and the whole capital invested into the project (own + external). Return of Investment can be determined for each calendar year or normal year of project operation.<sup>90</sup>

### **Payback period**

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<sup>89</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p. 64. ISBN 80-247-0939-2.

<sup>90</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p. 64. ISBN 80-247-0939-2.

“The payback period is defined as the period needed to repay all investment costs of the project by its net revenues. It means that during the payback period the resources put into the project will be returned to the investor.”<sup>91</sup>

The payback period is usually compared with a threshold. The threshold is determined on the basis of previous experience and investment opportunities. The heavy industry usually has payback periods longer than 8 years. Therefore, the project with a payback period of, for example, 6 years can be judged as a good project in heavy industry. On the other hand, a project with a payback period of 6 years can be judged as a project with a long payback period in industries with a short innovation cycle.

The advantage of the payback period is its simplicity thanks to which the payback period is easily understandable and can be used between a wide range of departments of the company.

The disadvantages are that the payback period:

- ignores the time course of cash flow;
- ignores the income after the payback period;
- points out the quick payback period – in the sense that it rises the tendency of acceptance of short-term projects rather than long-term projects;
- it disrespects the time factor – time value of money and the risk of the long-term project.

Therefore, it is advised not to use the payback period as the primary criterium for making the decision about the project; however, it can be used as a secondary criterium in order to make a decision.<sup>92</sup>

## **Net present value**

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<sup>91</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p. 66. ISBN 80-247-0939-2.

<sup>92</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p. 66–67. ISBN 80-247-0939-2.

“Net present value of the project represents the difference between the current value of all future incomes of the project and current value of the costs of the project.”<sup>93</sup>

The higher the net present value, the more advantageous the project is. Therefore, the company should accept the project with a positive net present value and reject the project with a negative net present value. The main advantage of the net present value is that it respects the time value of money, but unfortunately, the net present value presents absolute quantity and not the exact profitability rate.<sup>94</sup>

### **Profitability index**

“Profitability index is close to net present value. The difference between the profitability index and net present value is that the profitability index is relative. Profitability index is a ratio of the current value of future incomes of the project and current value of investment costs.”<sup>95</sup>

The project should be realized if the profitability index is greater than 1. The more the profitability index passes 1 the more advantageous the project is.<sup>96</sup>

“Financial objectives of a commercial business will usually involve being highly profitable and efficient while maintaining adequate liquidity and minimizing operating and financial risk. The challenge is quantifying these things and then achieving them. For a social enterprise with social objectives, profitability and efficiency may be constraints rather than elements to be maximized. However, whether it is a commercial or social enterprise the principles of financial management remain the same.”<sup>97</sup>

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<sup>93</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p. 69. ISBN 80-247-0939-2.

<sup>94</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p. 71. ISBN 80-247-0939-2.

<sup>95</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p. 72. ISBN 80-247-0939-2.

<sup>96</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p. 73. ISBN 80-247-0939-2.

<sup>97</sup> BURNS, Paul. *Entrepreneurship and Small Business: Start-up, Growth and Maturity*. New York: Palgrave Macmillan, 2016. p. 269. ISBN 978-1-137-43035-9.

### 1.13 SWOT Analysis

“SWOT analysis is an analysis which is focusing on summary of all outputs of strategic analysis in the division: strengths, weaknesses, opportunities, and threats. It can be used as independent analysis which is focusing on finding strengths, weaknesses, opportunities, and threats as well.”<sup>98</sup>

It is advised to prepare SWOT analysis as a table, which is shown in Table 3.

**Table 3: Possible Framework for Conduction of SWOT Analysis**<sup>99</sup>

<p><b>Strengths</b></p> <p>Strengths of the company</p> <ul style="list-style-type: none"> <li>• .....</li> <li>• .....</li> <li>• .....</li> <li>• .....</li> </ul>	<p><b>Weaknesses</b></p> <p>Weaknesses of the company</p> <ul style="list-style-type: none"> <li>• .....</li> <li>• .....</li> <li>• .....</li> <li>• .....</li> </ul>
<p><b>Opportunities</b></p> <p>Opportunities for the company</p> <ul style="list-style-type: none"> <li>• .....</li> <li>• .....</li> <li>• .....</li> <li>• .....</li> </ul>	<p><b>Threats</b></p> <p>Threats the company can be facing</p> <ul style="list-style-type: none"> <li>• .....</li> <li>• .....</li> <li>• .....</li> <li>• .....</li> </ul>

When preparing the SWOT analysis, the following principles should be applied:

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<sup>98</sup> ČERVENÝ, Radim, Jiří FICBAUER, Alena HANZELKOVÁ and Miloslav KEŘKOVSKÝ. *Business plán – krok za krokem*. Praha: C.H.Beck, 2014. p. 136. ISBN 978-80-7400-511-4.

<sup>99</sup> ČERVENÝ, Radim, Jiří FICBAUER, Alena HANZELKOVÁ and Miloslav KEŘKOVSKÝ. *Business plán – krok za krokem*. Praha: C.H.Beck, 2014. p. 137. ISBN 978-80-7400-511-4.

- If the SWOT analysis is used for strategic planning, it should contain only relevant information. For example, if the company suffers from conflicts between management, it should not be counted as a weakness because the situation can be solved by one-time action. On the other hand, fluctuation from a long-term perspective can be seen as a weakness.
- The findings from the SWOT analysis should be relevant to the goal for which the analysis was conducted.
- SWOT analysis should contain only relevant information for the field which is analysed by the SWOT analysis.
- SWOT analysis should be trustworthy and therefore, it should contain trustworthy, checked facts.
- SWOT analysis should be objective, and the conductor should not be affected by his/her feelings and should ask for the feedback of external experts after the conduction. The reason for such action is to achieve the highest objectivity possible. Another option of conduction of SWOT analysis is brainstorming between the conductors.<sup>100</sup>

### Opportunities and threats

“Marketing opportunity is the need and interest of buyer which the company is able to satisfy with the profit. Marketing opportunities are coming from 3 sources.”<sup>101</sup>

“The first of them is the offer of something which is not on the market. This situation requires a minimum of marketing talent because the need is more than obvious. The second is the offer of an already existing product or service but in a new and better way. How? **The problem detection method** is asking the consumers about their proposals, **method of ideal** wants them to introduce their ideal version of product or service, and the **consumer chain method** is asking them to draw concrete steps which there are doing when obtaining, using and throwing away the product.”<sup>102</sup>

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<sup>100</sup> ČERVENÝ, Radim, Jiří FICBAUER, Alena HANZELKOVÁ and Miloslav KEŘKOVSKÝ. *Business plán – krok za krokem*. Praha: C.H.Beck, 2014. p. 136. ISBN 978-80-7400-511-4.

<sup>101</sup> HINDO, Brian. Rewiring Westinghouse. *BusinessWeek*, 19.05.2008, p. 48 – 49. ISSN 0007-7135

<sup>102</sup> KOTLER, Philip, Kevin LANE KELLER. *Marketing Management*. Praha: Grada Publishing, 2013. p. 80. ISBN 978-80-247-4150-5.

“The threat is the challenge represented by adverse trend or development, which will lead to decrease in turnover or profit without defensive marketing reaction.”<sup>103</sup>

### **Strengths and weaknesses**

The first step for the company should be to find the opportunities but the second is to make advantage of them. Therefore, the company should evaluate its strengths and weaknesses. It can be demanding for the company to fix all its weaknesses, or otherwise, to make advantage out of all of its strengths. The decision the company has to make is whether to go with the opportunities for which it has the right predispositions or the ones for which it has to acquire or discover its strengths.<sup>104</sup>

### **1.14 Risk Analysis**

“The risk is on one side connected with the hope of achieving exceptionally good economic results and on the other side is accompanied with the danger of business failure leading to losses which can sometimes have such serious extent that they can affect the financial stability of the company and can lead to its decline.”<sup>105</sup>

Therefore, we can distinguish between 2 sides of risks:

- **The positive side** which is connected with the hope of success.
- **The negative side** which is connected with the danger of achieving bad economic results.

The success or failure of a company is influenced by many factors which are hard to predict and often vary over time. Such factors are called factors of risks which are appearing as causes or sources of risk. For example, selling prices, purchase prices of raw materials, materials and energies, demand, exchange rates, interests, political instability, or technological development. The investment risk of projects comes from the inability to set the future values of stated factors that are influencing certain parts of the financial

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<sup>103</sup> KOTLER, Philip, Kevin LANE KELLER. *Marketing Management*. Praha: Grada Publishing, 2013. p. 81. ISBN 978-80-247-4150-5.

<sup>104</sup> KOTLER, Philip, Kevin LANE KELLER. *Marketing Management*. Praha: Grada Publishing, 2013. p. 82. ISBN 978-80-247-4150-5.

<sup>105</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p. 135. ISBN 80-247-0939-2.

flows of judged projects. The reasons for the inability to make estimates of the development of risk factors are:

- Deficit of information and insufficient knowledge of processes which are causing uncertainty.
- Irrelevant sources of information and data.
- Use of bad methods for estimation of future development.
- The random nature of the processes resulting in uncertainty.

The uncertainty of the development of factors of risk and uncertainty can be decreased, for example, by acquiring better information or using relevant sources of data. Unfortunately, the uncertainty can not be removed permanently because of the random nature of processes.<sup>106</sup>

### **Classification of risks**

The risks can be classified from many aspects. Basic criteria are following:

- **Business risks and pure risks** where business risks have both positive and negative sides and pure risks have only negative sides.
- **Systematic risks and unsystematic risks** where systematic risks are caused by common factors and affect all business units and unsystematic risks are specific risks connected with a certain company; for example, brain-drain of key employees of the company.
- **Internal risks and external risks** where internal risks are connected to factors within the company and external factors are connected with the business environment of the company.
- **Impressionable risks and unaffected risks** where impressionable risks are those risks that can be eliminated and unaffected risks are risks for which some precautions can be taken to decrease the impact of the risk.

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<sup>106</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p. 136. ISBN 80-247-0939-2.

- **Primary risks and secondary risks** where primary risks are posed by factors stated above and secondary risks are posed by the precaution to decrease the primary risks.
- **Risks in the preparation phase, realization phase, and operational phase of the project.** <sup>107</sup>

### **Risk management**

“The basic goal of risk management is to increase the probability of project’s success and to minimize the danger of its failure which could endanger the financial stability of the company and lead to its probable decline.

The goal of risk management of the project is to find out:

- Which factors (cost items, demand, selling price, exchange rates, interests, etc.) are important and are affecting the risk of a certain project the most, or which factors are less important and can be neglected.
- How big the risk of the project is and if the risk is acceptable or not.
- Through which procurements it is able to decrease the risk of the project on acceptable, economically viable measure.” <sup>108</sup>

### **The risk database**

All the identified risks should be put in the end to a database which is called the risk database where all the information about certain risk is put together. The information includes: <sup>109</sup>

- “estimates of probabilities and potential impacts of risk occurrences in the breakdown of cost overruns, missing deadlines, and not fulfilling other goals of the project;

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<sup>107</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p. 138 - 139. ISBN 80-247-0939-2.

<sup>108</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p. 141. ISBN 80-247-0939-2.

<sup>109</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p. 192. ISBN 80-247-0939-2.

- quantitative evaluation of the importance of risk factors and their order according to their importance, respectively, order to the groups with different importance;
- characteristics of accepted risk reduction procurements of the project and the terms in which the procurements should be realized;
- statement naming the subjects responsible for monitoring individual factors of risk and realization of accepted procurements focused on the decrease of risks of the project caused by stated factors;
- the results of analysis of expected effects connected with the realization of risk reduction procurements;
- the overview of the most important risks (in terms of the probability of occurrence and magnitude of negative impacts on the project) after the realization of risk reduction procurements;
- the plan for corrective action in the event of risks;
- scales used to assess the likelihood and impact of risk factors etc.”<sup>110</sup>

As risk management is considered as a systematic process, it is advised to use the PDCA cycle.

“The PDCA cycle can be briefly described as follows:

- **Plan:** establish the objectives of the system and its processes, and the resources needed to deliver results in accordance with customer’s requirements and the organization’s policies and identify and address risks and opportunities.
- **Do:** implement what was planned.
- **Check:** monitor and (where applicable) measure processes and the resulting products and services against policies, objectives, requirements, and planned activities, and report the results.
- **Act:** take actions to improve performance, as necessary.”<sup>111</sup>

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<sup>110</sup> FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. p. 192. ISBN 80-247-0939-2.

<sup>111</sup> EN ISO 9001: 2015. Quality management systems. 1. ed. Brussels: European Committee for Standardisation, 2015. p. 13. Sorting character 03.120.10.

## 1.15 Specific Requirements for the Laboratory Accreditation

The conditions under which the laboratory, applying for the accreditation, obtains the accreditation are defined in the standard EN ISO 17025: 2018.

The requirements are following:

- General requirements:
  - Impartiality – ensuring that there is no conflict of interest in the laboratory. The management of the laboratory should be committed to impartiality.
  - Confidentiality – the laboratory shall be responsible towards the customer and inform him that it wants to publish certain information.
- Structural requirements:
  - The laboratory shall be a legal entity or part of a legal entity.
  - The laboratory shall have management that has responsibility for the laboratory.
  - The laboratory shall have a document listing range of activities of the laboratory.
  - All activities of the laboratory shall be carried out in a way meeting the requirements of the standard EN ISO 17025: 2018.
  - The laboratory has to have the organization and management structure and its place within the legal entity.
  - The laboratory has to specify the responsibilities of all people connected with the laboratory.
  - The laboratory shall document its procedures.
  - The laboratory shall have staff who have the authority and resources needed to carry out their duties.
  - The management of the laboratory shall ensure that the communication about the effectiveness of the management system and the importance of meeting customers' and other requirements take place.
  - The management of the laboratory shall ensure the maintenance of the management system when the changes in the system are planned and implemented.
- Resource requirements, which include requirements for:

- general – everything in the laboratory (personnel, facilities, equipment, systems, and support services) shall be available in the laboratory in order to perform its activities,
- personnel,
- facilities and environmental conditions,
- equipment,
- metrological traceability,
- externally provided products and services.
- Process requirements, which include requirements for:
  - review of requests, tenders, and contacts,
  - selection, verification, and validation of methods,
  - sampling,
  - handling of test or calibration items,
  - technical records,
  - ensuring the validity of results,
  - reporting of results,
  - complaints,
  - nonconforming work,
  - control of data and information management.
- Management system requirements <sup>112</sup>

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<sup>112</sup> EN ISO 17025: 2018. *General requirements for the competence or testing and calibration laboratories*. 1. ed. Brussels: European Committee for Standardisation, 2017. p. 11 – 40. Sorting character 03.120.10.

## 2 CURRENT SITUATION ANALYSIS

The following feasibility study has been carried out for the company ZVS Holding a.s. which is the part of MSM GROUP s.r.o. The study aims to provide information on whether it is feasible for ZVS Holding a.s. to transform an already existing testing laboratory into an accredited testing laboratory. The submitted feasibility study is divided into the following parts:

- **Introduction of the company and definition of the position of the current accredited testing laboratory** – which aims to provide a necessary overview on the company strategy and the current situation within the already established laboratory.
- **Analysis of the market and marketing strategy** – which aims to provide information about the potential market as well as the analysis of potential competitors. This part of the feasibility study outlines the proposal as well as the marketing strategy for the new potential accredited laboratory.
- **Description of technology used** – which aims to provide information about technology needed to perform the accredited tests in the potential accredited testing laboratory.
- **External sources** – which aims to provide information about all inputs from the external environment needed for operating the tests in the potential accredited testing laboratory.
- **Internal sources** – which aims to provide information about all inputs from inside the company needed for the operation of the potential accredited laboratory as well as the organizational structure of the laboratory.
- **SWOT analysis** – which aims to summarize all previous parts of the conducted feasibility study into identified strengths, weaknesses, opportunities, and threats.
- **Plan of realization** – which aims to formulate the concrete steps of the potential transformation. The plan is divided into 2 parts:
  - operational plan;
  - business plan.

- **Financial analysis and assessment** – which aims to provide information about costs connected with the potential transformation from the testing laboratory to the accredited testing laboratory.
- **Risk analysis** – which aims to provide information about risks connected with the potential realization
- **Conclusion**

## 2.1 Introduction of the Company

“The ZVS company has been founded in 1937 and deals with the development, production, and sale in the area of mechanical engineering, electrical engineering, and special production focusing on large calibre and medium calibre ammunition.

Since 2000, the company deals with the development and production of sub-calibre ammunition for military purposes, pistol and shotgun ammunition for target shooting and hunting purposes.

Since 2013, the company has the latest technology in metal processing (cutting - laser cutting, punching, bending, rolling, scoring) as well as any powder-coated finish.”<sup>113</sup>

“In January 2015, the company was incorporated as a branch plant into MSM Martin s.r.o. In May 2015, MSM GROUP s.r.o. has been established, covering several companies operating in the defence area including ZVS Holding a.s. and ZVS Impex a.s. also. By this step, our plant has gained strong partners and significant covering.”<sup>114</sup>

### 2.1.1 Vision, Mission, Strategic Goal, and Values of MSM Group s.r.o.

“MSM GROUP is a company covering subsidiaries with a portfolio in the segment of the defense and civil engineering industries. The goal of the group is the strategic management of subsidiaries to effectively obtain and manage orders within their offer and to deliver reliable and top products and services to their customers. The main portfolio of companies belonging to the group covers the entire life cycle of ammunition,

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<sup>113</sup> ZVS. *MSM Group* [online]. Dubnica nad Váhom: MSM Group, s.r.o., ©2021 [cit. 2021-03-06]. Accessible from: <https://zvsholding.sk/en/our-companies/zvs>

<sup>114</sup> ZVS. *MSM Group* [online]. Dubnica nad Váhom: MSM Group, s.r.o., ©2021 [cit. 2021-03-06]. Accessible from: <https://zvsholding.sk/en/our-companies/zvs>

radio navigation systems for airports, the production of special custom containers, mobile and air traffic control towers. MSM GROUP covers the activities of the entire group with a focus on increasing the efficiency and expansion of the historically proven reputation of the covered brands to the widest possible markets.”<sup>115</sup>

The vision statement is stated on the company’s website: “Our vision is to be a significant and trustworthy international group, whose companies play a significant role in building a secure world. Making an effort for the security of society is worth it!”<sup>116</sup>

The mission statement is formulated in points and is stated on the website of the company as well.

