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VYSOKÉ UČENÍ TECHNICKÉ V BRNĚ

FACULTY OF ELECTRICAL ENGINEERING AND COMMUNICATION
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ÚSTAV JAZYKŮ

PROJECT MANAGEMENT: METHODOLOGY AND IMPLEMENTATION
PROJEKTOVÉ ŘÍZENÍ: METODOLOGIE A IMPLEMENTACE

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Bendová, K. et al. (2012). Základy projektového řízení. Olomouc: Univerzita Palackého v Olomouci.

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Abstract

This thesis focuses on project management. It defines basic terms, principles and standards for the project and also describes individual phases of managing the project. Moreover, this thesis analyses methodologies which are used for project managing and for implementation of the projects. Furthermore, it deals with risks in project and solutions for them. The practical part focuses on the project management in practice where it examines the individual procedures and processes of the managing the individual projects in the form of questionnaire.

Key words

Project, project management, methodology, implementation

Abstrakt

Tato práce se zaměřuje na projektové řízení. Vymezuje základní pojmy a popisuje jednotlivé etapy řízení projektu. Rovněž popisuje metodologie, které se používají v projektovém řízení a pro implementaci výsledného produktu. Navíc se zabývá riziky v projektu a hledáním řešení pro daná rizika. Praktická část je zaměřená na projektové řízení v praxi, kdy formou dotazníku zkoumá jednotlivé postupy a průběh řízení jednotlivých projektů.

Klíčová slova

Projekt, projektový management, metodologie, implementace

Prohlášení

Prohlašuji, že svou bakalářskou práci na téma Projektové řízení: Metodologie a implementace jsem vypracovala samostatně pod vedením vedoucí bakalářské práce a s použitím odborné literatury a dalších informačních zdrojů, které jsou všechny citovány v práci a uvedeny v seznamu literatury na konci práce.

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Content

1. Introduction

Project management is essential and it has been needed from the very beginning of a human existence. Our ancestors had to deal with many projects in their lives, even in Ancient Egypt, when people built the huge pyramids, they had to have their work planned and managed everything, which was needed. In those days, it was not called a project management, however, the distribution of operations and activities effectively helped reach the aim. Hrazdilová-Bočková (2016) says that the project management, as it is known today, started to be a widely used method around the world in the early 60s of the 20th century, when companies found benefits in work organization and started to understand that it is required to connect business units and various professions. Project management can effectively help to improve an existing project or to create a new and unique one.

Nowadays, project management represents proven and established procedures which are based on personal and practical experience and they define activities or steps. They are called project methodologies. They can be specialized in one branch or we can use them to manage different types of projects. More types of methodologies can be distinguished. The first one is traditional and thus focuses on the process itself. The next one is referring to the agile methodology which is more simple and flexible so it is easier to react to every change in projects. The agile methodologies were developed on the base of disadvantages of traditional methodologies, nevertheless, in many cases it is better to use a traditional methodology instead. Another possibility is to combine them together.

This thesis also contains basic information to introduce a project management, explains the terms such as project, project life-cycle planning, project managing and comparison between the agile methodology and the traditional methodology, their advantages and disadvantages. Furthermore, it analyzes the project management in practice in the practical part.

2. Introduction to project management

2.1. Project management

According to Štefánek (2012), project management can be described as a set of methodologies for effective planning and implementing the projects. These methodologies are used for planning difficult actions. Project management is a set of so called best practices – methodologies and tools, which have been verified by years of experience. The procedures are not fixed so it is rather a manner of solving problems, attitude to solving problems or widely valid and settled facts.

Doležal (2007) defines project management as planning, organizing, monitoring, managing and submitting of reports on all aspects of the project. Moreover, it includes the motivation of all participants, who are trying to reach the goals of the project.

2.1.1. Principles of project management

According to Štefánek (2012), the project management is based on these principles:

The first one is a team work and the second principle is systematic attitude. It means the problems are structured. Firstly, the global aims are solved. Then the project management deals with more detailed activities. The next important part of project management is integration as well as continuous improvement.

2.2. Project management standards

There are standard organizations in the world which associate companies and project managers. One of the biggest is *Project Management Institute* (PMI). They say they are "the leading not-for-profit professional membership association for the project management profession" (Learn About PMI, n.d). Their professional resources and research "deliver value for more than 2.9 million professionals working in nearly every country in the world to enhance their careers, improve organizational success and further mature the profession." (Learn About PMI, n.d.)

The next is *International project management association* (IPMA). It is the World's first project management association. IPMA "actively promote competence in project management for individuals, project teams, businesses, organizations and government agencies around the World." (About IPMA, n.d.)

2.3. What is a project?

Project is a time-limited set of activities and processes with the aim to create something new or to change something that already exists but is not as effective as it could be (Project, n.d.). It is necessary to manage the project and this managing is characterized by the following typical features (Bendová, et. al., 2012; Project, n.d.):

- The aim – project has to have the clear aim, the outcome and benefits. As it was mentioned before, it means to have the aim to implement, create or change.
- Time – project is always somehow time-limited. It depends on the kind of project. Mostly it lasts for months, nevertheless, in some cases it can last for years. Every project has a defined start and finish dates, and it is important to reach the timeline.
- Uniqueness – every project is about unrepeatable and unique sequences of actions which need specific project management. In other words, every customer has different visions and specific goals. Companies have different business processes, areas and requirements. The difference can be also found in communication with different project teams.
- High degree of risk – it is a natural part of a project. Actions without risk are easier to implement, so in this case, it is not necessary to use project management.
- Complexity – a project is a complex activity, including many partial activities.
- Project team – a project is difficult and complex, thus a project team is required to realize it. Within the team, everyone has different tasks and responsibilities.

In accordance with project definitions from the standards and rules, it is said:

- Standard ISO 10006 (Project, n.d.): "Project is a unique process consisting of a set of coordinated and controlled activities with start and finish dates,

undertaken to achieve an objective conforming to specific requirements including constraints of time, cost and resources."

- Standard PMBOK (Project management body of knowledge, n.d.): "Project is a temporary endeavor undertaken to create unique product, service or result."
- PRINCE2 (as cited by Buehring, 2011) define a project as a temporary organization that is created for the purpose of delivering one or more business products according to an agreed business case.

Němec (2002) defines project as a process of planning and managing of difficult and extensive operations. Actually it is an entire creative process, not only oriented on the result or project documentation. Despite the fact every project is done in a unique way, they all have some specific common features. Especially it is referring to almost identical project phases which are defined in all the standards and rules in project management.

Actually the division of the project phases is the "division at the highest level". Individual phases define what kind of work should be realized at the individual level of the project development, furthermore what specific outputs should be obtained at each level (Svozilová, 2006). The project phases can be different in details but almost every project has the same five basic phases, namely (Životní cyklus projektu, n.d.):

- Initiating – that includes identification and processing of the project purpose. It also contains a decision of implementing a project purpose and its approval.
- Preparing and organization – that means establishment of the project team, determination of the project's outcome, processing the project documentation, approval of the project.
- Planning is about processing the project plan, furthermore, processing the plan for a risk management.
- Project managing contains project managing, managing of capacities, qualities, risks, finance, changes in project, moreover reporting about implementation.
- Implementing is the phase when the project is being implemented and operated.
- Closing is the phase when the project is closed.

2.4. The aim of the project

The aim is a complex result, which is really needed to be clearly defined on both sides, the customer's one and also from the point of view of the project team. If there is a problem or misunderstanding, it is necessary to discuss it with a project manager and afterwards, it is formulated by a customer conclusively and comprehensively (see Fig. 1). Every process, which is done during the project, depends on the aim, and the evaluating of the success depends on the aim, as well. (Bendová, et. al., 2012)

Defining of the aim is often much harder than it is expected, because everyone has a different vision. According to Nechvílová (2012), to define the aim correctly, the motto called *SMART(i)* has to be observed. It is the abbreviation for the subsequent instructions:

S means to be Specific, M means to be Measurable, which means to have measurable parameters, according to which it is possible to recognize whether the aim was reached or not. A means Accepted, Agreed, Assignable – the aim has to be accepted by both sides and also agreed by both sides. The aim has to be assignable to one subject with responsibility and authority for the enforcement. R stands for Realistic, Relevant – the aim is reachable with the use of resources. T is Track able, Timed, Time-bounded and I means Integrated.

