

**Czech University of Life Sciences Prague**

**Faculty of Economics and Management**



## **Diploma Thesis**

**Topic: The Use of PMBOK Guide. Case study - 2N  
Telekomunikace a.s. company**

**Mariia Gabelko**

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# CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

## DIPLOMA THESIS ASSIGNMENT

Bc. Mariia Gabelko

Economics and Management  
Economics and Management

Thesis title

**The Use of PMBoK Guide. Case study – 2N Telekomunikace a.s. company**

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### Objectives of thesis

The objective of the diploma thesis is to understand the application of PMBoK Guide. The author plans to identify what are the factors that are relevant in each knowledge area. However, a certain company was chosen, which applies the PMBoK 6th edition in order to improve its project management factors. There are ten main knowledge areas which are covered by the PMBoK and the author analyses which are crucial for the company.

### Methodology

The diploma thesis is divided into two parts, the theoretical part and practical part. The theoretical parts cover a background of PMBoK guide, its implementations, and feedbacks of different outputs as well as recommendations and discussions. However, the practical part will be focused on the main knowledge areas which should be overlooked when the PMBoK is applied. The author plans to use a survey with a multiple-choice question and also apply open questions with the project manager, in a way of open discussion, where necessary questions will be asked. The data will be processed, and the final conclusion will be made based on the data retrieved.

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**The proposed extent of the thesis**

60 – 80 pages

**Keywords**

PMBOK Guide, Project manager, Controlling, Risk Assurance, Project time, Project progress, Project techniques, Project tools.

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**Recommended information sources**

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## **Declaration**

I declare that I have been using only the resources mentioned below to bring a topic of “The Use of PMBOK Guide. Case study - 2N Telekomunikace a.s. company“, as being an author of the diploma thesis, I declare the thesis doesn't break any copyrights and doesn't correspond to any plagiarism.

In Prague on \_\_\_\_\_

Mariia Gabelko \_\_\_\_\_

## **Acknowledgment**

I would like to say the heartiest thanks to my family and friends for the big support. Special gratitude is goes to doc. Ing. Jan Bartoška, Ph.D , who helped me with the given topic.

# **The Use of PMBOK Guide. Case study - 2N Telekomunikace a.s. company**

## **Abstract**

The Diploma Thesis covers the PMBOK Guide, which stands for Guide to the Project Management Book of Knowledge. The study aims to understand the leaderships skills which are needed for a project manager to reach successful results or outcomes of any project. Primary, the theoretical part covers different theories and knowledge which PMBOK Guide applies. As a case study, the author chose “2N – Telekomunikace a.s.” which is involved in production of software’s, cables, and IT equipment in general. The author runs a survey with the 7 questions, where each question has a range of scaling answers methods. Based on the sample size, the author can judge what sub-factors are relevant the most. However, there are also over 10 questions to the CFO of 2N Telekomunikace a.s., with the open choice answers.

**Key words:** PMBOK Guide, Project manager, Controlling, Risk Assurance, Project time, Project progress, Project techniques, Project tools.

# **Použití průvodce PMBOK. Případová studie - 2N Telekomunikace a.s. společnost**

## **Souhrn**

Diplomová práce pokrývá Průvodce PMBOK, což je zkratka pro Průvodce knihou znalostí projektového řízení. Cílem studie je porozumět vůdčím dovednostem, které jsou potřebné pro projektového manažera, aby dosáhl úspěšných výsledků nebo výstupů jakéhokoli projektu. Primárně teoretická část pokrývá různé teorie a poznatky, které PMBOK Guide aplikuje. Jako případovou studii autor zvolil „2N – Telekomunikace as.“ která se zabývá výrobou softwaru, kabelů a IT zařízení obecně. Autor provádí průzkum se 7 otázkami, kde každá otázka má řadu metod škálování odpovědí. Na základě velikosti vzorku je autor schopen posoudit, které dílčí faktory jsou nejvíce relevantní. Existuje však také více než 10 otázek na finančního ředitele 2N Telekomunikace as, s otevřeným výběrem odpovědí.

**Klíčová slova:** PMBOK návod, Manažer, řízení, Zajištění rizika, Projektové nástroje, Projektové techniky.

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# 1 Introduction

Project management practices and theories have been adopted in recent decades by many companies and significant growth have been experienced. Different companies of different sector economies use project management tools and methods to achieve certain results on time and to do that, the organizations should go through certain disciplinary steps and controlling. The PMBOK Guide helps enterprises and organizations to overcome and solve challenges with pressure from shareholders, increased labour demand, fast moving technical innovations and over expectations from customers. It also helps keep a track of company's performance, in particular its ups and downs, which might occur due to internal and external factors.

There are many academic works and papers that are dedicated to the theoretical framework of project management methods and its problems, although this Diploma Thesis is based on the practical research of a "2N Telekomunikace a.s."

The company is focused on software production as well as IT equipment. In order for the processes to run smoothly, the company adopted PMBOK Guide 6<sup>th</sup> and runs its production and project with the standards. The Diploma thesis is divided into two parts, theoretical and practical. Where theoretical parts is mainly focused on the research papers and academic literature, which described pros and cons of the Guide, basically, the theory covers the whole range of opinions which might help the author to state the conclusion.

According to Meredith (2011), project management has always been existing informally, it only appeared formally for the past 20 years. However, people always needed the right tools and techniques for managing different types of projects. Companies always needed the right paths to allocate their time, money, and overall resources to achieve a certain outcome. Nowadays, the environment became more competitive, and in order to stay competitive, organizations need professionals with project management skills, who know the right way of how to manage people effectively and chose the right member for the team or a project as every project has the beginning and obviously the end, and the steps which are done throughout those two.

## **2 Objectives and Methodology**

### **2.1 Objectives**

The main goal is to analyze whether the PMBOK Guide of 6th, has helped the “2N Telekomunikace a.s.” to run their processes smoothly and manage to make all project on time. However, the author is also interested in knowing the obstacles and challenges that the company might be facing, another words what are the factors that might affect the project team performance and how team member evaluate what is important for them.

### **2.2 Methodology**

The objective of the Diploma Thesis is to cover the whole spectrum of the PMBOK Guide, specifically the knowledge areas, which are described deeply in Chapter 3.3.1. and discover what are the project management fields that the company is mostly focused on and why. In order to be more precise, the author came-up with a few assumptions for each knowledge. The author uses a survey method of 7 questions of scaling method, where for each knowledge area the author made the following assumptions:

Assumptions:

Project Cost Management

- 1) Increased motivation might increase a project team performance
- 2) Project team performance depends on the open communication with a project team leader
- 3) Performance review might increase a chance of better results for the next project and increase an overall performance of each employee.

Project Time Management

- 1) Experts' opinion is very important for the team performance, it might positively impact the outcome of the project.
- 2) Gantt diagram is very effective tool to allocate every team member's time properly.
- 3) Critical path method helps to save time and cut costs.
- 4) Group decision process usually might prolong the final decision hance project time management.

Quality project Management

- 1) Cost benefit analysis might affect an overall quality of project.
- 2) Inspections and audits might reveal the areas where the quality might be improved.

HR Management

- 1) Trainings of employees increases their efficiency within a project and saves time.

- 2) Recognition is very important factor that influences an overall performance of a team.
- 3) Negotiation skills are relevant skills to have for an HR Manager
- 4) Team building activities can bound team members together

#### Risk Management

- 1) Experts' opinions help to reconsider company's direction and avoid risks.
- 2) Modelling techniques help to avoid risk without any costs.
- 3) What if scenario is vital for board management.

#### Procurement Management

- 1) Market search is vital to save costs and find cheaper vendors.
- 2) Contract change control helps to save money.

#### Stakeholder Management

- 1) Only board management deals with the stakeholders
- 2) Analytical techniques help the board management to understand the direction of the market
- 3) Expert judgment might help the board management to negotiate the criteria of contracts.

In order to identify whether these assumptions are consistent within the group, the questions will be asked the same way, by scaling method to identify whether workers believe in these assumptions or not. In order to verify assumptions, the author uses Cronbach's Alpha Test.

Cronbach's formula is the following, which will be calculated in Excel.

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N - 1) \cdot \bar{c}}$$

Source: Lavrakas (2008).

Whereas:

N – is the number of observations

C – average covariance between item-pairs

V – average variance

### **3 Literature review**

This whole chapter is dedicated to explanation and meanings of every single aspect which is tightly linked with the project management. Since this framework is mostly focused on theoretical background and secondary data, I will highlight some part in order to apply the methods and planning within my practical part. The literature review will also define APM, as well as the growth of management system and its overall changes.

#### **3.1 Project and management definitions**

According to the (BS 6079-1:2002) and British standards, they define project as a “certain set of coordinated activities, that make a definite starting and finishing point, which is processed by either individual or organisation, in order to meet specific goals and objectives with a certain timeframe, cost and performance steps. Projects however can therefore be made in different lengths, sizes, and being either temporary, doesn't define project to be short. The final output of the project can be however a unique product, service, or mixture of both. But results as the third optional output, however, can be taking longer timeframe (PMBOK Guide, 2013:3). It also involves the risk elements, as every step is entailed a level of uncertainty and unpredictability. (Westland, 2006:2).

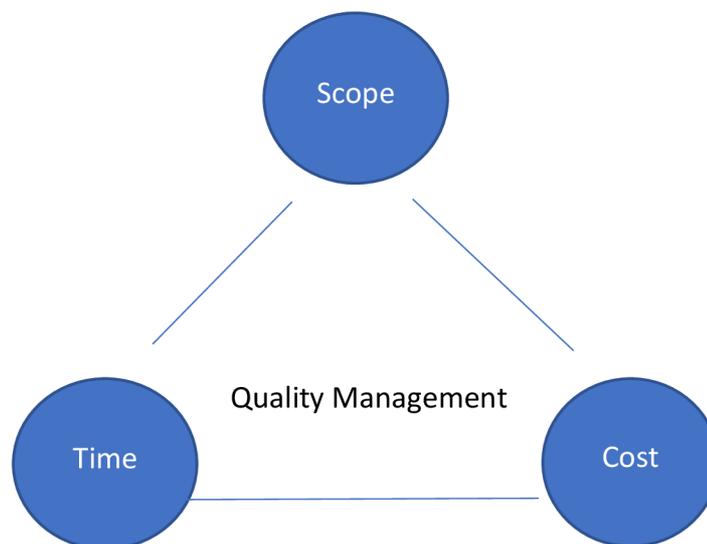
Project management is considered to consist of knowledge, skills, techniques, and tools to project activities in order to meet the requirements of the stated/planned project.(PMBOK Guide, 2014:5). Additionally, the definition provides an extensive set of terminology and guidelines, which are used by professionals and globally. However, the management processes from the 4<sup>th</sup> edition of (2012) are adopted on the base of ISO, and the books itself was recognized by American National Standards Institute, within an industry standard. Which carried on the 5<sup>th</sup> edition and I plan to describe that edition further on. The requirements for each project vary and reasons as well. Pelin (2011) stated the following reasons for the increase of requirements for PM:

- Objectives of projects increase due to international competitions
- Flows of information and communication management becomes more complicated
- Projects of organizations become more complex, as there are many parties (companies, suppliers, middlemen, vendors, logistic companies, and etc.) involved. Work is also done globally in many different countries.