“Our mission

- A well-functioning group of companies operating in the segment of the defense and security industry focused on large-caliber ammunition
- Achieving a significant place in the global market in this segment
- Promoting synergy effects with other business owners
- Generating resources for further own growth of MSM GROUP, but also for further business activities of owners in other segments”<sup>117</sup>

At the end of the mission statement, the company states that it is proud of the role it plays in the world which is followed by the statement of the strategic goal of the whole group. “Within five years, to become a prosperous, stable and reliable manufacturer and supplier

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<sup>115</sup> About MSM GROUP. *MSM Group* [online]. Dubnica nad Váhom: MSM Group, s.r.o., ©2021 [cit. 2021-03-06]. Accessible from: <https://zvsholding.sk/en/about-msm-group/about-msm-group/mission-vision-and-values/>

<sup>116</sup> About MSM GROUP. *MSM Group* [online]. Dubnica nad Váhom: MSM Group, s.r.o., ©2021 [cit. 2021-03-06]. Accessible from: <https://zvsholding.sk/en/about-msm-group/about-msm-group/mission-vision-and-values/>

<sup>117</sup> About MSM GROUP. *MSM Group* [online]. Dubnica nad Váhom: MSM Group, s.r.o., ©2021 [cit. 2021-03-06]. Accessible from: <https://zvsholding.sk/en/about-msm-group/about-msm-group/mission-vision-and-values/>

of large-caliber ammunition and provide services to partner countries' security forces throughout the life cycle of this ammunition, which aspires to a unit in Europe.”<sup>118</sup>

The company concludes the statements with an explanation of its values. The values of MSM GROUP s.r.o. are:

- Integrity and openness
- Customer orientation
- Continuous growth and performance
- Respect and trust
- Loyalty<sup>119</sup>

### **2.1.2 Testing Laboratory within MSM Group s.r.o. and ZVS Holding a.s.**

To get a better understanding of the plans of the top management of ZVS Holding a.s., a research interview was held with the Operation Director of ZVS Holding a.s.. Questions asked during the interview see in Appendix 1.

The current testing laboratory is situated within the structure of ZVS Holding a.s. as a separated unit operated by the testing department of the company which is responsible to the Head of Technical Inspection and Testing Department and the Operation Director of the company. The current laboratory is divided into 3 parts:

- Chemical testing laboratory
- Technical service, which is divided into:
  - Small caliber ammunition testing laboratory
  - Special equipment testing laboratory
- Training center

The chemical testing laboratory focuses on the control of the inputs according to current STN, STANAG, and ISO standards, verification, control, and production tests and

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<sup>118</sup> About MSM GROUP. *MSM Group* [online]. Dubnica nad Váhom: MSM Group, s.r.o., ©2021 [cit. 2021-03-06]. Accessible from: <https://zvsholding.sk/en/about-msm-group/about-msm-group/mission-vision-and-values/>

<sup>119</sup> About MSM GROUP. *MSM Group* [online]. Dubnica nad Váhom: MSM Group, s.r.o., ©2021 [cit. 2021-03-06]. Accessible from: <https://zvsholding.sk/en/about-msm-group/about-msm-group/mission-vision-and-values/>

analyses of explosives and all used one's materials, chemical and physical analysis of pyrotechnic compositions, and analysis of drinking, waste and sewage water.

The small-caliber ammunition testing laboratory performs in particular:

- ballistic measurements (measurement of pressures, velocities, dispersions, protocols, analyses),
- creation of programs for ballistic measurements,
- calibration of sensors and ballistic analyzers,
- repair and maintenance of measuring equipment,
- solving problems with other ballistic testing facilities.

The special equipment testing laboratory deals in particular with:

- destruction and disposal of explosives, explosive articles, and ammunition,
- functional testing of products containing explosives at the research and development stage and series production,
- climatic tests and equipment programming,
- mechanical tests and equipment programming (vibration, shock tests).

The special equipment testing laboratory shall provide:

- development of technological procedures for the destruction of explosives, explosive objects, and ammunition,
- creation of programs for various recordings of test results (Dasylab, Wavebook, USB oscilloscopes),
- calibration of measuring instruments, vibrometers, pressure and overload sensors, luxmeters, digital thermohydrographs, and furnaces,
- elaboration of test reports and destruction of explosives,
- external calibrations of measuring devices.

The training center as a part of the current testing laboratory provides:

- educational and training activities on the basis of relevant authorizations and accreditations,
- further education and training according to the requirements of other departments according to expertise individual employees,

- consulting activities for work with explosives, explosive articles, and ammunition within the meaning of the applicable legislation,
- calculations of object areas, elaboration of technical projects, procedures, and instructions.

The current laboratory is able to perform the following tests:

- chemical stability at 100°C, STN 66 8102,
- chemical stability in accordance with Bergmann-Junk, STN 66 8102,
- temperature of ignition/explosion, STN 66 8063, STANAG 4491,
- Stability Test Procedures and Requirements Using Stabilizer Depletion - Nitrocellulose Based Propellants - STANAG 4620/AOP-48,
- chemical compatibility of ammunition components with explosives on the base stabilizer depletion, STANAG 4147,
- paints and varnishes - cross-cut test (ISO 2409:2020),
- corrosion tests in artificial atmospheres, salt spray tests (STN EN ISO 9227),
- paints and varnishes, determination of film thickness (STN EN ISO 2808),
- preparation of steel substrates before application of paints and related products - surface roughness characteristics of blast-cleaned steel substrates - Part 4: Method for the calibration of ISO surface profile comparators and the determination of surface. The procedure with a profilometer. STN EN ISO 8503-4
- Paints and varnishes. Corrosion protection of steel structures by protective paint systems. Part 6: Laboratory performance test methods (STN EN ISO 12944-6)

The plan with the current testing laboratory is to apply for accreditation and transform the testing laboratory into an accredited testing laboratory, which will supply the whole group with the tests. ZVS Holding a.s. sees the opportunity in the development of intrapreneurship within the company by acquiring such accreditation with the potential for further development in means of the number of tests and the equipment as well. <sup>120</sup>

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<sup>120</sup> HELBICHOVÁ, Zuzana. *Current situation with the testing laboratory within ZVS Holding a.s.* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

## 2.2 External Analysis

### 2.2.1 SLEPT Analysis

SLEPT analysis was chosen as a framework in order to point out how the factors included in the analysis influence the market of accredited testing laboratories. To find out important factors and technical details connected with the laboratory, a research interview was held with the employee of the Technical Inspection and Testing Department. Questions from the conducted interview see Appendix 2.

**Legal factors** are probably the major force influencing the market of accredited testing laboratories as they are the barrier to entry to the market. Current legislation in the world is set in the standard EN ISO 17025:2018 which is the basic document under which all the accredited laboratories are validated by the accreditation process. All subjects in Slovakia and the Czech Republic are accredited under the standard EN ISO 17025:2018.

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As the standard was published 3 times, in 1999, 2005 and 2018, there is a low possibility of an important innovation in the standard, and it is highly probable that the new laboratory would be accredited under the current version of the standard (EN ISO 17025:2018) for the whole period of accreditation without the need of reaccreditation because of an updated norm.

As the accredited laboratories differentiate in the types of tests, the legislation narrows as well. The potential new accredited laboratory with ZVS Holding a.s. will carry out tests on the explosives which are regulated by the standard STN 66 8002 - Safety code for handling with explosives in laboratories, test rooms, and shooting ranges and adequate ČSN 66 8002 in the Czech Republic. <sup>123</sup>

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<sup>121</sup> Vyhľadávanie subjektov podľa oblastí akreditácie. *SNAS – Slovenská národná akreditačná služba* [online]. Bratislava: Slovenská národná akreditačná služba, ©2002-2021 [cit. 2021-03-06]. Accessible from:

<https://ais.snas.sk/ais/#!WebReports/2/list.accredited.subject.search.byfield/AccreditedSubjectsByFields>

<sup>122</sup> Databáze akreditovaných subjektů. *Český institut pro akreditaci* [online]. Praha: Český institut pro akreditaci, o.p.s., ©2021 [cit. 2021-03-06]. Accessible from: [https://www.cai.cz/?page\\_id=4499](https://www.cai.cz/?page_id=4499)

<sup>123</sup> BEREC, Milan. *Norms, which the accredited laboratories have to respect* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

The STN, respectively ČSN standard, was published in 1965 <sup>124</sup> and is still valid; therefore, some changes are not expected. STN and ČSN standards describe the procedure of each test performed as well.

Another act, which influences the market, is Act No. 58/2014 in Slovakia and similar Act No. 61/1988 in the Czech Republic which regulate:

- a) rights and obligations of persons in the field of explosives, explosive articles, and ammunition,
- b) conditions for the use of explosives and explosive articles,
- c) conditions for research, development, experimental production, manufacture, processing, acquisition, transport, storage, registration, testing, delaboration, disposal, disposal and destruction of explosives, explosive articles and ammunition and devices for the use of explosives,
- d) conditions for revision and repair of ammunition, search for unexploded ordnance and humanitarian demining,
- e) the competence of state administration bodies in the area of explosives, explosive articles, and ammunition. <sup>125 126</sup>

For explosives tests, there must be applied the legislation according to a standardization agreement (STANAG) as well. STANAG is applicable in all NATO member states. “A Standardization Agreement (STANAG) is a NATO standardization document that specifies the agreement of member nations to implement a standard, in whole or in part, with or without reservation, in order to meet an interoperability requirement.” <sup>127</sup>

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<sup>124</sup> Portál technických noriem - STN 66 8002. *Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky*® [online]. Bratislava: Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, ©2019 [cit. 2021-03-23]. Accessible from: [https://normy.unms.sk/eshop/public/standard\\_detail.aspx?id=67101](https://normy.unms.sk/eshop/public/standard_detail.aspx?id=67101)

<sup>125</sup> Zákon č. 58/2014 Z. z. Zákon o výbušninách, výbušných predmetoch a munícii a o zmene a doplnení niektorých zákonov. *Zákony pre ľudí* [online]. Žilina: S-EPI s.r.o. © 2010-2021 [cit. 2021-03-23]. Accessible from: <https://www.zakonypreludi.sk/zz/2014-58>

<sup>126</sup> Zákon č. 61/1988 Sb: Zákon České národní rady o hornické činnosti, výbušninách a o státní báňské správě. *Zákony pro lidi* [online]. Zlín: AION CS, s.r.o. © 2010-2021 [cit. 2021-03-23]. Accessible from: <https://www.zakonyprolidi.cz/cs/1988-61>

<sup>127</sup> Standardization. *NATO: North Atlantic Treaty Organization* [online]. Brussels: NATO ©2021 [cit. 2021-03-06]. Accessible from: [https://www.nato.int/cps/en/natolive/topics\\_69269.htm](https://www.nato.int/cps/en/natolive/topics_69269.htm)

Furthermore, NATO understands standardization as: "...the development and implementation of concepts, doctrines, and procedures to achieve and maintain the required levels of compatibility, interchangeability or commonality needed to achieve interoperability.

Standardization affects the operational, procedural, material, and administrative fields. This includes a common doctrine for planning a campaign, standard procedures for transferring supplies between ships at sea, and interoperable material such as fuel connections at airfields. It permits NATO countries to work together, as well as with their partners, preventing duplication and promoting better use of economic resources.”<sup>128</sup>

### **Political factors**

2 main institutions politically influence the market for accredited testing laboratories. The main authority is the Main Mining Office. One of the missions of the Mining Authorities is to: "...through the Main Mining Office and district mining offices to perform the main supervision over compliance with Act No. 58/2015 Coll., on explosives, explosive articles and ammunition and on the amendment of certain laws.”<sup>129</sup>

The institution which covers the environment where the new accredited laboratory will be situated is the District Mining Office in Prievidza which is the executive office of the Main Mining Office. The main task of district mining offices is the execution of the main supervision.<sup>130</sup>

“When performing the main supervision, the district mining authorities:

In connection with the performance of tasks in the performance of the main supervision, it carries out inspections of buildings, equipment, and workplaces and, at the same time, controls the obligations arising from the Mining Act, Act of the Slovak National Council

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<sup>128</sup> Standardization. *NATO: North Atlantic Treaty Organization* [online]. Brussels: NATO ©2021 [cit. 2021-03-06]. Accessible from: [https://www.nato.int/cps/en/natolive/topics\\_69269.htm](https://www.nato.int/cps/en/natolive/topics_69269.htm)

<sup>129</sup> Poslanie orgánov štátnej banskej správy. *Hlavný banský úrad* [online]. Banská Štiavnica: Hlavný banský úrad © 2004-2021 [cit. 2021-03-23]. Accessible from: <https://www.hbu.sk/sk/Identifikacia-organizacie/Poslanie.alej>

<sup>130</sup> O činnosti obvodných banských úradov. *Hlavný banský úrad* [online]. Banská Štiavnica: Hlavný banský úrad © 2004-2021 [cit. 2021-04-02]. Accessible from: <https://www.hbu.sk/sk/Identifikacia-organizacie/O-cinnosti/Obvodne-banske-urady.alej>

No. 51/1988 Coll., Act No. 58/2014 Coll. and regulations issued pursuant to them, protection and use of mineral deposits, safety and health at work and operational safety, securing protected objects and interests from the effects of mining activities, production, storage and use of explosives, explosive articles, and ammunition as well as other generally binding legal regulations to ensure safety and health protection at work, safety of technical equipment and working conditions, including regulations on underground fire protection.”<sup>131</sup>

The Main Mining Office and District Mining Office influence the new accredited laboratory in a way that they should approve the laboratory in terms of permitted quantity of explosives within the premises of the laboratory. Mining offices approve whether it is safe and possible to perform tests within the premises of the laboratory itself as well. The District Mining Office can, later on, execute controls in the premises which can lead, if the premises fail, to fine or, in the worst case, closure of the laboratory.<sup>132</sup>

### **Technological factors**

Technological factors can influence the new accredited laboratory as well. Especially, if we consider the technological development of past years. Accredited laboratories have to react to the changes on 2 sides:

1. Machinery – when there is different machinery required to perform the tests.
2. Ammunitions – when there are different conditions on the explosives.

Such changes occur when there is a new product developed or when there is a significant innovation in the production process. These changes are expected as the production process connected with the research and development takes a significant amount of time, so the accredited laboratories have time to adjust. Because of the fact that the tests that the new accredited laboratory wants to perform are executed in the same way for over 50 years now, the possibility of innovation of the procedure is less probable. The new

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<sup>131</sup> O činnosti obvodných banských úradov. *Hlavný banský úrad* [online]. Banská Štiavnica: Hlavný banský úrad © 2004-2021 [cit. 2021-04-02]. Accessible from: <https://www.hbu.sk/sk/Identifikacia-organizacie/O-cinnosti/Obvodne-banske-urady.alej>

<sup>132</sup> BEREK, Milan. *Roles of Mining Offices with regards to the accredited laboratory* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

accredited laboratory would have to adjust and consider possible investment into its equipment if there is a new explosive developed which will require some new specific testing method.”<sup>133</sup>

Social and environmental factors have not been identified.

The SLEPT analysis is summarized in Table 4.

**Table 4: SLEPT Analysis**<sup>134</sup>

<b>Factor</b>	<b>Threat characteristics</b>	<b>Trend</b>	<b>Characteristics of opportunity</b>	<b>Trend</b>
<b>Social</b>	Not identified		Not identified	
<b>Legal</b>	Change in ISO, Acts No. 58/2014 or 61/1988, STN or STANAG norms	Less probable (-)	Not identified	Rising (+)
<b>Economic</b>	Not identified		Not identified	
<b>Political</b>	Not identified		Not identified	
<b>Technological</b>	Development of new types of machines needed for the test performance	Less probable (-)	Not identified	Rising (+)

<sup>133</sup> BEREK, Milan. *Technological factors influencing accredited testing laboratories* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

<sup>134</sup> Own work

### **2.2.2 Primary Research Using Mystery Shopping**

To find out more information about prices on the market, mystery shopping was conducted among identified competitors. The methodology, used for conduction and depiction of the mystery shopping, was taken over from ZVS Holding a.s..

There were 4 main competitors identified:

- VTSÚ Záhorie, accredited testing laboratory S-145
- KONŠTRUKTA - Defence, a.s. operation of special testing Lieskovec, accredited testing laboratory S-077
- EXPLOSIA a.s., accredited testing laboratory 41/2021
- Ministry of Defence, Military base 5512, Týniště nad Orlicí, accredited testing laboratory 520/2019

Each of these four competitors was asked for the price and date of delivery for the test which would overlap with the new accredited laboratory. The following evaluation criteria were set with the following weight.