This picture has been found on the Internet. It illustrates the problem with defining the aim.
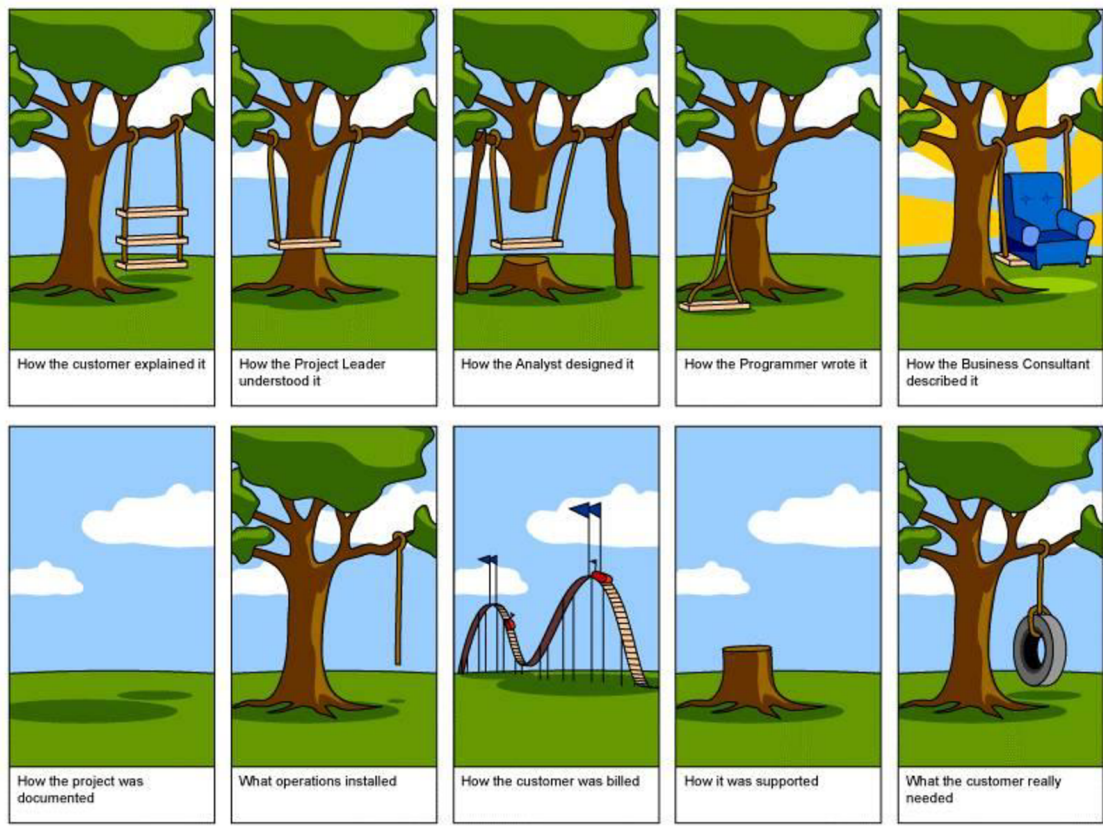

How the customer explained it | How the Project Leader understood it | How the Analyst designed it | How the Programmer wrote it | How the Business Consultant described it

How the project was documented | What operations installed | How the customer was billed | How it was supported | What the customer really needed

Figure 1: Problem of defining the aim, how the project should not work

(Cappel, 2005)

3. Specification of a project

3.1. Project plan

Project plan is "usually a document that defines how the project is planned and how the project organization should be organized, performed, monitored and controlled." (Project plan, n.d.)

It should include at least four basic questions for the project and for the project management (Project plan, n.d.).

- Why? – The reasons why the project is planned. What kind of problem should be solved using the project?
- What? – What is the aim of the project? What are the most important products and outputs of the project?
- Who? – Who will be the part of the project? What duties will these people have? For how long will they keep working on the project?
- When? – What is the timetable? What is the timeline?

3.2. Project team

Every single person who works on the project is a part of the project team. It includes the project manager, steering committee members and the people actively supporting the implementation of the project. Every member of the team is given a specific competence and responsibility. The minimal number of people in every team has to be at least 3 and then it can be called a team. The maximum should be about 7 ± 2 people. When the team is too small, there could be a problem with solving issues. In case the team is too big, the problem can occur in communication, since people tend to create smaller groups depending on their feelings, so the communication can be more difficult and much lengthy. The fact dealing with an efficient number in the project team was described by Doležal, et al. (2016). When there are more people than 7, there is a division of labor among teams of this size, to preserve benefits of personal interaction and to manage the team more efficiently. Also, the number of people in one team should be odd, because when it comes to decision making, there will always be the odd number of votes.

3.3. Project manager

Project manager is a person who is responsible for reaching goals and he/she is responsible for all the project phases. He/she assembles a project team, prepares a project plan, manages the project, controls it and he/she does a research at the end to establish whether the goals has been achieved or not. According to Šucha (2012), some important qualities has to be fulfilled, such as enthusiasm, confidence, endurance,

honesty, politeness, humility and modesty. A project manager has to perceive that his/her team believes in him/her, thus he/she has to believe in himself/herself as well.

3.4. Stakeholders

Stakeholders are subjects (organizations, people, spaces, or different projects) which are influenced by the project. It is needed to observe them continuously and evaluate the information. Nechvílová (2012) claims stakeholders can be divided into a primary and secondary group. Widely, it can be defined as (a) primary: owners of projects, investors, project team, employees, suppliers and other business partners, (b) secondary: media, public, competition, government, organizations and guilds.

There are questions that can help to obtain a right definition of the aim of the project (Bendová, et. al., 2012):

- What / who influences the aim and how?
- What / who influences the project and how?
- What / who influences implementation of the project and how?
- What / who influences the outputs of the project and how?

3.5. Triple constraint

Every project is prepared under different conditions, however, they always include a schedule, cost and scope constraints. It is represented as a triangle and called the triple constraint (see Fig. 2) (Delivering Microsoft Dynamics Solutions with Sure Step, n.d.).
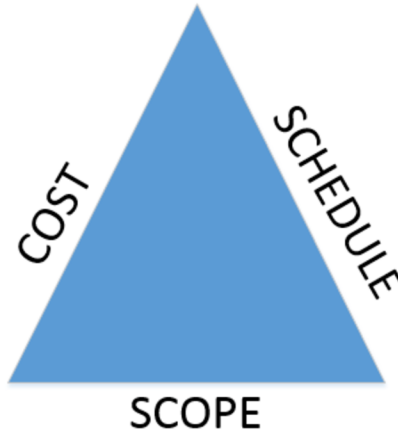

Figure 2: Triple constraint

(Adapted by author according to Delivering Microsoft Dynamics Solutions with Sure Step, n.d.)

According to Sure Step (Delivering Microsoft Dynamics Solutions with Sure Step, n.d.) "the project must be delivered a) within cost, b) on time, c) project must meet agreed scope."

It is possible to change one of the three constraints, but consequently, it results in changes of the two others.

For better understanding, when the time is reduced, it causes the increase in costs or the reduction in scope. On the other hand, when the cost is reduced, it causes the increase in time or the reduction in scope. In addition, the scope increase causes the increase in costs or time.