- The IT systems develop intensely. This has allowed the use of software which connects to companies database, and hence gives an allowance for real-time project planning and controlling. The potential of these new technologies is not fully discovered.
- Different requirements of ISO 10006 and PMBOOK. All managers and professionals require the certification in addition to increased professional requirements and career development.

Schwalbe (2009) argues that there four core areas that the manager should mostly focus on, time, cost, quality, and scope. Eventually these four will lead to the business objective. These are the constraints of any project that initially leads up to the limits and scarcity of these factors (See Figure 1), and it can impact the execution of a project, its process, program, structure and extra. The constraints are a good way of measuring the successfulness of a project. These constraints are shaped in triangle form. He concluded that a small change in one constraint might affect the change in another constraint, thus those are interdependent sets of constraints, and there is a strong equilibrium among those.

**Figure 1: Project Managment Triangle**



Source: Gianniris (2017).

Managing a project trough its knowledge areas (See Table 1.) means that each action will require a change in one or more crucial “triangle” area.

**Table 1: Knowledge areas and its description**

<b>Project Name</b>	<b>Description</b>
Project Integration Management	Overlooks all elements of a project, managing conflicts between different aspects of a project.
Project Scope Management	Measure the total amount of work that must be done within a certain timeframe.
Project Time Management	Analyzes and develops a schedule and timeline for project completion
Project Cost Management	Overlooks the costs that are involved in realization of a project.
Project Quality Management	Processes and measures the quality of all activities and taking necessary actions until the desired quality is achieved.
Project Human Resource Management	Organizes and manages a project team, people.
Project Communications Management	Organizes and ensures the processes that are required for the proper planning, collection, and creation.
Project Risk Management	Deals with analyzation of a risk, that could happen further on, while a project is in the process.
Project Procurement Management	Creates and maintenances the relationships with external resources needed to complete a project.
Project Stakeholder Management	Involves identification of stakeholders, analysis of their expectations and influences, development of appropriate strategies

Source: own processing, (PMBOK Guide, 2008).

### **3.1.1 Processes of Project**

A process is a series of actions that are linked with a particular result. PMI (2013) describes the project steps as “Project Management Process Groups” The groups are as follows:

- Initiating
- Planning
- Executing
- Monitoring & Controlling
- Closing
- Discussion

PMBOK (2013) explains the processes that are necessary to identify and clarify the projects objectives and what is needed to be achieved by them. As mentioned, in the Process Group and Knowledge Area Mapping (PMBOK 2013), initiating activities do not involve management activities based on the many knowledge areas. However, depending on the nature of the project, the initiative process group only involves developing a charter project for Integration Management, as well as identifying the projects stakeholders for Stakeholder Management.

A planning process formulate the objectives as well as define the scope of the project. It also creates the project management plan and the documents used to carry out the project (PMBOK, 2013). The management plan is included in the Project Integration Knowledge area. However, every project area needs a certain plan to follow (Alexander, 2017).

Executing process group is also vital, as it concludes all processes which defined in the project management play created in advance (PMBOK, 2013). In the executing processes, activities are done to meet different specifications of the project, it also entails managerial tasks in communication as well as the stakeholder knowledge areas.

Managing procurement, human, non-human activities are also part of executing activities.

Monitoring and controlling groups involve a measuring and monitoring procedures, that operate quite frequently to ensure different project objectives are met (Schwalbe, 2009). It is necessary to register any type of progress that goes differently than originally planned and to correct it if needed. This means defining certain places where actions and changes are needed to undertake, so the project runs smoothly forwards but not backwards.

Moreover, project stakeholder management focus on communicative part with stakeholder to understand their needs, expectations, addressing managing conflict and potential risks that could be avoided.

Any project is finalized with a process of Closing Process. It might happen either according to its plan or due to unpredictable cancelation, abortion or a critical situation which might occur (PMBOK, 2013).

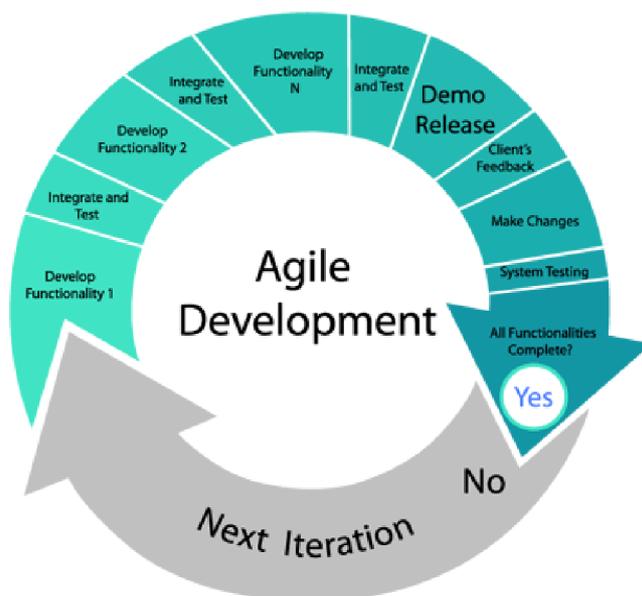
There is an order in which the process groups are completed for each project, the individual activities usually overlap and occur throughout the project (PMBOK, 2013). The length of every step varies from project to project (Schwalbe, 2009). But it is normal for Executing Progress Group to require up to 50-60 per cent of resources and time availability.

The other groups' requirements vary strongly but initiating and closing processes generally require the least resources amount and time 5 – 10 per cent.

### 3.1.2 Agile Project Management

To deeply understand the term Agile PM, firstly, it was represented in 2001, but the main idea behind that was developing long before that. Possibly, the most notable of the earlier methodologies created to improve on the Waterfall model was the Spiral model from Barry Boehm (1988). Just the years when the software industry was ramping-up and getting lots of attention for investors and a result software projects grew rapidly. However, the development of methods to carry-out the project was too slow. This led to increasing lead times and losses due to a Waterfall model, which is very constrained in terms of risk assessment and management aspect.

**Figure 2: Agile Model**



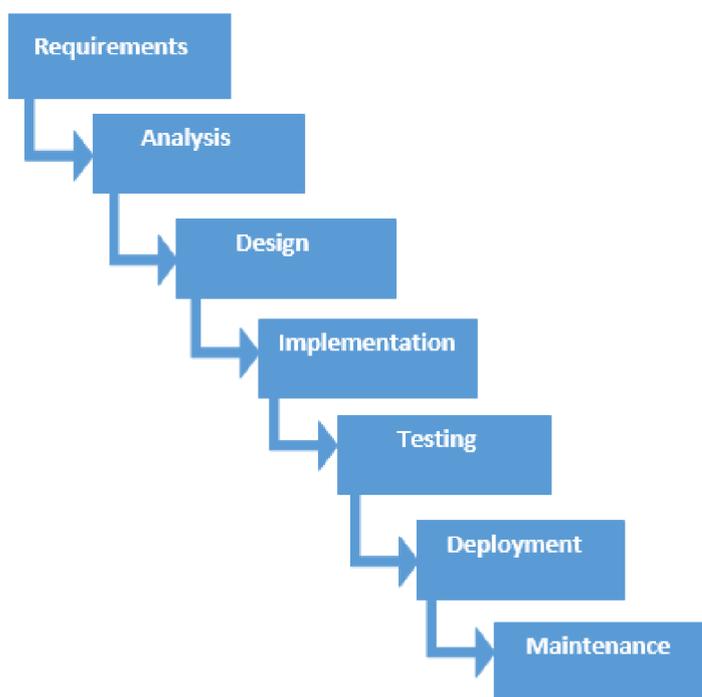
Source: Agile Alliance (2015).

However, Waterfall mode is divided into 5 main steps which overlooks the following aspects under each step:

- Requirements for the system is gathered with applying special techniques such as questionnaires, interviews, and surveys.

- System design is a process where it provides a detailed information regarding the flow between information and tables involved. This will also give a clearer idea of the tables needed. Such methods are used as (Entity relationship diagram)
- System development is the phase where all the designs will be transferred into machine-readable coding. The coding should keep in mind the future systems reliability.
- System testing and implementation, the complete software which is tested at the end of a project for its functionality and dysfunctionality. (See Figure 3).

**Figure 3: Waterfall model**

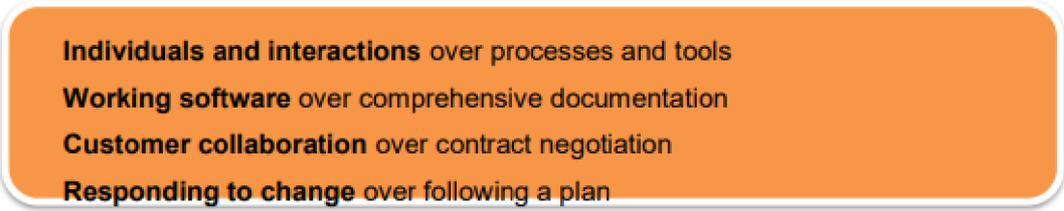


Source: Billingham, 2008.

The answer was a Spiral model which was created by Mr.Boehm, to minimize risks by using prototypes and other means. It involves risk analysis on every stage of the project. Like a spiral, the product is being built progressively, creating more complete versions as it spins outwards. The loops mark a point of analyzation of risk, and it is also where customer is able to evaluate the work and suggest improvements. The analysis itself results in a go and no-go decision-making process, and if the analysis demonstrates the risk on high level, the project will be immediately terminated (Frankovich, 1998).