- Quality – weight 5
- Stability, Flexibility, Reliability – weight 3
- Price – weight 5
- Communication – weight 4
- Overlap – weight 3

Each of the selected criteria was evaluated by a maximum of 100 points. After the evaluation, the result of each criterion is multiplied by the weight of the criterion. Therefore, the total sum of the points equals 2,000. After the sum, the gained points of each laboratory are transformed into a percentage. For the whole table for the mystery shopping see Appendix 3.

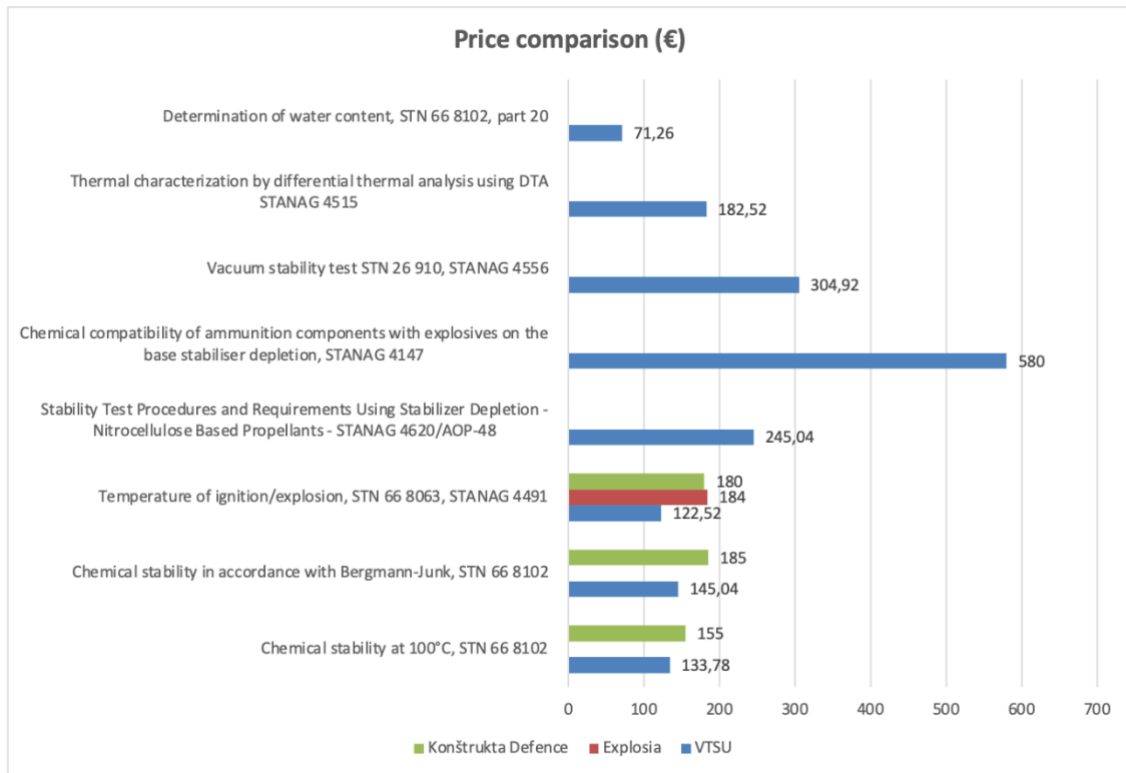
During the mystery shopping, it was not possible to reach the Military base 5512 in Týniště nad Orlicí. It is highly possible that the accredited testing laboratory situated in the military base operates exclusively for the purposes of the Ministry of Defence of the

Czech Republic and it does not aim at external clients. Due to this, there are no data about the price and communication of the laboratory.

As the quality is one of 2 major factors influencing the choice of the accredited laboratory, it would be necessary to perform the tests in the concrete laboratories which were included in the mystery shopping. However, this was not possible; therefore, it was assumed that if the laboratories are accredited under the standard EN ISO 17025:2018, they would deliver the quality complying with the standards. Therefore, most of the laboratories have the highest number of points on the basis of the accreditation certificate; just in the case of the Explosia the ranking is lower due to missing accreditation of the relevant tests.

Stability, flexibility, reliability was evaluated on the basis of the “history” of the company and the specific laboratory. The military base in Týniště nad Orlicí got the highest marks due to its long tradition and service to the Czech army. On the other hand, VTSÚ Záhorie received lower evaluation due to its problems connected with its past.

The price was evaluated just by the comparison of price offers because the lead time was more or less the same, so the rating was done just on the basis of the price level. The prices received from the laboratories see Graph 1.



**Graph 1: Price Comparison Between Competitors of the New Accredited Laboratory**<sup>135</sup>

Comparing prices from the laboratories, it is visible that VTSÚ Záhorie is the cheapest laboratory on the market. This is mainly because it is a budgetary organization established under the Ministry of Defence of the Slovak Republic and its goal is not to reach profit.

The reaction time on the price offer was a basis for the communication ranking. During the conduction of mystery shopping, it was impossible to reach the military base in Týnišťe nad Orlicí. The problem with communication occurred as well with Explosia. The other 2 laboratories performed an average which was sufficient to receive an offer in a reasonable time. None of the laboratories performed excellently; therefore, there can be potential for the new accredited laboratory to gain an advantage over them via better communication with its customers.

The overlap was evaluated just on the basis of the checking of the list of the accredited tests. The highest score got the VTSÚ Záhorie because the VTSÚ is also the National Authority with the testing laboratory owned by the government (Ministry of Defence -

<sup>135</sup> Own work.

MoD). VTSÚ is a government budgetary organization, which is focused to serve mainly demands of the MoD. The same status has the Military base Týniště nad Orlicí. These government laboratories do not have any business plan/interest to serve the standard market and, at the same time, do not do any activity towards the market because the laboratories are directly sponsored/financed by the Ministries of Defences. However, as stated previously, VTSÚ covers the whole portfolio with its offer of tests. The second in the order is the military base in Týniště nad Orlicí and the other 2 laboratories have not got that significant overlap.

Graph 2 shows the final scores of the 4 competitors.



**Graph 2: Final Scores from Mystery Shopping of the Potential Competitors of the New Accredited Laboratory <sup>136</sup>**

The laboratories differ in color depending on the country where they operate. VTSÚ Záhorie achieved the highest score from mystery shopping (89.3%). The other 3 laboratories achieved significantly lower evaluation, mainly because of their portfolio in combination with communication. The main findings from the mystery shopping are:

- All laboratories are hard to reach.
- The laboratories established under the ministries of defense tend to offer lower prices in comparison with laboratories established under private companies. In the case of the Czech laboratory established under the Ministry of Defence of the Czech Republic, it serves just the demand from the ministry.

<sup>136</sup> Own work according retrieved method from ZVS Holding a.s..

- The offered portfolio of tests in laboratories differs. There is no significant trend with regards to the portfolio because the laboratories tend to adjust to the demand of the institution they operate under.

Based on the findings, the new accredited laboratory should pay attention to the services accompanied with testing such as communication as it can be a decisive factor for the potential customers. Therefore, good communication from the new accredited laboratory towards the clients can be identified as an opportunity that can lead to an increase in the number of customers and eventually an increase in turnover.

### 2.2.3 Porter's Model of 5 Forces

To perform and execute the analysis of the microenvironment, a research interview with the manager of quality control was held.

#### Threat of new entrant

Currently, there are 4 accredited laboratories testing explosives in the Czech and Slovak Republic. These laboratories are:

- Military Technical and Testing Institute, accredited testing laboratory S-145 – which is accredited from: 04.12.2020 <sup>137</sup>
- KONŠTRUKTA - Defence, a.s. operation of special testing Lieskovec, accredited testing laboratory S-077 – which is accredited from: 10.04.2020 <sup>138</sup>
- Czechia: EXPLOSIA a.s., accredited testing laboratory 41/2021 – which is accredited from: 14.1.2021 <sup>139</sup>

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<sup>137</sup> Vojenský technický a skúšobný ústav Záhorie.. *SNAS - Slovenská národná akreditačná služba* [online]. Bratislava: *Slovenská národná akreditačná služba* © 2002-2021 [cit. 2021-04-02]. Accessible from: <https://ais.snas.sk/ais/?restartApplication#!WebReports/191,2033,1460,2032,2031,470,196,2390,472,1734,198,990,199,1611,1610,993,1212,999,1614,1735,1190,2045,1191,2,3,20,1363,1362,1483,134,255,2048,2047,2046,419,1374,1373,2065,1371,1370,1369,420,2215,421,1>

<sup>138</sup> KONŠTRUKTA - Defence, a.s. *SNAS - Slovenská národná akreditačná služba* [online]. Bratislava: *Slovenská národná akreditačná služba* © 2002-2021 [cit. 2021-04-02]. Accessible from: <https://ais.snas.sk/ais/#!WebReports/3029,1324,205,1709,427,2939,1728,2284/list.accredited.subject.search.fulltext/AccreditedSubjectsFulltext/fullText>

<sup>139</sup> 1167.2 – Explosia a.s.. *Český Institut pro akreditaci* [online]. Praha: Český institut pro akreditaci o.p.s.© 2021 [cit. 2021-04-02]. Accessible from: <https://www.cai.cz/?subjekt=1167-2-explosia-a-s>

- Ministry of Defence, Military base 5512, Týniště nad Orlicí, accredited testing laboratory 520/2019 – which is accredited from: 23.3.2021 <sup>140</sup>

Following 4 laboratories supply the market in the Czech and Slovak Republic. All of them are somehow connected with the explosives production, respectively, with the army and Ministry of Defense of the Slovak, respectively, the Czech Republic. The reason is that companies, producing explosives, must fulfill a standard regulation in order to place the product – explosive on the specific marked. The national authorities approve the explosives for the intended use on the basis of the reliable or accredited laboratories where the final testing of the approval process of the explosives is carried out.

On the other hand, there are not so many companies producing explosives in the Czech and Slovak Republic. It seems that MSM Group s.r.o. is the only company without an accredited laboratory. <sup>141</sup>

Generally, the threat of new entrant to the market is not significant and can be perceived as an **opportunity** for new existing laboratory, because of the fact that there are not many companies working with or producing explosives and, secondly, that there is a high cost to enter the market because of the need to purchase equipment needed for the tests. ZVS Holding a.s. should build on the fact that it has already invested in the equipment needed for the tests.

### **Rivalry among existing firms**

As there are 4 companies supplying the tests for the Czechoslovak market at the moment, the rivalry among them is defined by the number of tests they are able to execute. Companies mostly decide based on the product they want to test in a way that companies ideally want to do all the tests connected with the product in the same place with no need to contact another laboratory for additional testing. Therefore, accredited laboratories try to find the best possible ratio between the number of tests and, consequently, machinery

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<sup>140</sup> 1705 – Česká republika – Ministerstvo obrany. *Český Institut pro akreditaci* [online]. Praha: Český Institut pro akreditaci o.p.s.© 2021 [cit. 2021-04-02]. Accessible from: <https://www.cai.cz/?subjekt=1705-ceska-republika-ministerstvo-obrany>

<sup>141</sup> BEREK, Milan. *Competitors for the new accredited laboratory on the Czechoslovak market* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

and equipment needed to do the tests. See the list of potential competitors and the overlap between the tests in the new accredited laboratory in ZVS Holding a.s..

- Military Technical and Testing Institute, accredited testing laboratory S-145 – overlap: the whole range <sup>142</sup>
- KONŠTRUKTA - Defence, a.s. operation of special testing Lieskovec, accredited testing laboratory S-077 - overlap: Temperature of ignition/explosion, Chemical stability at 100°C, Chemical stability in accordance with Bergmann-Junk <sup>143</sup>
- EXPLOSIA a.s., accredited testing laboratory 41/2021 - overlap: Temperature of ignition/explosion <sup>144</sup>
- Ministry of Defence, Military base 5512, Týniště nad Orlicí, accredited testing laboratory 520/2019 - overlap Determination of the water content, Vacuum Stability Test STANAF 4556, Thermal characterization by DTA STANAG 4515, Chemical stability at 100°C, Stability Test Procedures and Requirements Using Stabilizer Depletion - Nitrocellulose Based Propellants - STANAG 4620/AOP-48

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Thanks to the fact that the procedures of the tests are standardized, the market is as well. The rule which can be applied towards the potential competitive advantage on this exact market is that if a certain laboratory offers a whole range of tests required for a certain explosive, the probability that the company will choose the laboratory to perform the test on their product increases rapidly. Stated competitive advantage exists as well in the case

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<sup>142</sup> Vojenský technický a skúšobný ústav Záhorie. *SNAS - Slovenská národná akreditačná služba* [online]. Bratislava: *Slovenská národná akreditačná služba* © 2002-2021 [cit. 2021-04-02]. Accessible from: <https://ais.snas.sk/ais/?restartApplication#!WebReports/191,2033,1460,2032,2031,470,196,2390,472,1734,198,990,199,1611,1610,993,1212,999,1614,1735,1190,2045,1191,2,3,20,1363,1362,1483,134,255,2048,2047,2046,419,1374,1373,2065,1371,1370,1369,420,2215,421,1>

<sup>143</sup> KONŠTRUKTA - Defence, a.s. *SNAS - Slovenská národná akreditačná služba* [online]. Bratislava: *Slovenská národná akreditačná služba* © 2002-2021 [cit. 2021-04-02]. Accessible from: <https://ais.snas.sk/ais/#!WebReports/3029,1324,205,1709,427,2939,1728,2284/list.accredited.subject.search.fulltext/AccreditedSubjectsFulltext/fullText>

<sup>144</sup> 1167.2 – Explosia a.s.. *Český Institut pro akreditaci* [online]. Praha: Český institut pro akreditaci o.p.s. © 2021 [cit. 2021-04-02]. Accessible from: <https://www.cai.cz/?subjekt=1167-2-explosia-a-s>

<sup>145</sup> 1705 – Česká republika – Ministerstvo obrany. *Český institut pro akreditaci* [online]. Praha: Český Institut pro akreditaci o.p.s. © 2021 [cit. 2021-04-02]. Accessible from: <https://www.cai.cz/?subjekt=1705-ceska-republika-ministerstvo-obrany>

when the company wants to prolong the lifespan of the ammunition which contains explosives.<sup>146</sup>

Therefore, the offered range of accredited tests can be understood as an **opportunity** for the new laboratory because the portfolio is adjusted according to the needs of the biggest spender from MSM Group which is focused on the prolonging lifespan of ammunition. The portfolio can be, therefore, interesting for companies focusing on prolonging the lifespan of ammunition from the external environment as well.

### **Threat of substitute products or service**

As the new laboratory is going to be operating on the market of explosives, their testing and approval, the companies which want to test and approve their products can decide if they want the test to be performed in whichever laboratory in the European Union, doing the tests according to the procedure they want the explosives to be approved. However, if the company, which has a seat and production in a certain country, decides to use the services of another laboratory it has to have a license for import and export of explosives which can be understood as an administrative barrier for testing in foreign countries. Therefore, the companies with the seat in Slovakia tend to use services of accredited testing laboratories based in Slovakia.<sup>147</sup>

The new accredited laboratory should consider the fact that the tests as such cannot be substituted as an **opportunity** with which is connected the possibility to supply the Slovak market and possibilities to supply foreign companies as well.

### **Bargaining power of buyers**

After the decision is made by the company which wants to get its products tested, it basically loses power over the laboratory as a supplier. Testing procedures are strict, and they cannot be accelerated; therefore, the date of delivery is strictly laid down by the

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<sup>146</sup> BEREK, Milan. *Current competitors on the market* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

<sup>147</sup> BEREK, Milan. *Alternatives of accredited testing laboratories* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

procedure as well as the occupation of the laboratory. The buyers usually consider the following factors when deciding about the laboratory which would provide them the tests:

- price;
- date of delivery;
- communication;
- additional costs - license for import and export of explosives. <sup>148</sup>

From the point of view of the new accredited laboratory, the power of buyers can be seen as an **opportunity** because the laboratory can attract new clients not only by the interesting portfolio of tests but also with better accompanying services such as communication.

### **Bargaining power of suppliers**

Based on the type of explosive, which is undergoing the test, an adequate chemical is used. Adequate chemicals have to be used during certain test procedures as well. Fortunately, for the new testing laboratory, almost all laboratory equipment, and chemicals are easy to buy. However, there is always the risk of breaking the glass equipment which is used to perform the tests and as well some chemicals such as carbon tetrachloride that have a long date of delivery and it is difficult to buy them. <sup>149</sup>

Therefore, the laboratory should have a stable relationship with the suppliers of the items with a long date of delivery. The laboratory should establish a system of precautionary actions to avoid problems connected with the suppliers. All materials used during each test are further described in Chapter 2.2.4. Therefore, the establishment of the precautionary actions against problems connected with suppliers can be seen as a **threat** to the laboratory.

Table 5 summarizes identified strengths, weaknesses, opportunities, and threats among Porter's model of 5 forces.

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<sup>148</sup> BEREK, Milan. *Power of buyers in the business of accredited laboratories* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

<sup>149</sup> BEREK, Milan. *Power of suppliers in the business of accredited laboratories* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

**Table 5: Porter's Model of 5 Forces** <sup>150</sup>

<b>Force</b>	<b>Category (strength, weakness, opportunity, threat)</b>	<b>Note</b>
<b>Threat of new entrant</b>	Opportunity	ZVS Holding a.s. already invested in the equipment and needed to perform the tests. It has as well working capacity.
<b>Rivalry among existing firms</b>	Opportunity	Extended portfolio of tests offered by the laboratory.
<b>Threat of substitute products or service</b>	Opportunity	Companies based in Slovakia will decide among 3 laboratories in Slovakia and other foreign laboratories – but with foreign laboratories, there is an additional cost connected.
<b>Bargaining power of buyers</b>	Opportunity	The laboratory can build not only an offered portfolio of tests but as well accompanied services.
<b>Bargaining power of suppliers</b>	Threat	Depending on the ability of the new laboratory to establish a stable relationship with the suppliers of problematic items.