3.6. Project management diamond

The triple constraints can be expanded to a project management diamond with one more constraint, which is quality. At the center of the diamond there are customer's expectations (see Fig. 3). This will guarantee that every customer is unique and it is needed to give priority to their expectations (Delivering Microsoft Dynamics Solutions with Sure Step, n.d.).
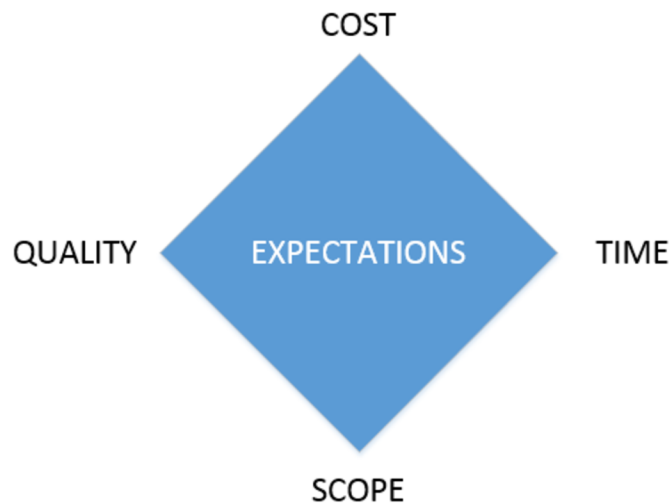

Figure 3: The project management diamond

(Adapted by author according to Delivering Microsoft Dynamics Solutions with Sure Step, n.d.)

3.7. Project life-cycle

The project is realized step by step. These steps are defined in the project plan and they allow reaching the aim. The project comes through different phases and in accordance to a project management, it is divided into groups which are interrelated and they create project life-cycle.

- According to PMBOK (Project management body of knowledge, n.d.) the project life-cycle is a "series of phases that represent the evolution of a product, from concept through delivery, maturity, and to retirement."
- PRINCE2 (n.d.) define the project life-cycle as a "the time period from the initiation of the project until the acceptation of the product."

According to Sure Step (Delivering Microsoft Dynamics Solutions with Sure Step, n.d.), it is said that in general, the lifecycle of the project determines which work should be done in which phase. Additionally, it is required to control who should work on the project in each phase, furthermore, how to control and accept results from every phase. The difference among the project phases refers to the type of the project, its size and the specialization. Generally, the basic structure of every project distinguishes the phase of *initiation*, *organization*, *implementation* and *closing* (see Fig. 4).
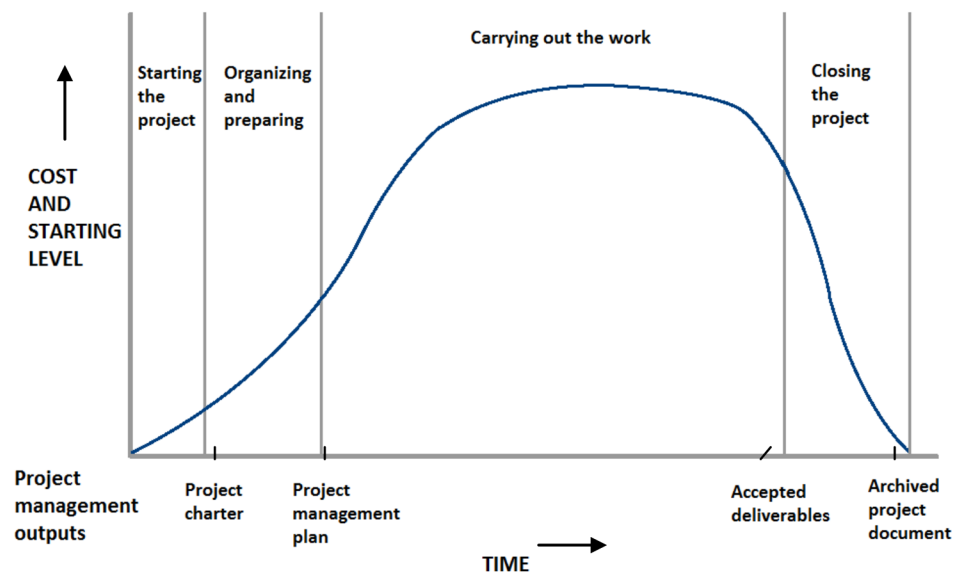

Figure 4: Lifecycle of the project

(Adapted by the author according to Project Life Cycle, n.d.)

4. Risks in project

Every project is different, but they still have something in common. Every project brings a risk, because a project manager and his/her team have to have enough information and on the other hand, the customer needs the same. The implementation of a project is connected with many decisions and many intentions from both sides.

According to Seitl (2012), the lack of information causes the uncertainty, which is different for every project. It occurs every time and therefore every project is accompanied by an unexpected situation. And this uncertainty associated with

information, phenomena and occasions, which cannot be controlled directly, is called the risk in project management.

It is important to understand, that not every uncertainty is a threat. Some of them could be a great opportunity. Seitl (2012) describes a threat as an uncertain event, which can have a negative impact on outputs of the project in spite of opportunity, which is also an uncertain event, but it can have a positive impact on the outputs. The example of the threat can be the lack of people in the project team, caused by an illness. On the other hand, the opportunity can be new people in the project team, because they can be better experienced or educated, so it can improve the quality of the project in the end.

Risk management includes following processes according to ČSN 31 000 (as cited by Doležal, et. al., 2016):

- Determination the context
- Identification of risks
- Analysis of risks
- Ratings of risks
- Treatment of risks
- Monitoring and review
- Communication and consultation

5. Methodologies

5.1. Traditional and agile methodologies

Methodologies can be divided into *traditional* and *agile* methodology.

Traditional methodologies are rather detailed, formal and they establish processes, requests and products. They presuppose everything can be clearly defined, described and repeatedly implemented. Most of these methodologies are based on the waterfall delivery of the life-cycle where all the phases are consecutive. Traditional methodologies should be used for standard and big projects. (Delivering Microsoft Dynamics Solutions with Sure Step, n.d.)

The opposite is agile methodologies. The process is not clearly described and it should be flexible and offers fast solutions. They describe principles, not processes. They are based on experience gained during the progression, when it is needed to adjust the project to an actual situation and correctly react to changes or customer's requests. It is recommended to use these methodologies for projects with not clearly defined task and for smaller project teams. (Delivering Microsoft Dynamics Solutions with Sure Step, n.d.)

The four basic values for agile methodology are described in *Manifesto for agile software development* (Manifesto for Agile Software Development, n.d.):

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

Another difference between traditional and agile methodology is in the *triple constraint*. Traditional methodologies define scope as a consistent quantity and in respect to the scope estimate cost and time which are variable. On the contrary, the time and cost are consistent for agile methodologies while the scope is variable and is adjusted to the priorities of the customer (see Fig. 5). (Delivering Microsoft Dynamics Solutions with Sure Step, n.d.).
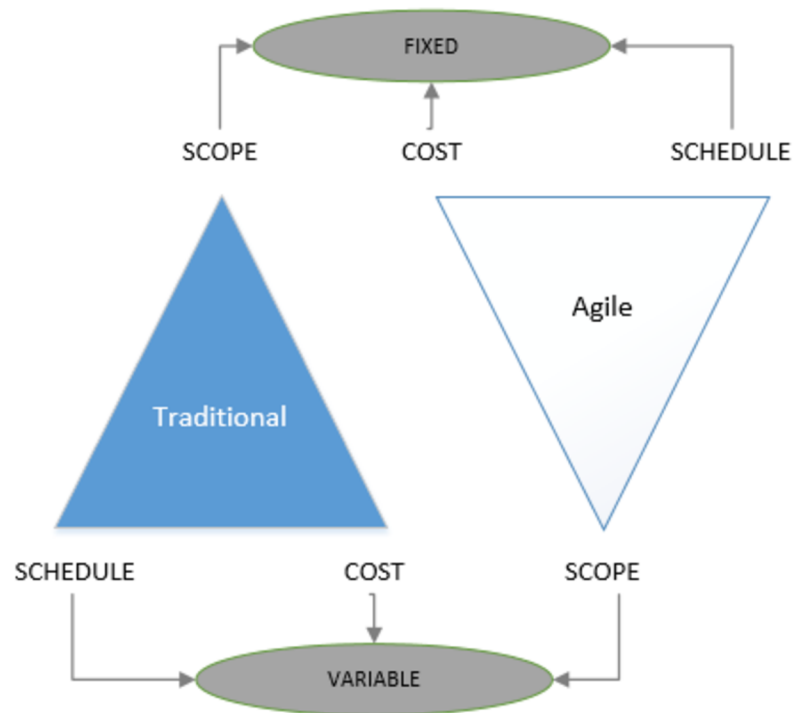
Figure 5: Comparison of traditional and agile methodologies in triple constaint

(Author)

Whether it is agile or not, the following principles are crucial (Doležal, et. al., 2016):

- Incremental supplies: Products of the project are delivered gradually in the form of partial increments. Project team is always focused only on a part of the project to minimize the amount of the work. Then they can watch a gradual increase of the finished parts of the product. Every increment should represent an independent functional unit that has an added value for the customer.