### 3.1.3 Agile Manifesto and business objectives

As stated above, the main idea of Agile has gained popularity in the growing software industry mainly because of the shared values. In the Agile Manifesto, values are described as following:



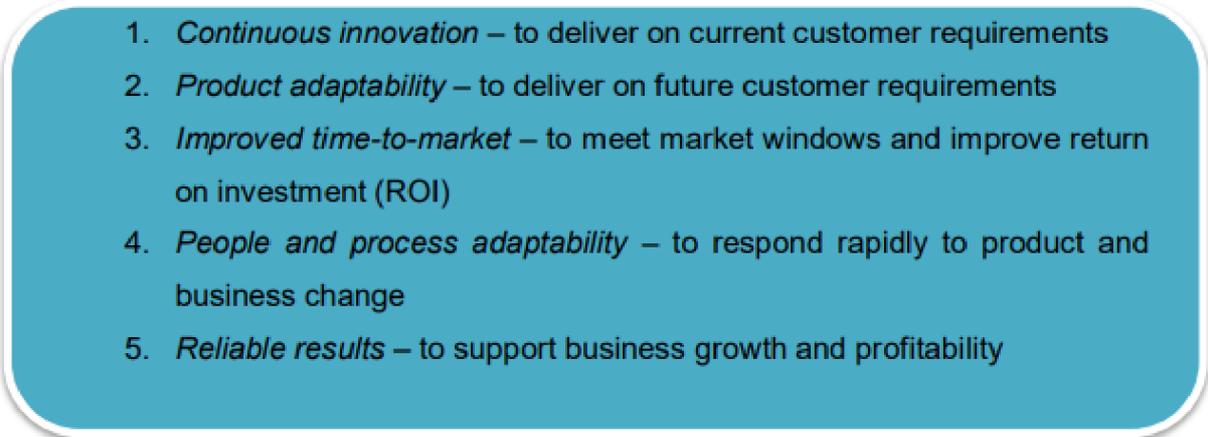
**Individuals and interactions** over processes and tools  
**Working software** over comprehensive documentation  
**Customer collaboration** over contract negotiation  
**Responding to change** over following a plan

Source: The values of Agile Manifesto (The Agile Manifesto, 2011).

The author added the “while there’s value in the items on the right, we value the items on the left more” (The Agile Manifesto authors, 2011). Agile PM covers the Scrum process, which is treated as part of the much larger entity of Agile. A survey of 2015 conducted by Forrester, that the professionals up-to-date, based on the agile practice have demonstrated the efficiency of 86 per cent in the software usage and right allocation of timing for each project, yet 40 % of increase was noticed in the risk avoidance field. He claimed however, many different types of hybrid practices combine different elements and methods such as Waterfall, Lean and Kanban. However, his research was based only on the companies who used Agile, based Scrum processes.

The business objectives that use the Agile PM, are highlighted by Jim Highsmith in the book of Agile Project Management – Creating Innovative Products of 2010. He argued that there are five key components that could potentially help to PM and management process overall.

**Figure 4: Five steps of PM by Highsmith**

- 
1. *Continuous innovation* – to deliver on current customer requirements
  2. *Product adaptability* – to deliver on future customer requirements
  3. *Improved time-to-market* – to meet market windows and improve return on investment (ROI)
  4. *People and process adaptability* – to respond rapidly to product and business change
  5. *Reliable results* – to support business growth and profitability

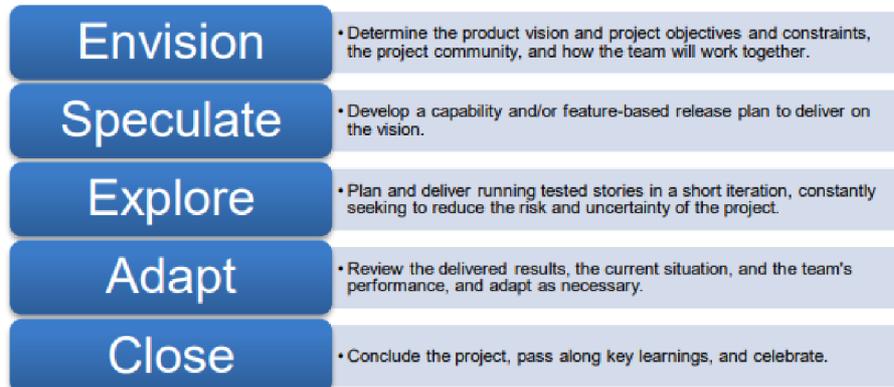
Source: Highsmith, 2010.

He introduced the processes of agile and its framework, focusing on a major phase of a project. He also described the need for a more comprehensive framework has grown tremendously. Various agile methods are now applied in many companies and business organizations, for certain projects. And that's why I personally focus on that edition, since it is tightly linked with the topic of my Diploma Thesis, and the techniques that are described in this book, will be applied, analyzed and the results will be concluded based on the techniques which are offered for Agile Enterprise Framework. Basically, he came up with a four-layered enterprise Framework. Where the first layer represents Portfolio Governance, which overlooks an organizational set of checkpoints to help and evaluate the projects with emphasis on the common concerns of the executive branch, which author describes as „investments and risk“. Directors, investors, and general executives usually want to know the exact (ROI) measure, and the certainty or uncertainty of obtaining the ROI. For the most part, executive do not consider the administrative part of documents to be finished, they want to know about the successfulness of a project and its progress, re-investments, and risks (Highsmith,2010). Project management layer can be used as a substitute guidance to manage and release the project, and also manage the external stakeholders and people outside the core team of the project. He stated that the project management layer if focused on overall project, release activities, assisting coordination among multiple teams and managing factors which are external parts of the project. The Iteration management layer differs from project management in a sense that it mostly has a focus on internally guide planning, execution, and leadership of team towards the iteration itself. This type of management can take place on a daily basis and its activities and has nothing to do with an overall project management, as objectives of these two, differ among each other. The last one on the layer order is the Technical Practices layer, which includes integration and test-driven development among other. He confirms that his book focuses mostly on the first three layers in general. Just because they are project-oriented layers, but he agrees that the foundation of all together deliver an effective result in the technical arena. However, the last is slightly detached from the previous three and it is easier for companies to apply for projects of non-software. Which doesn't mean that the layer is only applicable for software projects, only that it can be more useful in such projects. Highsmith points out that “in applying agile methods for a wide variety of organizations, transforming technical practices are crucial”. The AFM can also be helpful in finding a place and time for agile practices for the organizational growth.

### 3.1.4 The phases of APM – Agile Delivery Framework

Carrying out an agile project requires processes, but they are 5 different processes in relation to a project that is based on the PMBOK Guide. Highsmith (2010) created a framework in order to reach the purpose and its goals, those are shown in Figure below.

**Figure 5: Phases of APM by Highsmith**



Source: Five phases of APM, Highsmith, 2010.

When compared both of these, side-by-side with PMBOK Guide's processes, the differences can be seen instantly. Since the PMBOK Guide's processes motives are straightforward approach based to a project, the APM phases suggest a framework that is considered to be a true Manifesto, without losing the effectiveness of determining a clear set of processes. Processes don't have to be negative and should be linked to business objectives. (Highsmith, 2010).

However, the APM includes both cycles, the traditional approach to PM, and the universe of the management of complexity, because it values communication, observation, perception of project dynamics. However, both of them rely on standards of PM, such as PMBOK Guide, ICB-5 OF IPMA (2013) and ISO standard 100006:2003, which are quite the same in a sense, and nearly 75 per cent according to Saynisch (2010), PM literature has been written.

### **Comparing Agile and Waterfall Models:**

Thompson (2013) described key differences between agile and Waterfall software development strategies, which are described below:

<b>Plan-Driven Process (Waterfall)</b>	<b>Agile Process</b>
Predictive	Adaptive
Fixed scope	Fixed schedule
Adjusted schedule to preserve scope	Adjusted scope to preserve schedule
Long development cycle	Short development cycle (2-4 weeks)
Linear	Cyclic
Organized work within major phases	Organized work within small deliverables
Delivers value at project completion	Delivers value partly, over time

Source: Own.

By looking at the table above, the differences might be clear, however, each of them effects each stage of the project in an absolutely different manner and might even take a different direction of a project, unless it is not risky, so the head of the project decides to terminate the project immediately (Thompson, 2013). He also concluded that the Agile project base, is more likely to deliver some values when unpredictable conditions happen, since it is better prepared for such type of environment. However, short interactions within development frame might potentially create more costs. Therefore, each project stage needed to be understood and uncertainty level should be considered as well, and if everything goes according to the stated plan, the plan-driven strategy might be more suitable and effective.

### **3.2 Project manager and project team**

The chapter is dedicated to the crucial part of any project which, for the most part consists of project manager and project team. Since both parts are essential for any project to achieve a certain success. The chapter will disclose who is the project manager, what are the obstacles of PM, his/her responsibilities, skills, and extra. As if not, having necessary skills the project manager can't function. Additionally, the chapter will cover the qualities of effective teams and factors which affect project performance.

Motivated and skilled project manager and the project team is crucial to achieve success in the project management (Young, 2007). He claims that enthusiasm is one of the vital elements

when selecting the project manager. Project managers not only have to do their duties relating to a job position, but they would have to enjoy it as well. By demonstrating confidence, positive approach and enthusiasm during the work process, they motivate project team members and create a positive environment (Verma 1996, Graham 2004).

A project manager is a person assigned to the project, who is responsible for making project to succeed. Sometimes project managers complaint that the reason for failure in achieving goals of a certain project is the wrong individual that is assigned to the project (Graham, 2004). That's why, PM should select the right individuals for a project, maintain the high attitude, focus on common goals and complete the project on time, within a budget and quality frame (Turner, 2014). Since the importance of communication was already mentioned above, the PM should communicative and should always be in touch with his/her team members, including upper-level management and with other stakeholders of an organization. By creating an open communication environment, the project team members will feel much better, and a trust criterion will be ingrained within the project framework.

According to the Longman & Mullins (2005), good project managers are also good decision makers, responsible people, who are ready to take responsible for preventing obstacles and creating opportunity. Based on the writings on (PMBOK, Guide:6) states that PM interacts with portfolio managers and program managers when a project is within this scope. Due to the fact that multiple objectives might be needed to achieve a set of goals for a certain organization. Most people, however, get their positions by accident. Years ago, people with technical skills were observed to be good project managers. People with good skills in programming, could potentially be good managers in software development projects, engineers are prone to be good managers in product development projects. Overall, the technical side of the project is crucial, but usually it's the easiest and the smallest part than the rest, because the fact that, technical success alone is not able to lead the whole project to the successful stage.

Working as a PM without any skills and knowledge in project management is very challenging and the same could be stressful for any individual. According to Weiss & Wysocki (1992), workers who are assigned to a project and didn't go through any trainings and educational background, usually might face problems and struggling in applying a particular method and a technique, in order to complete the project effectively and finish it on time.

### **3.2.1 Obstacles of the PM**

For the most part, PM have quite a massive responsibility but a very little authority, in comparison functional managers (Meredith & Mantel, 2011). Sometimes there is a confusion

and conflict between functional managers and project managers concerning their roles and duties, specifically in the matrix structure organization. For the most part, there is no clear border between authorities and responsibilities, and hence conflict or misunderstanding arise (Minavand et., el. 2013). In his opinion, the functional manager is focused on day-to-day operations in the particular department. The main difference is that, while project manager tries to achieve project objectives within a certain frame time, budget limits, the functional manager has an ongoing responsibility to manage and allocate resources properly such as, human resources of its department to meet organizational goals (et., el. Mantel, 2011).

Et., el. Mantel (2011) argues that as the capacity of a worker to make others think about him/her seriously and listen to him. If the successful manager lacks the authority, they create it by mobilizing their strength and using it.