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<sup>150</sup> Own work

## 2.2.4 Description of the Technology Used

The new accredited laboratory is going to focus on business-to-business market in the Slovak Republic and the Czech Republic. The laboratory will employ the standard EN ISO 17025:2018 which is applicable worldwide. Currently, in Slovakia, there are 220 subjects accredited under this norm <sup>151</sup>, and in the Czech Republic, there are 635 subjects.  
152

Accreditation under the standard EN ISO 17025:2018 means that the subject is able to do accredited testing. What makes the difference between subjects is the range of accredited tests. The new accredited laboratory would like to get the accreditation to do the following tests:

- Chemical stability at 100°C, STN 66 8102
- Chemical stability in accordance with Bergmann-Junk, STN 66 8102
- Temperature of ignition/explosion, STN 66 8063, STANAG 4491
- Stability Test Procedures and Requirements Using Stabilizer Depletion - Nitrocellulose Based Propellants - STANAG 4620/AOP-48
- Chemical compatibility of ammunition components with explosives on the base stabilizer depletion, STANAG 4147
- Vacuum stability test STN 26 910, STANAG 4556
- Thermal characterization by differential thermal analysis using DTA STANAG 4515
- Determination of water content, STN 66 8102, part 20

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<sup>151</sup> Vyhľadavanie subjektov podľa oblastí akreditácie. *SNAS – Slovenská národná akreditačná služba* [online]. Bratislava: Slovenská národná akreditačná služba, ©2002-2021 [cit. 2021-03-06]. Accessible from: <https://ais.snas.sk/ais/#!WebReports/2/list.accredited.subject.search.byfield/AccreditedSubjectsByFields>

<sup>152</sup> Databáze akreditovaných subjektů. *Český institut pro akreditaci* [online]. Praha: Český institut pro akreditaci, o.p.s., ©2021 [cit. 2021-03-06]. Accessible from: [https://www.cai.cz/?page\\_id=4499](https://www.cai.cz/?page_id=4499)

The current laboratory is not able to provide the last 2 mentioned tests; nevertheless, the company is willing to investigate if it would be feasible to purchase the equipment needed to perform such tests. <sup>153</sup>

ZVS Holding a.s. has already invested in the equipment of the laboratory, purchased basic chemicals and laboratory glass as well. The laboratory has already gained approval for regular operation from the state authority. ZVS Holding a.s. has invested in machinery needed to perform the tests, namely:

- heating block OZM CH 100-01 for € 10,107.00 - used for the test of chemical stability at 100°C, STN 66 8102;
- heating block OZM B8 – rented for free from MSM Nováky a.s. – used for the test of chemical stability in accordance with Bergmann-Junk, STN 66 8102;
- high-performance liquid chromatography UltiMate 3000 for € 31,000.00 – used for tests: Stability Test Procedures and Requirements Using Stabilizer Depletion - Nitrocellulose Based Propellants - STANAG 4620/AOP-48 and chemical compatibility of ammunition components with explosives on the base stabilizer depletion, STANAG 4147;
- AET 402 for € 12,728 used for temperature of ignition in accordance with STANAG 4491;
- heat treatment oven for € 1,547.67 used for sample preparation.

ZVS Holding a.s. has spent € 55,382.67 in total on the equipment so far. The machinery is not regularly used because of a lack of orders for tests which is caused by missing accreditation of the laboratory.

To accredit the whole range of tests proposed earlier, ZVS Holding a.s. would have to invest in 2 more machines. Those machines are:

- DTA 552-Ex for € 13,997.00 to perform the test of thermal characterization by differential thermal analysis using DTA STANAG 4515;

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<sup>153</sup> HELBICHOVÁ, Zuzana. *Plans with the accredited testing laboratory within ZVS Holding a.s.* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 19.03.2021.

- Stabil 6 for € 42,044.80 to perform the test of vacuum stability test STN 26 910, STANAG 4556.

ZVS Holding a.s. would have to invest € 56,041.80 in total to buy the equipment to perform all the tests planned for accreditation.

### **2.2.5 External Sources Analysis Using Kraljic Model**

The following chapter further describes materials which the laboratory has to acquire before it starts testing.

#### **Material inputs**

For the testing, it is required to use the equipment already stored in the laboratory such as laboratory furniture, standard chemical glass such as test tubes, beakers, pipettes, volumetric banks, measuring cylinders, special chemical glass for the specific machine, mixers, analytical scales or laboratory thermometers.

The tests differ in the required usage of chemicals. Therefore, we can distinguish between 2 types of tests:

- Tests that do not require chemicals to be performed
- Tests that require chemicals to be performed

The chemicals which have to be used during the tests include the following chemicals:

- Hydrochloric acid - PA Quality
- Sulfuric acid – PA Quality
- Sodium hydroxide - PA Quality
- Sodium thiosulphate - PA Quality
- Potassium iodide - PA Quality
- Methyl red - PA Quality
- Low melting alloy Bi50Sn16Pb
- Acetonitrile – HPLC Quality
- Distilled water – PA Quality

The probability of destruction of the equipment during the performance of the test is relatively low; therefore, the staff performing the test washes the equipment after the test

has been completed and prepares it for future usage. To wash the equipment, the following chemicals are used:

- carbon tetrachloride – standard quality
- basic cleaning products <sup>154</sup>
- all the chemicals (except HPLC quality and carbon tetrachloride – PA Quality) and equipment of the laboratory are included in the calculation list which is an internal document of ZVS Holding a.s. and is further described in Chapter 2.2.3.2.

### **Energy consumption**

All energy consumption of the machines is included in the calculation list of ZVS Holding a.s.. The price of one test is calculated by the following Formula 1. The formula was retrieved from the economic director of ZVS Holding a.s..

$$PC+O+M+SM= FPPT$$

#### **Formula 1: Calculation of Final Price per Test <sup>155</sup>**

where:

- PC is a personal cost and is set per actual year. As of 01.04.2021, the personal cost is € 9.82 per normative hour of work.
- O is overheads and is set per actual year. As of 01.04.2021, the overheads are € 12.09 per normative hour of work.
- M is margin and is set per actual year. As of 01.04.2021, the margin within MSM group is 7% and the margin for external customers is 21%.
- SM is a special material that includes more expensive chemicals needed to perform the tests. It is set individually according to the type of the test.
- FPPT is the final price per test. <sup>156</sup>

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<sup>154</sup> ŠUPÁKOVÁ, Daniela. *Chemicals which the new accredited laboratory is going to use* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 19.03.2021.

<sup>155</sup> LEDECKÝ, Peter. *Formula for calculation of final price per test* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 19.03.2021.

<sup>156</sup> LEDECKÝ, Peter. *Formula for calculation of final price per test* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 19.03.2021.

## Kraljic model

In order to provide elaboration of input materials needed to perform the test, the Kraljic model was chosen. The information about the input materials and tests, in general, was retrieved from the laboratory assistant working in the current testing laboratory. Questions, which the laboratory assistant answered during the research interview, see Appendix 4. As stated previously, the input materials are:

- Laboratory glass
- Hydrochloric acid - PA Quality
- Sulfuric acid – PA Quality
- Sodium hydroxide - PA Quality
- Sodium thiosulphate - PA Quality
- Potassium iodide - PA Quality
- Methyl red - PA Quality
- Low melting alloy Bi50Sn16Pb
- Acetonitrile – HPLC Quality
- Distilled water – PA Quality
- carbon tetrachloride – Standard Quality
- basic cleaning products <sup>157</sup>

In phase 1 according to Kraljic, we determine the profit impact and supply risk of each of the items. <sup>158</sup>

Each of the stated chemicals is required to be used during the performance of the tests. Table 6 summarizes phase 1 of the Kraljic model.

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<sup>157</sup> ŠUPÁKOVÁ, Daniela. *Chemicals which the new accredited laboratory is going to use* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 19.03.2021.

<sup>158</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard business review*, 1983, 61.5. p. 111. ISSN 0017-8012

**Table 6: Phase 1 of Kraljic Model**<sup>159</sup>

<b>Item</b>	<b>Profit impact</b>	<b>Note</b>	<b>Supply risk</b>	<b>Note</b>
Laboratory glass	Low	A low percentage of the total cost. Already included in overheads.	Low	Available items with multiple suppliers.
Hydrochloric acid - PA Quality	Low	A low percentage of the total cost. Already included in overheads.	Low	An available item with multiple suppliers.
Sulfuric acid – PA Quality	Low	A low percentage of the total cost. Already included in overheads.	Low	An available item with multiple suppliers.
Sodium hydroxide - PA Quality	Low	A low percentage of the total cost. Already included in overheads.	Low	An available item with multiple suppliers.
Sodium thiosulphate - PA Quality	Low	A low percentage of the total cost. Already included in overheads.	Low	An available item with multiple suppliers.
Potassium iodide - PA Quality	Low	A low percentage of the total cost. Already included in overheads.	Low	An available item with multiple suppliers.

<sup>159</sup> Own work

Methyl red - PA Quality	Low	A low percentage of the total cost. Already included in overheads.	Low	An available item with multiple suppliers.
Low melting alloy Bi50Sn16Pb	Low	A low percentage of the total cost. Already included in overheads.	Low	An available item with multiple suppliers.
Acetonitrile – HPLC Quality	High	In comparison with other chemicals, it is rapidly more expensive and spent in high amounts during testing.	Low	An available item with multiple suppliers.
Distilled water – PA Quality	Low	A low percentage of the total cost. Already included in overheads.	Low	An available item with multiple suppliers.
Carbon tetrachloride – Standard Quality	High	In comparison with other chemicals, it is far more expensive. Therefore, it has a great impact on the final price of the test.	High	An item with a long date of delivery with no substitution.
Basic cleaning products	Low	A low percentage of the total cost. Already included in overheads.	Low	Available items with multiple suppliers.

The majority of input materials were identified as non-critical items for which Peter Krajlic suggests the following tasks: “Product standardization. Order volume monitoring/optimization. Efficient processing. Inventory optimization.”<sup>160</sup>

Required information includes: “Good market overview. Short-term demand forecast. Economic order quantity inventory levels.”<sup>161</sup>

Acetonitrile in HPLC Quality was identified as a leverage item for which Peter Krajlic recommends the following tasks: “Exploitation of full purchasing power. Vendor selection. Product substitution. Targeted pricing strategies/negotiations. Contract/spot purchasing mix. Order volume optimization.”<sup>162</sup>

Required information includes: “Good market data. Short to medium-term demand planning. Accurate vendor data. Price/transport rate forecasts.”<sup>163</sup>

Carbon tetrachloride in standard quality was identified as a strategic item for which Peter Krajlic recommends the following tasks: “Accurate demand forecasting. Detailed market research. Development of long-term supply relationships. Make-or-buy decisions. Contract staggering. Risk analysis. Contingency planning. Logistics, inventory, and vendor control.”<sup>164</sup>

Required information includes: “Highly detailed market data. Long-term supply and demand trend information. Good competitive intelligence. Industry cost curves.”<sup>165</sup>

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<sup>160</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 112. ISSN 0017-8012

<sup>161</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 112. ISSN 0017-8012

<sup>162</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 112. ISSN 0017-8012

<sup>163</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 112. ISSN 0017-8012

<sup>164</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 112. ISSN 0017-8012

<sup>165</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 112. ISSN 0017-8012

Based on the information gained from phase 1 of the Kraljic model, it would be advised to the new laboratory to use the internal systems of ZVS Holding a.s. in order to secure stable supplies of all required materials needed to perform the tests.

Phase 2 of the Kraljic model – market analysis was conducted for input materials which were identified as non-critical items and as well as for acetonitrile in HPLC Quality and carbon tetrachloride in PA Quality. The material which was identified as non-critical is available from multiple suppliers and is already included in overheads from the calculation list. ZVS Holding a.s. will play a dominant role and the strength of suppliers will be low.

In the case of acetonitrile, the strength on the side of the company can be the purchasing volume as there is predicted demand during the operation of the new accredited laboratory. On the other hand, the strength of the supplier can be on the side of its capacity as the supplier can dictate rules on the market as the chemicals in HPLC quality are quite rare on the market. Therefore, we can recognize the balance on the item as there is no clear side in advantage.

Carbon tetrachloride as itself is carcinogenic substance that is very rare on the market. If the laboratory wants to use this chemical, it needs to use its strength in purchasing volume. On the other hand, the laboratory should keep in mind the advantage of the supplier thanks to the fact that the supplier delivers very rare and dangerous chemical.

Coming into phase 3 of the Kraljic model – strategic positioning, the laboratory should apply an exploit strategy for non-critical items in the respect that the company should be aggressive because of the low supply risk.

For the leverage item, it should apply a balance strategy and try to find the balance between possible costly defense position and too aggressive position which can possibly damage relationships with the supplier.

Lastly, for the strategic item, it should apply a diversification strategy, which means that the company would start in the defensive position and would invest in market research and supplier relations. <sup>166</sup>

Figure 10 summarizes strategies of purchasing positioning for the material inputs of the new accredited laboratory.

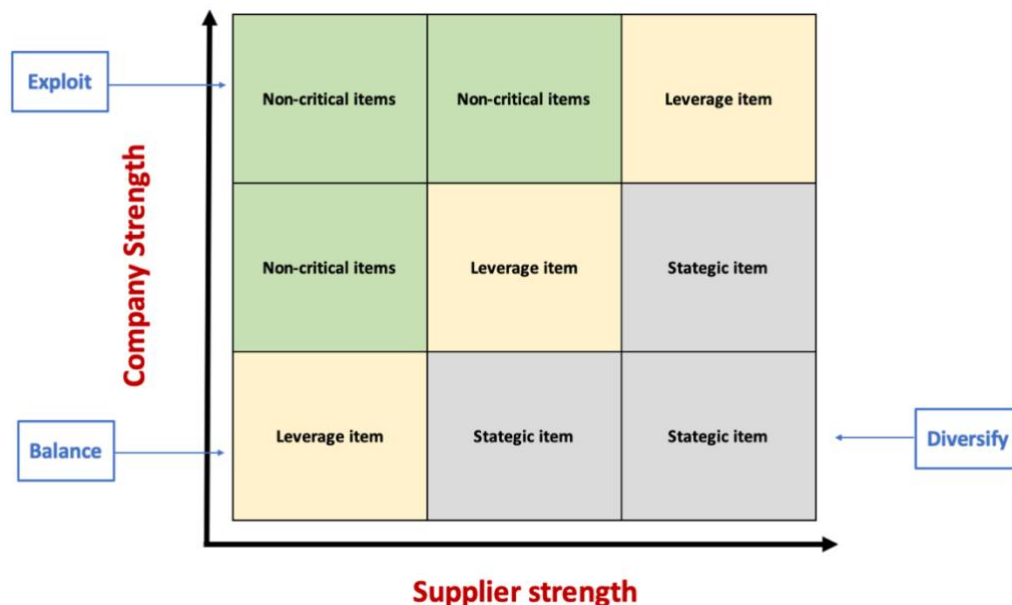


Figure 10: Strategies of Purchasing Positioning for the Material Inputs of the New Accredited Laboratory <sup>167</sup>

According to the performed analysis, non-critical items can be understood as company's **opportunity**, while leverage item can be an **opportunity** in case of successful establishment of the processes and implemented strategies according to the suggestions from Peter Kraljic within the new accredited laboratory and in case of failure can be a **threat** for the laboratory. The strategic item can be seen as a **threat** to the laboratory as it is irreplaceable for the moment.

<sup>166</sup> KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 113. ISSN 0017-8012

<sup>167</sup> Own work according KRALJIC, Peter. Purchasing must become supply management. *Harvard Business Review*, 1983, 61.5. p. 115. ISSN 0017-8012

## 2.3 Internal Analysis

The following chapter describes sources with which ZVS Holding a.s. is supplying its laboratory from internal sources or already acquired sources.

### 2.3.1 Location of the Production Unit

The current and the new accredited laboratory are and will be located in Dubnica nad Váhom and the company describes its location as follows: “The corporate domicile is situated in a strategically advantageous position near the border with the Czech Republic. It is located on the main railway and highway and in direct reach of airports in Trenčín and Žilina. It is 130 km far from Bratislava and 180 km far from Vienna.”<sup>168</sup>

The location of the production unit forms the advantage as to the distance between the laboratory and the biggest spender from MSM Group. In matters of the whole market of accredited laboratories, the location does not play a significant role. The country, in which the laboratory is established, plays a role because of the need for a license for the import and export of explosives if the companies from certain countries want to use the services of foreign laboratories.

Internally, the location of the accredited laboratory is within the object which is owned by ZVS Holding a.s. in Dubnica nad Váhom. It will have its own building in which there is an already established testing laboratory. The premises, in which the new accredited laboratory will work, are already prepared, adjusted, and approved for the needs of the new laboratory.<sup>169</sup>

The location of the production unit can be understood as a **strength** of the new accredited laboratory mainly because of already prepared and approved premises as well as the advantages of the object of ZVS Holding a.s. in which the new laboratory will be situated.