- Iterative attitude: The work on the project is divided into phases, which are characteristic with the same length. After that, project products have to be divided into such increments, which can be delivered within the stated *time-box*. A shorter period is preferred.

There are more principles which support the previous principles, or which are logically related. Project teams have to be multifunctional, because there are people with different expertise and they have to communicate together effectively. It is requested to keep in contact with the customer, because in agile methodology there are lots of changes in the project and the customer has to be familiar with them. Also, they have to

discuss these changes and other requests. Frequently at the beginning of an agile project, the definite form of the final product is not clearly defined. To successful managing of the agile project, there are mechanisms needed, providing a regular feedback between the project team and the customer, to determine new requests. (Doležal, et. al., 2016)

5.1.1. Scrum method

The most used methodic of the agile managing is *scrum.* It is a conformable method and the abbreviation comes from the word *scrumage,* which represents a game discipline where there is a whole team and together they are trying to keep or gain the ball.

Scrum uses iterations called *sprints* (see Fig. 6) with the exactly given time duration (typically two weeks, not more than one month). At the end of every sprint, a product should be made, or at least its part, which can be implemented to the customer. When the duration of some part of the development or the production is estimated for a longer time, it is necessary to divide it into more components. This procedure allows managing of risks more effectively and it also improves estimations. (Doležal, et. al., 2016)
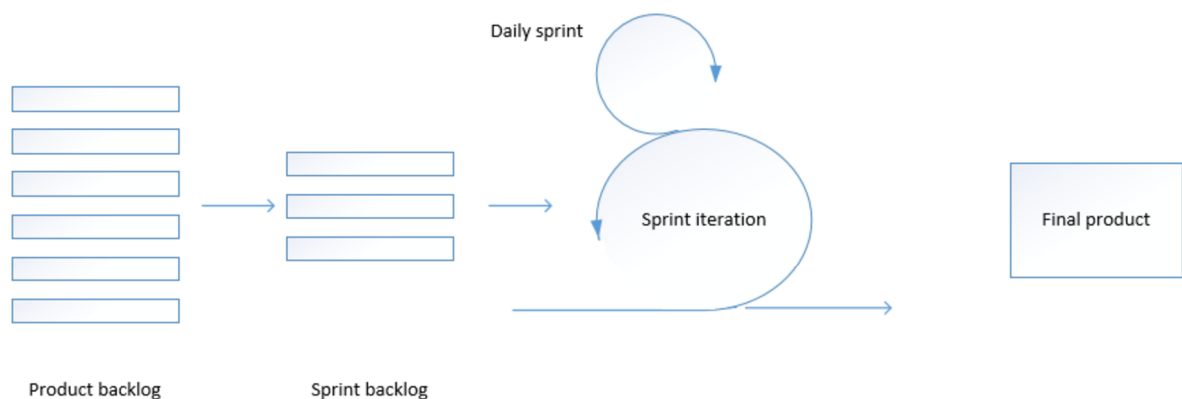

Figure 6: Schema of sprint

(Adapted by the author according to Delivering Microsoft Dynamics Solutions with Sure Step, n.d.; Doležal, et. al., 2016)

At the beginning of the project, there is a collection of requests for a final product and their ordering according to their priorities. The *product backlog* is created, and this product contains all the requests, which are needed for the project. In accordance with

the priorities or logical continuity of the production, they are sorted to *sprint backlog*, which presents a task of the following phase. During the sprint, the project team has regular meetings in order to evaluate procedures and accept necessary decisions. (Doležal, et. al., 2016)

5.2. Methodologies in different phases in the project management

5.2.1. Opportunity study

Opportunity study is, according to Štefánek (2012), implemented before the implementation of the project itself. The aim of this study is to find, identify and analyze opportunities, which could be beneficial for the organization.

5.2.2. Feasibility study / Analysis

Feasibility study is defines in Business Dictionary (BusinessDictionary, n.d.) as an "analysis and evaluation of a proposed project to determine if it (a) is technically feasible, (b) is feasible within the estimated cost, and (c) will be profitable. Feasibility studies are almost always conducted where large sums are at stake." Lacko (2007) claims the feasibility study is processed for projects with total cost over 5 million Czech crowns excluding VAT.

5.2.3. Logical framework (or LogFrame)

Logical framework can be used as an effective and useful technique to make a project more successful. This approach is described in Business Dictionary (BusinessDictionary, n.d.) by these four steps: "(a) establishing objectives, (b) establishing cause-and-effect relationships (causal linkages) among activities, inputs, outputs, and objectives, (c) identifying assumptions underlying the causal linkages, and (d) identifying objectively-verifiable measures for evaluating progress and success."

5.2.4. Work breakdown structure (or WBS)

Work breakdown structure is, according to Štefánek (2012), a hierarchical structure of work and it is used to structure and rationalize many of project activities into a clear and understandable form. It is a simple method and, furthermore, very effective. Two types of displaying the WBS are recognized, the first one is a (a) functional display, where WBS is in the form of Excel chart (see Fig. 7) and the second one is a (b) graphic display (see Fig. 8), where WBS is a kind of proposal of organizational structure according to a company.

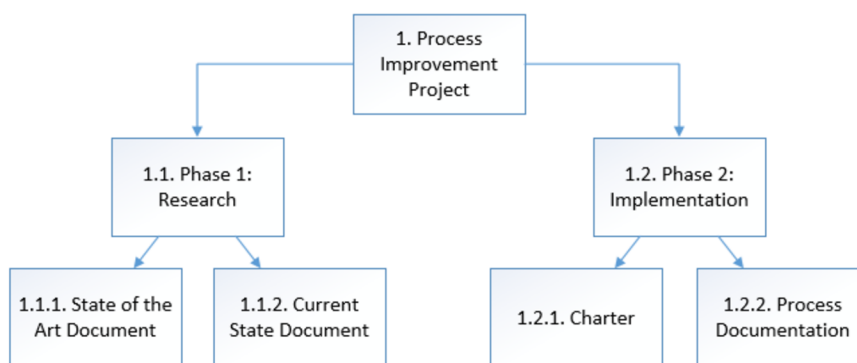
Figure 7: Functional display of WBS (Lorenc, n.d.)

Figure 8: Graphic display of WBS

(Adapted by the author according to Project Management Skills, n.d.)

Štefánek (2012) recommends using the graphical display for brainstorming a project team, where the group of smaller tasks is discussed, despite the functional display, which is suitable in situations when there is a need for summarization of all project activities.

5.2.5. Earned value management (or EVM)

Earned value management is a project management technique which monitors and measures keeping deadlines in association with its cost and scope (Basic Concepts of Earned Value Management, 2015). "Basic concept of EVM is (a) all project steps 'earn' value as work is completed, (b) the earned value (EV) can then be compared to actual costs and planned costs to determine project performance and predict future performance trends and (c) physical progress is measured in dollars, so schedule performance and cost performance can be analyzed in the same terms." (What is Earned Value Management?, n.d.)

5.2.6. SWOT Analysis

According to *Management mania* (Management Mania, n.d.), the definition of SWOT analysis is "a universal analytical technique focused on the evaluation of internal and external factors affecting the success of the organization or any other evaluated system." Also, they say that "the SWOT analysis is used in the strategic management of the organization in evaluating a strategic intention." The acronym SWOT means s*trengths*, *weaknesses*, *opportunities* and *threats*. The aim of the SWOT analysis for project manager and his team is to realize these facts, moreover, to understand the consequences.

This analysis is one of the most used analyses, because it is really universal and it is used in practice. It is also one of the basic instruments in strategic management, however, it can be used almost everywhere.

According to Poster (2006), strengths and weaknesses include all the internal environment factors of the project, e.g. people, equipment, image, reputation, financial resources, technology, etc. Among opportunities and threats are external factors, e.g. political, social and economic changes, competition, market size, market profitability, etc.