Another challenge for project manager is supposed to be a working condition within cross-cultural project team. In today's modern economy and cross-cultural world, it is easily understandable that it has got lots of advantages. Many people and companies assume that diversity is a thing that can create a better-off performance. Besides the mentioned advantages, managing cross-cultural team is very challenging for PM's due to the problems in dealing a language barrier, cultural issues, communication forms, decision making process (Drew, 2014).

Another obstacle which might occur within a team, is the motivational drive. The PM should find different ways to motivated project team members (Turner, 2014). Hence, it will lead to the better results and high performance (Verma, 1997 & Billingham 2008). Based on Verma's research, the stable motivation of the project team members will improve the productivity of the team, increase quality, increase morale and overall project success. The motivated team is able to cooperate much longer, solve different problems within a project, can take extra responsibility and by doing so, motivate other team members as well. In addition, the project manager should bear in mind that the motivation does not last for a long time, each person is motivated in an absolutely different way (Billingham, 2008).

### **3.2.2 PM's responsibilities**

There is a common list of responsibilities for every project manager, that should be followed on a daily basis, such as: organizing, planning, leading and controlling (Westland, 2017 & Bodepudi, 2017).

- Planning, defining the goal of the project, developing project plans, allocation of resources, time and budget, it is very crucial for a project manager to have, critical thinking, time management, resources management skills (Bodepudi, 2018).
- Organizing, implementing the defined project plan, allocating the roles and responsibilities and assigning those responsibilities to the project team members, based on their competencies (Bodepudi, 2018).
- Managing, the project team members so that they perform their duties as planned, and the effectiveness of that performance is seen as a result of the given project or task. (Englund, 2004). In order to do that, it is very important to have the right skills, like people management, the sense of ownerships and mission, political situation to understand the external factors and their impact in certain case scenario.
- Monitoring and making sure the project go well and to do that, PM should control the team on a daily bases, analyze the progress of a project, find the deviations and take corrective actions (Englund, 2004)
- Overlooking and predicting managing project risks, the bigger the project the more likely and higher the chance of risks. That's why PM should predict and analyze future risks before the project starts. As soon as any type of risk is noticed, the PM should immediately deal with it. (Englund, 2004)
- Managing reports and necessary documentation, information about the people involved in the project, history of the project and its results (Englund, 2004)
- Communication is one of the most crucial aspects for the outstanding project manager. Communicative aspect within a project is a necessary thing that project manager will have to perform on a daily basis (Badiru, 2017).

### **3.2.3 Project Team**

This chapter is dedicated to focusing on the importance of project team members for the success of project managers and project itself.

There is no way that project management can be achieved all alone by a project manager, as one individual is not able to think about everything besides his experience and educational background. The number of individuals involved in the project increases as the goal of a project is getting more complicated (Mullins, 2005). There is a need for individuals who can share a moment of work glory at the end of a project, with the project manager. And the collection of those individuals is called project team. (Weiss & Wysocki, 1992).

Henry Ford, the founder of Ford Motor company once concluded, “Coming together is a beginning, Keeping together is progress, Working together is success”. (Billingham, 2008). In order to achieve the project success, with a good project manager, it is very important to build an effective project team from the beginning.

It became very popular to build a team-based structure in organizations. Companies and project benefit when different skilled people work on a certain project together. (et., el. Weiss,1992). He defines the team as a group of people working together to achieve a common goal. Goals and objectives are like a roadmap, that help project manager and project team to understand the scope of the project, assign resources and define the project deadline (Weiss & Wysocki, 1992).

A similar project can be run by different teams. Communications and interactions between team members are based on member’s skills, background, knowledge, and culture. The project team can be run based on the cross-functional aspect, which consists of the individuals from the different departments of the organization. It is designated by the specific and clear targets, with stated boundaries, deadlines, and tools to achieve those targets. Those individuals are connected until the end of the project (Zeuch, 2016).

Wong (2007) claimed that PMBOK-5<sup>th</sup> edition, links people together and eventually give a team diversity which has an advantage in achieving better results and better performance. He claims that every project is evaluated differently and hence project team members including manager are usually judged by the achieved project objectives, which puts a lot of stress on the project manager, the collaboration however, between the project manager and team members is not an easy task to do.

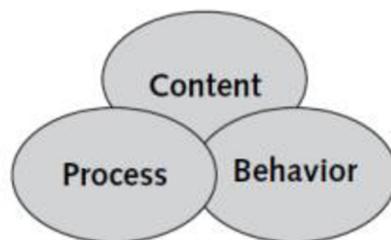
According to the Rogers (2017), good teammates is the main source of a great team. He judges the team member by six qualities of 6B’s, Those B’s are:

- Be selfless – a person who respects other needs ahead of his/her own.
- Be Trustworthy – trust is crucial within any teamwork. Having trustworthiness is highly appreciated within a team and makes communication and collaboration easy.
- Be Humble – modest teammates are mainly focused on the improvement of the team.
- Be Positive – having positive energy within a team is a contagious feeling.
- Be Respectful – being respectful in the team improves the connection within a team.
- Be Great – this is an opportunity for the team members to be great and motivate them ahead of their task.

### 3.2.4 Factors Affecting Team Performance

Wong (2007) claimed that there are at least four different elements to achieve the successfulness performance of the project team: content, process, and behavior. Human factors are combined in all of them. In order to form a proper and successful team, team has to have the ability to develop and agree on the main purpose, goal and the plan of the project, abilities to apply the right tools and techniques to achieve the objectives of the project, ability to communicate effectively and collaborate with the project team members (behavior). Those elements are independent and must work together, so the team would be able to achieve more better results. According to him, he puts human behavior on the first place as every team member has got a different approach to the content and processes. Hence, the behavior should be somehow linked with the individual preferences. Content is, however, should be aligned with the interests of each individual, because every team member is supposed to be motivated for achieving the planned goal. He puts a process on the last place because processes are not stable, depending on the occurred obstacle, the processes have tendencies to adjust according to the problem situation. Nevertheless, all three factors should be aligned with each other. (See Figure 6).

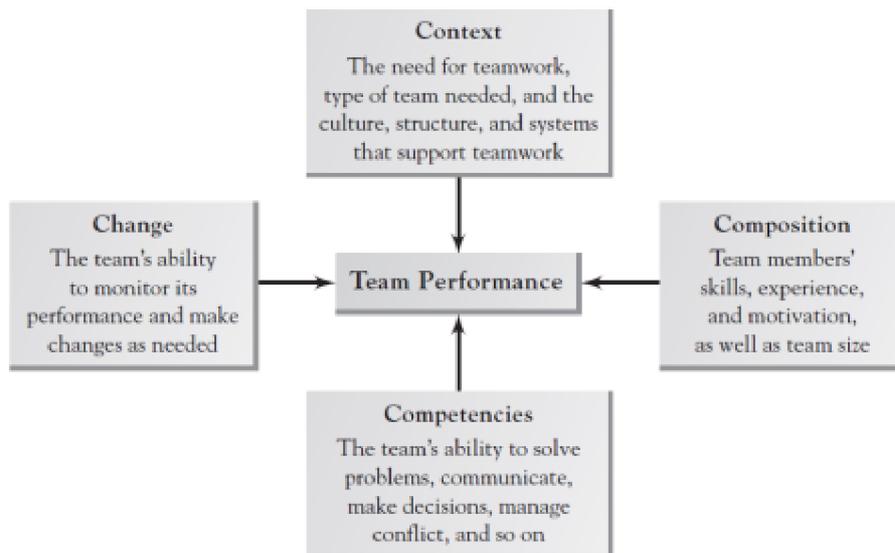
**Figure 6: Key elements of Team Performance**



Source: Wong (2007).

Dyer (2013) did research on how to manage a Temporary Team, a group of people who works together for a short period of time. A good example of a temporary team is a project team. The tasks of the temporary team are quite the same as the task of the permanent teams. He stresses out four C's that must be understood and managed to achieve better team performance.

**Figure 7: The Four Cs of Team Performance**



Source: Dyer (2013).

Different authors emphasize on different factors that can affect the team performance. Root (2017) claimed that employee satisfaction might depend on the feeling of being needed in the team, if a team member feels happy with his/her work environment. Decreased level of satisfaction of the team members can lead to the productivity decrease as well.

Most of the important factors agreed by the authors are:

1. Motivation is one of the key elements that good project managers have to apply in order to increase productivity of the team and its effectiveness. Motivation comes when a team member feels his/her intellectual and emotional needs are met, eventually they feel themselves valued and needed. Those people, create success and make a big difference. Those people can generate necessary motivation in relation to their job. Creating. The environment where people feel motivated, lead to the increase of satisfaction level and leads to an overall performance.

Wong (2007) relies on the dual factor theory by Herzberg, who created main reasons of satisfaction and dissatisfaction. See Figure 8, Hygiene factors are “employment factors that prevent dissatisfaction and are expected to be adequately provided”. However, the other personalized factors are more of a personal level that give a positive satisfaction, like feelings, learning opportunities, achievements, recognition growth and extra.

**Figure 8: Herzberg's Dual Factors**

Hygiene Factors	Motivators
Salary	Recognition
Policies	Responsibilities
Work conditions	Advancement
Administration	Personal achievement
Security	Interest in the work
Safety	Awarding
Supervision	
Interpersonal relationships	

Source: Wong, 2007.

2. Cohesiveness – is the quality of the member's desire to stick to a team and its commitments. It is assumed to be one of the essential factors that lead to the better team performance (Verma, 1997). If similar ideas and opinions are prevailing in the same team within the team members which is meant to be cohesiveness. Eventually it leads to the team satisfaction and better team performance.
3. Trust – is a very important quality that has a high degree between team members. Dyer (2013) stated that there is not good team which exists without a trust. Trust makes a big difference between team members, regardless of how talented and skilled that team members are, if there is not trust among them, there is most probably a high failure percentage.
4. Clarity, in order to achieve a certain objective of the project, the team members should have a an efficient and effectively stated goals and well-defined roles in order to eliminate misunderstanding and conflicts that might come along. (Dyer, 2013).
5. Team size – effective team size is ranged between 3 up to 16 people. This is an amount of the team members where effective communication is still possible, higher than 17 people, the communication might slightly lead to the misunderstandings and dissatisfactions of the other team members.
6. Communication – effective communication is crucial for the success of the team, interaction between team members. Communication involves not only the stated goals of the project but also it focuses on factors of agree and disagree, where is a need for an open communication. (Verma, 1997).