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<sup>168</sup> ZVS. *MSM Group* [online]. Dubnica nad Váhom: MSM Group, s.r.o., ©2021 [cit. 2021-03-06]. Accessible from: <https://zvsholding.sk/en/our-companies/zvs>

<sup>169</sup> BEREK, Milan. *Location of the new laboratory* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

### 2.3.2 Workforce

There are already 2 people employed in the current testing laboratory to do the operative work. One of them is the head of the department of testing of ZVS Holding a.s. and another one is a laboratory assistant. The employees do the tests mainly on the demand of the production which runs in the companies from MSM Group situated within the object in Dubnica nad Váhom, specifically, ZVS Holding a.s. and ZVS Impex a.s.. Capacities of the current laboratory are not fully exploited because the laboratory is not accredited. Therefore, the current capacity of 2 workers will be fulfilled and at the beginning, it is not predicted that some additional workforce would be needed.

The occupation and usage of the capacity of the workforce employed in the laboratory are dependent on the current demand of the laboratory as well as on the processes established within the laboratory in order to achieve maximum possible efficiency. On the other hand, there is a possibility of needed additional training for the current employees to be sure that they will be able to do accredited tests according to the procedures stated in the accreditation and that they will be able to work with the machines which will be added to the inventory of the laboratory.<sup>170</sup>

The workforce can be, therefore, understood as a **strength** for ZVS Holding a.s.; however, ZVS Holding a.s. should use the roles and responsibilities of the already employed workforce of the laboratory as well as redesign processes within the current testing laboratory.

### 2.3.3 Organization and Management

The current testing laboratory is based under the Technical Inspection and Testing Department. The current organizational structure see Figure 11.

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<sup>170</sup> BEREC, Milan. *Workforce in current laboratory and its capacity* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

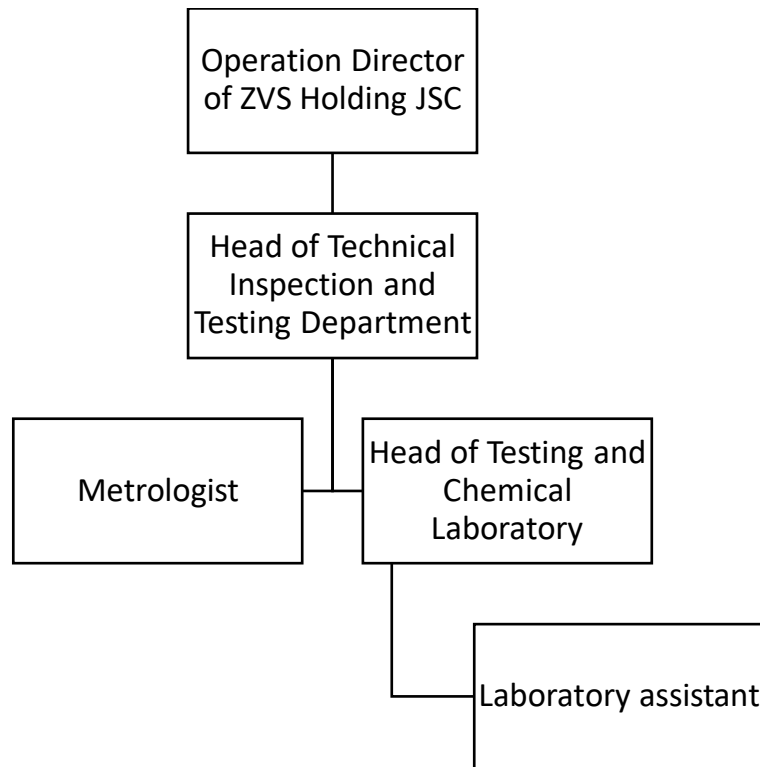


Figure 11: Organizational Structure of Current Testing Laboratory <sup>171</sup>

The accreditation of the laboratory requires independence from the mother organization which must be proved in line with EN ISO 17025:2018. The quality manual of the accredited laboratory will be required. The quality manual will define all roles, responsibilities, processes, and interactions with the mother organization. Currently, there is no quality manual written for the laboratory. The new organizational structure will adjust according to the new quality manual. Before the application for accreditation, the manual would have to be prepared and all processes validated by an internal audit. <sup>172</sup>

Therefore, missing quality manual is identified as a **weakness** in the process of transformation of the current testing laboratory into the accredited testing laboratory.

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<sup>171</sup> Internal document of ZVS Holding a.s. – Organizational structure of ZVS Holding a.s..

<sup>172</sup> BEREC, Milan. *Need of quality manual for accredited laboratory* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

## 2.4 SWOT Analysis

Table 7 depicts strengths, weaknesses, opportunities, and threats identified during the analyses performed.

**Table 7: Summary of SWOT Analysis for Accredited Laboratory** <sup>173</sup>

<p style="text-align: center;"><b>Strengths</b></p> <p>Strengths of the new laboratory</p> <ul style="list-style-type: none"> <li>• Range of planned accreditation</li> <li>• Accompanied services of the laboratory</li> <li>• Already bought equipment of the laboratory</li> <li>• Location of the laboratory</li> <li>• Workforce</li> </ul>	<p style="text-align: center;"><b>Weaknesses</b></p> <p>Weaknesses of the new laboratory</p> <ul style="list-style-type: none"> <li>• Missing quality manual in the laboratory</li> </ul>
<p style="text-align: center;"><b>Opportunities</b></p> <p>Opportunities for the new laboratory</p> <ul style="list-style-type: none"> <li>• High costs barrier to enter the market</li> <li>• Accredited portfolio of tests</li> <li>• Range of offered accredited tests</li> <li>• Demand from MSM Group</li> <li>• Non-critical items from the Kraljic model</li> </ul>	<p style="text-align: center;"><b>Threats</b></p> <p>Threats the new laboratory can face</p> <ul style="list-style-type: none"> <li>• Change in ISO, Acts No. 58/2014 or 61/1988, STN or STANAG norms</li> <li>• Development of new types of machines needed for the test performance</li> <li>• Establishment of procurements in relation to suppliers</li> </ul>

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<sup>173</sup> Own work according to ČERVENÝ, Radim, Jiří FICBAUER, Alena HANZELKOVÁ and Miloslav KEŘKOVSKÝ. *Business plán – krok za krokem*. Praha: C.H.Beck, 2014. p. 137. ISBN 978-80-7400-511-4.

	<ul style="list-style-type: none"><li>• Strategic item from the Kraljic model</li></ul>
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The conducted SWOT analysis summarizes previously completed analysis showing that there are more identified strengths than weaknesses connected with the project of transformation of the current laboratory and, at the same time, more opportunities coming from the external environment than threats. The new accredited laboratory should build on the fact that it has already employed the workforce and that ZVS Holding a.s. has already invested in the machinery and equipment of the laboratory which ultimately helps the new accredited testing laboratory to overcome high costs entry barrier on the market of accredited laboratories. On the other hand, there is one significant weakness - missing quality manual for the new laboratory; in addition, weaknesses include demand on the laboratory management to establish procurements and clear communication.

## 3 PROPOSALS AND CONTRIBUTION

### 3.1 Contribution to the Vision, Mission, Strategic Goal, and Values of MSM Group

As the new accredited laboratory will be the part of ZVS Holding a.s. which is the part of MSM Group s.r.o., its goals should reflect the vision and mission of the whole group: “Our vision is to be a significant and trustworthy international group, whose companies play a significant role in building a secure world. Making an effort for the security of society is worth it!”<sup>174</sup>

The establishment of a new accredited testing laboratory should contribute to the fulfillment of the vision of MSM Group in a way that it can add credits to the trustworthiness of the group as the laboratory is going to be a relevant independent institution accredited under the most current norms.

Continuing with the contribution to the mission statement which is formulated as:

“Our mission

- A well-functioning group of companies operating in the segment of the defense and security industry focused on large-caliber ammunition
- Achieving a significant place in the global market in this segment
- Promoting synergy effects with other business owners
- Generating resources for further own growth of MSM GROUP, but also for further business activities of owners in other segments”<sup>175</sup>

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<sup>174</sup> About MSM GROUP. *MSM Group* [online]. Dubnica nad Váhom: MSM Group, s.r.o., ©2021 [cit. 2021-03-06]. Accessible from: <https://zvsholding.sk/en/about-msm-group/about-msm-group/mission-vision-and-values/>

<sup>175</sup> About MSM GROUP. *MSM Group* [online]. Dubnica nad Váhom: MSM Group, s.r.o., ©2021 [cit. 2021-03-06]. Accessible from: <https://zvsholding.sk/en/about-msm-group/about-msm-group/mission-vision-and-values/>

The establishment of the new accredited laboratory can help the whole group to reach all 4 points listed in the mission statement. Specifically, it can contribute in the following ways:

- To the first point – the accredited laboratory will supply the demand mainly from the side of the companies from MSM Group s.r.o. which can contribute to the functionality of the whole group
- To the second point – the establishment of the new laboratory will strengthen the position of the whole group on the global market because the group would have additional service and segment in which it will operate.
- To the third point – the new laboratory is not meant just for the internal demand, but it can supply the demand from companies outside the group as well.
- To the fourth point – naturally, as there will be payments coming to the laboratory for performed tests, it will generate resources for the whole group for further development.

In addition, the establishment of the new accredited laboratory will contribute to the strategic goal of the whole group: “Within five years, become a prosperous, stable and reliable manufacturer and supplier of large-caliber ammunition and provide services to partner countries’ security forces throughout the life cycle of this ammunition, which aspires to a unit in Europe.”<sup>176</sup>

On the supply side, it will contribute to the prolongation of the lifespan of the ammunition as the portfolio of the performed tests is designed for such purposes.

Besides, the new accredited laboratory will respect the values of MSM GROUP s.r.o. which are:

- Integrity and openness
- Customer orientation
- Continuous growth and performance

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<sup>176</sup> About MSM GROUP. *MSM Group* [online]. Dubnica nad Váhom: MSM Group, s.r.o., ©2021 [cit. 2021-03-06]. Accessible from: <https://zvsholding.sk/en/about-msm-group/about-msm-group/mission-vision-and-values/>

- Respect and trust
- Loyalty <sup>177</sup>

### **3.2 Goals of the New Accredited Laboratory**

The goals of the new accredited laboratory are divided into 3 segments – economic, external and internal. Subsequently, each of the segments is divided into areas in which the individual goals should be fulfilled.

#### **Economic dimension**

Within the economic dimension, the laboratory should focus on the goals in the following areas:

- Repaying the investment of the group into the laboratory
- Reaching turnover
- Becoming financially independent

#### **External dimension**

Within the external dimension, the laboratory should focus on the goals in the following areas:

- Branding and communication towards potential external customers
- Reaching turnover from external companies
- Extending the accreditation for the tests for paints and varnishes which the laboratory already can perform

#### **Internal dimension**

Within the internal dimension, the laboratory should focus on the goals in the following areas:

- Establishment of processes and systems within the laboratory
- Filling the capacity of current employees

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<sup>177</sup> About MSM GROUP. *MSM Group* [online]. Dubnica nad Váhom: MSM Group, s.r.o., ©2021 [cit. 2021-03-06]. Accessible from: <https://zvsholding.sk/en/about-msm-group/about-msm-group/mission-vision-and-values/>

- Communication and supply towards MSM Group

### 3.3 Plan of Realization

#### 3.3.1 Business Plan

The new accredited laboratory would aim at 2 types of customers, as stated previously. Those 2 types are:

- Internal customers – companies within MSM Group and the Czechoslovak Group
- External customers – external companies interested in the tests which the new laboratory will offer

Based on the identified 2 types of customers, the prices for each of the tests were calculated. For the calculation, Formula 1 was used.

$$PC+O+M+SM= FPPT$$

**Formula 1: Calculation of Final Price per Test** <sup>178</sup>

Table 8 summarizes the calculated prices of the tests for internal customers and external customers as well. For the internal customers, the margin of 7% was added and for the external customers margin of 21% was used.

**Table 8: Prices of Tests in the New Accredited Laboratory** <sup>179</sup>

Test	Price for the internal customer (€ per test)	Price for the external customer (€ per test)
Chemical stability at 100°C, STN 66 8102	91	113

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<sup>178</sup> LEDECKÝ, Peter. *Formula for calculation of final price per test* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 19.03.2021.

<sup>179</sup> Own work

Chemical stability in accordance with Bergmann-Junk, STN 66 8102	135	169
Temperature of ignition/explosion, STN 66 8063, STANAG 4491	61	76
Stability Test Procedures and Requirements Using Stabilizer Depletion - Nitrocellulose Based Propellants - STANAG 4620/AOP-48	201	250
Chemical compatibility of ammunition components with explosives on the base stabilizer depletion, STANAG 4147	265	326
Vacuum stability test STN 26 910, STANAG 4556	91	113
Thermal characterization by differential thermal analysis using DTA STANAG 4515	70	87
Determination of water content, STN 66 8102, part 20	30,5	38

The prices can be compared with the prices identified during the conduction of mystery shopping. The comparison is summarized in the following tables.

**Table 9: Price Comparison for the Test of Chemical Stability at 100°C, STN 66 8102** <sup>180</sup>

<b>Laboratory</b>	<b>Price per one test in €</b>
The new accredited laboratory in ZVS Holding a.s. – price for the internal customer	91
The new accredited laboratory in ZVS Holding a.s. – price for the external customer	113
VTSÚ Záhorie	138.78
Explosia	Not executing
Konštrukta Defence a.s.	160
Military base Týniště nad Orlicí	Not provided

For the test of chemical stability at 100°C, STN 66 8102, the price for the internal customer is clearly below the price offered by the competitors of the new accredited laboratory. The price for external customers is lower than offered prices from the other laboratories as well. There is a possibility of a price adjustment after the launch of the new laboratory.

**Table 10: Price Comparison for the Test of Chemical Stability in Accordance with Bergmann-Junk, STN 66 8102** <sup>181</sup>

<b>Laboratory</b>	<b>Price per one test in €</b>
The new accredited laboratory in ZVS Holding a.s. – price for the internal customer	135

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<sup>180</sup> Own work

<sup>181</sup> Own work

The new accredited laboratory in ZVS Holding a.s. – price for the external customer	169
VTSÚ Záhorie	145.04
Explosia	Not executing
Konštrukta Defence a.s.	185
Military base Týniště nad Orlicí	Not executing

The same situation with regards to the price for internal clients happens with the test of chemical stability in accordance with Bergmann-Junk. On the other hand, the price for external clients is between the prices offered by the competitors. With regards to this specific test, the new laboratory can try to persuade external clients by better communication compared to other competitors.

**Table 11: Price Comparison for the Test of Temperature of Ignition/Explosion, STN 66 8063, STANAG 4491 <sup>182</sup>**

<b>Laboratory</b>	<b>Price per one test in €</b>
The new accredited laboratory in ZVS Holding a.s. – price for the internal customer	61
The new accredited laboratory in ZVS Holding a.s. – price for the external customer	76
VTSÚ Záhorie	122.52
Explosia	184

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<sup>182</sup> Own work

Konštrukta Defence a.s.	180
Military base Týniště nad Orlicí	Not executing

For the test of the temperature of ignition/explosion, there are the most significant differences identified. The prices of ZVS Holding both for internal and external customers are significantly lower than the prices of the competitors. Therefore, the new laboratory should pay attention to the expenses for the performed test and, if needed, react and adjust the prices.

**Table 12: Price Comparison for the Stability Test Procedures and Requirements Using Stabilizer Depletion - Nitrocellulose Based Propellants - STANAG 4620/AOP-48 <sup>183</sup>**

Laboratory	Price per one test in €
The new accredited laboratory in ZVS Holding a.s. – price for the internal customer	201
The new accredited laboratory in ZVS Holding a.s. – price for the external customer	250
VTSÚ Záhorie	245.04
Explosia	Not executing
Konštrukta Defence a.s.	Not executing
Military base Týniště nad Orlicí	Not provided

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<sup>183</sup> Own work

For the Stability Test Procedures and Requirements Using Stabilizer Depletion - Nitrocellulose Based Propellants - STANAG 4620/AOP-48, the price for the external customer slightly exceeds the offer provided by the VTSÚ Záhorie while the price for the internal customer is lower which is caused by the lower margin. However, the price for external customers is comparable to the competition.

**Table 13: Price Comparison for the Test of Chemical Compatibility of Ammunition Components with Explosives on the Base Stabiliser Depletion, STANAG 4147 <sup>184</sup>**

<b>Laboratory</b>	<b>Price per one test in €</b>
The new accredited laboratory in ZVS Holding a.s. – price for the internal customer	265
The new accredited laboratory in ZVS Holding a.s. – price for the external customer	326
VTSÚ Záhorie	580
Explosia	Not executing
Konstruktá Defence a.s.	Not executing
Military base Týniště nad Orlicí	Not executing

For the test of chemical compatibility of ammunition components with explosives on the base stabilizer depletion, there is just one competitor on the Czechoslovak market. Calculated prices both for the internal and external customers are lower than the price offered by VTSÚ Záhorie. VTSÚ builds its price on the fact that it is the only laboratory offering the test on the Czechoslovak market. Therefore, the new accredited laboratory

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<sup>184</sup> Own work

would need to recalculate the price after the actual performance of the test and, afterwards, confirm the correctness of the price set or change the price.

**Table 14: Price Comparison for Vacuum Stability Test STN 26 910, STANAG 4556 <sup>185</sup>**

<b>Laboratory</b>	<b>Price per one test in €</b>
The new accredited laboratory in ZVS Holding a.s. – price for the internal customer	91
The new accredited laboratory in ZVS Holding a.s. – price for the external customer	113
VTSÚ Záhorie	304
Explosia	Not executing
Konštrukta Defence a.s.	Not executing
Military base Týniště nad Orlicí	Not provided

The same situation as with the previous test happens with the vacuum stability test where VTSÚ Záhorie has a monopoly on the market. The new accredited laboratory would have to react again and recalculate the price for the test after the performance.