6. Post-project part

At the moment of finishing the project, the activity of the project team is not at the end. After finishing the project, everything has to be documented. The problem is the motivation of the project team, because having ended the project, nobody wants to continue working, nonetheless, it is necessary to do so. The main part of the post-project part is the evaluation of the project and archiving project documentation. Another important part after the finish of the project is to register the feedback from key stakeholders and learn from mistakes, which have been made, and try to avoid them in forthcoming projects. (Bendová, et. al., 2012)

Some of projects need to keep working on them, even though the project has already been finished. It often happens when some software is implemented. The company obtaining the new software will need a support during some period of time to acquire the product properly. Sometimes the post-project part can last for years, which in fact depends on the product, but it has to be always a part of negotiations and documentations at the beginning of the project.

7. Practical part

In the practical part I am going to do an analysis of the project management in practice in Company X. I have asked 12 project managers from Company X and 10 of them answered about their projects with the biggest budget implemented within the past three years. The questionnaire is in the paper form. The evaluation and summarization will be based on the knowledge of methodologies and tools used for the project management, their pros and cons which are described in Chapter 5.

I cannot be specific about the name of the company nor about the name of customers, according to the non-disclosure agreement (NDA), also known as a secrecy agreement (SA). It is a legal contract between at least two parties that share confidential material, knowledge or information shared for certain purpose, but who want to restrict an access to or by the third parties. In this case one party is Company X and the second one is me. Therefore the name of the company in this thesis will be X. (Non-disclosure agreement, n.d.)

7.1. Company X

Customers of the company are medium-sized and large-sized firms, local governments and public administrations, moreover small-sized commercial firms, organizations and educational institutions. There work approximately 700 employees and most of them are well experienced in their fields. They also employ young people and students to the trainee program which is a great opportunity for people who want to gain new experience during their studies and also for the company, because they can educate their own employees.

The company really has a various offer, e.g. IT infrastructure, integration and consultancy, business applications and services, outsourcing and cloud or software development.

7.1.1. Fields of business

The company has an experience in public administration, so they support the computerization and modernization of it and also the local government. Company X covers a wide geographical coverage of the market, so they can collaborate with the

local government on the projects. The field education and science is traditionally supplied by this company for more than 20 years. They supply IT products, school equipment and also school licenses. Company X offers a complex IT system for healthcare that can save the time for both the doctor and the patient. They have the know-how and knowledge for services like spas, hotels and wellness, transport or logistics or service firms etc. They provide the business IT system for wholesale and retail that can cover the specific requests of the industry and their individual needs. They offer also a specialized solution to electricity, gas, heat and water, their distribution and sale of energy, because reliability in this area is very crucial. Service industry requires especially very reliable and customer-focused information systems. This is a very brief review of fields that are covered by this company, but it is obvious that Company X has a strong position on the market.

7.2. The questionnaire

The purpose of the questionnaire is to analyze individual projects that were implemented then summarize their effectiveness, efficiency but also the failure. In the case the project was not successful I would like to suggest a possible solution to prevent the failure the next time in accordance with the known methodologies described in the theoretical part (see Chapter 5).

The questionnaire (see Attachment) consists of twelve questions, two of them are general and the rest focuses on one project with the biggest budget. Ten questions are close-ended, two questions are semi close-ended which means there are given possibilities, but the respondent can write down his/her own option. Furthermore, there is one more open-ended question that summarizes reasons of the failure in the project or in any part of the project. Projects with the biggest budget are the most important for the company, so that is the reason why I am going to analyze them.

Questions are clear and understandable. According to the fact that the respondents know the terminology I did not have to explain it additionally. However it will be explained in more details in the practical part for better understanding. The questionnaire is quite short and it takes approximately 8 minutes, thus it did not take much time for the respondents.

7.3. The results of the questionnaire

The questionnaire has been filled in by 10 project managers, which is 76.9 % of all asked respondents. Although the number of respondents is very low, it is the maximum of project managers in Company X, thus 12 project managers represent 100 %. Therefore the success rate is very high and it has a great deal of testimony.

The questionnaire will not be used commercially. The purpose of it is to determine what type of problems can occur during implementation, which phases of the project life cycle are the most problematic and why. The result should be the solution how to improve the quality of project managers and their teams according to the obtained information.

7.4. Questions

1. Which fields of business are you interested in?

Possibilities	Frequency of answers
Public administration	2
Education and science	0
Healthcare	0
Wholesale and retail	5
Electricity, gas, heat, water	1
Service industry	7
Holding companies	2
Non-profit organizations	0
Other	3

Tab 1: The field of business
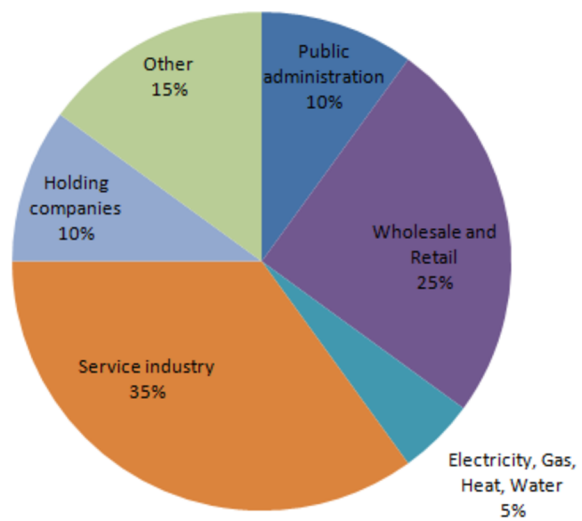
Graph 1: The field of business

This question is used to determine the field of business where the project managers are interested in. In this question the respondents could use more than one question. We can see the service industry is the most common, because 7 respondents have implemented the project with the biggest budget in this field, in the contrary to the fields that have zero respondents, e.g. education and science, healthcare or non-profit organizations. That is the reason I did not mention them in the graph.

There was the option *Other* that was selected by three project managers. Other fields were IT, repairs and construction industry. It is obvious that the spectrum of fields where projects are implemented is really wide.

2. How many projects have you implemented in the past three years?

Possibilities	Frequency of answers
1 – 2	5
3 – 4	5
5 and more	0

Tab 2: The number of implemented projects
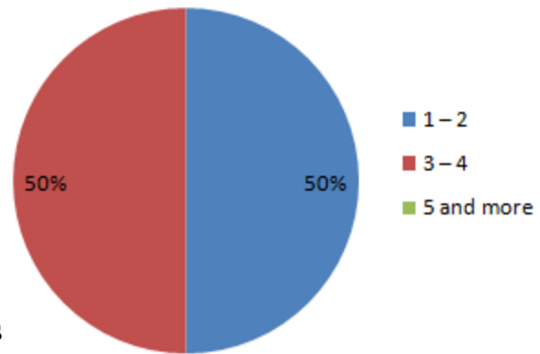
Graph 2: The number of implemented projects

The second question is also general and it is used to examine how many projects have the project managers already implemented within the past five years. None of asked managers have implemented 5 or more projects.

The more projects the manager implements, the more experience he gains. No matter whether it was a successful implementation or not, it is always a new experience and everyone should learn from the previous success or failure.

3. What was the biggest budget of the implemented project?

Possibilities	Frequency of answers
0 – 1M	1
2 – 5M	3
6 – 10M	3
11M and more	3

Tab 3: The budget of the project
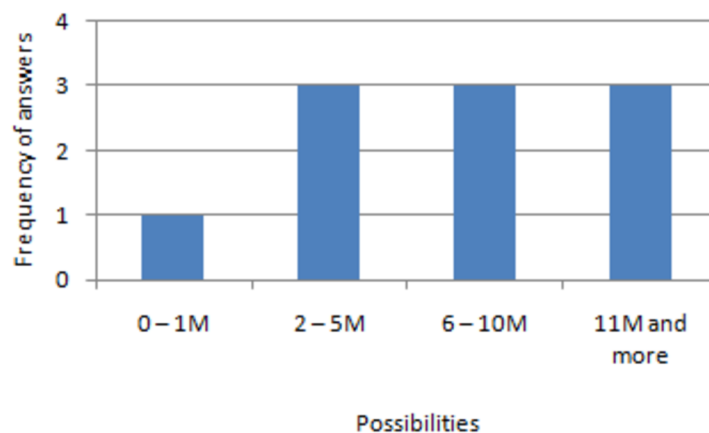
Graph 3: The budget of the project

To make an analysis more efficient and effective the best choice was to analyze the project with the biggest budget. There are many projects that are important for the company, but those with the biggest budget are mostly the most important. It is because those projects earn the most. Moreover, they keep the position of the company on the market.