7. Stability – is the thing that helps project team members to manage project effectively. The working environment of a project should be like a second family for team members. The ideas should be shared freely without any judgments, even conversation about concerns or obstacles to their management or even with upper management level. All employees should feel that they treated like a valuable asset of the company and that's where motivation kicks in, to work hardly and effectively. (Atesman,2014)
8. Training – this factor is entitled to make a team performance better. Effective training helps team members to get new information, skills and attitudes which relevant for more effective performance. (Aldag and Kuzuhara, 2015). They claim that theoretical knowledge should be also repeated in order to apply them in practice, how properly use its theoretical knowledge while working on the project. Rogers (1990) made a survey with the inclusion of PMBOK 4<sup>th</sup> edition, where the better performance and achievement of the project objectives in the companies provided 40 % of more training for their employees. Additionally, he concluded that companies that allocated at least 6 percent of the budget for training were way more successful that the ones that spend less than 3.
9. Team Rewards – rewards and other types of recognition of employees is another way to positively reinforce the contribution of team members. According to the theory of expectancy, there are three factors that affect the performance level of the individual: effort, performance, and reward. Usually, employees measure their effort of the work done, by the reward programs.
10. Diversity – it is assumed that diversity factor at work can increase the level of project team performance Diverse project team can identify problems and risks in a very fast way, different views and opinions of people can lead to a creative solution of an occurred problem. (Harrin, 2015) believes that diverse team equals to better team performance.

### **3.3 Theoretical Background of PMBOK Guides 5<sup>th</sup> and 6<sup>th</sup>**

This chapter is based on the PMBOK 5th and 6th guide and companies who have used the guides and had feedbacks on a certain topic. The concept of the success which is highlighted in the PMBOK 5th and 6th. Since both project bodies of knowledges include the same criteria, different people found an interesting comments to each division of the body knowledge. (See Table 1).

#### **3.3.1 Project Management Body of Knowledge**

PMBK covers all factors of project, starting of inception to completion using method and methodologies, tools, decision making techniques, risk assessment and different ways to reach a qualitative outcome. It accounts over 150 tools and different techniques which are part of the Appendix A. There are studies that have studied the correlations between BOK and PM practices from a wider perspective to detect a general use PM practice. (Besner and Hobbs, 2006, 2008, 2012a).

Hobbs (2012) argues that there is a need to fill the gaps on the current body knowledge (PMBOK 5<sup>th</sup> edition) with the framework of the project management practices and achievement of a high level of success, in his opinion this chapter needs to be added. However, he states that the Guide covered all the international institutes advises such as (PMI, AIPM, APM, IPMA) on project management.

IPMA is recorded in the International Competence Baseline (ICB) was deemed to be one of the oldest project management bodies of knowledge (Ghosh and Vogt, 2012). The first project management practice was published in 1987 by PMI, PMBoK Guide has based its standards set on the PMI. Bourne (2011) stated that there is a big difference in competence between PMBoK and ICB.

Institutions such as British Standards Institute, American National Standards Institute, International Standards Organization, Association for Project Management and extra, have set their own standards and guides. The Body of Knowledge PMBoK 6<sup>th</sup> divides a project into multiple modules for better resource allocation to gain a better chance rate for a success project. It is mainly focused on efficiency and not on the lines of project success. It differs from P2M in many ways. As an example, P2M is focused mainly on organization and its program, which makes a classic framework follow the documentary of the project rather than just one project

as standardized in PMBoK 6<sup>th</sup>. Yet, PMBoK 6<sup>th</sup> edition practice has limits for an individual project and has a deadline to finish. P2M is more diverse and has an ongoing approach with involvement of all stages of the project life cycle through services and model systems.

Farahmandian (2013) stated that APMBok of 2005 and PMBoK 5<sup>th</sup> edition are quite similar and has the same stages, where both focus on topics of safety and skills of PM, communicational skills with employees and shareholders. APMBok 2005, focuses on the high overview level of a project management and provide guidelines for those competencies PMs should understand but with an exception that, often there is no necessity to implement these steps for MPs. Besides the application of body of knowledge, the nature and core business of industry determine which PM standards to use, APMBok 5<sup>th</sup> or 6<sup>th</sup> Edition. Hoobs (2012) argues that 5<sup>th</sup> is more likely to be applicable for organizations which work closely to governmental or civil services. Therefore, nowadays it is also applicable for a large and small businesses and complex projects, depending on the industry. On the other hand, Bourne (2011) described an application of 5<sup>th</sup> edition in the field of non-governmental organisation (NGOs) when carrying-out the project in developing countries. He closely described each area of usage.

#### **3.3.1.1 Project Integration Management**

Project integration management consists of the main characteristic of consolidation, unification, communication, and integration which eventually create a full scope of project. (Farahmandian, 2013). He added that it also deals with managing stakeholders in a successful way and meeting their requirements. Kerzner (2017) it also deals with making decisions on allocation of resources, search for compromises withing a competing objectives and alternatives and manage interdependencies between all project management areas. It consists of several managing processes such as: developing project management plans, direct and manage project work, monitor, and control risk of project work, overlook for integrated change control and close all phases of a project.

#### **3.3.1.2 Project Scope Management**

PMBOK (2013) the project scope management focuses on the processes related to activities that are needed to be finished to complete the project successfully. It includes documentation of stakeholders needs, analysis and description of the project, validation of deliverables of the project, controlling and monitoring the status of the project and management changes. Project scope management gives a good guidance for directing on how the scope of the project will be managed. A consistency of scope management is (project charter, project

plan) tools (expert judgement, collect requirement, product analysis) output (scope management, management plan).

#### **3.3.1.3 Project Time Management**

It is crucial part of the project as it relates to complete all the necessary activities and finalize the project within a certain time frame (Farahmandian, 2013). Project time management include planning schedules and processes for establishing policies, procedures and documentation planning, overall costs as well. Time management registers certain actions which should be accomplished to produce deliverables in the project. It also evaluates the duration and periods needed to complete the project as well as structure analysis schedule of activities, duration, and analysis of the right allocation of resources. It also controls and monitors the status and progress of the project and manages changes to the baseline of the original plan. It consists of numbers of inputs such as: (project management plan and charter), twenty-four tools (critical path analysis, expert judgment, analytical procedures, and Gantt diagram).

#### **3.3.1.4 Project Cost Management**

Project cost management deals with the several stages, especially it estimates budgeting, financial, funding, managing, and controlling costs (Schwalbe, 2015). Hence, the project can only be completed by the correct allocation of budget. It also focuses on policy establishments, procedures and planning and documentation costs, expenditures and controlling costs. Additionally, cost management evaluates the whole process in the monetary matter. It checks and controls how budget is allocated through a process of evaluating an approximate cost of every activity related to a project. This type of project consists of (project management plan, organizational process assets), sixteen tools (analytical procedures, 3-point estimation, value management earned) and outputs (cost management plan).

#### **3.3.1.5 Project Quality Management**

All processes of project quality management are related to focused on forming the organizational related quality policies. Aims and objectives as well as responsibilities (Kerzner, 2017). Project quality controls the procedures and policies to execute the quality within organization and makes sure that quality aspects work accordingly to the project requirements. Generally, project quality management focuses on the processes of quality and its standards when a project is being implemented as well as defining results and documenting how the project meets quality requirements.

It also takes into account the auditing process and auditing requirements and the results from the measurement of the quality control which makes sure that the usage of operational standards of quality and similar techniques from the other industries (Farahmandian, 2013)

#### **3.3.1.6 Project Human Resource Management**

Project of Human Resource management consists of a few parts such as:

- Organizational
- Managerial
- Leading

The team in a project will usually comprise with other people who are assigned tasks and obligations to finish the project. Project team members have different skills and knowledge about a certain subject, which eventually helps them all achieve the stated goal of the project. Usually, the Manager of HR department is responsible for allocating the right people for the right positions but also reports the relationship between team members. HR management considers team members availability in order to complete all necessary activities within a project (Farahmandian, 2013). It also on the competences level development of each team member that contribute with its performance. HR management has inputs such as activity resources requirements, environmental factors of company and processes of assets, as well as safety of all co-workers.

#### **3.3.1.7 Project Communication Management**

Project communication management ensures all the process that are related with information. All processes required for adequate and on time delivered information which undergoes to planning, collection, distributing, managing and extra. Therefore, communication management focuses on time spent by PM's communication with team members and stakeholders (internal and external) (Schwalbe, 2015). Communication management, when done effectively, builds a bridge where team members and even stakeholders communicate among them. Eventually, it opens for exchanging experience and perspectives. When done ineffectively, most probably it could cause project failure and may include progress, reports, and other documentation. Management communication has such inputs as: (stakeholder register – always done in auditing processes, project management plan, environmental factors of industry), tools (communication requirements, communication technology, models, and methods), outputs (project document updates).

### **3.3.1.8 Project Risk Management**

Project risk management consists of several processes such as conduct risks management planning, identifying, and analysing and controlling risks within a project. It focuses and tries to predict future risks and acts accordingly to avoid a probability of occurrence. Additionally, that's where project communication considers the process of developing options and actions to avoid threats to achieve the objectives of the project. It can be done by implementing risk plans and monitoring risk programs. Risk project management consist of (project charter, stakeholder register, enterprise environmental factors), tools (analytical techniques, opinions of experts) and output (risk management plan). Additionally, it is much better to identify such risks at the beginning of the project, so it will be way more effective to finish the project (Hobbs, 2012).

### **3.3.1.9 Project Procurement Management**

Project procurement management works with the processes of purchasing raw materials or services (Hobbs, 2012). Mostly it deals with administrative work, managing contracts and controlling processes that are required to develop administrative contracts and purchase orders. It monitors all processes related to a contract performance, sales, discounts, volumes and extra. There are inputs that are used by procurement (required documentation, project schedule, stakeholder register) and tools (judgment, bidder conference, performance reporting) as well as inputs (documentation, source selection criteria, document updates).

### **3.3.1.10 Project Stakeholder Management**

Project stakeholder management consists of such processes that are required to identify stakeholders (team members related to a project), organizations and groups who may affect the project and may be affected by the project Kerzner (2017). Stakeholder management analyses stakeholder's expectations from the project and makes proper strategies for an effective interaction of stakeholders in decisions linked with project. Communication of stakeholders is constantly about needs and expectations, solving problems and addressing conflict situations among stakeholders (Drew, 2014). Stakeholders have some inputs as well (project charter, organisational assets), tools (stakeholder analysis, methods of communication) and outputs (register of stakeholders).

## 4 Practical part

Since the author has chosen the company which implements the standards of PMBOK Guide 6<sup>th</sup>, the short information about the company will be relevant and especially about the people who apply techniques and methods of PMBOK Guide 6<sup>th</sup>. The company's name is "2N Telekomunikace a.s." and the following data was retrieved from justice.cz

Date of creation and registration: June 19, 2000

File number: B 6613 held at the Municipal Court in Prague

Trading company: 2N TELEKOMUNIKACE a.s.

Residence: Prague 4, Modřanská 621/72, postal code 14301

Identification number:26183960

Legal form: Joint-stock company

Scope of business: manufacture, installation, repair of electrical machinery and apparatus, electronic and telecommunications equipment

activities of accounting consultants, bookkeeping, tax records

production, trade, and services not listed in Annexes 1 to 3 of the Trade Licensing Act

Stocks: 5,115 registered shares in paper form with a nominal value of CZK 10,000

Basic capital: 51,150,000 CZK

Paid: CZK 51,150,000 – CZK.