**Table 15: Price Comparison for Test of Thermal Characterization by Differential Thermal Analysis Using DTA STANAG 4515 <sup>186</sup>**

<b>Laboratory</b>	<b>Price per one test in €</b>
The new accredited laboratory in ZVS Holding a.s. – price for the internal customer	70

<sup>185</sup> Own work

<sup>186</sup> Own work

The new accredited laboratory in ZVS Holding a.s. – price for the external customer	87
VTSÚ Záhorie	182.52
Explosia	Not executing
Konštrukta Defence a.s.	Not executing
Military base Týniště nad Orlicí	Not provided

VTSÚ Záhorie uses its monopoly in price setting for the test of thermal characterization by differential thermal analysis using DTA where the offered price is more than twice as high as the calculated price for the external client of the new accredited laboratory.

**Table 16: Price Comparison for Determination of Water Content, STN 66 8102, Part 20 <sup>187</sup>**

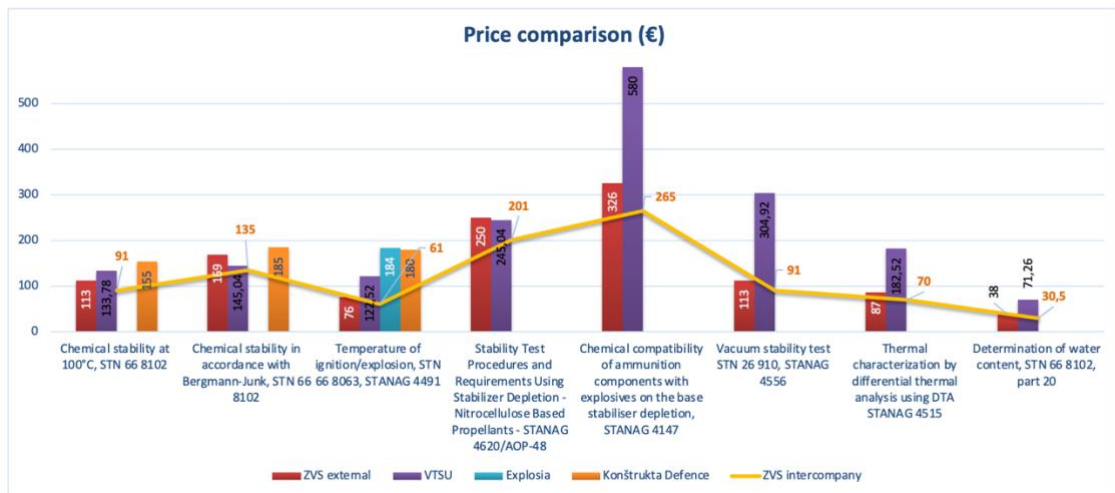
<b>Laboratory</b>	<b>Price per one test in €</b>
The new accredited laboratory in ZVS Holding a.s. – price for the internal customer	30,5
The new accredited laboratory in ZVS Holding a.s. – price for the external customer	38
VTSÚ Záhorie	71.26
Explosia	Not executing
Konštrukta Defence a.s.	Not executing
Military base Týniště nad Orlicí	Not provided

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<sup>187</sup> Own work

The monopoly situation occurs as well in the determination of water content. VTSÚ offers a higher price than the calculated price for both internal and external clients of the laboratory.

Graph 3 summarizes the comparison between retrieved prices from the mystery shopping and calculated prices for internal and external customers of the new accredited laboratory.



**Graph 3: Price Comparison between Retrieved Prices from Mystery Shopping and Calculated Prices for Internal and External Clients** <sup>188</sup>

According to the retrieved prices, there is a need for the new accredited laboratory to compete with the VTSÚ Záhorie in the matter of price, and for careful monitoring of the situation on the market as the VTSÚ Záhorie offers lower prices when there is a competition on the market and, on the other hand, offers significantly higher prices when there is no competition on the market. The new accredited laboratory would have to recalculate and adjust the prices in order to compete with VTSÚ.

The activities of the laboratory will be promoted via different channels depending on the type of customer it would target. The internal customers would be targeted via the following channels:

- Internal newsletter of MSM Group

<sup>188</sup> Own work

- MSM Group printed magazine
- Direct contact with the representatives from the other companies from MSM Group

The external customers would be targeted via the following channels:

- Press release by MSM Group
- Newly established channels of the new accredited laboratory – which would be established in cooperation with the marketing department of MSM Group
- The new laboratory will be traceable via the database of the Slovak National Accreditation Service

The need for the establishment of new communication channels results from the need for the presentation of the new accredited laboratory to external clients. All the competitors, except the Military Base in Týniště nad Orlicí, have their laboratory mentioned on their websites.<sup>189 190 191</sup>

The laboratory should be mentioned on the already existing website of MSM Group, or it should have its own website in order to make it easier for the customers to reach the laboratory and ask for the offer for the test performance.

### 3.3.3.1 Market Segmentation

In order to perform market segmentation, Table 17 has been compiled.

**Table 17: Market Segmentation for the New Accredited Laboratory**<sup>192</sup>

<p><b>Demography</b></p> <p>1. Industry – The accredited laboratory should serve the defense industry.</p>
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<sup>189</sup> Skúšobné laboratórium, *Konštrukta Defence* [online]. Dubnica nad Váhom: KONŠTRUKTA Defence, a.s., ©2021 [cit. 2021-04-22]. Accessible from: <https://kotadef.sk/skusobnictvo/skusobne-laboratorium/>

<sup>190</sup> Akreditované skúšky - Skúšobné laboratórium S-145, *Vojenský technický a skúšobný ústav Záhorie* [online]. Senica: Vojenský technický a skúšobný ústav Záhorie, ©2021 [cit. 2021-04-22]. Accessible from: [http://www.vtsu.sk/opravnenia\\_a\\_certifikaty.html](http://www.vtsu.sk/opravnenia_a_certifikaty.html)

<sup>191</sup> Laborať bezpečnostního inženýrství, *Explosia* ® [online]. Pardubice: EXPLOSIA a.s., ©2021 [cit. 2021-04-22]. Accessible from: <https://explosia.cz/sluzby/laborator-bezpecnostniho-inzenyrstvi/>

<sup>192</sup> Own work according to KOTLER, Philip, Kevin LANE KELLER. *Marketing Management*. Praha: Grada Publishing, 2013. p. 268. ISBN 978-80-247-4150-5. from BONOMA, Thomas V., Benson P. SHAPIRO. *Segmenting the industrial market*. Lexington Books, 1983. ISBN 978-06-690-9469-5

2. The size of the company – The size of the company does not matter in means of the accredited laboratory.
3. Location – The accredited laboratory should primarily serve companies from Slovakia, secondarily the companies from abroad.

#### **Customer operating characteristics**

4. Technologies – The niche of the accredited laboratory is strictly defined by the range of accredited tests connected with explosives and explosives used in the ammunition (life cycle).
5. User or non-user status – The accredited laboratory should serve regular users.
6. Customer's abilities – The laboratory should serve customers who require more services.

#### **Purchasing approaches**

7. Organization of purchasing functions – For the business of the accredited laboratory centralized, respectively, decentralised approach does not matter.
8. Power structure – The accredited laboratory should serve the companies where the decision-makers are the quality management staff with the knowledge in the field of testing.
9. The nature of existing relationships – The relationship does not play role in the business of accredited laboratories.
10. General purchasing approaches – The laboratory should serve companies that prefer service contracts.
11. Purchasing criteria – The laboratory should serve companies looking for price and/or communication.

#### **Situational factors**

12. Acuteness – The laboratory sets conditions after it is chosen by the buyer.
13. Specific usage – The laboratory is serving quite a narrow niche.

<p>14. Size of order – The ideal scenario for the laboratory is to get a big order for a single explosive which can be tested by the number of tests from the portfolio of the laboratory.</p>
<p><b>Personal characteristics</b></p> <p>15. Similarity of the buyer and the seller – The laboratory should serve companies that follow the same rules as we do while working with explosives.</p> <p>16. Attitude to risk – It does not play any role.</p> <p>17. Loyalty – The laboratory should serve reliable companies.</p>

### 3.3.3.2 Market Targeting

In order to target the market of companies operating in the defense industry, the accredited laboratory is going to use individual marketing. That means that it would target companies that work with explosives that have to be tested and approved or it would target the companies which have the old ammunition in stock and want to prolong its lifespan.

The laboratory will also operate with the fact that it is the part of ZVS Holding a.s. which is the part of MSM Group s.r.o. Within MSM Group s.r.o., there are companies that use the services of accredited testing laboratories in order to prolong the lifespan of its clients' ammunition. According to the data from controlling, the biggest spender on the tests is company MSM Nováky a.s. with ca. € 30,000 per year spent on accredited tests with a rising tendency. Table 18 summarizes the annual spending of MSM Nováky a.s. on accredited testing.

**Table 18: MSM Nováky's Spending on Accredited Testing**<sup>193</sup>

Year	2018	2019	2020
Amount spent in €	2,120	8,280	31,836

<sup>193</sup> Own work

This happens thanks to the fact that the company MSM Nováky a.s. specializes in prolongation of the ammunition lifespan. The new accredited laboratory would be identified as an intrapreneurship within the whole group and would aim mainly to serve the needs of the other companies from MSM Group which are situated in Slovakia and abroad.

The selection of tests that the laboratory wants to accredit was done after the consultation and analysis of tests for which the companies from MSM Group have paid. Therefore, the principle of individual marketing was applied as the selection of tests was done based on the needs of specific customers.

The demand from MSM Nováky and the whole MSM Group can be, therefore, understood as an **opportunity** as it can form a significant turnover for the new accredited laboratory.

### **3.3.3.3 Differentiation and Positioning**

The strategy of differentiation and positioning for the new accredited laboratory contains 3 steps as identified by Kotler, Armstrong and Opresnik.<sup>194</sup>

- 1. Identifying possible value differences and competitive advantages** – thanks to the fact that the accredited laboratory is meant as an intrapreneurship project, one of its advantages is that it understands the specific needs of other companies joined in MSM Group and, therefore, can adjust to the needs of its customers. Another advantage is that the laboratory will be part of a huge group of companies which can create a significant amount of its turnover. Thirdly, there is an advantage for the whole MSM Group as itself because the money invested in the laboratory and later on paid for the testing will stay within the group.
- 2. Choosing the right competitive advantages** – the new accredited laboratory has 2 options of promoting itself.

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<sup>194</sup> KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. p. 228 - 232. ISBN 978-1-292-22017-8.

- a. Internal – the internal promotion can happen via channels of MSM Group, which means directly contacting the authorities in other companies within MSM Group, mainly MSM Nováky, which could be interested in the accredited testing from the new laboratory.
- b. External – the external promotion can happen via issuing a press release which can be supported by the promotion from the side of the Czechoslovak Group which is the mother organization of MSM Group. Thanks to the PR support from the Czechoslovak Group, the new accredited laboratory can gain customers from abroad, especially from the Czech Republic.

Internally, the laboratory would build its competitive advantage on 3 pillars:

1. Belonging to MSM Group, i.e., the money spent by the other companies would stay within the group.
2. Location of the laboratory – the laboratory is one hour away from the biggest spender from MSM Group.
3. Portfolio of offered tests – the laboratory has consulted and selected the tests according to the needs of the companies from MSM group.

Externally, the laboratory would build its competitive advantage on 2 pillars:

1. Belonging to MSM Group – the laboratory will use the strong brand of the whole group and the tradition of ZVS Holding a.s..
2. Portfolio of offered tests – the portfolio is overlapped by one of 2 competitors in Slovakia; therefore, the laboratory can attract customers by its location in the middle of Slovakia.
3. **Selecting on overall positioning strategy** – the internal value proposition is **More for less** – as there will be a lower price in comparison with other competitors with more benefits mainly connected with the belonging to MSM Group and tailored selection of accredited tests. The new accredited laboratory will offer a complete package of tests needed to extend the lifespan of ammunition on the market, except the firing tests which can be performed only on the government firing range.

The external value proposition is **more for the same** as the company would build offered benefits on the portfolio of tests which is meant to attract external customers outside MSM Group, focusing on the prolonging of the ammunition lifespan. On the other hand, as the procedures for the tests are the same, therefore, the new accredited laboratory will not compete in matters of price with the external companies.

### **3.3.2 Operational Plan**

As identified earlier, one of the first challenges facing the new accredited laboratory with regards to its operation, is the **formulation of a quality manual**. The operations within the new accredited laboratory should contribute to the fulfilment of goals defined within the selected areas in the previously stated 3D model.

Simultaneously to the formulation and submission of the quality manual, the new accredited laboratory would have to **adopt processes and systems** from the submitted quality manual. This adaption should contribute to the **fulfilment of the capacity of the current employees** of the laboratory. An important step before the actual launch of the laboratory is the **communication and role assignment to the employees**.

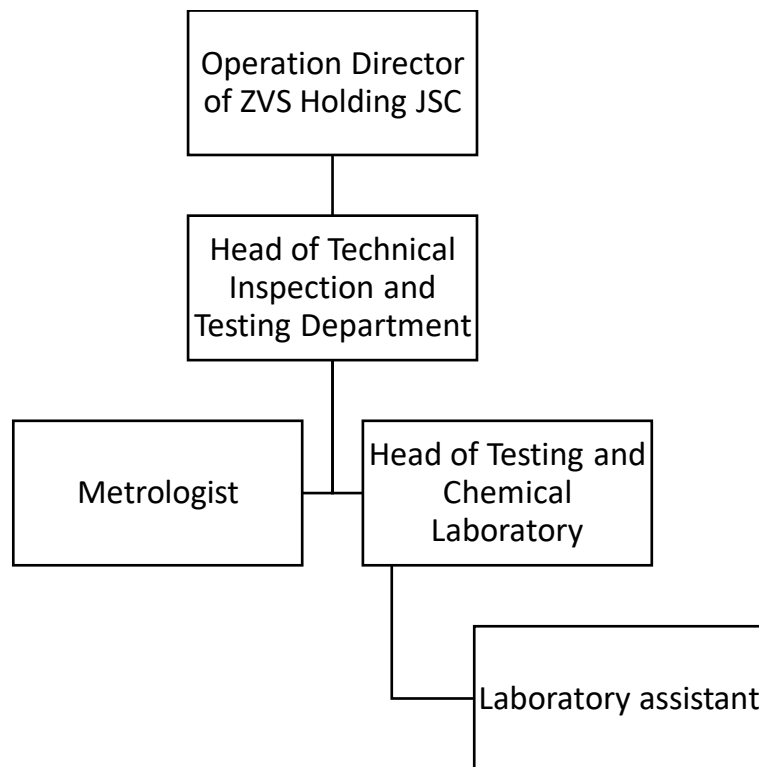
During this time, ZVS Holding would have to **acquire new machinery into the laboratory and caliber already owned machinery** in order to be able to prove that the laboratory is able to get the accreditation for certain tests. This process will take some time for the current employees as there will be **training** needed for them in order to be able to work with the machines and perform the tests.

After the whole documentation, staff and the premises are ready, ZVS Holding a.s. will **submit the request for accreditation**. The internal audit will be performed to prove conformity with the EN ISO 17025.

If the request is successful and the Slovak National Accreditation Service (SNAS) will perform an accreditation audit and in case of a positive result/conformity with the EN IASO 17025 requirements the SANAS approves the laboratory and awards the accreditation, the laboratory would be able to **communicate towards its potential clients**.

As mentioned previously, one of the initial steps would be to **establish communication channels in cooperation with the marketing department of MSM Group** as well as to prepare an article and press release to MSM Group’s internal newsletter, respectively, MSM Group’s magazine. Intercompany company price list of the new accredited laboratory will be distributed within the whole group. The group companies will have to use the services of the accredited laboratory as a kind of positive discrimination.

In the beginning, the new laboratory would work with the organizational structure depicted in Figure 12.



**Figure 12: Organizational Structure of the New Accredited Testing Laboratory** <sup>195</sup>

Each of the positions defined in the organizational structure will have defined powers and responsibilities towards the laboratory. Powers, responsibilities, and reporting needs of the positions are depicted in Table 19.

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<sup>195</sup> Own work according to the internal document of ZVS Holding a.s. – Organizational Structure of ZVS Holding a.s..

**Table 19: Powers and Responsibilities of People Involved in the Operation of New Accredited Testing Laboratory <sup>196</sup>**

<b>Position</b>	<b>Powers</b>	<b>Responsibilities</b>	<b>Reporting to</b>
Operation Director of ZVS Holding a.s.	Setting the budget for the laboratory, approval to proposed investments	Control of the whole operation of the laboratory with regards to the plans of ZVS Holding	-
Head of Technical Inspection and Testing Department	Communication with clients, design of the processes for the laboratory, pricing, development plans for the laboratory	Control of the whole operation of the laboratory with regards to the plans of the laboratory	Operation Director of ZVS Holding a.s.
Metrologist	-	Supplement with data towards the laboratory, reporting based on needed activity	Head of Technical Inspection and Testing Department
Head of Testing and Chemical Laboratory	Analysis of the requests/orders delivered, preparation of month/week and day-to-day schedule for the laboratory, responsible testing technician,	Reporting based on the activity of the laboratory – evidence keeping, supply management	Head of Technical Inspection and Testing Department

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<sup>196</sup> Own work

	execution of advanced tests, communication with clients, cooperation on the design of the processes for the laboratory, pricing, development plans for the laboratory		
Laboratory assistant/testing technician	Execution of the tests, test reports	Execution of the tests	Head of Testing and Chemical Laboratory

At the beginning of the operation of the laboratory, there will be 5 people involved in the operation as stated in Table 19. However, the laboratory would have to adjust to the needs of the clients and reflect internally which can cause shifts in the organizational structure, powers, and responsibilities.