I have divided the projects into categories according to their financial difficulty, which made it easier and clear for analyzing and comparison. Only in one case the budget of the project was less than 2 million. On the contrary, three of the managers answered they biggest budget was more than 11 million, which is a big difference. Not every project is successfully implemented at the end, but it is a great opportunity to do the best for both the company and the customer.

The following questions are based on the biggest budget of the project.

4. How big was the company according to the number of employees?

Possibilities	Frequency of answers
0 – 50	1
51 – 100	2
101 – 500	5
501 and more	2

Tab 4: Size of the company according to the number of employees
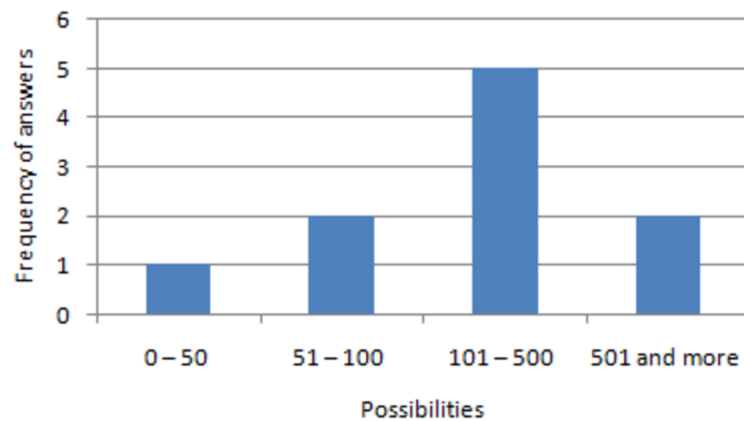
Graph 4: Size of the company according to the number of employees

The basic criteria to recognize whether the company is a large, middle or small-sized enterprise is the number of employees, the amount of annual turnover and annual balance sheet total (size of the assets). A small or middle-sized enterprise is businessman who employs fewer than 250 employees and his annual turnover is fewer than 50 million EUR or his annual balance sheet total is lower than 43 million EUR. Small enterprise is a kind of business that employs fewer than 50 employees and their annual turnover or annual balance sheet total do not exceed 10 million EUR. (Definice malého a středního podnikatele, n.d.)

Five project managers which mean 50 % of all respondents stated the company had 101-500 employees which is the border between the small and middle-sized enterprise. Two project managers have implemented the projects in the company that had 600 employees or more. It is not the rule that a bigger company needs a higher budget.

5. How many members were in the project team?

Possibilities	Frequency of answers
1 – 3	1
4 – 6	5
7 – 10	3
11 and more	1

Tab 5: Size of the project team
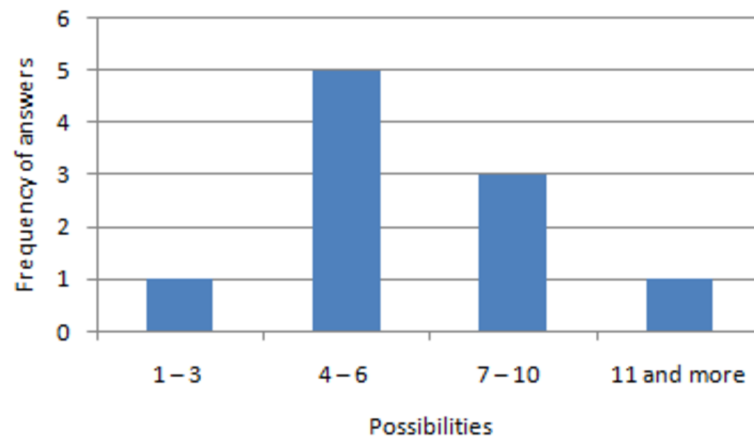

Graph 5: Size of the project team

I have already described what the project team is and who the members of the team are in Chapter 3.2, however, I will briefly summarize it. The project team includes people who work on the project, e.g. project manager, steering committee members, people who support the implementation, etc. The minimum of people in every team has to be at least 3 and then it can be called the team. The maximum should be about 7 ± 2 people, but in some cases more members are needed. It depends on the difficulty of the project and requests from the customer.

50 % of the respondents answered their team had 4-6 members, which is probably the best option. As the number of people in the team should be odd, this choice is very suitable for better decision making and especially voting. Only in one case the project manager chose an option 11 and more. Taking into account the budget of this project was 11 million or more, we can consider the need of more members makes sense. Nevertheless, it is not the rule to establish a bigger team for bigger projects, it is absolutely individual.

6. Which methodology for project management did you use?

Possibilities	Frequency of answers
PRINCE2	6
Microsoft Dynamics Sure Step	6
Other	0

Tab 6: Used methodology
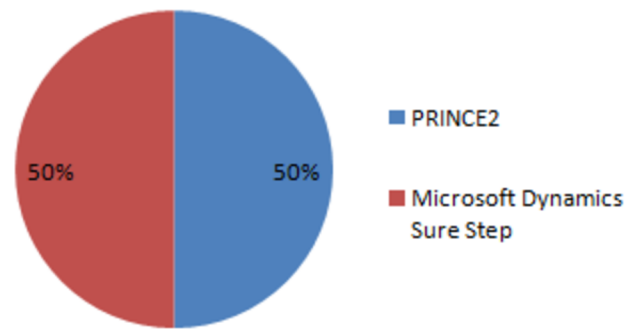
Graph 6: Used methodology

The possibilities of used methodologies were limited because the company uses only these two methodologies, or their combination, so the respondents were allowed to choose both these options. There was also an option *Other*, but none of the respondents has filled this option.

The basic principles of both methodologies are described in the theoretical part. To briefly summarize them, Projects in a controlled environment (=PRINCE2) is the method of process management from Great Britain. The basic principle of PRINCE2 is the fact that every project has its own commercial use. It means it is used for project management of commercial projects in business field. It clearly defines organizational structure for the project team and responsibilities for customers and suppliers within the project organization. PRINCE2 is more result-oriented that process-oriented. (Gřešák, 2007)

Microsoft Dynamics Sure Step (=Sure Step) provides a detailed guidance for the complete implementation of the life cycle. It also uses the best practices of the project management from other methodologies, e.g. Project management body of knowledge (PMBOK), Scrum, etc. Sure Step is a comprehensive implementation methodology that provides project management strategies, tools and templates that Microsoft partners can use to implement Microsoft Dynamics products for their customers (Delivering Microsoft Dynamics Solutions with Sure Step, n.d.). Both these methodologies are agile methodologies, it means they enable quick software development and they can react to all changes during the development cycle.

7. What was the planned implementation time?

Possibilities	Frequency of answers
0 – 1Y	3
2 – 3Y	6
4 – 5Y	1
6Y and more	0

Tab 7: Planned implementation time
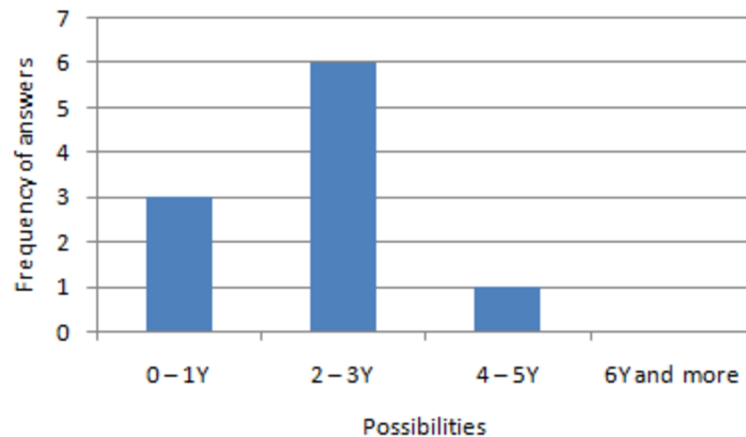
Graph 7: Planned implementation time

Time schedule of the project is created according to the basis of a qualified estimation of time that the project team will need for implementation of all project tasks. Time units depend on the project, it can be days, months or years.