The company is engaged in production of communication services, such as touch pads, cameras ensuring the safety of households and private areas in general.

The company has been bought by the Swedish group of Axis in 2016, based on the financial report of 2020, company didn't experience much of a burden due to coronavirus, it has slightly affected the working environment, but in terms of sales, it did have any impact.

## **The management board of 2N Telekomunikace a.s.**

Michal Kratochvil – Chief Executive Officer (CEO)

Josef Besta – Chief Operations Officer (COO)

Tomas Klima – Chief Sales Officer (CSO)

Jan Mastalir – Chief Technology Officer (CTO)

Jan Pleskot – Chief Financial Officer (CFO)

Monika Rousova – Chief Human Resource Management (CHRO)

Tomas Vystavel – Chief Product Officer (CPO)

Jan Makalous – Director of Procurement and ICT

Petr Polanecky – Director of Manufacturing.

For the year of 2020, in the department of HR, the main problem was the Covid – 19, due to its restrictions and lockdown period, company had cut its employees by 5 % only. However, the company has gained the certificate of BOZP (ISO 45001) which eventually will improve the working conditions in the long terms.

### **4.1 Satisfaction survey of 2N Telekomunikace a.s.**

Every year, the company runs an anonymous survey which is focused to gain feedback of employees and their level of satisfaction and especially their motivation, which is a key factor of running such a successful company. The survey is focused mainly on whether people feel happy and needed among their team members. The total amount of workers who participated in the survey for the year of 2020, was 66 %, out of it 89 % responded positively. Workers value the working conditions and history of the company in general. Additionally, participants responded positively in terms of relationship with their managers and bosses. The company also has the environmental certificate of ISO 14001, which is focused on saving environment and propagate it in a good manner.

The company applies the PMBOK Guide 6<sup>th</sup> knowledge since 2016, right after the Swedish acquisition.

## 4.2 Survey assessment of 2N - Telekomunikace a.s.

As a main methodological tool that the author constructed was a survey which covered the whole-body knowledge of PMBOK Guide. However, after reading the theoretical parts, the author discovered that not every knowledge area is being used by companies, some companies focus on certain areas that they have obstacles with, that why the survey was sent to CFO – Mr. Pleskot for evaluation and defining what knowledge areas are important for 2N Telekomunikace a.s. and why. Additionally, the author put the “Stage of Risk” for each knowledge area and for how long every knowledge area has been applied. The results are the following (See Table – 2).

**Table 2: Knowledge areas of 2N Telekomunikace a.s.**

Project Name	Years of implication	Usage	Reason	Feedback	Stage of risk
Project Integration Management	4	No	We used integration project management till the end of 2019, however, after covid situation, much of integration have shifted online. We spend thousands of dollars to set the integration processes within the company, now it works perfectly fine. However, there are no limits to improve.	Not important	Low
Project Scope Management	0	No	The Axis group which we fall into, has taken over the Project Scope Management and runs it, we basically have nothing to do the Scope management, because it is not much of a focus, we rather discuss it with our Swedish colleagues and set the scope accordingly.	Indifferent	Low
Project Time Management	5	Yes	Very important for the projects especially, every project that we have run for the past 2 years had to be on time. The pressure was big, however we managed to achieve big success. Our main projects of 2N IP Solo and 2N Indoor View.	Very Important	Medium
Project Cost Management	5	Yes	As we are partly dependent on the Swedish branch, we share costs and profits together. Very important management area, which helps to analyse the direction of the company and helps to realize the direction of the market in general.	Very Important	High
Project Quality Management	5	Yes	Quality is all we have. We overspent our budget in the year of 2020, for the Research and Development, due to improvements in a high quality of our product's portfolio. We even signed new contracts with suppliers of IT equipment's, such as Cisco and Nefta company to improve our quality.	Very Important	Medium

Project Human Resource Management	5	Yes	Very volatile area to work in. Our Human Resource management and acquisition managers went through recruitment trainings, COVID-19 has slowed things down in production area, so we had to find external companies and talents abroad. Now we could see it recovering. We expect it to be back on track within the next 2 years.	Very Important	High
Project Communications Management	5	No	Not much of a focus for our group.	Not important	Low
Project Risk Management	5	Yes	Risk is highly volatile factor that merges with the cost and quality management areas, we do consider risk analysis of markets. We monitor our competitors and try to Improve our quality of products and services. Our risks are avoided with the help of reports and proper risk assessments.	Very Important	Medium
Project Procurement Management	5	Yes	In the procurement department, we only work based on the contracts signed with our suppliers. Every vendor is put in the Helios system that we use. It helped us to be competent and accountable.	Important	Low
Project Stakeholder Management	5	Yes	Stakeholder management is crucial for our company. It keeps us updated about our current situations. For the past 4 years we managed to pay all our dividends to our stakeholders and investor. We have built good relationship with all of them.	Important	Medim

Source: Own, Excel.

Based on the short overview of Mr. Pleskot's comments, there are six main knowledge areas which the whole organization focus on. In the next step, the author found out how many people are involved in each knowledge areas and used a scaling method, to rate the importance of each. However, after an online discussion with Mr. Pleskot, he explained that the whole MPBOK Guide has helped them to be more open to obstacles and predict the situations in the future.

**Table 3: Project Cost Management**

Project Cost Management	Total	Very important	Important	Moderately important	Less Important	Not important at all.
Communication	18	67%	22%	11%	0%	0%
Importance of analytical skills	18	67%	17%	0%	11%	6%
Cost of quality	18	78%	17%	6%	0%	0%
Forecasting	18	56%	17%	17%	0%	11%
Performance reviews	18	50%	28%	22%	0%	0%
Published estimating data	18	100%	0%	0%	0%	0%
Project management software	18	100%	0%	0%	0%	0%

Source: Own, Excel.

It is significantly important tools that help us to understand whether we are close to achieving our business objectives and are we meeting our quality requirements? There are 18 people who directly involved in the management of costs, and the author chose the tools that might be applicable within this project management scope because cost management overlooks different processes, of estimating, budgeting, and controlling the life cycle of the project, with its objective of not over drafting the bank account with unnecessary purchases. Since it focuses on production of IT devices, the purchases of materials are not quite stable for the past 2 years, due-to covid lockdown, 30 % of our supply chains have stopped. Hence, the company had to restructure its logistic which turned out to be very costly. Main tolls that are important for such project is shown in Table – 3, and results are the following: Communication is important for 89 % out of 18 people who are involved in this management processes, for 11 %, around 2 people, communication is not that important because they are more involved in the modelling of cost management projects. Analytical skills are also important for majority of participants around 84 %, however not important at all for 17 % of the sampling, which again covers around 2-3 participants. Cost of quality is important for the 94 %, due to its high correlation with the quality management project, and for 6 % it is indifferent. Forecasting important for 72 % in total, for 17 % are indifferent and for 11 % are not important at all. Performance reviews are important for 78 %, and 22 % of workers feel indifferent towards that tool. Data estimation and project management software are important for all workers with the ration 100%. For the whole organization, this project management scope is at a risky stage.

**Table 4: Project Time Management**

Project Time Management	Total	Very important	Important	Moderately important	Less Important	Not important at all.
Expert time judgment	82	70%	20%	2%	4%	4%
Decomposition	82	31%	2%	7%	20%	40%
Group-decision making techniques	82	28%	39%	20%	13%	0%
Schedule network analysis	82	43%	49%	2%	6%	0%
Critical path method	82	16%	49%	16%	19%	0%
Gantt diagram	82	46%	21%	12%	16%	6%
Schedule tool	82	61%	18%	18%	4%	0%

Source: Own, Excel.

In general, after the dialogue with the board management, the always stick to the plan, in order to be much efficient with their time. The time is needed to be organized in a way to complete all the projects on time, it is very necessary, because the team of workers needed to be organized. When considering time management, it is highly linked with the stakeholder's objective, as they control the processing of all activities within the organization. This is the most mysterious management, due to its unpredictability. It involves so many tools for time management to be properly set-up: CPM Techniques, What-if analysis, Critical chain methods and extra. However, the author gained an information before structuring the survey that this is an important topic to cover, due to its successful project release of 2N and the end of the year (See Table – 2.) the company uses main tools are demonstrated in the Table – 4. Based on the worker's responses, and to notice, there are more people who are involved in this management, 82 people within the whole group. The results are the following:

Expert's time judgment is important for 90 % of the respondents, meaning that within the time management, for 2 % of participants its moderately important, and the left 8 % of participants do not feel the importance and need of experts with the allocation of time within a project. Decomposition isn't relevant for the majority of participants, as Mr. Pleskot and Mr. Vystavel explained that the project is not divided into small parts, rather those parts are big and there are certain amount of people who are involved in the projects, so there is on need to decompose the projects into small parts. However, decomposition of time is still important for 33 % of participants, for the rest of the people it is rather unimportant which is the majority of participants. Group – decision making techniques are relevant for only who are directly involved in the decision processes, which are 67 % of workers out of 82 participants. The rest have minor decision processes or are not involved at all.

Schedule network analysis is important for 92 % of workers, as they allocated their time in a way to be productive and more efficient with all processes of projects, another 8 % fell unimportance of the tool. Critical path method is correlated with the schedule network analysis and being important for 65 % of workers, for 16 % it is indifferent and for 19 %. Gantt diagram is used by 67 % of workers to allocate their time properly, the rest in author's assumption the diagram is not used, which are 33 % of workers. Schedule tool is important for 79 % of participants, for the rest it is either unimportant or moderately important.

**Table 5: Quality Project Management**

Quality Project Management	Total	Very important	Important	Moderately important	Less Important	Not important at all.
Cost – benefit analysis	40	63%	30%	8%	0%	0%
Benchmarking	40	78%	10%	13%	0%	0%
Quality audits	40	88%	12%	0%	0%	0%
Quality management and control tools	40	87%	13%	0%	0%	0%
Process analysis	40	62%	12%	13%	13%	0%
Decision tree	40	45%	5%	25%	25%	0%
Inspections	40	45%	18%	30%	8%	0%

Source: Own, Excel.

Based on the quality project management, the company has overreached its budget limit for the year 2020. In order to improve the quality of their product portfolio. However, its costs have been covered with by the excessive net income, that’s why the stage of risk in the project management is medium. The tools are demonstrated in the Table – 5. It has been applied since the beginning and the company still relies on some tools that are more comfortable for the workers. The survey regarding quality project management consisted with the following results: 92 % of workers responded that the analysis of cost benefit is relevant, and only 8 % of workers responded that the feel indifferent. Benchmarking, or another words “Testing” is relevant for the 87 % of workers, as they are being a part of production and the rest are responsible for expedition of the final product, so logically it makes sense that 13 % are not involved into the benchmark. Quality of audits is relevant for all the scopes in the project management. Since it concerns the audit quality of products, all the production side should comply with the standards, so hance for all the participants it is very important, 100 % of workers, they should have all documentation and supporting materials in order to verify its quality. The audit management and control tools are an internal tool than helps the company to be more organized for the processes of audit and quality controls from the state institutions, it is highly correlated with the quality of audits, and the results are quite the same, in total in is important for every participant, which indicated that the company treasures and values its quality framework. Process analysis is important for the 74 % of participants, indifferent for 13 % and for 13 % is not important at all, hance most workers do consider analysis of the quality very relevant. Decision tree is another tool which is applied in the company, however not every worker is involved in the decision processes. The ration in percentage have split apart, for 50 % each, important and indifferent or unimportant.