### 3.4 Financial Analysis and Assessment

As stated previously, ZVS Holding a.s. has already invested in the current testing laboratory. Table 20 summarizes already performed investment into the machinery of the current laboratory.

**Table 20: Already Owned Equipment in the Current Testing Laboratory <sup>197</sup>**

Item	Purchasing cost	Depreciation per year	Date of last depreciation	Accumulated depreciation	Remaining value

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<sup>197</sup> Own work

Machine AET 402	€ 12,728.00	€ 3,182.04	31.12.2020	€ 6,894.00	€ 5,834.00
Machine UltiMate 3000	€ 31,000.00	€ 7,749.96	31.12.2020	€ 18,729.07	€ 12,270.93
Machine OZM CH 100-01	€ 10,107.00	€ 10,107.00	31.08.2020	€ 10,107.00	€ 0.00
Tempering boxes	€ 1,547.67	€ 1,547.67	31.12.2009	€ 1,547.67	€ 0.00

The total sum of already performed investment equals € 55,382.67 and the remaining depreciation and maintenance costs connected with the machines already owned by the laboratory are included in the overheads. To perform the accredited tests, machines AET 402 and UltiMate 3000 would need to be calibrated. The calibration fee per one machine equals € 500. The calibration of both machines once in 2 years.

The equipment also includes one borrowed machine – OZM B8, borrowed to ZVS Holding a.s. for free by the company MSM Nováky. The machine OZM B does not need any calibration and ZVS Holding a.s. pays only for the maintenance.

If the project of transformation of the already existing testing laboratory into the new accredited testing laboratory is accepted by the board of ZVS Holding a.s., it will be accomplished in 2022. Therefore, the investment is calculated from the beginning of the year 2022. There will be 2 new machines which the company would have to purchase in order to perform all tests included in the proposed portfolio. Due to this, the company OZM Research has been addressed as it is the manufacturer of needed machines. Table 21 summarizes expenses and depreciation connected with the new machinery.

**Table 21: Investment in New Equipment of the Laboratory**<sup>198</sup>

Item	Purchasing cost	Depreciation period	Depreciation per year
Machine DTA 552-Ex	€ 13,997.00	4 years	€ 3,499.25
Machine Stabil 6	€ 42,044.80	4 years	€ 10,511.20

The two machines would be needed to perform the vacuum stability test STN 26 910, STANAG 4556, respectively, thermal characterization by differential thermal analysis using DTA STANAG 4515. After the delivery and installation in the laboratory, the machines would need to undergo calibration which would cost € 500 per machine. The calibration period for the 2 machines is the same as for machines AET 402 and UltiMate 3000 – 2 years. As the accreditation is a recurring cost, it is already included in the overheads, but it is stated in Appendix 5 to inform the company about the need for calibration of machines.

The process of accreditation starts after the whole laboratory is prepared and all the machines are calibrated. There is a fee for a request for accreditation of € 500, paid to the Slovak National Accreditation Service.<sup>199</sup> If the accreditation is successful, according to the price list of the Slovak National Accreditation Service the fee for accreditation of 6 – 10 tests is set at € 5,096.<sup>200</sup>

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<sup>198</sup> Own work

<sup>199</sup> Cenník služieb SNAS, *SNAS – Slovenská národná akreditačná služba* [online]. Bratislava: SNAS – Slovenská národná akreditačná služba, ©2002-2021 [cit. 2021-04-25]. Accessible from: <http://www.snas.sk/index.php?l=sk&p=6&ps=52>

<sup>200</sup> Cenník služieb SNAS, *SNAS – Slovenská národná akreditačná služba* [online]. Bratislava: SNAS – Slovenská národná akreditačná služba, ©2002-2021 [cit. 2021-04-25]. Accessible from: <http://www.snas.sk/index.php?l=sk&p=6&ps=52>

If the laboratory wants to prolong the accreditation, it needs to pay a maintenance fee yearly. The fee is € 650 according to the price list of the Slovak National Accreditation Service.<sup>201</sup>

The calculation also includes investment in the basic inventory of the laboratory which includes laboratory glass, chemicals, and protective equipment. The fee is set at € 500 - just in case there is a need to purchase more consumables at the beginning of the operation of the new laboratory.

Table 22 summarizes all expenses connected with the transformation of the current testing laboratory into the accredited testing laboratory excluding calibration fees and maintenance fees.

**Table 22: Summary of Investment Needed for Transformation of the Current Laboratory**<sup>202</sup>

<b>Expense</b>	<b>Costs</b>
Purchase of machine DTA 552-Ex	€ 13,997.00
Purchase of machine Stabil 6	€ 42,044.80
Request for accreditation	€ 500.00
Accreditation fee	€ 5,096.00
Purchase of the basic equipment of the laboratory	€ 500.00
<b>Total sum</b>	<b>€ 62,137.80</b>

The total sum of needed investment is € 62,137.80. All the coefficients and metrics were calculated with the usage of the stated sum. The laboratory will create its plan on the

<sup>201</sup> Cenník služieb SNAS, *SNAS – Slovenská národná akreditačná služba* [online]. Bratislava: SNAS – Slovenská národná akreditačná služba, ©2002-2021 [cit. 2021-04-25]. Accessible from: <http://www.snas.sk/index.php?l=sk&p=6&ps=52>

<sup>202</sup> Own work

stable demand from MSM Group and especially MSM Nováky. Table 23 depicts the yearly change in spending on accredited tests of MSM Nováky. Although the annual spending for tests is increasing rapidly by MSM Nováky, the calculation counts with the increase in spending by 25% within the whole MSM Group as there is a predicted demand from the other companies joined in MSM Group which have lower spending.

**Table 23: Predicted Spending of Companies from MSM Group on Accredited Tests <sup>203</sup>**

<b>Year</b>	<b>Amount spent</b>	<b>Yearly change in %</b>
2017	€ 2,120.00	
2018	€ 8,280.00	390.6%
2019	€ 31,836.00	384.5%
2020	€ 39,795.00	25%
2021	€ 49,743.75	25%
2022	€ 62,179.69	25%
2023	€ 77,724.61	25%
2024	€ 97,155.76	25%
2025	€ 121,444.70	25%
2026	€ 151,805.88	25%
<b>Intercompany spending 2022 - 2026</b>	<b>€ 510,310.64</b>	

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<sup>203</sup> Own work

The spending of external companies is accompanied with the spending of companies from MSM Group as well. The primary objective of the new accredited laboratory is to serve the demand from the side of MSM Group and, eventually, the Czechoslovak group, but as there is an available capacity of the workforce already employed within the laboratory, the laboratory would be able to serve the demand from external companies as well. The ratio between tests for internal clients and external clients is 2:1. It is very important to state that there are different margins for internal and external customers, therefore, if the laboratory would have the capacity, it can accept more requests for the tests from external clients. Table 24 summarizes the predicted spending of external clients from 2022 until 2026 counting with 25% increase per year.

**Table 24: Predicted Spending of External Companies on Accredited Tests <sup>204</sup>**

<b>Year</b>	<b>Amount spent</b>	<b>Yearly change in %</b>
2022	€ 31,089.84	
2023	€ 38,862.30	25%
2024	€ 48,577.88	25%
2025	€ 60,722.35	25%
2026	€ 75,902.94	25%
<b>External clients spending 2022 - 2026</b>	<b>€ 255,155.32</b>	

After the deduction of the costs connected with the performance of the test, EBIT was calculated as shown in Table 25.

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<sup>204</sup> Own work

**Table 25: Predicted EBIT of the New Laboratory** <sup>205</sup>

<b>Year</b>	<b>EBIT Internal</b>	<b>EBIT External</b>	<b>Total EBIT</b>
2022	€ 4,352.58	€ 6,528.87	<b>€ 10,881.45</b>
2023	€ 5,440.72	€ 8,161.08	<b>€ 13,601.81</b>
2024	€ 6,800.90	€10,201.35	<b>€ 17,002.26</b>
2025	€ 8,501.13	€ 12,751.69	<b>€ 21,252.82</b>
2026	€ 10,626.41	€ 15,939.62	<b>€ 26,566.03</b>

To evaluate the investment, the following coefficients were chosen:

- Return on Equity
- Return on Assets
- Return on Investment
- Payback period
- Net present value
- Profitability index

Graph 4 depicts the calculated return on equity.

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<sup>205</sup> Own work



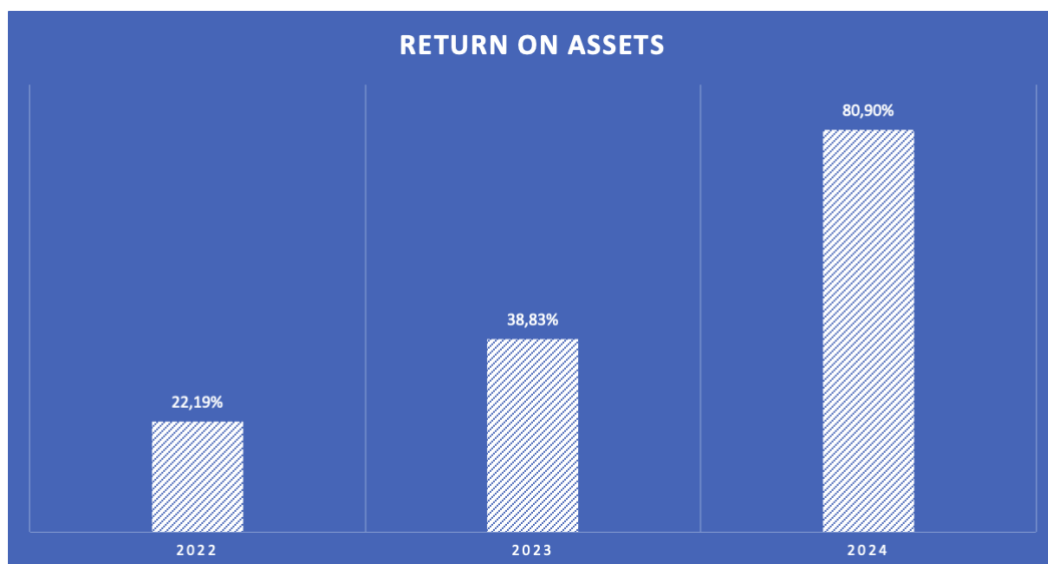
**Graph 4: Calculated Return on Equity**<sup>206</sup>

The calculated return on equity does not count with any investment within the first 5 years after the establishment of the new accredited laboratory. The percentage grows with the number of performed tests and EBIT.

The return on assets is a positive number as well as there is no future investment into assets predicted. Graph 5 depicts the predicted return on assets until the year 2024.

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<sup>206</sup> Own work



**Graph 5: Calculated Return on Assets** <sup>207</sup>

The increase in return of assets is caused as well because of the increase in EBIT.

The return on investment grows over the calculated 5 years. Table 26 depicts the development of return on investment over the years.

**Table 26: Return on Investment of the New Laboratory** <sup>208</sup>

Year	2022	2023	2024	2025	2026
Return on investment	-82.49%	-60.60%	-33%	0.97%	43.72%

In 2025, the return on investment is a positive number which indicates that the investment would be repaid in the third year of operation. The payback period has been calculated at 3.97 years – 3 years and 11 and half months.

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<sup>207</sup> Own work

<sup>208</sup> Own work

The net present value of the project after 5 years of existence in the year 2026 has been calculated at € 13,549.84. The profitability index after 5 years is 1.22. For all calculations see Appendix 5.

Thanks to the already performed investment, the amount of money needed to be invested into the laboratory is decreased by almost a half. The new accredited laboratory faces ambitious goals in the matter of investment repayment. The fact that the investment should be repaid within 4 years should also support the positive decision regarding the transformation of the current testing laboratory. Another factor supporting the decision to establish the accredited laboratory is the demand from the companies inside MSM Group, which should secure, at least, the minimum operation of the laboratory.

### **3.5 Milestones of the New Accredited Laboratory**

The milestones of the new accredited laboratory can be generally divided into 2 categories according to the time of realization. Those 2 categories are:

- **Milestones to be reached before the establishment** among which we consider:
  - Formulation of the quality manual for the new accredited laboratory
  - Design of systems and processes under which the laboratory will operate
  - Role assignment to current employees
  - Acquisition of new equipment
  - Calibration of all machines which have to be calibrated
  - Submitting the request for accreditation
- **Milestones to be reached after the establishment** among which we consider reaching milestones from the fields identified within the 3D model:
  - **Economic dimension**
    - Repaying the investment of the group into the laboratory – this should happen within 4 years according to the calculation.
    - Reaching turnover – the goal of the laboratory should be to reach the total turnover of ca. € 765,000 in the first 5 years of its existence.
    - Becoming financially independent – the laboratory should become financially independent after 4 years of operation.
  - **External dimension**

- Branding and communication towards potential external customers – the laboratory should build on the connection with the brand of ZVS Holding a.s.
- Reaching turnover from external companies – the laboratory should aim to provide the test to the external companies as well. The ratio between tests performed for internal clients and external clients is set to 2:1.
- Extending the accreditation for the tests for paints and varnishes which the laboratory already can perform – after the repayment of the initial investment, the laboratory can consider future investment into an extension of the offered portfolio of tests by adding the tests of paints and varnishes. This should happen in the 5<sup>th</sup> year of existence.
- **Internal dimension**
  - Establishment of processes and systems within the laboratory – the design should happen before the request for accreditation. The laboratory and its management should be able to adjust and optimize the processes and systems after the test in real operation.
  - Filling the capacity of current employees – the laboratory builds on the fact that the current testing laboratory already employs 2 employees performing the tests. With the increased demand, the capacity of current employees will be filled.
  - Communication and supply towards MSM Group – the initial communication towards MSM Group will happen via internal newsletter, MSM Magazine, and direct contact with the companies which are using the services of accredited testing laboratories. Another important aspect is that the companies within MSM Group would have to use the services of the new accredited laboratory to keep the money spent on the testing within MSM Group.

### **3.6 Risk Analysis**

The risks connected with the transformation of the current testing laboratory into the accredited laboratory were identified based on the previously mentioned 3D model. The risks identified in each of the 3 dimensions include:

#### **Economic dimension**

- Inability to reach turnover to repay the initial investment
- The calculation formula has limitations

#### **External dimension**

- Failure of the establishment of communication channels in cooperation with the marketing department of MSM Group
- Inability to sell the accompanied services such as communication

#### **Internal dimension**

- Failure of the establishment of a quality manual
- Failure of the maintenance of the established systems and processes
- Workforce failing to deliver results and communication

All the identified risks were put in the risk database previously created by ZVS Holding a.s. where they have been further described and evaluated according to selected criteria. The risks are evaluated based on their probability of occurring and potential impact on the new accredited laboratory. For both categories, the risks are evaluated from 1 to 5 points where 1 is the lowest evaluation. After the evaluation, the values of probability and impact are multiplied, forming the priority level.

In the table, there are stated people responsible for the management of the specific risk. Table 27 summarizes all identified risks in the risk database.

**Table 27: Risk Database** <sup>209</sup>

<b>Name of the risk</b>	<b>Description of the risk</b>	<b>Probability of occurring</b>	<b>Impact of the risk</b>	<b>Priority of the risk</b>	<b>Person responsible</b>
Reaching turnover	Laboratory unable to reach the turnover	2	4	8	Head of Technical Inspection and Testing Department
Calculation formula	Calculation formula has limitations	3	1	3	Economic Director of ZVS Holding a.s.
Communication channels establishment	Inability of the establishment of communication channels of the laboratory	1	5	5	Head of Technical Inspection and Testing Department
Accompanied services	Inability to deliver the accompanied services such as communication	5	2	10	Head of Testing and Chemical Laboratory

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<sup>209</sup> Own work according to the internal methodology of ZVS Holding a.s.

Quality manual	Failure of the establishment of a quality manual	1	5	5	Head of Technical Inspection and Testing Department
Systems and processes	Failure of the maintenance of the established systems and processes	3	5	15	Head of Testing and Chemical Laboratory
Workforce	Workforce failing to deliver the results	2	5	6	Head of Testing and Chemical Laboratory

The risk connected with the turnover reaching is considered as less probable with high impact. The probability is low because of the demand from the companies from MSM Group.

The limitations connected with the calculation formula have neutral probability as the new accredited laboratory does not exist at the moment. However, it would be important for the economic director of ZVS Holding a.s. to check whether the formula for the price setting is correct or not.

The establishment of the communication channels in cooperation with the marketing department of MSM Group has a high impact due to the fact that the laboratory would be able to communicate to the external customers via these channels. Failure of the establishment can cause lower demand from the companies outside MSM Group.

As it was discovered during the conduction of the mystery shopping, competing laboratories are often hard to reach and the communication with them is not smooth. Therefore, it would be important for the Head of Testing and Chemical Laboratory to be easy to reach and communicate clearly.

The failure of the establishment of the quality manual is less probable as ZVS Holding a.s. already employs people who have experience with the establishment and formulation of the quality manual.

Keeping the established systems and processes will be a crucial task for the Head of Testing and Chemical Laboratory as he/she will be responsible for the day-to-day operation of the accredited laboratory.

The probability that the workforce would not be able to deliver the expected results is relatively low. However, as the tests in the laboratory will be accredited, the demand for the delivery of accurate services is high which results in a high impact in case of failure.

For each of the identified risks, there are proposed procurements which are summarized in Table 28.