In many cases the time boundary is determined by the supplier and then it becomes the basic standpoint for the project team. Then the process has to be done vice versa, which means the project team has to estimate the number of tasks that are possible to process within a given time boundary.

There are some useful tips that can be used for the creation of the time schedule of the project. A project should be divided into short time intervals, thus it is easier to control every step. A project team has to take into consideration all possible complications and they should be prepared to quickly react to these problems. The project manager should consider the acknowledgement and experiences of all the members in the project team.

Planned time of the project covers all phases of the project life cycle including the post-project phase. It means the project team provides support for the customer even after the implementation. All phases are described in Chapter 3.7. We can see the most common answer is the range 2-3 years. Six respondents (60 %) have chosen this option. None of the project managers did the implementation for 6 years or more.

8. Was the time schedule for the analysis phase maintained?

Possibilities	Frequency of answers
Yes	6
No	4

Tab 8: Time schedule for the analysis phase
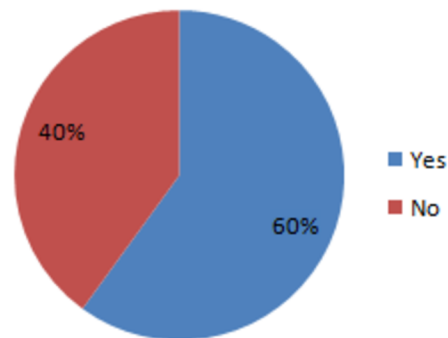
Graph 8: Time schedule for the analysis phase

Firstly it is needed to explain what exactly the analysis phase means. It is a necessary and very important phase of the project life cycle. In this phase the project is being prepared, which means both the customer and the supplier have to establish the project team, set the outputs of the project and process the project documentation.

It is obvious it takes a long time, but it is important to be in time and properly communicate with the customer. The reason is very simple, namely it is the first task after the initiation phase, where the project intention is just identified and processed. In the initiation phase everything is just estimated (price, time, etc.) and after the analysis phase these goals are clearly defined. Therefore it is necessary to properly define the aim and make an agreement on milestones (both time and cost) of the project.

Unfortunately we can see in four cases the analysis phase was out of time. It is needed to be aware, that it does not have to mean the project will not continue, but it is very important to keep the communication with the customer. As I mentioned in Chapter 4, the risk management deals with all possible risks that can occur during the project.

9. Was the analysis phase accepted by the customer?

Possibilities	Frequency of answers
Yes	5
Yes with a comment	3
No	2

Tab 9: Was the analysis phase accepted?
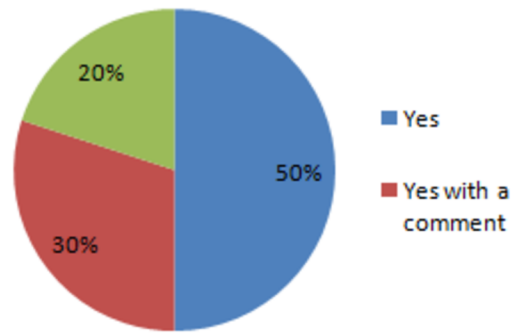
Graph 9: Was the analysis phase accepted?

There occurs the option *Yes with a comment* which means that the phase was accepted by the customer, but he/she has some shortcomings, that were incorporated into the contract and the supplier has to solve them later. It enables to continue with the work on the project to the next phase, so the time milestones can be accomplished.

Unfortunately, two of the project managers had to interrupt the project, because the customers did not accept the analysis phase and the project could not continue. The first of them stated that the reason had been a significant increase of the project budget based on the detailed analysis, so the customer did not accept the analysis phase. The customer could not afford to spend so much money on the implementation so there was no other possibility to keep this customer. From my point of view, the problem occurred when the price was estimated. As I stated in Chapter 2.4 the motto called *SMART(i)* should be respected. R means to be realistic, so the project manager should have already noticed in the initiation phase that it is not possible to accomplish customer's requirements and implement the project with the customer's budget. It would save money and time for both sides.

The second manager stated, the problem had been that scope and time milestones were not determined properly. Moreover, the customer has changed the project team many times. It is then very difficult to properly communicate with the customer. Furthermore, as being described in Chapter 2.4 the problem of defining the aim, that was confirmed in practice that it is necessary to be absolutely specific about the expectation and possibilities on both sides.

10. Was the time schedule for the implementation phase maintained?

Possibilities	Frequency of answers
Yes	6
No	4

Tab 10: Time schedule for the implementation phase
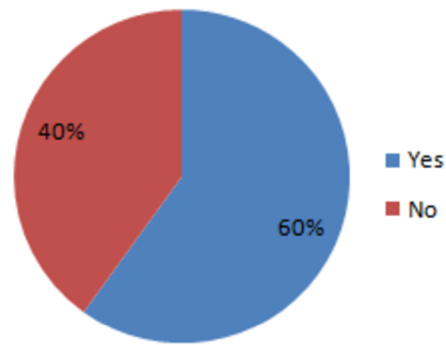
Graph 10: Time schedule for the implementation phase

It has to be explained what the implementation phase means. Due to the fact Company X is an IT company, it can be explained on the situation when *Information system* (IS) is implemented. In this phase the software (SW) is practically implemented. In the case the hardware (HW) is needed as well, it is also implemented. It is the phase where all the expectation becomes to the reality and customer can see the result of used SW and HW. One of the most problematic parts is the data migration from the previous IS, because the data can be wrong, they can be included in more versions or the IS does not include them at all, which means the advantages of the new IS cannot be fully used until the company does not collect all the data. The basic feature of this phase is to create a test version and educate the customer and his employees to use the system correctly to fulfill their expectations.

When there is a problem with the time milestones, it is better to divide the work into smaller subtasks to be able to be on time at least in the most important parts.

Two projects had been interrupted in the previous phase. It means they did not continue, but 60 % of all projects were maintained on time.

11. Was the implementation phase successfully completed?

Possibilities	Frequency of answers
Yes	4
Yes with a comment	4
No	2

Tab 11: The implementation phase
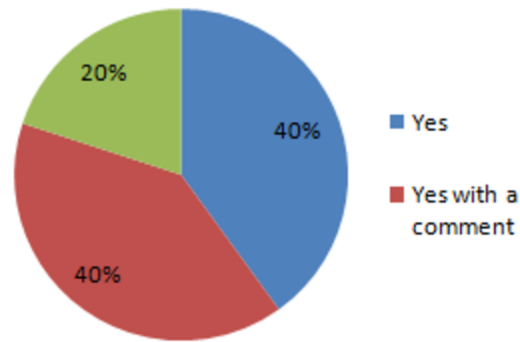
Graph 11: The implementation phase

Successful implementation in the case of delivering a new IS means the company or its department can start to use the new information system and new process settings. This applies to all employees and in this part it is very important to provide additional training for all users of new IS. Sometimes there can occur previously unrecovered errors. It can be the problem of the IS itself or the problem of the customer's order in the practice. When this happens, it is needed to fix these errors.

Only two projects had not been successfully implemented, because they had to be interrupted in the previous phase. Four project managers have chosen an option *Yes with a comment*, it means the projects were successfully implemented, but the customer had some inadequacies that were actually not reasons to stop the implementation. It means these inadequacies were incorporated to the contract as well as after the analysis phase.

The rest of projects were successfully finished. It means 40 % were finished without the inadequacies, even though not all of them were maintained on time. It is the result of the hard work of both project teams and communication between them.