Inspections are important for MP's the most, most managers control and inspect the quality of project and make sure that it is in line with the standards and doesn't break any copy right or plagiarism of any kind, even documentary. As a tool, it is important for the 63 % of workers among 40, and the rest fell either indifferent or unimportant.

**Table 6:HR Management**

HR Management	Total	Very important	Important	Moderately important	Less Important	Not important at all.
Networking	15	73%	27%	0%	0%	0%
Expert judgment	15	74%	13%	13%	0%	0%
Negotiation	15	33%	67%	0%	0%	0%
Acquisition	15	100%	0%	0%	0%	0%
Virtual team	15	87%	13%	0%	0%	0%
Interpersonal skills	15	93%	7%	0%	0%	0%
Trainings	15	100%	0%	0%	0%	0%
Team building activities	15	87%	13%	0%	0%	0%
Recognition and rewards	15	100%	0%	0%	0%	0%
Personal assessment tools	15	80%	13%	7%	0%	0%
Conflict management	15	100%	0%	0%	0%	0%

Source: Own, Excel.

HR is being the riskiest project management for the company. Due to covid-19, the company still tries to recover after it, many employees had been cut from their working position (See Table – 2). There are more than 15 people are involved because company works with 4 different external acquisitions hunter companies in order to attract the right and competent workers. However, based on their assessments, all of the tools that have been chosen by the author were absolutely important due to high shortage of skilled labour force. Networking is very important for the whole department. Expert judgment is also important for the workers to know how to attract the right talents better and faster. Negotiation skills are important for all workers. Acquisition as a process is very important for all workers, they use that tool to see the closing ration of each acquisition talent signed. Virtual team is a platform that they use as a tool for interaction, especially during the covid lockdown. Interpersonal skills, is a tool to see the matching skills of potential worker and what the actual position requires, it is important for the all workers. Trainings is important for all participants, as additionally revealed they spend the whole budget on trainings of their employees, and again because of the lockdown. There were not go-outs as a firm, or Christmas parties, the whole budget was allocated for trainings. Team building activities are important for all workers of HR department, however most of the team building went online. Recognition and rewards are also important for all workers, as they believe that employees needed to be recognized and rewarded within the company. However, they noticed that the environment became more competitive internally, which positively influence the motivation of all workers. Personal assessment tool is also very important for the

majority of workers involved in the HR department, 93 %, however 7 % are only working as a support assistance and doesn't deal with the assessment of the workers. Conflict management is also important as a tool to solve any conflict between the workers, especially within team members. On the end of each phase of the project, the workers receive a short survey where they are able to comment and give their personal satisfaction level, after the HR department rates an overall survey and in case of a conflict, which is detected by evaluation worker's responses.

**Table 7: Risk Management Project**

Risk Management	Total	Very important	Important	Moderately important	Less important	Not important at all.
Analytical techniques	14	71%	29%	0%	0%	0%
Assumption analysis	14	29%	29%	28%	0%	14%
Expert risk judgment	14	71%	29%	0%	0%	0%
Risk probability and impact assessment	14	79%	21%	0%	0%	0%
Risk urgency assessment	14	71%	29%	0%	0%	0%
Modelling techniques for risk occurrence	14	29%	71%	0%	0%	0%
Risk of audit	14	71%	29%	0%	0%	0%
What if scenario	14	14%	14%	36%	36%	0%
Tracking risk issues	14	79%	21%	0%	0%	0%

Source: Own, Excel.

Risk management project covers all project at once, especially risk management project has been constantly monitoring the Human Development Project management for the year 2020, as well as Cost Management Project and Quality Project Management. However, risk is an unpredictable in all areas mentioned. An overall survey with the scaling method demonstrated in Table – 7. There are 14 people who are involved in the risk management project. All of the responded that the analytical techniques are important tool to assess the risk management. Assumption analysis is important for the 58 % of workers, 29 feel indifferent and 14 consider it as not important. The risk management project covers the top board management of 2 people who might not rely on assumptions much, they only base their risk analysis on current situation, but this is just a theory. However, 14 % of workers, which is 2 workers consider the tool as not important. Expert risk judgment is very important for all workers, indeed Mr. Pleskot explained that they work within Axis group with many experts who are also involved in the risk management and provide support in order to avoid risky situations, by elaborating together. Risk probability and impact assessment is very important for all workers. As every risk possess an impact, the assessment helps to understand of what kind the impact will be, whether positive or eventually negative, and the additional tool that could be used is the Risk urgency assessment which has a 100 % ratio votes for as important, as the company tries to act accordingly as soon as the risk is detected or has a minor detection assumption. Modelling techniques for risk occurrence is a good tool to know upfront, what is exactly going to be happening, in case of risk, how big of an impact it could have on the project, according to the worker’s responses

this tool is important as the two above it. Risk of audit has also achieved a 100 % rating importance. As the auditing can reveal the risk that might not be seen inside the company, it is however linked with an expert judgment that are also important for the workers. What – if scenario as a tool, didn't gain much of importance, only 28 %. The 36 % of the workers feel indifferent towards it and the equal proportion considers it to be unimportant. Tracking issues has also gained a 100 % rating of importance for the workers in the risk project management. Mr. Pleskot explained that the risk assurance for the 2N Telekomunikace in 2020 was mainly due to Brexit. The UK market was 15 % of the net income profit for the year 2019. Hence the decision of United Kingdom to exit, assumed to have such a negative impact of the company, that they started to consider cutting its employees from production facilities and hence it eventually impacts the Time Project Management and Quality respectively. However, company did fire employees, but it reacted to that risk so quickly, by attracting foreigners to work for relatively cheaper price. The balance was equal, and the company managed to overcome challenges due to Brexit and covid lockdown. However, the small risk might even be considered a delivery of raw materials for a project, that have been stuck somewhere and the team of engineers supposed to make it on time, but due to such a small problem, it might impact the whole project and the desired outcome. As every contract entails the promised obligations and in case these obligations are not met from both sides, the fees are inevitable.

**Table 8: Procurement Management Project**

Procurement Management Project	Total	Very important	Important	Moderately important	Less Important	Not important at all.
Make or buy analysis	48	56%	23%	6%	10%	4%
Expert judgment	48	46%	25%	4%	25%	0%
Market search	48	77%	2%	0%	21%	0%
Advertising	48	29%	15%	6%	31%	19%
Procurement negotiations	48	46%	6%	25%	23%	0%
Contract change control	48	50%	4%	25%	21%	0%
Inspections and audits	48	60%	29%	7%	4%	0%
Payment due	48	73%	27%	0%	0%	0%

Source: Own, Excel

Procurement management project entails 48 people, who uses different tools to run it smoothly. The procurement department is an important part of projects, as it looks for better deals in components and tries to find a better one. Procurement department reports every month to the CFO, with its budgeting constraints and overall spendings, based on the information the margins are set accordingly so the company doesn't loss its value and doesn't exceed its costs in general. However, procurement department is only responsible for the purchases which are planned, there are rare situations of uncertain purchases. The supply chain is set in the way that helps the CFO predicts its spendings for the quarter ahead. The tools that are used within the Procurement Project Management are listed in Table – 8.

Make or buy analysis is important for the 79 % of workers, the 6 % feel indifferent and for 14 % it is not important, as part of the workers are from the warehouses all over the Czech Republic, so they might be a part of supply chain, however not directly involved into the purchase activities. Expert judgment is important for the 71 % of workers, and most of these workers are of higher positions in the company, who make decisions on deals with the suppliers. The rest of the workers fell either indifferent or less important towards this tool. Market search is important for 79 % of workers, as it is correlated with make or buy analysis, which have the same ration of workers, defining it as important. However, the rest do not feel like this tool could be helpful for them. Advertising is important for the 44 % of workers, which only concerns the top managers who might have noticed a good deal, based on the advertising, the rest of the suppliers have long-term contracts and relationships, where all the prices and terms are already agreed, so there is no need for the rest of the workers who are involved into this project to consider advertising as important. Procurement negotiations are important for 52 % of workers, 25 % feel indifferent and 23 % chose the tool as less important. However, there are

again, people of a higher positions and power who negotiate in the processes of procurements. Contract change control is important for 54 % of workers which double checks all terms and agreements within a contract, the tool is very crucial for organizations. Usually, law people with the high analytical skills are needed for such tool usage. 25 % of workers feel indifferent towards this and 21 % feel its tool is less important within their daily activities. Inspections and audits are important for 89 % of workers and the rest either feel indifferent or consider it less important. However, 89 % is a high ration, which might indicate that audit processes in every project management is something that company should be in line with. Which indicated a good controlling mechanism, internally. Payment due is important for 100 % of workers, as they value the relationships with their vendors and make sure that everything is received on time.

**Table 9: Stakeholder Management Project**

Stakeholder Management Project	Total	Very important	Important	Moderately important	Less Important	Not important at all.
Stakeholder Analysis Matrix	10	100%	0%	0%	0%	0%
Expert judgment	10	100%	0%	0%	0%	0%
Analytical techniques	10	100%	0%	0%	0%	0%
Communication methods	10	100%	0%	0%	0%	0%
Management skills	10	100%	0%	0%	0%	0%
Negotiation skills	10	100%	0%	0%	0%	0%
Law knowledge	10	100%	0%	0%	0%	0%
Market Analysis	10	100%	0%	0%	0%	0%

Source: Excel, Own.

Stakeholder Management Project, there are only top board management workers who are involved in this project and carry out the responsibilities that should be fulfilled. Every stakeholder needs to be informed about the project as they are interested in the direction of the company. The company's goal is to win as many stakeholders as possible. The results of the survey are demonstrated in Table – 9.

Stakeholder analysis matrix is a tool which helps the project managers (In the company's case to cover as many people as possible and place them into the matrix in order to identify the importance of each member. Overall, it helps the company to understand the stakeholder's initiatives and whether they support the project or behave critically. Expert judgment as a tool is also very important for all the workers, experts in this field, might identify a risk occurrence before ahead, and keep the management informed about potential risks within stakeholder management project, that's why it is important. Analytical techniques is a tool which is used on general meetings, where a brainstorming analysis is used to evaluate the potential success and options to improve the project, for all workers it is very important. Communication method is also important for all workers together with the management skills, every top project manager should have all managerial skills to run a project effectively, in order to accomplish its goals and objectives. Negotiation skills are very important for all workers, in case of a risk occurrence, every member of the stakeholder project management should be able to solve any problem that might occur whilst project is in run. Law knowledge is also very important for all workers, together with the market analysis. Stakeholder project management seem to be very consistent.