**Table 28: Proposed Procurements for Identified Risks <sup>210</sup>**

<b>Name of the risk</b>	<b>Procurements</b>
Reaching turnover	Monitoring of the laboratory and its performance – using the established communication channels
Calculation formula	Control of the formula after the agreed amount of performed tests
Communication channels establishment	Clear communication with the marketing department of MSM Group in advance
Accompanied services	Training of employees in communication
Quality manual	Maximum support to the Head of Technical Inspection and Testing Department during the process of creation
Systems and processes	Control of the operations of the laboratory

<sup>210</sup> Own work

Workforce	Training of employees in the use of the equipment of the laboratory and performance of the tests
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To manage identified risks and propose procurements, the PDCA cycle will be used in the laboratory. Therefore, it would be important for the Head of Technical Inspection and Testing Department to clearly design the quality manual and the procedures of implementation of the PDCA cycle.

## CONCLUSION

The presented bachelor's thesis deals with the problem which the company ZVS Holding a.s. is currently facing, i.e., whether to transform the currently existing testing laboratory for explosives into an accredited testing laboratory.

The main goal of the bachelor's thesis was to complete the feasibility study for the selected company as to whether to establish an accredited testing laboratory for technical testing by transformation from the already existing testing laboratory.

To find out the information required by the methodology designed by Jiří Fotr and Ivan Souček, selected frameworks were theoretically defined within the chapter "Theoretical Foundations" as well as in the subsequently described company strategy and 3D approach towards goal design. Specific features of accredited testing laboratories were mentioned, too.

The feasibility study is divided into 2 chapters – "Current Situation Analysis" and "Proposals and Contribution" based on the stage of the conduction of the feasibility study. The current situation analysis shows the current situation in the market and describes the technology needed for the performance of the selected portfolio of tests. The chapter includes the mystery shopping report. Mystery shopping was conducted to be able to understand the competitors and their market behavior. To find out specific information about the company ZVS Holding a.s., a research interview was held with the operation director of ZVS Holding a.s..

Furthermore, the chapter "Current Situation Analysis" describes specific features of the current accredited laboratory as well as the needs and requirements for the accreditation of the selected portfolio of tests. To retrieve information, a research interview was held with the employee of the Technical Inspection and Testing Department. Besides, the chapter includes the information collected from another research interview with the laboratory assistant working in the current laboratory. The interview was held to gather information about the use of chemicals used for the tests included in the selected portfolio.

The chapter "Proposals and Contribution" opens with the analysis of the contribution of the transformation of the current testing laboratory into the accredited testing laboratory to the vision, mission, strategic goals, and values of MSM Group. Subsequently, the

chapter continues with the financial analysis and assessment with the calculation of the selected economic indicator which should help the company to decide about the realization of the project. The chapter ends with the identification and proposal for the procurement for the risks connected with the implementation and realization of the transformation.

Based on all collected information, the company ZVS Holding a.s. is recommended to realize the project of transformation of the current testing laboratory into the accredited testing laboratory. The reasons why the company should realize the project include:

- demand raised by the sister company MSM Nováky;
- already realized investment into the current testing laboratory;
- payback period of the investment shorter than 4 years;
- possibility to fill the capacity of already employed staff working in the current testing laboratory;
- possibility to use the strong brand of ZVS Holding a.s., MSM Group, and Czechoslovak Group.

In addition, the transformation of the current laboratory will have a positive effect on the vision, mission, strategic goals, and values of MSM Group as the transformation will help to strengthen the position of MSM Group in the market. Moreover, it will generate a new source of financing for ZVS Holding a.s.. The company should consider the investment for the year 2022 and use the time remaining from 2021 to prepare all the required documents and design systems and processes for the new accredited laboratory.

While considering the investment, ZVS Holding a.s. should also examine the purchase of the washing machine for the laboratory glass, which will help to optimize the operations within the accredited testing laboratory.

On the other hand, the company should carefully monitor the operations of the new accredited laboratory and pay attention to the communication of the laboratory as it can be a significant competitive advantage.

In conclusion, based on the findings from this thesis, the transformation of the current testing laboratory into the accredited testing laboratory is advised.

## REFERENCES

1167.2 – Explosia a.s.. Český institut pro akreditaci [online]. Praha: Český institut pro akreditaci o.p.s.© 2021 [cit. 2021-04-02]. Accessible from: <https://www.cai.cz/?subjekt=1167-2-explosia-a-s>

1705 – Česká republika – Ministerstvo obrany. Český institut pro akreditaci [online]. Praha: Český institut pro akreditaci o.p.s.© 2021 [cit. 2021-04-02]. Accessible from: <https://www.cai.cz/?subjekt=1705-ceska-republika-ministerstvo-obrany>

About MSM GROUP. *MSM Group* [online]. Dubnica nad Váhom: MSM Group, s.r.o., ©2021 [cit. 2021-03-06]. Accessible from: <https://zvsholding.sk/en/about-msm-group/about-msm-group/mission-vision-and-values/>

Akreditované skúšky - Skúšobné laboratórium S-145, *Vojenský technický a skúšobný ústav Záhorie* [online]. Senica: Vojenský technický a skúšobný ústav Záhorie, ©2021 [cit. 2021-04-22]. Accessible from: [http://www.vtsu.sk/opravnenia\\_a\\_certifikaty.html](http://www.vtsu.sk/opravnenia_a_certifikaty.html)

BEREC, Milan. *Alternatives of accredited testing laboratories* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

BEREC, Milan. *Competitors for the new accredited laboratory on the Czechoslovak market* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

BEREC, Milan. *Current competitors on the market* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

BEREC, Milan. *Location of the new laboratory* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

BEREC, Milan. *Need of quality manual for accredited laboratory* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

BEREC, Milan. *Norms, which the accredited laboratories have to respect* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

BEREC, Milan. *Power of buyers in the business of accredited laboratories* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

BEREC, Milan. *Power of suppliers in the business of accredited laboratories* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

BEREC, Milan. *Roles of Mining Offices with regards to the accredited laboratory* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

BEREC, Milan. *Technological factors influencing accredited testing laboratories* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

BEREC, Milan. *Workforce in the current laboratory and its capacity* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

BLAŽKOVÁ, Martina. *Marketingové řízení a plánování pro malé a střední firmy*. Praha: Grada, 2007. ISBN 978-80-247-1535-3.

BURNS, Paul. *Entrepreneurship and Small Business: Start-up, Growth, and Maturity*. New York: Palgrave Macmillan, 2016. ISBN 978-1-137-43035-9.

Cenník služieb SNAS, *SNAS – Slovenská národná akreditačná služba* [online]. Bratislava: SNAS – Slovenská národná akreditačná služba, ©2002-2021 [cit. 2021-04-25]. Accessible from: <http://www.snas.sk/index.php?l=sk&p=6&ps=52>

ČERVENÝ, Radim, Jiří FICBAUER, Alena HANZELKOVÁ and Miloslav KEŘKOVSKÝ. *Business plán – krok za krokem*. Praha: C.H.Beck, 2014. ISBN 978-80-7400-511-4.

Databáze akreditovaných subjektů. Český institut pro akreditaci [online]. Praha: Český institut pro akreditaci, o.p.s., ©2021 [cit. 2021-03-06]. Accessible from: [https://www.cai.cz/?page\\_id=4499](https://www.cai.cz/?page_id=4499)

EN ISO 9001: 2015. *Quality management systems*. 1. ed. Brussels: European Committee for Standardisation, 2015. Sorting character 03.120.10.

EN ISO 17025: 2018. *General requirements for the competence or testing and calibration laboratories*. 1. ed. Brussels: European Committee for Standardisation, 2017. Sorting character 03.120.10.

GILLHAM, Bill. *Research interview*. London: Continuum, 2000. ISBN 978-0-826-44797-5

HELBICHOVÁ, Zuzana. *Current situation with the testing laboratory within ZVS Holding a.s.* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 08.03.2021.

HELBICHOVÁ, Zuzana. *Plans with the accredited testing laboratory within ZVS Holding a.s.* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 19.03.2021.

HINDO, Brian. Rewiring Westinghouse. *BusinessWeek*, 19.05.2008, p. 48 – 49. ISSN 0007-7135.

Internal document of ZVS Holding a.s. – Organizational structure of ZVS Holding a.s..

JAKUBÍKOVÁ, Dagmar. *Strategický marketing: strategie a trendy*. Praha: Grada, 2013. ISBN 978-80-247-4670-8.

KRALJIC, Peter. Purchasing must become supply management. *Harvard business review*, 1983, 61.5. p. 109 - 117. ISSN 0017-8012.

FOTR, Jiří and Ivan SOUČEK. *Podnikatelský záměr a investiční rozhodování*. Praha: Grada, 2005. ISBN 80-247-0939-2.

KONŠTRUKTA - Defence, a.s. SNAS - Slovenská národná akreditačná služba [online]. Bratislava: Slovenská národná akreditačná služba © 2002-2021 [cit. 2021-04-02]. Accessible from: <https://ais.snas.sk/ais/#!WebReports/3029,1324,205,1709,427,2939,1728,2284/list.accredited.subject.search.fulltext/AccreditedSubjectsFulltext/fullText>

KORÁB, Vojtěch, Jiří PETERKA and Mária REŽŇÁKOVÁ. *Podnikatelský plán*. Brno: Computer Press, 2007. ISBN 978-80-251-1605-0.

KOTLER, Philip, Gary ARMSTRONG and Marc Oliver OPRESNIK. *Principles of Marketing*. Harlow: Pearson, 2018. ISBN 978-1-292-22017-8.

KOTLER, Philip, Kevin LANE KELLER. *Marketing Management*. Praha: Grada Publishing, 2013. ISBN 978-80-247-4150-5.

Laboratoř bezpečnostního inženýrství, *Explosia*® [online]. Pardubice: EXPLOSIA a.s., ©2021 [cit. 2021-04-22]. Accessible from: <https://explosia.cz/sluzby/laborator-bezpecnostniho-inzenyrstvi/>

LEDECKÝ, Peter. *Formula for calculation of final price per test* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 19.03.2021.

NYKIEL, Ronald A. *Handbook of marketing research methodologies for hospitality and tourism*. New York Haworth Press, 2007. p. 135-136. ISBN 978-0-7890-3426-7

O činnosti obvodných banských úradov. *Hlavný Banský Úrad* [online]. Banská Štiavnica: Hlavný banský úrad © 2004-2021 [cit. 2021-03-23]. Accessible from: <https://www.hbu.sk/sk/Identifikacia-organizacie/O-cinnosti/Obvodne-banske-urady.alej>

Skúšobné laboratórium, Konštrukta Defence® [online]. Dubnica nad Váhom: KONŠTRUKTA Defence, a.s., ©2021 [cit. 2021-04-22]. Accessible from: <https://kotadef.sk/skusobnictvo/skusobne-laboratorium/>

Standardization. NATO: North Atlantic Treaty Organization [online]. Brussels: NATO ©2021 [cit. 2021-03-06]. Accessible from: [https://www.nato.int/cps/en/natolive/topics\\_69269.htm](https://www.nato.int/cps/en/natolive/topics_69269.htm)

ŠUPÁKOVÁ, Daniela. *Chemicals which the new accredited laboratory is going to use* [oral communication]. ZVS Holding a.s. Štúrova 925/27, 018 41 Dubnica nad Váhom. 19.03.2021.

Portál technických noriem - STN 66 8002, Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky® [online]. Bratislava: Slovenská národná akreditačná služba, ©2019 [cit. 2021-03-23]. Accessible from: [https://normy.unms.sk/eshop/public/standard\\_detail.aspx?id=67101](https://normy.unms.sk/eshop/public/standard_detail.aspx?id=67101)

PORTER, Michael Eugene. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press, 1998. ISBN 0-684-84148-7.

Poslanie orgánov štátnej banskej správy. Hlavný Banský Úrad [online]. Banská Štiavnica: Hlavný banský úrad © 2004-2021 [cit. 2021-03-23]. Accessible from: <https://www.hbu.sk/sk/Identifikacia-organizacie/Poslanie.alej>

Vojenský technický a skúšobný ústav Záhorie.. SNAS - Slovenská národná akreditačná služba [online]. Bratislava: Slovenská národná akreditačná služba © 2002-2021 [cit. 2021-04-02]. Accessible

from:<https://ais.snas.sk/ais/?restartApplication#!WebReports/191,2033,1460,2032,2031,470,196,2390,472,1734,198,990,199,1611,1610,993,1212,999,1614,1735,1190,2045,191,2,3,20,1363,1362,1483,134,255,2048,2047,2046,419,1374,1373,2065,1371,1370,1369,420,2215,421,1>

Vyhľadávanie subjektov podľa oblastí akreditácie. *SNAS – Slovenská národná akreditačná služba* [online]. Bratislava: Slovenská národná akreditačná služba, ©2002-2021 [cit. 2021-03-06]. Accessible from: <https://ais.snas.sk/ais/#!WebReports/2/list.accredited.subject.search.byfield/AccreditedSubjectsByFields>

WIELE, Ton Van der; HESSELINK, Martin; IWAARDEN, Jos Van. Mystery shopping: A tool to develop insight into customer service provision. *Total Quality Management & Business Excellence*, 2005, 16.4. DOI: 10.1080/14783360500078433

WILSON, Alan M. The role of mystery shopping in the measurement of service performance. *Managing Service Quality: An International Journal*, 1998. ISSN 0960-4529

Zákon č. 58/2014 Z. z. Zákon o výbušninách, výbušných predmetoch a munícii a o zmene a doplnení niektorých zákonov. *Zákony pre ľudí* [online]. Žilina: S-EPI s.r.o. © 2010-2021 [cit. 2021-03-23]. Accessible from: <https://www.zakonypreludi.sk/zz/2014-58>

Zákon č. 61/1988 Sb: Zákon České národní rady o hornické činnosti, výbušninách a o státní báňské správě. Zákony pro lidi [online]. Zlín: AION CS, s.r.o. © 2010-2021 [cit. 2021-03-23]. Accessible from: <https://www.zakonyprolidi.cz/cs/1988-61>

ZICH, Robert. Koncepce úspěchuschopnosti: konkurenceschopnost - vítězství, nebo účast v soutěži?. Brno: Akademické nakladatelství CERM, 2012. ISBN 978-80-7204-818-2.

ZVS. *MSM Group* [online]. Dubnica nad Váhom: MSM Group, s.r.o., ©2021 [cit. 2021-03-06]. Accessible from: <https://zvsholding.sk/en/our-companies/zvs>

## LIST OF ABBREVIATIONS

Bi:	Bismuth
Sn:	Tin
Pb:	Lead
STN:	Slovak Technical Norms
STANAG:	Standardization Agreement
ISO:	International Organization for Standardization
s.r.o.:	Limited Liability Company
a.s.:	Joint Stock Company
ČSN:	Czech Technical Norms
HPLC:	High-performance liquid chromatography
PA:	Per analysis
MoD:	Ministry of Defence

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## **APPENDICES**

### **Appendix 1 – Questions for the Operation Director of ZVS Holding**

**a.s.**

1. What is the current situation with the testing laboratory?
2. How is it divided?
3. How does the organizational structure of the laboratory look like?
4. Which tests is it able to perform?
5. What are the plans of the top management with the current testing laboratory?

## **Appendix 2 – Questions for the Employee of the Technical Inspection and Testing Department**

1. Where is the current testing laboratory operated now?
2. Is the capacity of the current laboratory employees fully used? If not, what do they do in their work hours?
3. Which equipment does the laboratory already possess?
4. Which standards must the accredited laboratory comply with?
5. What are the legal barriers which accredited laboratories face?
6. Is the change in legal barriers probable?
7. What is the role of mining offices in connection with the accredited laboratory?
8. Can the buyer dictate rules while purchasing the accredited test from the laboratory?
9. Is there a problem connected with the supply of the items needed for the performance of the accredited tests?
10. What is the probability of change in the technological procedures of the accredited tests or the technology itself needed for the execution of the tests?
11. Is there an alternative to accredited tests for the explosives?
12. Who are the potential competitors for the new accredited laboratory on the Czechoslovak market?
13. For what does the laboratory need the quality manual?

### **Appendix 3 – Mystery Shopping Form**

The table showing carried-out mystery shopping see the attached Excel file entitled as Appendix\_3.xls.

## Appendix 4 – Questions for the Laboratory Assistant

1. Which chemicals are needed to perform tests included in the proposed portfolio?
  - Chemical stability at 100°C, STN 66 8102
  - Chemical stability in accordance with Bergmann-Junk, STN 66 8102
  - Temperature of ignition/explosion, STN 66 8063, STANAG 4491
  - Stability Test Procedures and Requirements Using Stabilizer Depletion - Nitrocellulose Based Propellants - STANAG 4620/AOP-48
  - Chemical compatibility of ammunition components with explosives on the base stabilizer depletion, STANAG 4147
  - Vacuum stability test STN 26 910, STANAG 4556
  - Thermal characterization by differential thermal analysis using DTA STANAG 4515
  - Determination of water content, STN 66 8102, part 20
2. Which of the chemicals needed for the test have a long delivery time?
3. Which of the chemicals needed for the performance are more expensive than the others?
4. How do you control the inventory status in the laboratory?
5. How do you report the need to purchase some equipment into the inventory of the laboratory?
6. How long does it take to perform each of the stated tests?
7. What is the probability that the laboratory equipment used during the performance of each of the tests included in the portfolio will be destroyed?
8. Which protective equipment do you use during the performance of the tests? Is the equipment durable, or for single use only?
9. What is the procedure from receiving the sample until the formulation of the test protocol?

## **Appendix 5 – Financial Analysis and Assessment**

The table showing carried-out financial analysis and assessment see the attached Excel file entitled as Appendix\_5.xls.