12. Was the customer transferred to the support mode after finishing the implementation?

Possibilities	Frequency of answers
Yes	7
No	3

Tab 12: Support mode
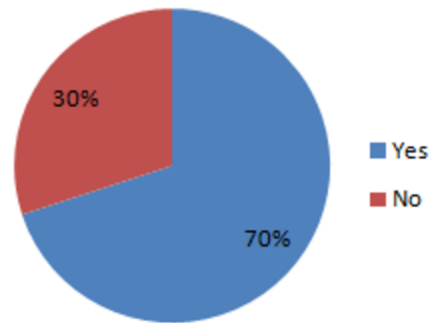
Graph 12: Support mode

After the successful implementation it is important to evaluate the project, archive the project documentation, moreover, register the feedback from key stakeholders and especially to learn from previous mistakes or to remember what was helpful during the work on the project.

In many cases the project continues even if the implementation phase was successfully finished. The reason is that the customer needs support or development work for some time period to learn properly with the product and to be able to take advantages of all the product options. In the case the time milestones are very short, the work on the project can be divided into "nice to have" or "must have" orders. It is obvious that "must have" orders have to be finished during the implementation phase, in the contrary to "nice to have orders" that can be done in the support mode as a part of development work on the project.

The supplier can offer a "support mode" in various manners, but the most common is the helpdesk which is a service that offers a help for the customers, even for the employees. It is a place where the user can report an error or put a request to resolve any problem.

It is always the part of negotiations and documentations at the beginning of every project, whether the customer wants the support mode or not. Furthermore, for how long the support mode will be provided and how much it will cost. In the questionnaire, three project managers said their customers had not been transferred to the support mode.

One of them noticed a reason in the last open question. He wrote that the customer was not willing to accept the support agreement, so they have decided to provide support and development work on the basis of individual orders of partial tasks. From my point of view, it was a good decision, because the company can retain a client, additionally the customer has an opportunity to order individual tasks.

13. What were the reasons for failure of the project or the sub-sections of the project?

The very last question is the only one that is an open-ended question. I have asked respondents to write down reasons why the project or any sub-sections have failed. Four of them wrote me the feedback so I analyzed their answers and tried to find possible solution to prevent these failures in the future. I am glad they have spent their time by explaining the failure, because it was really helpful. Every reason of the failure is described exactly in the question where the problem occurred (see Chapter 7.4). This makes the reason more understandable in the context.

Nevertheless, the most common problems in the project management are:

- Change of important people in one of the team (customer's or supplier's)
- Change of the whole project team
- Insufficient communication between project teams (customer's or supplier's)
- Non-compliance of the milestones (cost, time)
- Inaccurately defined aim
- The quality of the resulting product
- Wrong or insufficient use of project methodologies

Nowadays the communication between people is more and more problematic, so it is very important to establish the project team from experienced people in senior positions, who are able to communicate properly, moreover who are able to solve all the problems occurring during the implementation of the project. It is important to study not only project methodologies, but also to be able to use so-called common sense.

To successfully implement the project it is needed to keep the key factors described by the triple constraint (see Chapter 3.5), it means to achieve the given aim, keep the budget and keep the time boundary.

8. Conclusion

The aim of this thesis was to summarize the basic information about the project management. It offers the information about a project itself and explains what the project is, including its basic standards. Moreover, there is information about everything that is important to know before starting to manage the project, distribution of project phases, as well as the summary of tasks which have to be completed in every phase. Also, it includes information about techniques and methodologies, which can improve the project management, after that it describes risk management and how to deal with risks and opportunities in a project. The thesis also informs about the unavoidable part of a successful project management, which is communication, a fixed position of a project manager and a professional as well as keen project team.

The practical part deals with the analysis of the project management in practice in Company X. The analysis is realized in the form of a questionnaire survey. The result of the questionnaire is that 8 projects, which means 80 %, have been successfully implemented. The individual questions are then analyzed and briefly described. There is always an explanation to the terminology and summarization of the obtained result.

Unfortunately, commercial companies like Company X do not spend their time on the analysis after finishing the project. It is because this part of the post-project phase is not obligatory, furthermore, they are mostly not paid for this. From my point of view this is one of the biggest problems. This thesis should reveal that it is very important to do an analysis after finishing each project. The most problematic part of the project management itself is human resources. The team should recapitulate any misconduct. Every person of the team should be aware of the problems as well as of the success. It should be done the same way with a customer. A project manager should visit the customer and receive his/her feedback and subsequently record what the most problematic and positive aspect was. There are many tools that can be used, e.g. SWOT analysis, as it is described in Chapter 5.2.6. This analysis is used in the analysis phase, but it reveals all strengths, weaknesses, opportunities and threats. Furthermore, the comparison with the SWOT analysis from the analysis phase can be done, so the project team can see whether their expectations have been fulfilled or not and they can discuss why.

Regrettably, the "one-size-fits-all" solution does not exist. It means there exist many recommended solutions to every situation, but it is highly individual. There is a brief review of possible ways of successful implementation. It is necessary to respect the triple constraint, it means the scope of the project has to be clearly defined at the beginning of the project, because even small changes can accumulate and cause the substantial change in the overall volume of the work. It is needed to ensure that all team members understand priorities, so it is recommended to control the work of every person regularly. Furthermore, from the very beginning of the project, it is needed to set the actual completion dates in order to make the predictions accurate. Meeting deadlines and maintaining project development according to the timetable and budget plan requires the commitment of all stakeholders. This means that the representatives of the customer, the management and the project team must always express their opinion on the expected completion dates in order to ensure their mutual agreement and support from every point of view.

Last but not least it is necessary to follow the project methodologies, so it is crucial to educate members of the project team with the given methodology according to the type of the project. In conclusion it is essential to be aware of the importance of the risk management described in Chapter 4.

We can see the project management is very difficult, so it is recommended to use the knowledge obtained from the project methodologies. It means not to neglect any phase of the project life cycle, to process necessary analyzes, communicate with the customer and with the project team and to clearly define the aim, expectation and possibilities of both the costumer and the supplier.

To sum it up I would like to use one old familiar phrase: Time is money and effective management of time is the basis of the success (as cited by Bendová, et. al., 2012).

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List of pictures

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Attachment

The questionnaire

Dear Sir or Madam,

I would like to ask you to fill in the short questionnaire. It will be used to determine your opinions to managing of the projects for the last 3 years.

The results of the questionnaire will be included in my Bachelor thesis, which is focused on different approaches in project management. The questionnaire will not be used commercially.

Filling in the questionnaire will take you approximately 8 minutes. The questionnaire is anonymous.

---

1. Which fields of business are you interested in?

☐　　Public administration

☐　　Education and science

☐　　Healthcare

☐　　Wholesale and retail

☐　　Electricity, gas, heat, water

☐　　Service industry

☐　　Holding companies

☐　　Non-profit organizations

☐　　Other, please specify:

_____

---

2. How many projects have you implemented in the past five years?

☐　　1 – 2

☐　　3 – 4

☐　　5 and more

3. **What was the budget of the biggest implemented project?**

(unit – million [M])

☐   0 – 1M

☐   2 – 5M

☐   6 – 10M

☐   11M and more

---

4. **How big was the company according to the number of employees?**

☐   0 – 50

☐   51 – 100

☐   101 – 500

☐   600 and more

---

5. **How many members were in the project team?**

☐   1 – 3

☐   4 – 6

☐   7 – 10

☐   11 and more

---

6. **Which methodology for project management did you use?**

☐   PRINCE2

☐   Microsoft Dynamics Sure Step

☐   Other, please specify:

_____

7. What was the planned implementation time?

(unit – year [Y])

☐　　0 – 1Y

☐　　2 – 3Y

☐　　4 – 5Y

☐　　6Y and more

---

8. Was the time schedule for the analysis phase maintained?

☐　　Yes

☐　　No

---

9. Was the analysis phase accepted by the customer?

☐　　Yes

☐　　Yes with a comment

☐　　No

10.　Was the time schedule for the implementation phase maintained?

☐　　Yes

☐　　No

---

11. Was the implementation phase successfully completed?

☐　　Yes

☐　　Yes with a comment

☐　　No

12. Was the customer transferred to the support mode after finishing the implementation?

☐　　Yes

☐　　No

___

13. What were the reasons for failure of the project or the sub-sections of the project?

Write the reasons of the failure here.

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Thank you for filling out the questionnaire!

Barbora Bělašková