### 4.3 Verifications of assumptions

To verify the assumptions, the author uses the Cronbach's Alpha Test, where criteria of the outputs could be described the following way:

Picture 1: Cronbach's alpha Test

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Source: Statistics.com (2014)

#### Project Cost Management assumptions

	Strongly Agree	Agree	Disagree	Strongly disagree
Increased motivation might increase a project team performance.	1	2	3	4
Project team performance depends on the open communication with a project team leader.	1	2	3	4
Performance review might increase a chance of better results for the next project and increase an overall performance of each employee.	1	2	3	4

#### Output of the test:

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Rows	13,95555556	29	0,481226054	4,038585209	3,04408E-06	1,662900781
Columns	1,755555556	2	0,877777778	7,366559486	0,001409865	3,155931971
Error	6,911111111	58	0,119157088			
Total	22,62222222	89				
		Cronbach's Test	0,752388535			

Source: Own, Excel.

Based on the Cronbach's test, the author can conclude that the people who are involved in the Project Cost Management have the same opinions, and that the assumptions are acceptable.

### Project Time Management

	Strongly Agree	Agree	Disagree	Strongly disagree
Experts' opinion is very important for the team performance, it might positively impact the outcome of the project.	1	2	3	4
Gantt diagram is very effective tool to allocate every team member's time properly.	1	2	3	4
Critical path method helps to save time and cut costs.	1	2	3	4
Group decision process usually might prolong the final decision hence project time management.	1	2	3	4

### Output of the test:

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Rows	19,22727273	32	0,600852273	5,294853964	1,10327E-10	1,564048497
Columns	17,60606061	3	5,868686869	51,7162726	5,58336E-20	2,699392598
Error	10,89393939	96	0,113478535			
Total	47,72727273	131				
		Cronbach's Test	0,811137379			

Source: Own, Excel.

Based on the Cronbach's test, the author can conclude that the people who are involved in the Project Time Management have the same opinions, and that the assumptions are acceptable.

### Project Quality Management

Quality	Strongly Agree	Agree	Disagree	Strongly disagree
Cost benefit analysis might affect an overall quality of project.	1	2	3	4
Inspections and audits might reveal the areas where the quality might be improved.	1	2	3	4

### Output of the test:

ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Rows	2,32	24	0,096667	4,833333	0,000133	1,98376
Columns	0,02	1	0,02	1	0,327287	4,259677
Error	0,48	24	0,02			
Total	2,82	49				
		Cronbach's Test	0,793103			

Source: Own, Excel.

Based on the Cronbach's test, the author can conclude that the people who are involved in the Project Quality Management have the same opinions, and that the assumptions are acceptable.

### Human Resources Project Management

	Strongly Agree	Agree	Disagree	Strongly disagree
Trainings of employees increases their efficiency within a project and saves time.	1	2	3	4
Recognition is very important factor that influences an overall performance of a team.	1	2	3	4
Negotiation skills are relevant skills to have for an HR Manager	1	2	3	4
Team building activities can bound team members together	1	2	3	4

### Output of the test:

ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Rows	3,6	9	0,4	1,862069	0,102276	2,250131
Columns	1,7	3	0,566667	2,637931	0,069884	2,960351
Error	5,8	27	0,214815			
Total	11,1	39				
		Cronbach's Test	0,462963			

Source: Own, Excel.

Based on the Cronbach's test, the author can conclude that the people who are involved in the Project of Human Resource Management have different opinions regarding the assumptions, thus the assumptions cannot be verified internally, the Cronbach's test is unacceptable.

### Risk Management Project

	Strongly Agree	Agree	Disagree	Strongly disagree
Experts' opinions help to reconsider company's direction and avoid risks.	1	2	3	4
Modelling techniques help to avoid risk without any costs.	1	2	3	4
What if scenario is vital for board management.	1	2	3	4

### Output of the test:

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Rows	2,358974	12	0,196581	2,875	0,013335	2,18338
Columns	28,35897	2	14,17949	207,375	7,18E-16	3,402826
Error	1,641026	24	0,068376			
Total	32,35897	38				
		Cronbach's Test	0,652174			

Source: Own, Excel.

Based on the Cronbach's test, the author can conclude that the people who are involved in the Project Risk Management have different opinions about the stated assumptions, the test shows that assumptions cannot be acceptable within the group, as opinions deviate among the workers.

### Procurement Management Project

	Strongly Agree	Agree	Disagree	Strongly disagree
Market search is vital to save costs and find cheaper vendors.	1	2	3	4
Contract change control helps to save money.	1	2	3	4

### Output of the test:

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Rows	13,77273	43	0,320296	3,482759	3,96E-05	1,660744
Columns	20,04545	1	20,04545	217,9655	1,92E-18	4,067047
Error	3,954545	43	0,091966			
Total	37,77273	87				
		Cronbach's Test	0,712871			

Source: Own, Excel.

Based on the Cronbach's test, the author can conclude that the people who are involved in the Project Procurement Management have the same opinions, and that the assumptions are acceptable.

### Stakeholder Management

	Strongly Agree	Agree	Disagree	Strongly disagree
Only board management deals with the stakeholders	1	2	3	4
Analytical techniques help the board management to understand the direction of the market	1	2	3	4
Expert judgment might help the board management to negotiate the criteria of contracts.	1	2	3	4

### Output of the test:

ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Rows	3,633333	9	0,403703704	2,945946	0,024407	2,456281
Columns	0,866667	2	0,433333333	3,162162	0,06654	3,554557
Error	2,466667	18	0,137037037			
Total	6,966667	29				
		Cronbach's Test	0,660550459			

Source: Own, Excel.

Based on the Cronbach's test, the author can conclude that the people who are involved in the Project Stakeholder Management have the same opinions, however, the assumptions deviate mostly in the 3d assumption, that's why totally, assumptions are under the question and cannot be fully accepted.

## 5 Analysis

Based on the survey with the scaling method, the author first of all send the requirements to identify what knowledge areas are relevant for the company and created it in a way of table review. (See Table – 1).

Based on the Table – 1, the author has gained an information that company doesn't have much of a focus on the following knowledge areas:

- Project Integration Management
- Project Scope Management
- Project Communication Management

The rest of the knowledge areas are applied till today, with the help of MPBOK Guide 6<sup>th</sup>. The company every year, runs a survey around the company to identify the level of satisfaction of each employee, it is not however obligatory to participate.

The survey is focused mainly on whether people feel happy and needed among their team members. The total amount of workers who participated in the survey for the year of 2020, was 66 %, out of it 89 % responded positively. Workers value the working conditions and history of the company in general. Additionally, participants responded positively in terms of relationship with their managers and bosses. The company also has the environmental certificate of ISO 14001, which is focused on saving environment and propagate it in a good manner.

The author's goal was to identify, how exactly the PMBOK Guide 6<sup>th</sup> helpful within all project management areas. In order to do that, the author used questions of scaling method, and the results were demonstrated in the percentage ratio. Additionally, the author came up with assumptions which all the employees at the end of the survey have either confirmed or rejected. The main test that the author relied on was the Cronbach's test, to verify the collective assumptions.

## **Assumptions**

### Project Cost Management

- Increased motivation might increase a project team performance
- Project team performance depends on the open communication with a project team leader
- Performance review might increase a chance of better results for the next project and increase an overall performance of each employee.

Based on the Cronbach's test, the author can conclude that the people who are involved in the Project Cost Management have the same opinions, and that the assumptions are acceptable.

### Project Time Management

- Experts' opinion is very important for the team performance, it might positively impact the outcome of the project.
- Gantt diagram is very effective tool to allocate every team member's time properly.
- Critical path method helps to save time and cut costs.
- Group decision process usually might prolong the final decision hence project time management.

Based on the Cronbach's test, the author can conclude that the people who are involved in the Project Time Management have the same opinions, and that the assumptions are acceptable.

### Quality project Management

- Cost benefit analysis might affect an overall quality of project.
- Inspections and audits might reveal the areas where the quality might be improved.

Based on the Cronbach's test, the author can conclude that the people who are involved in the Project Quality Management have the same opinions, and that the assumptions are acceptable.

### HR Management

- Trainings of employees increases their efficiency within a project and saves time.
- Recognition is very important factor that influences an overall performance of a team.
- Negotiation skills are relevant skills to have for an HR Manager
- Team building activities can bound team members together

Based on the Cronbach's test, the author can conclude that the people who are involved in the Project of Human Resource Management have different opinions regarding the assumptions, thus the assumptions cannot be verified internally, the Cronbach's test is unacceptable.

## Risk Management

- Experts' opinions help to reconsider company's direction and avoid risks.
- Modelling techniques help to avoid risk without any costs.
- What if scenario is vital for board management.

Based on the Cronbach's test, the author can conclude that the people who are involved in the Project Risk Management have different opinions about the stated assumptions, the test shows that assumptions cannot be acceptable within the group, as opinions deviate among the workers.

## Procurement Management

- Market search is vital to save costs and find cheaper vendors.
- Contract change control helps to save money.

Based on the Cronbach's test, the author can conclude that the people who are involved in the Project Procurement Management have the same opinions, and that the assumptions are acceptable.

## Stakeholder Management

- Only board management deals with the stakeholders
- Analytical techniques help the board management to understand the direction of the market
- Expert judgment might help the board management to negotiate the criteria of contracts.

Based on the Cronbach's test, the author can conclude that the people who are involved in the Project Stakeholder Management have the same opinions, however, the assumptions deviate mostly in the 3d assumption, that's why totally, assumptions are under the question and cannot be fully accepted.

## **6 Conclusion**

In this Diploma Practice, the author has covered the theoretical background of PMBOK Guide of 5<sup>th</sup> and 6<sup>th</sup> edition. Different theoretical reviews and feedbacks were covered of how helpful those editions are and what exactly could be improved. Since the practical part was mainly focused on discussion with the higher top management (Project Managers) who reviews and controls the process from the start till the end. The project manager theory has also been covered, especially what quality are needed for project manager to run big teams, allocated tasks and control the processes effectively. As the main tool, the author used survey with the scaling method, where the needed data were gathered and processed. Additionally, the author came up with the assumptions for each Project management knowledge area in order to see how cooperative the workers think, within the same daily tasks, and whether the tools of the PMBOK Guide are helpful for every project/department. With the help of the survey, there were 8 knowledge areas covered, and 57 questions asked regarding the importance of different tools for each knowledge areas. The total number of workers who dedicated their time to answer the scaling questions were 227. Each knowledge areas consisted of different number of workers. An overall overview is that the PMBOK Guide 6<sup>th</sup> edition usage is very helpful for the whole company, most of the participants use the mentioned tools (See from Table 3 – 9). Around 80 % of all workers from all the mentioned departments use the mentioned tools.

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